

27th Feb 2023



IPCSA

International Port
Community Systems
Association



NETWORK
OF TRUSTED NETWORKS

Connecting and
sharing data globally
between ports and
cross border

PROTECT

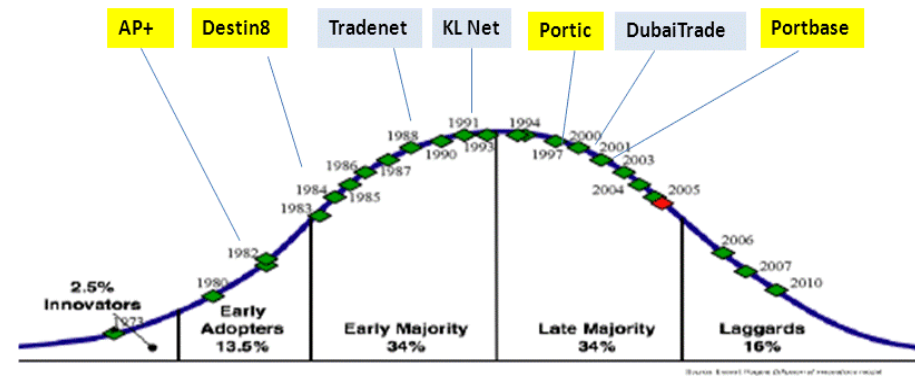
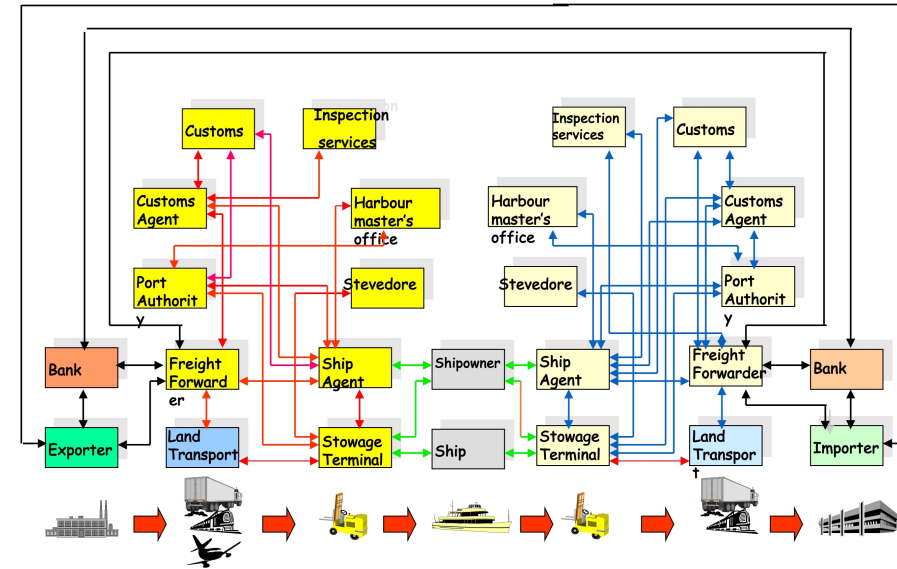
Javier Gallardo
Chairman, IPCSA

Agenda

1. **Port Community System (PCS)**
2. IPCSA
3. Creating Community / Change Management
4. Governance / Legal Framework /
5. PCS Services
6. Technology

1. Port Community System (PCS)

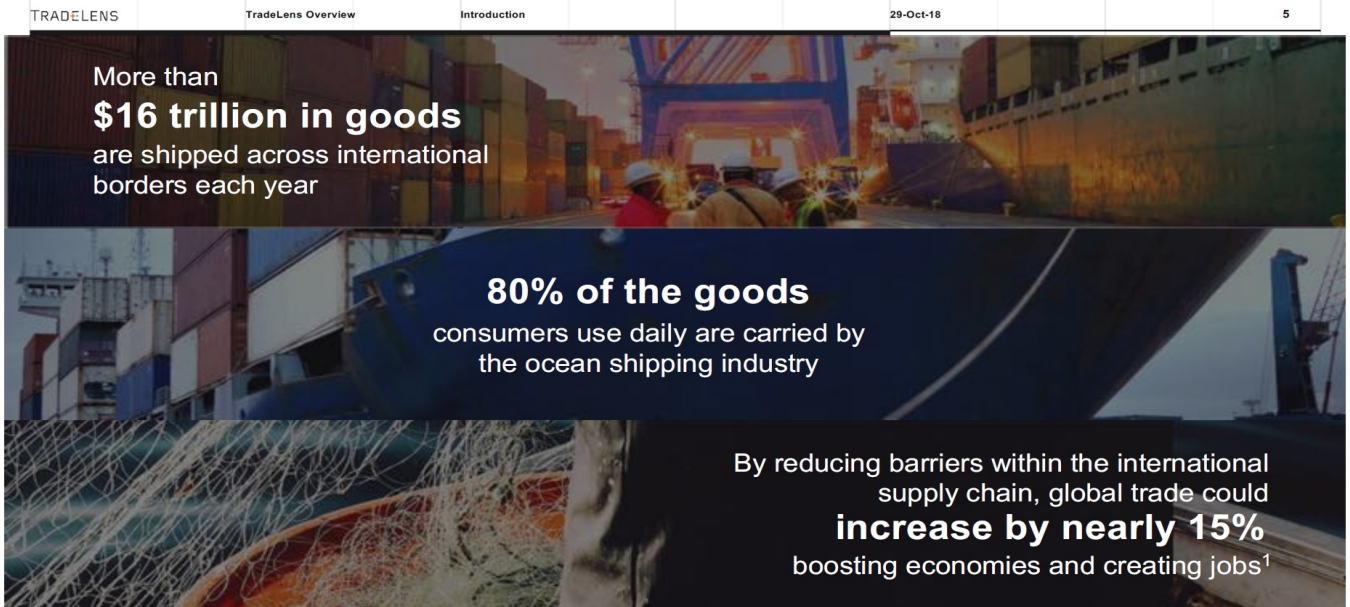
- The optimization of data information flow in the logistic trade is challenging.
- PCS came as a solution to improve the efficiency and the visibility of the logistics operations at port areas



Source: Forrester Research, Division of Forrester Research

1. Port Community System (PCS)

- The direct and indirect impact of the PCS on the economy are massive.
 - Economic Savings
 - Increment in commercial activities.
 - Reduction CO2
- Digitalisation generates added value
 - Transparency & reliability with customers
 - Reputation towards customers



DIGITALISATION INCREASES PRODUCTIVITY

Direct annual savings of €450 million per year for the Port Community.

“63% of these savings comes from the telematization of documentary processes.

This has led to an increase in employment estimated at 2,564 jobs, which represents 16% of the direct employment of the Port.

it has led to a **reduction in polluting emissions estimated at 781.7 tons** and a reduction in the **carbon footprint of 38,629 tons of CO2 eq**, savings that represent 13% and 12% of the total emissions emitted by the Port’s activity.

