

# Digitalization for Sustainable Port Management

September 23<sup>th</sup> 2025,  
6<sup>th</sup> Hemispheric Conference on  
Sustainable Port Management &  
Environmental Protection

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# IPCSA

International Port  
Community Systems  
Association



**NETWORK**  
OF TRUSTED NETWORKS

Connecting and  
sharing data globally  
between ports and  
cross border

**PROTECT**



# Nico De Cauwer



## • IPCSA Secretary-General

- Official IMO/MSW-expert, Member of IMO's FAL Committee & IMO's Expert Group on Data Harmonization (EGDH)
- Member of the Data Collaboration Steering Committee of IAPH
- official Expert in Transport & Logistics domain within UN/CEFACT



- Business Architect Digitalisation & Innovation, Port Community Solutions, within Port of Antwerp-Bruges.



# Who is IPCSA ?



# IPCSA

International Port  
Community Systems  
Association

# “A Community of Communities”



55 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

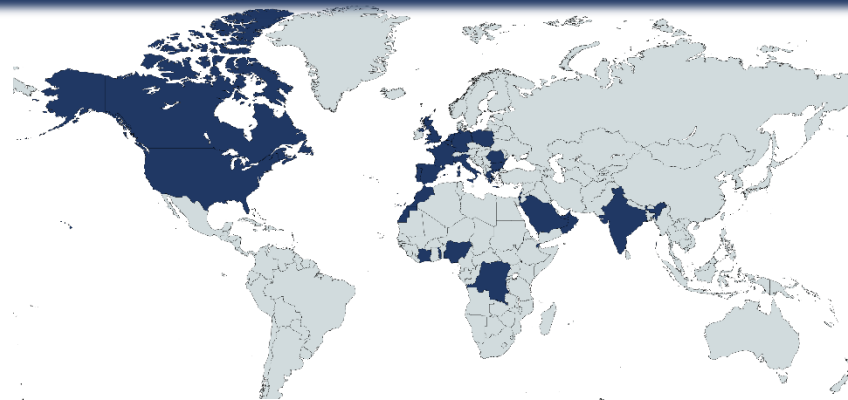


Covering  
500m + TEUS  
20bn + Tonnes  
of cargo



**IPCSA**  
International Port  
Community Systems  
Association





DAKOSY

be smart. get connected.  
portbase®

MCP plc  
Port Community Systems

PORTico

PORT OF  
PRINCE RUPERT  
LINKING A WORLD OF OPPORTUNITY

PORT of  
vancouver

LA  
THE PORT  
OF LOS ANGELES

دبي التجارية  
DUBAI TRADE

RAK  
PORTS

DT World

Port of  
Antwerp  
Bruges

ISRAEL PORTS  
Development & Assets Company Ltd.

BULGARIAN PORTS  
INFRASTRUCTURE Co.

Puertos del Estado

PORTNET  
الشباك الوطني لتسيير مراكز التجارة الخارجية  
GUICHET UNIQUE NATIONAL DES PROCÉDURES DU COMMERCE EXTÉRIEUR

ANP  
الوكالة الوطنية للموانئ  
ANP (ANP) Agence Nationale des Ports

TANGER MED  
PORT AUTHORITY

Algeciras  
Port

mgj  
LOGISTICS EXPERTS  
FOR FASTER AND MORE SECURE FLOWS

CURAÇAO PORTS  
AUTHORITY

PORT ST. MAARTEN  
GROUP OF COMPANIES

BARBADOS  
PORT INC.

