ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Smart Ports – Current Challenges and Perspectives

International Maritime and Transport Law Course - Maritime Law Colloquium “Professor Hrvoje Kačić” - Transport Law de Lege Ferenda 2023
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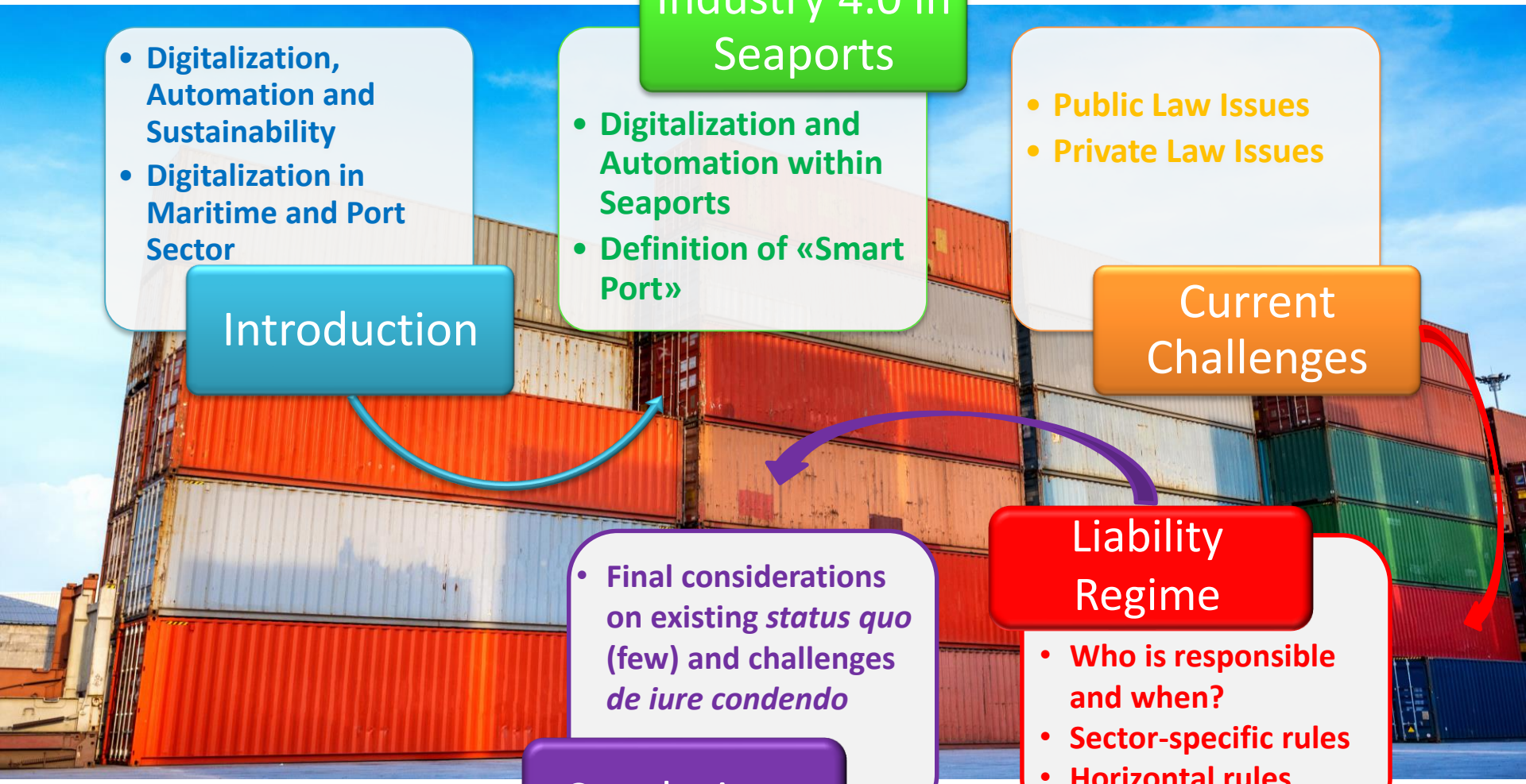
Summary



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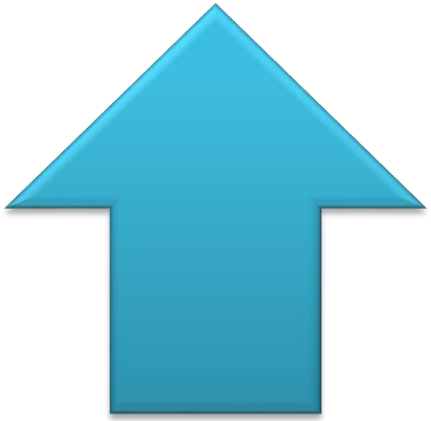
Digitalization, Automation and Sustainability as Intertwined Drivers For Future Development

- UNDP's Digital Strategy for the years 2022-2025
- Commission's Communication "*A Clean Planet for all. A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy*" (COM/2018/773 final)
- Commission's Communication "The European Green Deal" (COM(2019) 640 final),
- Commission's communication of 9 March 2021 entitled "*2030 Digital Compass: the European way for the Digital Decade*" (the '*Digital Compass Communication*'
- Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022, establishing the Digital Decade policy programme 2030

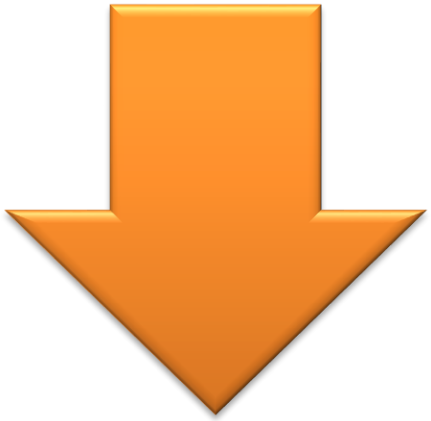
What About the Transport Sector?