While the investment in digitalisation was €52.6 M on average, the direct annual savings derived from digitalisation was €450 M

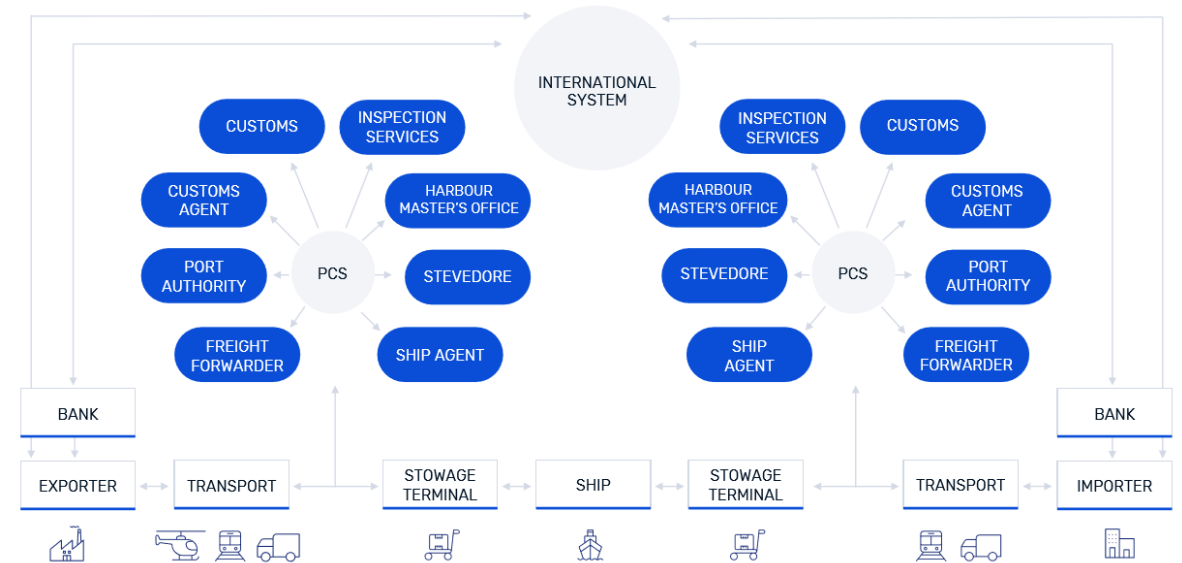


1. Port Community System (PCS)

“Neutral and open electronic platform enabling intelligent and secure exchange of information between public and private stakeholders in order to improve the competitive position of the sea and air ports’ communities.

It optimises, manages and automates port and logistics efficient processes through a single submission of data and connecting transport and logistics chains.”

(quote from IPCSA)



1. Port Community System (PCS) - Benefits

VALUE CREATION

it provides greater reliability, more efficiency and total transparency and traceability of the goods throughout the port logistics chain.

JUST IN TIME

Information according to business needs, in real time, correctly (without errors) and accurate

COMPETITIVENESS

It allows generating indicators and measuring the quality of the service, allowing to improve the positioning and competitiveness of the port system.

NEUTRALITY AND SECURITY

It provides greater security and confidentiality to the Port Community

STANDARDIZATION AND OPTIMIZATION

From the logistic-port processes, it homogenizes the procedures while simplifying the procedures.

REDUCTION OF TIME AND COSTS

Reduction of times in sending and receiving data, reduction of processing times and decision making with higher quality and faster. Cost reduction in the administration and management of cargo circulation.

RESILIENCE

It must respond in an agile and flexible way to the demands of a market that is increasingly demanding information and quality.

“Benefits of a PCS”

Reduction of Container Dwell Times



PPL 33-35, Odessa, Ukraine – 2 years from 40 days to maximum 1 hour, in many cases under a minute to be available for collection



PORTNET, Morocco – Reduction to 2-3 days in dwell time from over 30. PCS linked to Single Window



SEGUBE, Togo, West Africa – Reduction of 30+days to 3 days in two years – PCS connected to Single Window

Agenda

1. Port Community System (PCS)
2. **IPCSA**
3. Creating Community / Change Management
4. Governance / Legal Framework /
5. PCS Services
6. Technology

2. IPCSA

International Port Community System Association (IPCSA)

- **Founded in 2011**
- **PCS / SW Operator (Sea / Air)/ Ports Authorities.**

IPCSA Mission

Our mission:

“To act in the common interest of **IPCSA members to influence public policy at the international level**, in order to **promote the electronic exchange of information to enable seamless and efficient trade logistics processes**. This will be achieved through lobbying, practical initiatives and projects, as well as engagement with the global, regional and national logistics communities and relevant public bodies.”

IPCSA Objectives

In order to achieve its mission, IPCSA has agreed the following objectives:

- 1.To ensure that the importance of Port Community System Operators (PCSO), Single Window Operators (SWO) and Sea and Air Port Authorities are recognised internationally relating to the electronic exchange of information and that the sector is consulted substantively on any measure likely to affect them;
- 2.To **promote the highest possible use of standards** within PCSOs, SWOs and Sea and Air Port Authorities and the use of international standards;
- 3.To encourage all IPCSA members to be proactive in PCS, SW, and sea port and airport development specifically related to the electronic exchange of data;
- 4.To **support and promote international, regional and national trade facilitation measures** and the integration of PCS, SW and Sea and Air Port Authorities into such measures;
- 5.To **promote international collaboration for more effective cross-border and port-to-port exchange of data, processes and supply chain visibility.**

2. IPCSA

“A Community of Communities”

Collaboration – Collaboration is as much about people as it is about technology.

Standards & technology

Globally Networked Platforms



50 Members
operating in over 50
Countries



Members Operating in
excess of 500 Sea Air
Ports, Inland terminals
& border crossings



Seaports, Airports,
PCS Operators,
Single Window
Operators

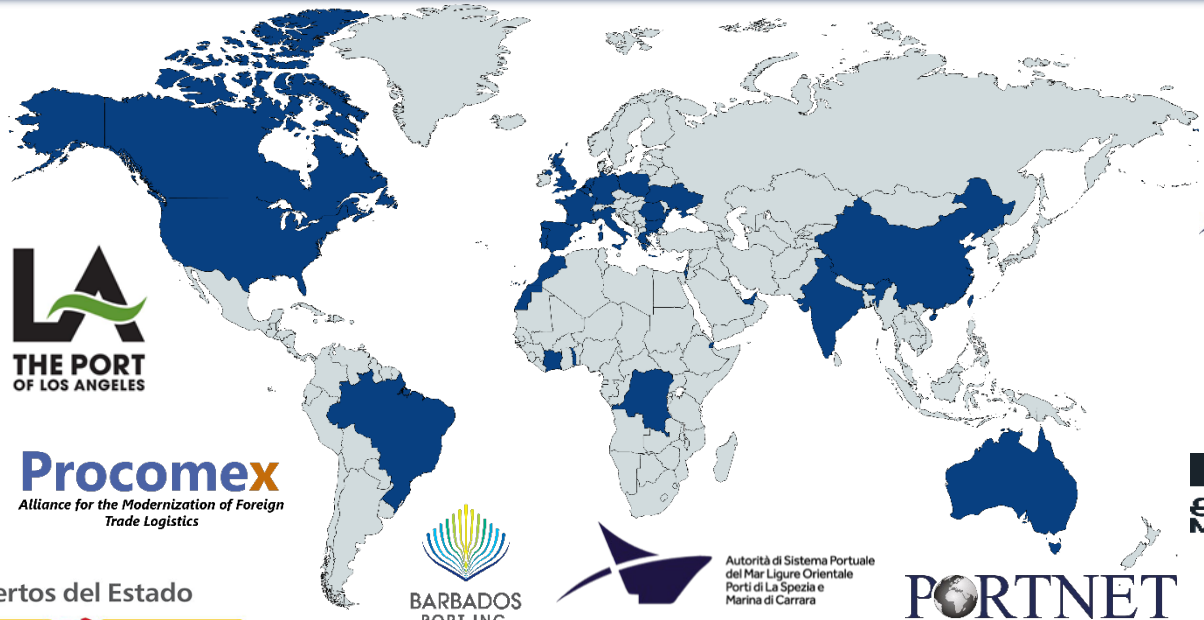


Over 50bn electronic
exchanges per
annum and 1.5m+
users



Covering
500m + TEUS
20bn + Tonnes of
cargo

IPCSA MEMBERS 2022



IPCSA Representation, Collaborations and working relationships



Global & Regional Trade Associations and Organisations





NETWORK

OF TRUSTED NETWORKS

Connecting and sharing data globally between ports and cross border

Pilot Phase until Mid 2023

IPCSA's unique governance platform to support in the exchange of information cross border by creating mechanisms for contractual arrangements between all parties – it is not a Data Platform