porto  
sines

HPA  
Hamburg Port Authority

valenciaport  
Autoridad Portuaria de Valencia

Port of  
Rotterdam

Port of Amsterdam

PORT 25  
PPLE 25

polski pcs

INDIAN PORTS ASSOCIATION

North  
Together.  
Smarter.  
Sea  
Port

LE HAVRE  
port  
NAROPAT

portall  
TRANSPARENCY ALL THE WAY

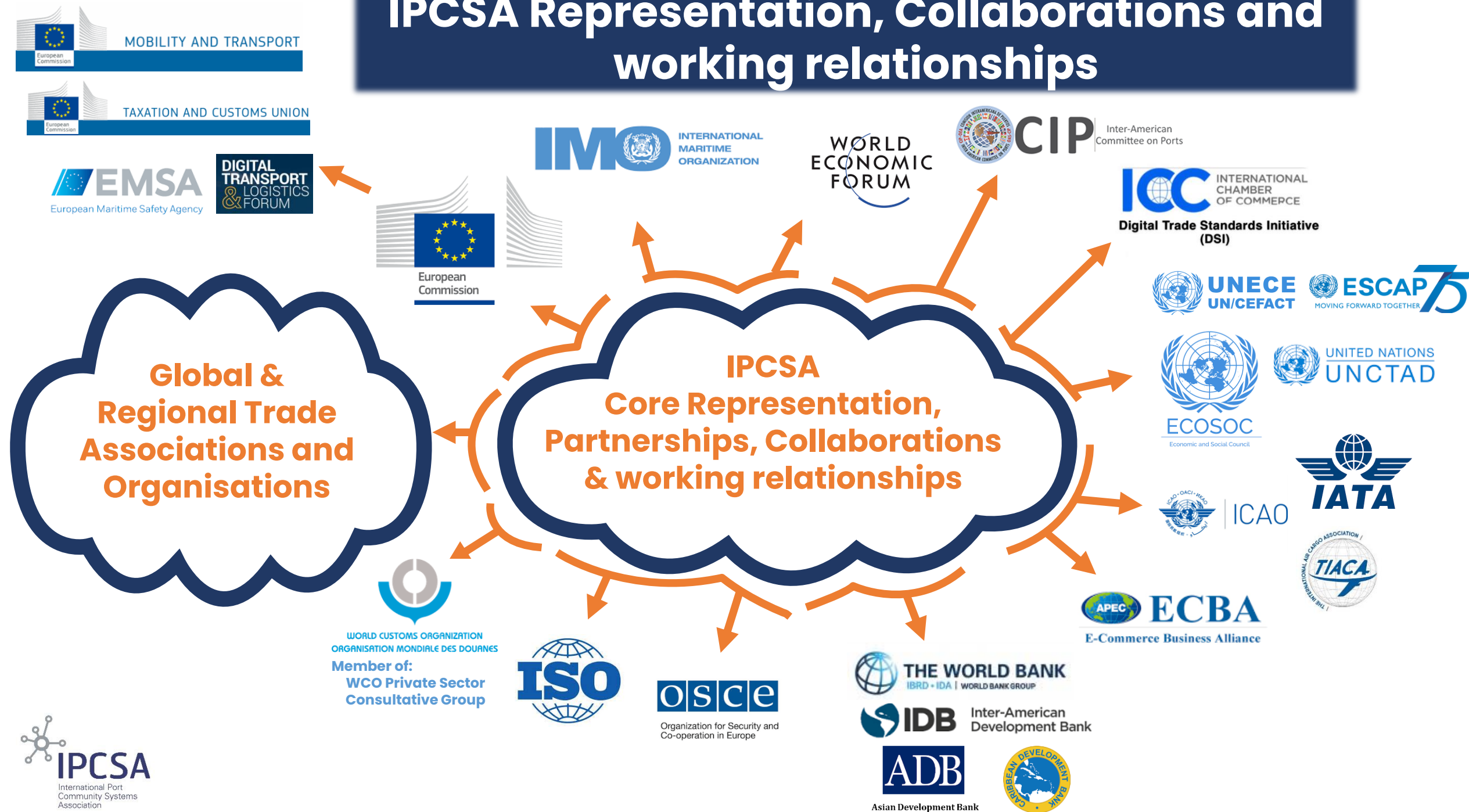
GUICHET UNIQUE DU  
COMMERCE EXTÉRIEUR  
COTE D'IVOIRE

NIGERIAN  
PORTS  
AUTHORITY

PORT  
OF NEOM

PORT  
OF NEOM

# IPCSA Representation, Collaborations and working relationships





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# Sustainability — definition



## Sustainability

*[sə-,stā-nə-'bi-lə-tē]*

The ability to maintain or support a process continuously over time.

 Investopedia

### DEFINITION:

Sustainability is the ability to maintain or support economic, environmental, or social processes over time without depleting natural resources.