“Facilitate a neutral, global, scalable and collaborative solution among PCS and Single Windows based initially on Track & Trace APIs, facilitated by IPCSA. To share and exchange data Port to Port and Cross Border and to simplify the associated administrative and technical solutions”



Principles



Governance Platform



Global Data Standards



Electronic Fee Negotiation



Encrypted Data



Allows for different business models



Low cost to Platforms and thus end users



Neutral & Not for Profit



Structured Contractual Flows



Digital Handshake



User Services & Platform Maintenance



Standard Platform APIs



Local Authentication

Initial API Catalogue



Portcall



Cargo Status



BIC Code



UN Locode



ISPS Code

Coverage



17 Countries



Over 50 Seaports



10 Airports

To come.....More APIs including Air Cargo data and Participants

<https://notn.ipcsa.international>



Dashboard

Choose your role

- Data user
- Data provider
- Asset owner
- My Organization
- Billing

Portcalls Info • Live

[Console](#) > [Subscriptions](#) > Portcalls Info • Live

SUBSCRIPTION

DATA

USAGE

NOTIFICATIONS

Date	Status
5 ene 2021, 17:20	Active

Data provider

Name	NxtEntityId	EORI	DUNS	VAT
Port of Antwerp-Bruges	NXT19000000894	BE0248399380	370859360	BE 0248399380

Fees

Fee description	Transaction (NxtPort)	Data (Port of Antwerp-Bruges)	Total
Charged per successful request	€ 0,04	€ 0	€ 0,04
Renewal of handshake	month(s)		

Current Participants Status



Fully Implemented looking to share data with Port of Antwerp-Brugges



Under implementation, delayed due to current crisis in Ukraine



Fully Implemented looking



Under implementation



Fully Implemented
Implementation ongoing and will look to Port of Antwerp-Brugges and Portnet for first exchanges. Linked to Belt & Road initiative



Under implementation



Under implementation



Fully Implemented and incorporated into the Trade Single Window in Morocco



Under implementation with a focus on Airports



Port of Antwerp Bruges

Fully Implemented

DUETs – Data driven Ukraine EU Transport solution – An initiative to support export and import of goods between Ukraine and the EU, currently under development with NoTN being the core to the data exchange

Aruba – Currently under discussions with Aruba Airport, ICAO and other parties as to the digitalisation of Aruba airport and the use of NoTN for cross border exchanges on information.

“Some Activities”



IPCSA Global
PCS Study

Global Contributors - “The PCS Global Study is focus on the practical development of Port Community Systems (PCS) in Maritime Ports”
- **The HOW To not the THEORY**

Agenda

1. Port Community System (PCS)
2. IPCSA
3. **Creating Community / Change Management**
4. Governance / Legal Framework /
5. PCS Services
6. Technology

3. Creating Community / Change Management

what is a Port Community System ?

“A Port Community System is not an IT project, but a change management project.”

PCS Project are “long distance” requires leadership, commitment and community



Key: Risk Management/Mitigation Plan

Project factors

- Deadline
- **Service scope**
- Technical specifications
- Governmental supervision

Organizational factors

- Support from stakeholders/SLA compliance.
- Support from OGA /SLA compliance.
- **PCS operator governance.**
- Alignment among project partners.

Technological factors

- **Interfaces with main stakeholders**
- Partner's experience with proposed architecture
- Development team experience and skills

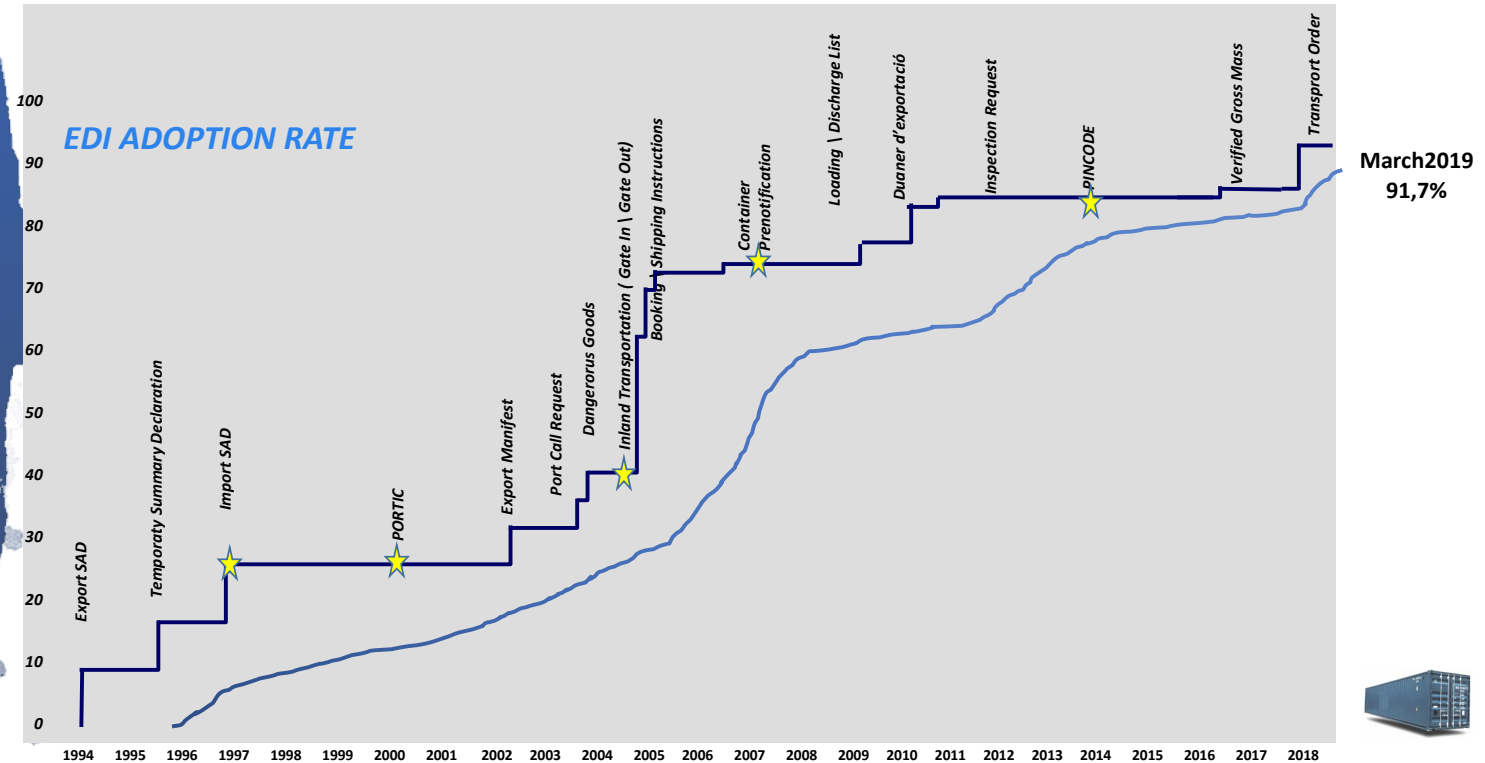
Port Community/Market factors

- Solution design acceptance
- Go-Live
- **Port Community adoption**
- Change Management

3. Creating Community / Change Management

To Achieve a high level of adoption takes a lot of time.

- Soft Measures
 - Promotion/Training / Assistance
 - Aligned with Governmental Project
 - Work with Standards
 - Discounts
 - Reuse what it is in place
 - Incremental Approach
- Hard Measure
 - Penalties
 - Mandatorily Use



PORTIC PCS main milestones



3. Creating Community / Change Management

- ◆ Legal and Regulatory Framework
- ◆ Inter-Operability with Customs Management Systems
- ◆ Modernization and simplification of process (mobility)
- ◆ Connectivity to / Compatibility with:
 - ✓ Terminal Operating Systems
 - ✓ All Critical Stakeholders (customs Brokers/ship agents/freight forwarders/truckers)



3. Creating Community / Change Management

FOCUS ON STANDARDS

SUMMARY OF IPCSA INVOLVEMENT

- Member of the **IMO** Expert Group on Data Harmonisation
- Member of EU Expert group on European Maritime Single Environment
- ICC Digital Standards Initiative Industry Advisory Board member
- Most IPCSA members are experts at **UNCEFACT**
- Supporting the work of ICAO and UNECE on interoperability standards
- Member of WCO Data Model Working Group
- Member of the WCO Private Sector Working Group
- Liaison at **ISO** for TC158 and one other TC8
- Member of EU Digital Transport and Logistic Forum
- Supporting the WEF Global Supply System Dashboard



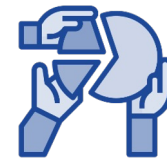
Data



Processes










































Regulatory Acceptance



Standards & Interoperability



GLOBAL MARITIME STANDARDS – Simple but complex

Organisation	Maritime Reference Model	Data Model	EDI		
			EDIFACT	XML - API	JSON-API
		N/A	N/A	N/A	N/A
	N/A	 Multi-model Transport			
	N/A	 TC/8			
	N/A	 WCO Data Model			
	N/A	 Reference to 			
  	N/A	 S-100 / S-200	TECHNICAL NAVIGATION STANDARDS		
	N/A	 Reference to 			
	N/A	 Reference to 			

Note: This is a visual representation and precise details should be requested from each of the standards organisations

PROTECT

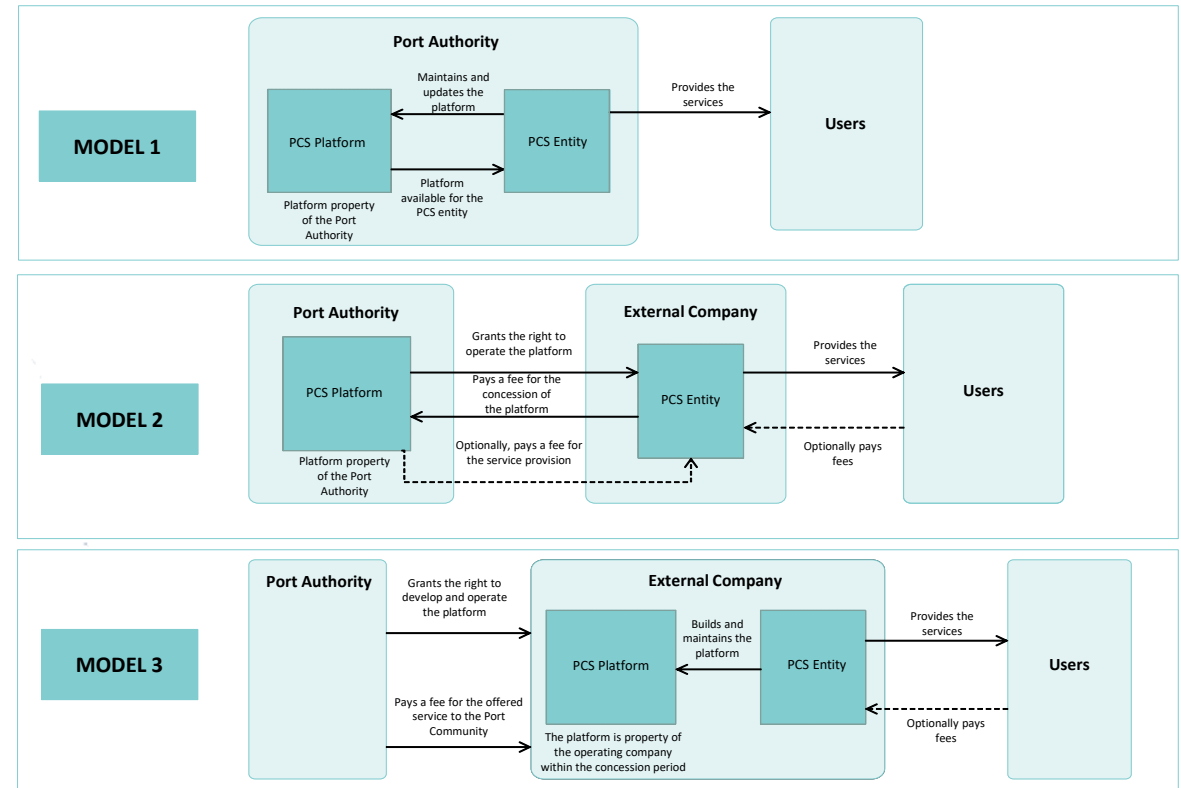
- Created in the 1990's to develop messages for Port Authorities by Port Authorities
- Integrated into IPCSA 2021 and undergoing a reset
- Leading EU Ports and Harbourmaster departments and PCS as members
- Standards are developed by PROTECT but published through UNCEFACT. PROTECT supports Maintenance and Message implementation guides
- Created, in EDIFACT, the:
 - IFTDGN (International Freight Transport Dangerous Goods Note (Undergoing revision through UNCEFACT Project at current time))
 - WASDIS (Waste Disposal message)
 - BERMAN (Berth Management Message)
- Current Reset of PROTECT
 - Update existing messages for multiple formats
 - Support Port Call Optimization efforts

Agenda

1. Port Community System (PCS)
2. IPCSA
3. Creating Community / Change Management
4. **Governance / Legal Framework /**
5. PCS Services
6. Technology