# Sustainability — definition

So, sustainability is more than only talking about climate, but it talks about preserving the 3 pillars at the same time :

- **Environment**
- **Economy**
- **Society**



# Economic Sustainability

“Economic sustainability refers to a **company’s ability to continue its operations over a long-term horizon.**

In order to be economically sustainable, a company must be able to ensure that it will have **adequate resources**, workers and consumers for its products **into the distant future.**”

*So – how to match these adequate resources with Ports’ core business, delivering smooth & efficient port operations ?*

# Sustainability in Ports — a global challenge

Ports are on a **dual pressure** when it comes to sustainability :

- **Environmental** – reduce emissions, align with the SDGs and IMO/UN sustainability targets
- **Operational** – stay competitive, resilient and efficient in global trade

All this while operating in a **more complex compliancy** environment with increasing regulations, and in a world that is **ever more technologically evolving**

# Sustainability in Ports

—  
there is a  
solution !

## Technology

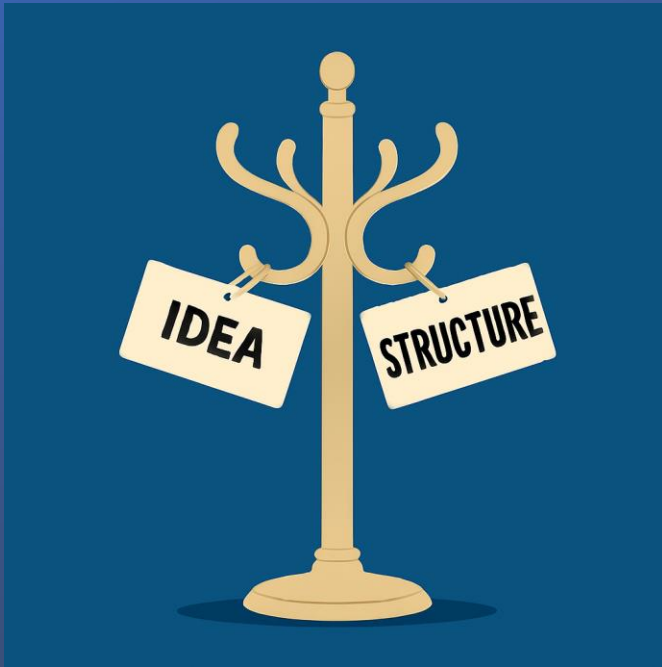


## Digitalization





# Some handholds...



## Sustainable Digitalization

≠

Making paper-based processes electronic

≡

(re)think & improve business  
> optimizing your business processes

- Use a **holistic** approach (center = global trade)
- Leave the 'vertical' focus, instead look towards a 'horizontal' integration as an enabler of trade

>> needs **COLLABORATION** – digital & human  
≡ **COMMUNITY**

# Collaboration = Port Community Systems

Human & digital collaboration **implies** the use  
of **Port Community Systems**

to **foster** Sustainable & Global Trade !!

Multiple stakeholders **collaborating** by means  
of **digital services**, sharing real-time data, on  
a joint PCS-platform