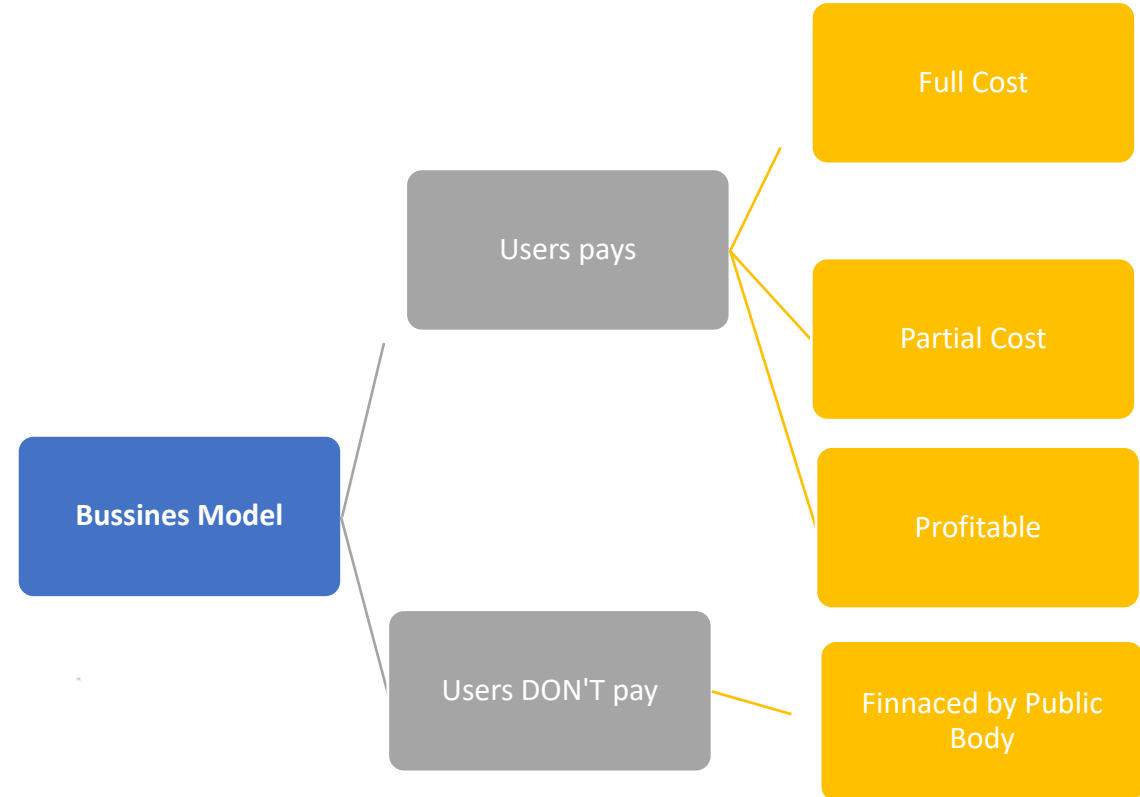
4. Governance

- PCS Ownership & PCS Operator
- National PCS - Port PCS
- PCS Asset
 - Strategic
 - Mission Critical
 - Business Continuity
- PCS Operator Structure
 - Governance (Public / Private)
 - Know How
 - Profitable or Not Profitable
- PCS are COST FIXED entities



4. Governance

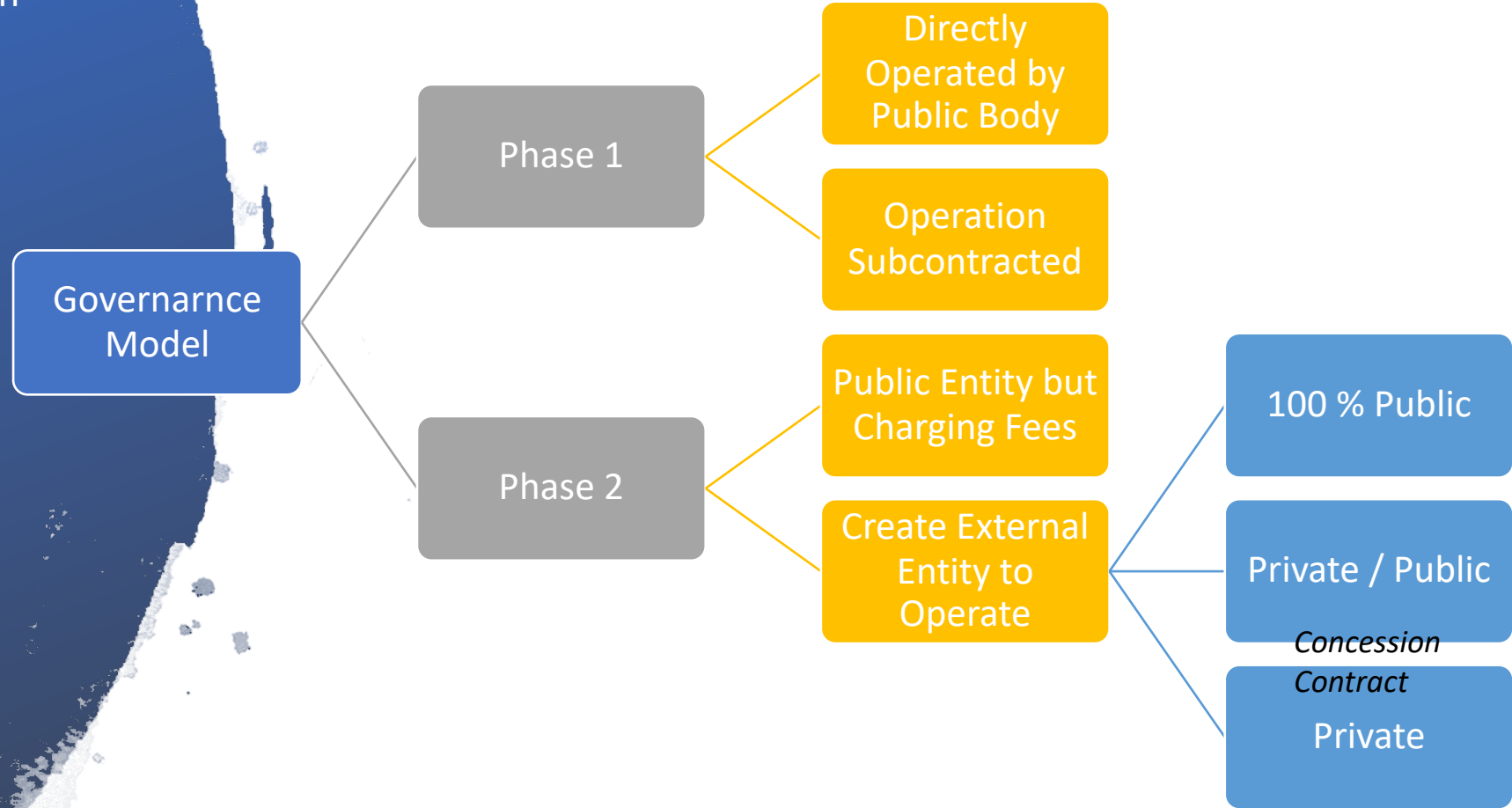
- PCS Operator & PCS Ownership formal relationship
 - Concession Model
 - Risk Transferred to Concessionaire
 - User Fees
 - Upfront Fees
 - Fixed Fee
 - Transaction
 - Contract Modal
 - Subcontracting Partners
 - Allows different contracts for different activities (Dev, Operation, Customer Service)
 - SLA



4. Governance

Governance Model Evolution (Transition From Model 1 to Model 2 / 3

- Phase 1
 - Investment
 - Create Critical Mass
- Phase 2
 - Economic Sustainability