will **optimize** your **port operations**

+

**Technology** will help you doing that

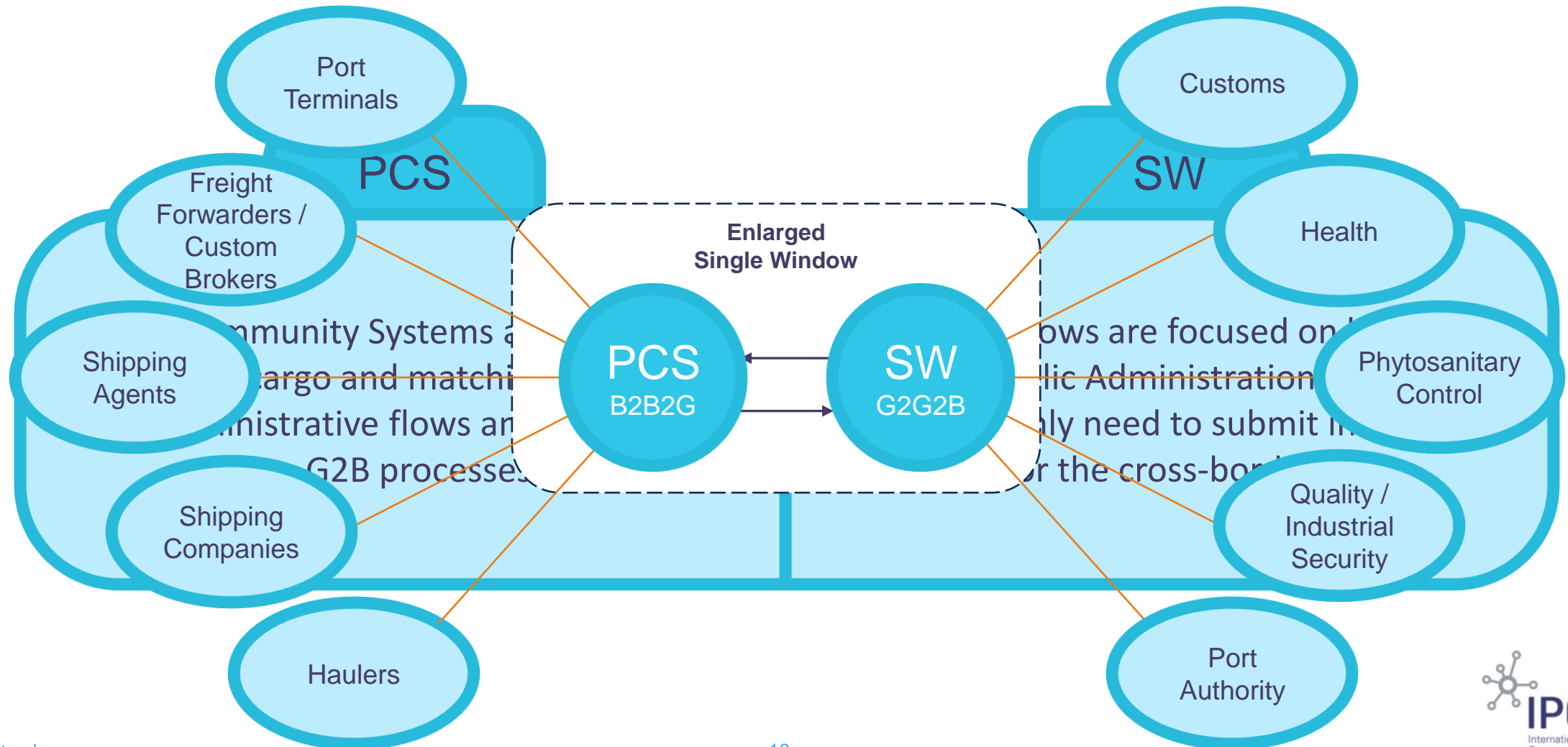
# PCS implementation — Considerations

- Don't think 'technology first': a PCS is not an IT-project but a Change management project !
- Stakeholder awareness and 'Community building' is a time-consuming but necessary effort
- Technology comes at the end: proven solutions are there



# the PCS as a Single Window Environment

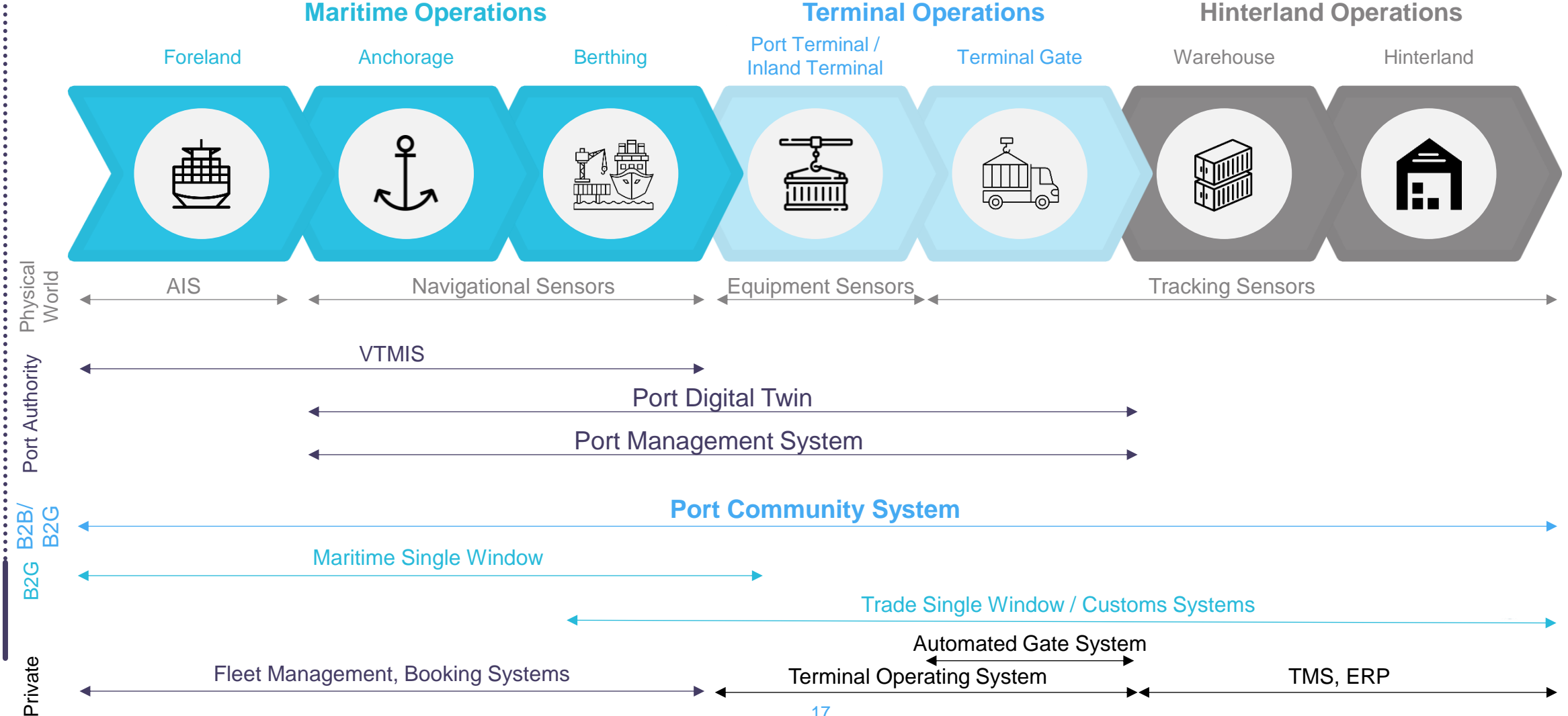
PCS FOCUS ON VOYAGE, CARGO AND INTERNAL FLOWS WHILST SW DUTIES INVOLVE DEALING WITH PUBLIC ADMINISTRATION





# Port IT ecosystem: the relevance of interoperability

MAIN INFORMATION SYSTEMS IN A PORT MUST INTERACT BETWEEN THEM TO PROVIDE A HOLISTIC VIEW



# What IPCSA provides

## –

# PCS Masterclass



## PCS Masterclass

**A unique in-depth training to leverage your PCS-knowledge!**  
With this educational initiative, IPCSAs commitment to knowledge dissemination and skill enhancement remains clear and steady, contributing to:

- Strengthen IPCSAs role of influencing the conditions for successful PCS implementations and operations.
- Increase IPCSAs expansion of knowledge around the use of Port Community Systems & Single Windows worldwide.
- Creating and promoting stakeholders' buy-in to support the role of PCS & SW in port logistics chains.

### TARGET AUDIENCE:

- Members in the progress of their PCS journey
- Members with a certain level of maturity in PCS utilisation
- Interested parties who want to complete their PCS knowledge or initiating their PCS/SW-journey

### DURATION AND FORM:

- 4 days for the full PCS Masterclass
- On-site classes, 4 to 5-h
- 1 session per course



## Course Contents

### 1 Introduction to PCS & Key Stakeholders

- Port Community and relevant stakeholders
- Guidelines for the construction of a robust Port Community
- What is a PCS?
- How to develop a PCS
- Methodologies for Change Management
- Communication Plan
- PCS Benefits
- Capacity building
- Legal aspects

### 2 PCS Technology aspects

- PCS IT Landscape Overview
- PCS modern and robust architectures
- Resilience measures for the Port Community
- PCS Future Challenges

### 3 PCS processes & services

- Core processes of a PCS
- Data and process international standards
- PCS services

### 4 PCS Governance & Business Models

- Governance Models for the Operation
- Business Models
- Revenues
- Implementation Models
- Capital & Operational Expenditures

### Contact us

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Become an IPCSA member to learn about PCSs, Single Windows and a lot more!

\*Images courtesy of Solihull Port. IPCSA pilot Masterclasses held from May 18th to 20th, 2020, in Muzos, Oman, in partnership with Solihull Port.