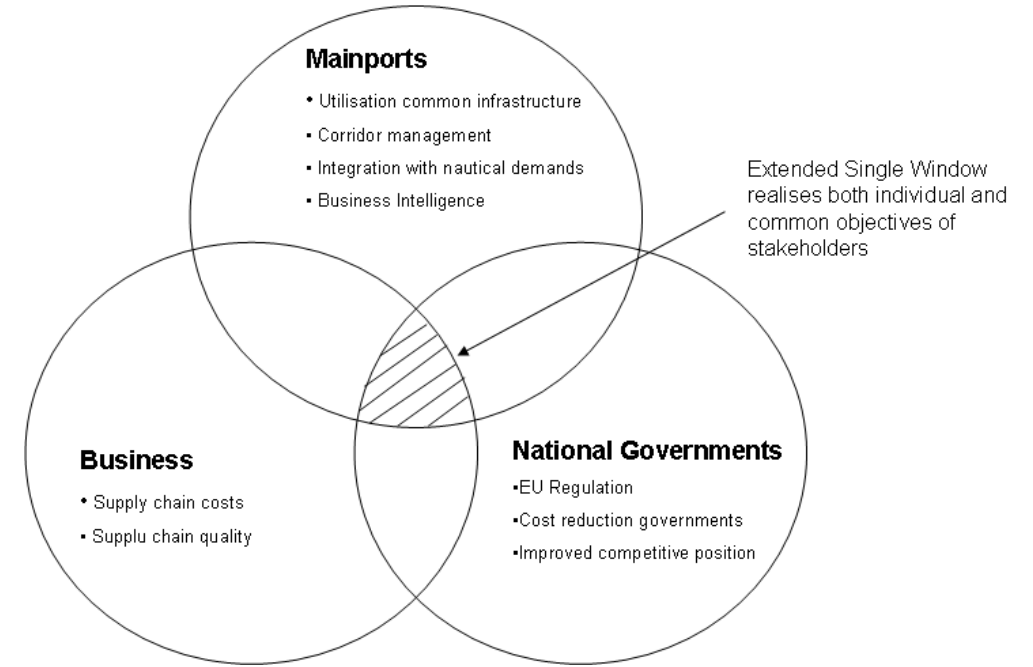
4. Governance

- Different Model for PCS Operator
 - Public
 - Private
 - Public Private Partnership (PPP)
- Key Elements
 - PCS must be
 - Neutral
 - Reliable
 - Business Plan
 - Ensure Revenue Stream
 - Regulatory Framework
 - Additional Contracts ?
 - Equity ?

	PROS	CONS
PUBLIC	Business Continuity Long Return of the Investment Low /Regulated Fees Mandatorily Use Neutrality	Lack of Agility Focus B2G Lack Logistic Knowledge
PRIVATE	Agility Customer Oriented Know How Focus on B2B Added Value Services	Continuity based on profit Short Return of the Investment High Fees Optional Use Not attractive Projects for private investors

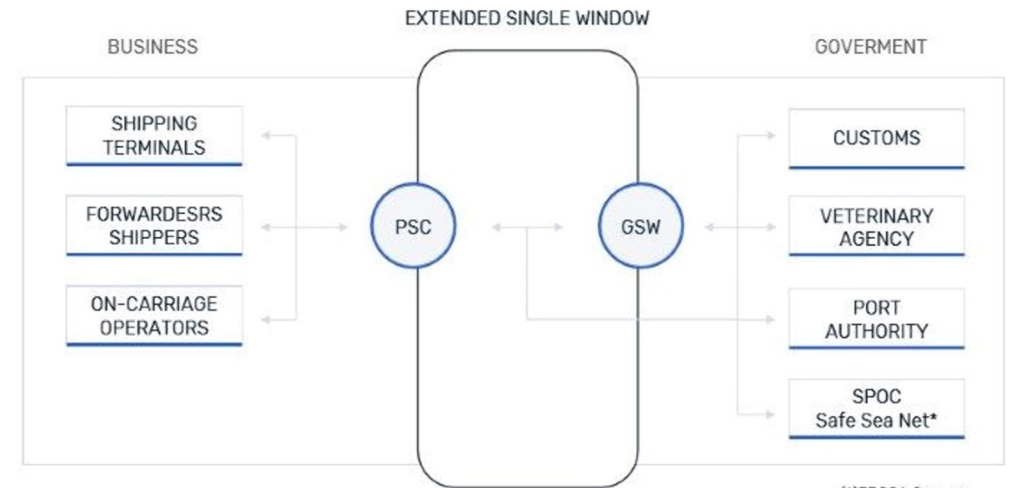
4. Regulatory Framework

- Civil Contract
 - User agreements and Terms & Conditions
- Related Electronic Records & Transactions
 - Electronic Records & Transactions
 - GDPR (Personal Data)
- Related to Port Administrations
 - MSW
 - Single Window for trade
 - Customs Systems /OGA
 - Port Authority Regulations
 - Local Agreements
 - Concession Contract



PCS are supported by Public Bodies which have entitled (some cases) the use by law, regulation > Mandatorial Use

The PCS concept is usually implemented with a commitment to facilitate the re-use of data from a **single submission reusing existing systems**, provide value-added use of information, develop infrastructure and interconnectivity as well as horizontal activities in areas of **technical assistance, process reengineering, consultancy, customization projects, customer service and user training.**



Agenda

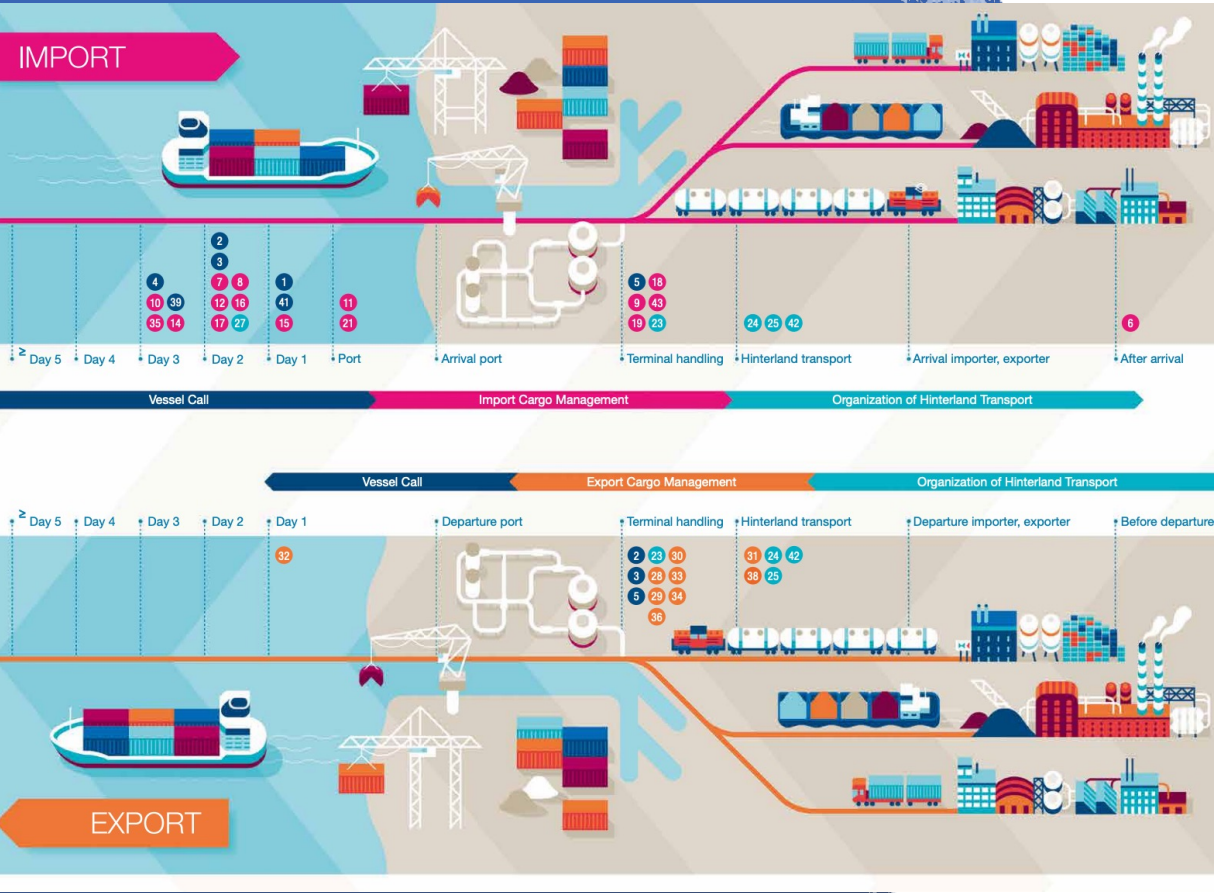
1. Port Community System (PCS)
2. IPCSA
3. Creating Community / Change Management
4. Governance / Legal Framework /
5. **PCS Services**
6. Technology

5. PCS Services



- **Maritime Services:** services related to vessel management.
- **Port Services:** services related to cargo and documentation processes carried out within Port Terminals.
- **Land Services:** services related to cargo and documentation processes carried out on the hinterland, after / before the cargo leaves / enters Port Terminals.
- **Transversal Services:** services that cannot be categorized in any other group as they are cross-sectional services.
- **Passenger Services:** services related to cruise / ferry passengers.
- **Airport Services:** services related to airborne cargo management.

5. PCS Services



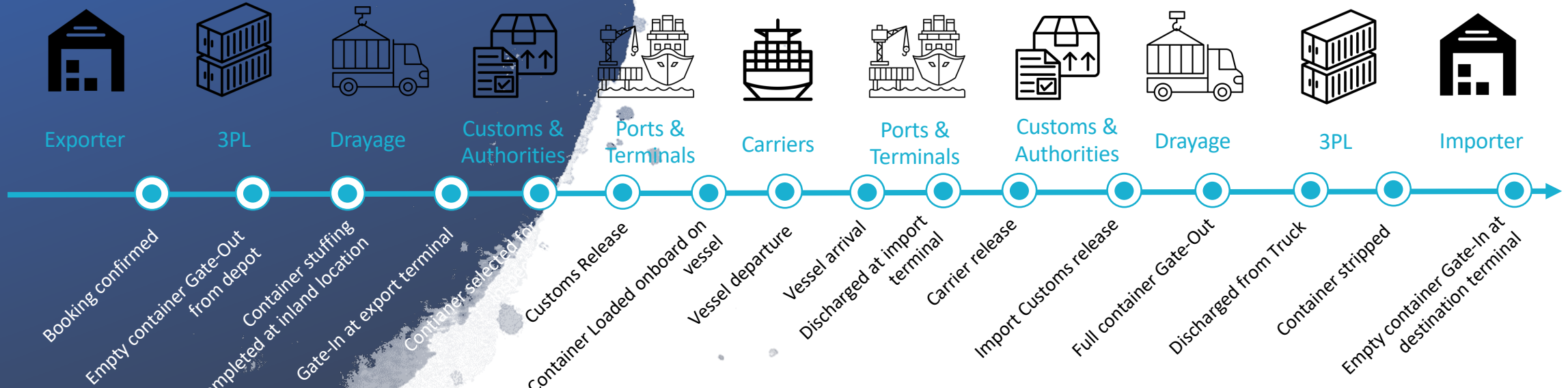
Vessel Call	Import Cargo Management	Organization of Hinterland Transport	Export Cargo Management
<ul style="list-style-type: none"> 39 Notification Crew and Passengers 2 Notification Dangerous Goods 41 Notification Ship's Stores 3 Notification Single Window 1 Notification Waste Disposal 5 Statement Harbour Dues Amsterdam 4 Vessel Notification 1.0 and 2.0 	<ul style="list-style-type: none"> 14 Cargo Declaration Import 6 Cargo Declaration Status Report 8 Cargo Information 44 Data Service Discharge Information 43 Import Status 7 Inspection Portal 15 Declaration Food and Consumer Products 9 Discharge Confirmation Report 18 Discharge Difference List 10 Discharge Information 11 Discharge List 16 Notification Import Documentation 12 Notification Local Clearance 2.0 21 Pre-arrival Cargo Declaration Import (4h) 35 Seaport Statistics 17 Transit Declaration 35 Veterinary Inspection Process 	<ul style="list-style-type: none"> 42 Hinterland Container Notification Barge 42 Hinterland Container Notification Road 23 Inland Port Dues 25 Rail Planning 24 Wagonload Information System 	<ul style="list-style-type: none"> 32 Cargo Declaration Export Bulk 32 Cargo Declaration Export Containers 36 Clearance NCTS Export Containers 33 Exit Summary Declaration 28 Loading List 30 Notification Arrival ECS Cargo 29 Notification Arrival Export Containers 31 Notification Export Documentation 35 Notification Verified Gross Mass 35 Seaport Statistics 34 Track & Trace Export
<p>This improves the logistic process because authorities - such as Customs and the Harbour Master - and port authorities are informed in good time about the arrival of a ship, the cargo and the country of origin. There is also more coordination between all the parties involved. As a result, activities can be scheduled well in advance and potential risks evaluated ahead of time. Any inspections can be scheduled before the ship actually enters the port. Throughput times in ship handling are being reduced further.</p>	<p>Agents, shipping companies and shipbrokers in the bulk and container sector are required to notify various authorities of the cargo they want to import to the European Union. This applies to both bulk and container transport. The Portbase services make it easy to comply with these requirements.</p> <p>Information is provided efficiently and transparently to all the parties involved, such as Customs and the Food and Consumer Product Safety Authority. Timely information makes a smooth flow of goods possible. Within the Portbase services, the reuse of information enables a further simplification of logistics processes.</p>	<p>The port represents the gateway to and from the hinterland. Road operators, barge operators and rail hauliers use the Portbase services to deliver and collect containers at the sea terminals.</p> <p>For cargo that needs to be moved to and from the port, the Portbase services provide a user-friendly way of exchanging information. Thanks to the Portbase services, terminals are informed well ahead of time and all the required information is known. As a result, logistics processes run smoothly.</p>	<p>Portbase offers forwarders, exporters, agents, shipbrokers and shipping companies a one-stop-shop solution for handling the export formalities.</p> <p>The Portbase services improve the flow for both bulk and container transport. They provide optimum information for all parties involved, including terminals and Customs, and make it easy for all requirements to be met. Optimum and efficient logistics from A to Z.</p>

5. PCS Services

Tracebility Services shows up the potential of PCS

	FECHA		TIPO	LUGAR	BUQUE	+INFO
ÚLTIMO EVENTO T&T DESDE ORIGEN	22/05/2019 08:05	-2 D	CARGADO EN BUQUE	GIOIA TAURO, ITALIA	MSC JADE	[+]