# What IPCSA provides - PCS Sustainability Guidelines

IPCSA guidelines  
on  
Sustainability for Port  
Community Systems



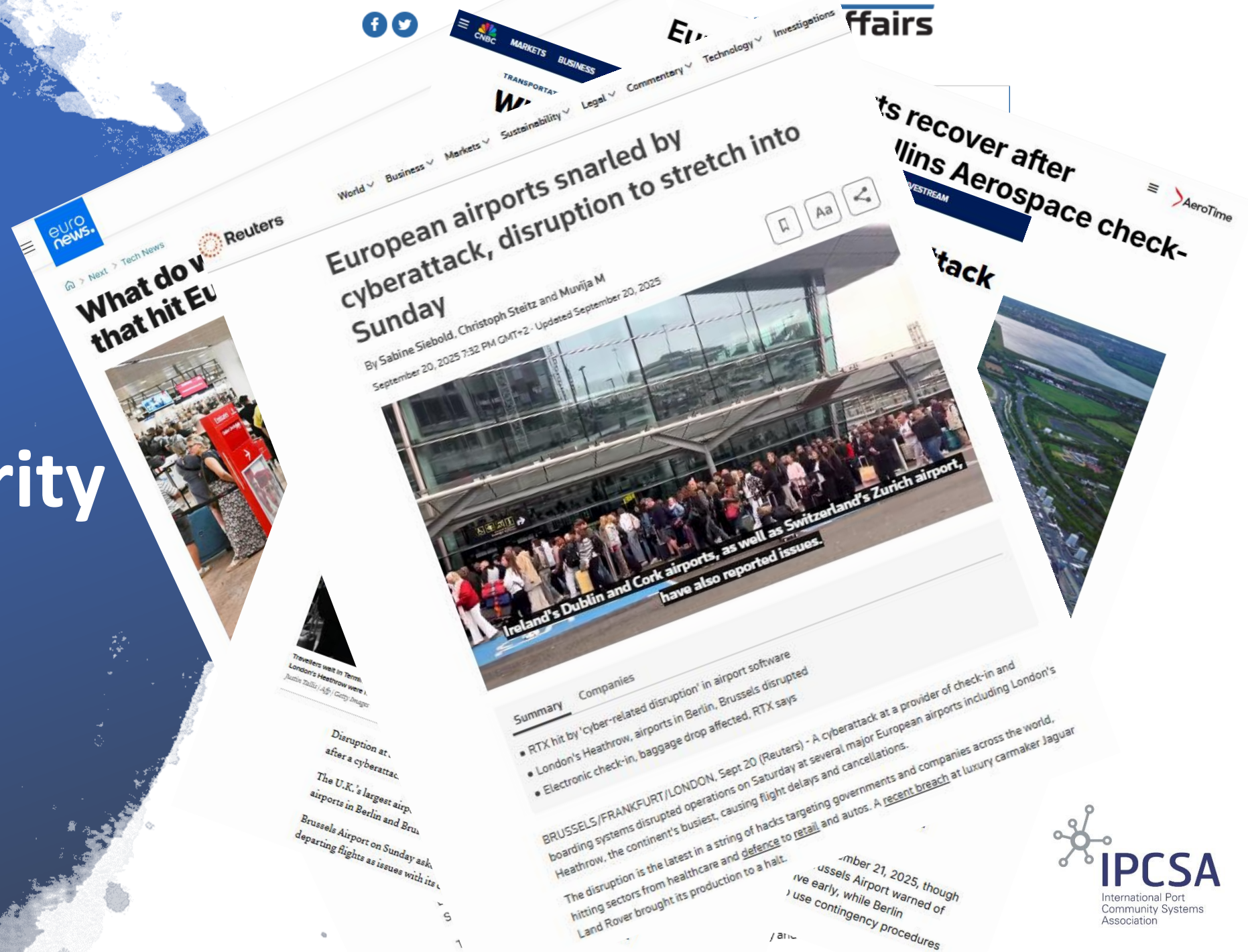
# Sustainable Port Management — Challenges & considerations

- **Cybersecurity** risks: more digital → more vulnerable
- **Interoperability**: fragmented systems can limit impact if not harmonized
- **Investment gap**: digital infrastructure requires upfront costs
- **Skills**: workforce must adapt to data-driven tools.