EVENTO(*)	S/N	FECHA		ESTADO	+INFO	SUBSCR.
AUTORIZACION MMPP						
LLEGADA BUQUE	✓	24/05/2019 22:22	0 H	Finalizado	[+]	
ACTIVACIÓN SUMARIA	✓	24/05/2019 21:23	0 H	Activada	[+]	
DESCARGA BUQUE	✓	26/05/2019 06:00	+1 D	Confirmado	[+]	
DECL. ADUANERA	✓	29/05/2019 11:45	+4 D	Despachado	[+]	
INSPECCIÓN						
EMISIÓN LEVANTE	✓	29/05/2019 11:45	+4 D	Autorizada salida sin papeles	[+]	
EMISIÓN ENTRÉGUENSE	✓	29/05/2019 16:35	+4 D	Aceptado 19/06/2019		
EMISIÓN ADMÍTASE VACÍO	✓	29/05/2019 16:35	+4 D	Entregado		
EMISIÓN OT	✓	29/05/2019 16:48	+4 D	Entregado	[+]	
RESERVA RECOGIDA MERCANCÍA	✓	30/05/2019 13:09	+5 D	Finalizada	[+]	
RESERVA ENTREGA VACÍO				No necesaria		
PREAVISO TERMINAL	✓	30/05/2019 11:28	+5 D	Aceptado		
SALIDA TERMINAL	✓	30/05/2019 13:09	+5 D	Confirmado		
DESCARGA CLIENTE		30/05/2019 16:00	+5 D	Previsto	[+]	
ENTRADA DEPOT	✓	30/05/2019 16:29	+5 D	Confirmado		



Agenda

1. Port Community System (PCS)
2. IPCSA
3. Creating Community / Change Management
4. Governance / Legal Framework /
5. PCS Services
6. **Technology**

5. Technology

Most Common facts among PCS

- Data Center .
 - Most of PCS are on Premises but On Cloud is “coming”
 - Concerns about location of “NATIONAL DATA”-
 - Controls over Personnel Data.
 - Disaster Recovery Site, Backup
- Operating System (Linux)
- Virtualization Solution
 - (VmWare, HyperWare)
 - New Trend (Dockers, Kubernetes,OpenShift..)
- Web User Interface
 - HTML5 + Responsive.
- Database
 - Relational Database
- Standardization
 - UN/CEFACT, IMO FAL, proprietary
- Formats
 - XML, EDIFACT, ... JSON !!
- Protocols
 - REST(HTTP), FTP,SOAP, POP/SMTP

5. Technology

CyberSecurity

- Confidentiality
- Data access controls
- Safeguards for commercially sensitive information
- Firewalls
- Management of CYBER Security

- CyberSecurity Standards
 - ISO 27001
 - National Standard
- Cybersecurity framework
 - OWASP (Open Web Application Security Project)
 - CSA Cloud Security Alliance
- Organization
 - CISO on board
- Cybersecurity Testing
 - Penetrations Test
 - SOC
- Encryption
 - Used in Transit.
- Hardware
 - Firewall
 - Antivirus
 - Network Access Control

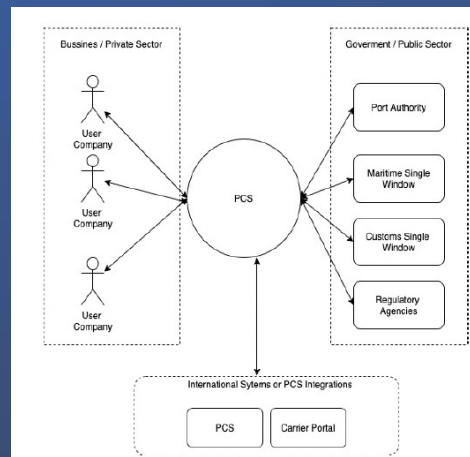


5. Technology

Digital Platform

Technical view

- Inter-organization **Middleware models**
 - Point-to-point Model
 - Hub-and-spoke Model
- Alternatives of **PCS implementation models**
 - Message-oriented middleware based on message broker
 - Webservice API Oriented
 - Blockchain or Distributed ledger technology (DLT)



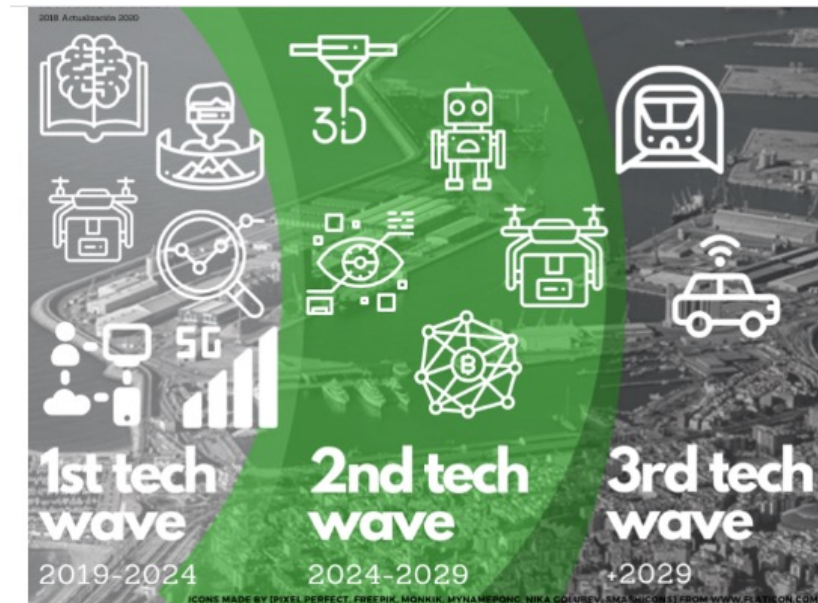
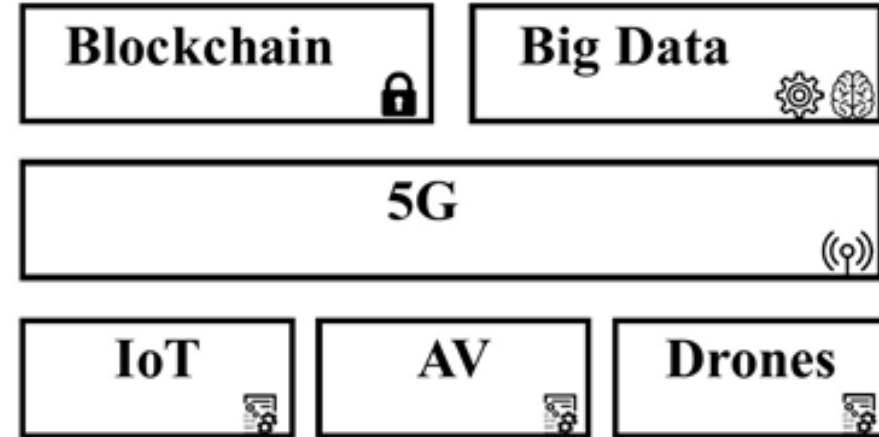
- Administrative Platform
 - Maritime Single Windows
 - Customs Single Windows
 - Trade Single Windows
- Commercial Platforms
 - Intra/ GT Nexus
 - Tradelens
 - eFTI (Transfollow, Pionera)
- Port Platform
 - VTS (Vessel Traffic Services)
 - VTMS (Vessel Traffic Monitoring Services)
 - PMS (Port Management System)
 - AIS (Automatic Identification Services)
 - TOS (Terminal Operating System)
 - GAS (Gate Appointment System)
 - CCTV,OCR, LPR (Acces Control System)
 - GIS (Geography system)

5. Technology

Emerging Technologies

Based on these data, the study (Navarro-Herrera 2018) concludes that the ports of the future will combine the use of these 6 technologies. Therefore, it will not be a single technology that will define how the ports will be in 10 years, but it will be the combination of these technologies

<https://ipcsa.international/initiatives/ipcsa-emerging-technologies-study/>



THANK YOU

Please do send me emails or questions you may have as we always welcome for discussion and collaboration

Javier Gallardo

Chairman, IPCSA

javier@ipcsa.international

<https://ipcsa.international>

<https://notn.ipcsa.international>