→ But these challenges are also **opportunities to innovate.**



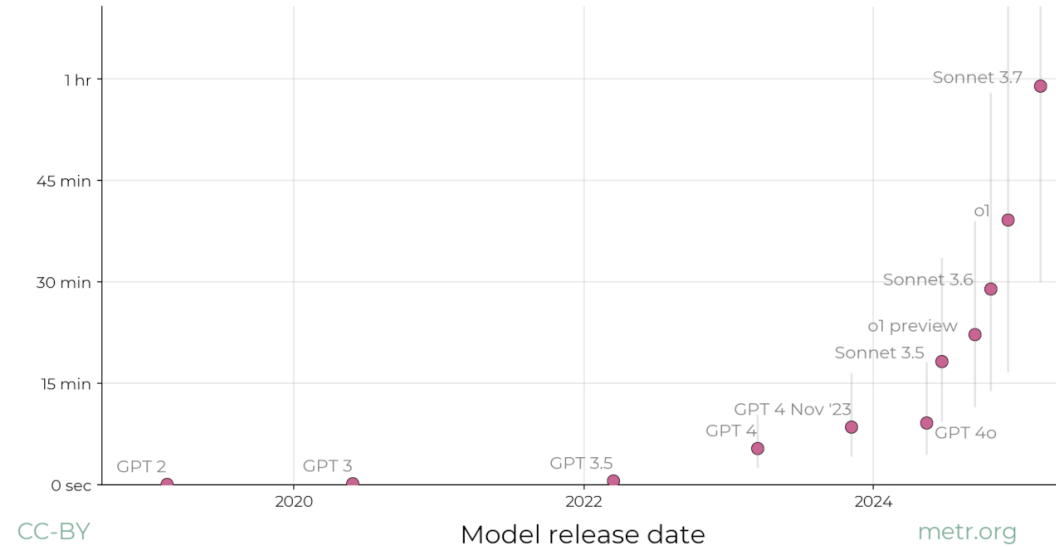
# Cybersecurity



# Artificial Intelligence

The length of tasks AIs can do is doubling every 7 months

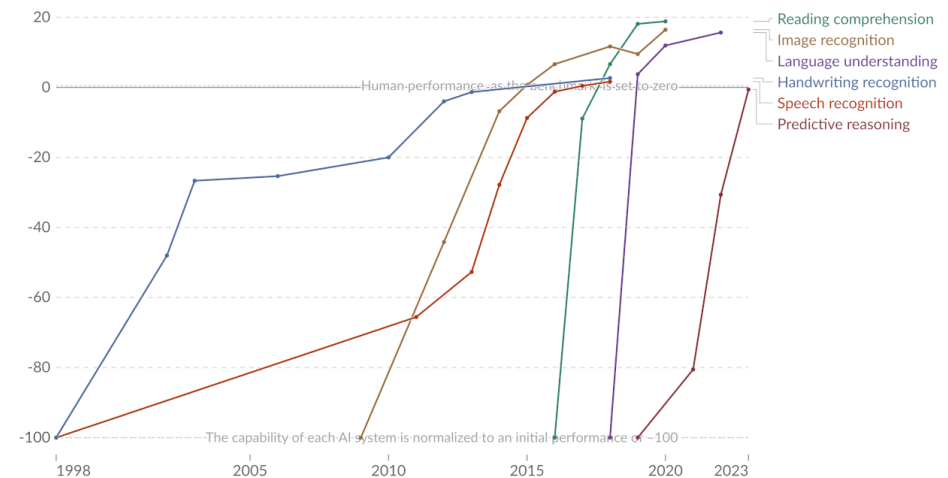
Task length (at 50% success rate)



## Test scores of AI systems on various capabilities relative to human performance



Within each domain, the initial performance of the AI is set to -100. Human performance is used as a baseline, set to zero. When the AI's performance crosses the zero line, it scored more points than humans.



Data source: Kiela et al. (2023)

OurWorldinData.org/artificial-intelligence | CC BY

Note: For each capability, the first year always shows a baseline of -100, even if better performance was recorded later that year.



# Conclusions

- Digitalization is not the end goal — it's the **enabler** of greener, more resilient, and competitive ports.
- In today's digital era, "A sustainable port is a **smart port**"
- By **embracing digital tools**, ports can simultaneously reduce environmental impact, boost efficiency, and remain central hubs in global trade.





Ports are a catalyst  
towards a  
sustainable future





**Don't forget...**

**“In order to stay the same,  
you need to change !”**

*[attributed to Willy Brandt, former Chancellor of West-Germany  
from 1969-1974]*



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# THANK YOU

Please send e-mails or questions you may have  
as we always are welcome for discussion and collaboration

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