- Commission's "White Paper – Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system" [COM (2011) 144 final]
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, adopted on 30 November 2016, "A European strategy on Cooperative Intelligent Transport Systems, a milestone towards cooperative, connected and automated mobility" (COM/2016/0766 final)
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Sustainable and Smart Mobility Strategy – putting European transport on track for the future" (COM(2020) 789 final)
- EU Green Deal  Green Ports and Airports
- IAPH's 2019 World Ports Sustainability Programme (WPSP): integration of the SDGs into the business strategies and governance by port authorities.

Excursus on Digitalization in Maritime and Port Sector



Safety and security purposes



Commercial purposes

Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 established a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC, as amended

'**SafeSeaNet**' = "the Community maritime information exchange system developed by the Commission in cooperation with the Member States to ensure the implementation of Community legislation"

LRIT = "a system for the long-range identification and tracking of ships in accordance with SOLAS regulation V/19-1"

Directive 2010/65/EU on reporting formalities for ships arriving in and/or departing from EU ports (c.d. Reporting Formalities Directive – RFD) → National Single Windows (NSW)

RFD repealed by the Regulation (EU) 2019/1239 Regulation (EU) 2019/1239 of the European Parliament and of the Council of 20 June 2019 establishing a European Maritime Single Window environment and repealing Directive 2010/65/EU as of 15 August 2025: the existing maritime NSWs in each Member State will be the basis for the "technologically neutral and interoperable European Maritime Single Window environment ('EMSWe')".

IMO → **e-navigation strategy**

"The harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment"

For commercial purposes, several platforms have been created at the domestic level in order to enable the submission and interchange of information and data among the relevant authorities and the users through a single access point (**one-stop-service**).

Regulation (EU) 2020/1056 of the European Parliament and of the Council of 15 July 2020 on electronic freight transport information

↓

creation of eFTI (electronic freight transport information platforms)

Intelligent Transport Systems (ITSs): key tools as part of the Digital Single Market Strategy and since Horizon 2020 programme they imply both the integration of all the transport modes and their links with automation.

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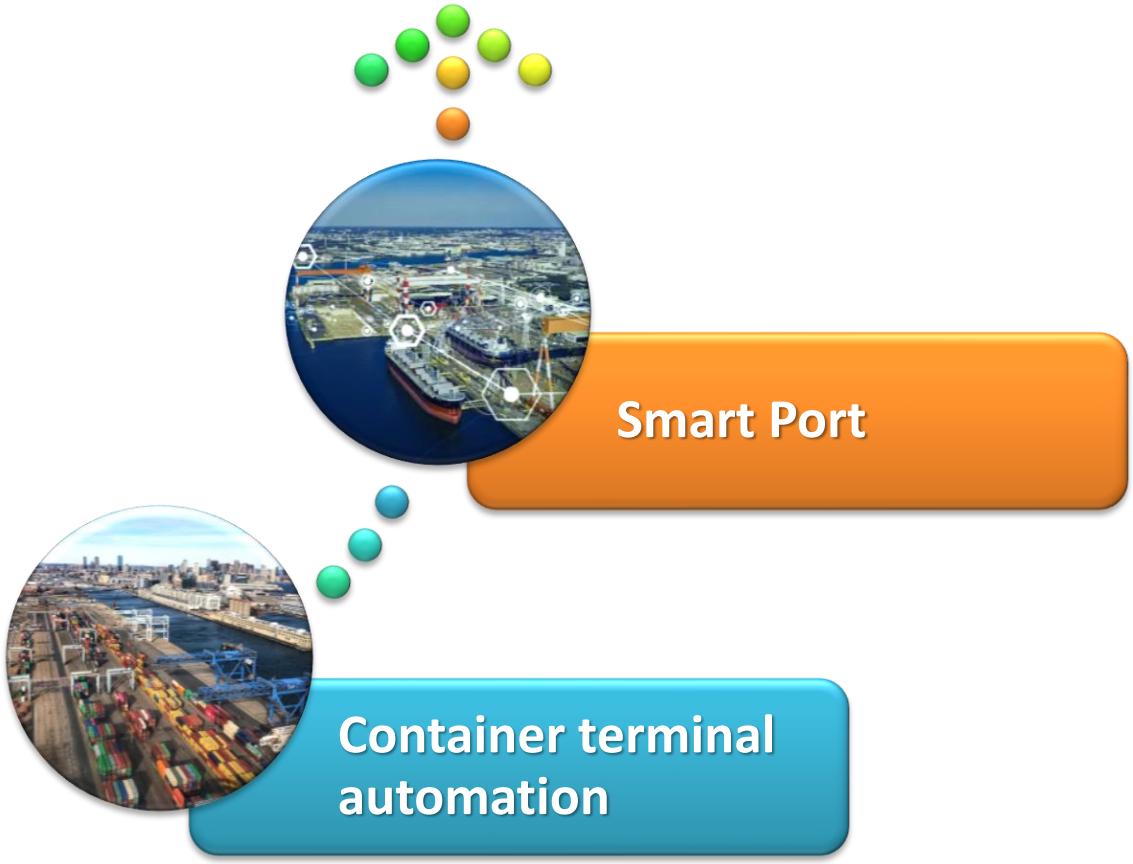
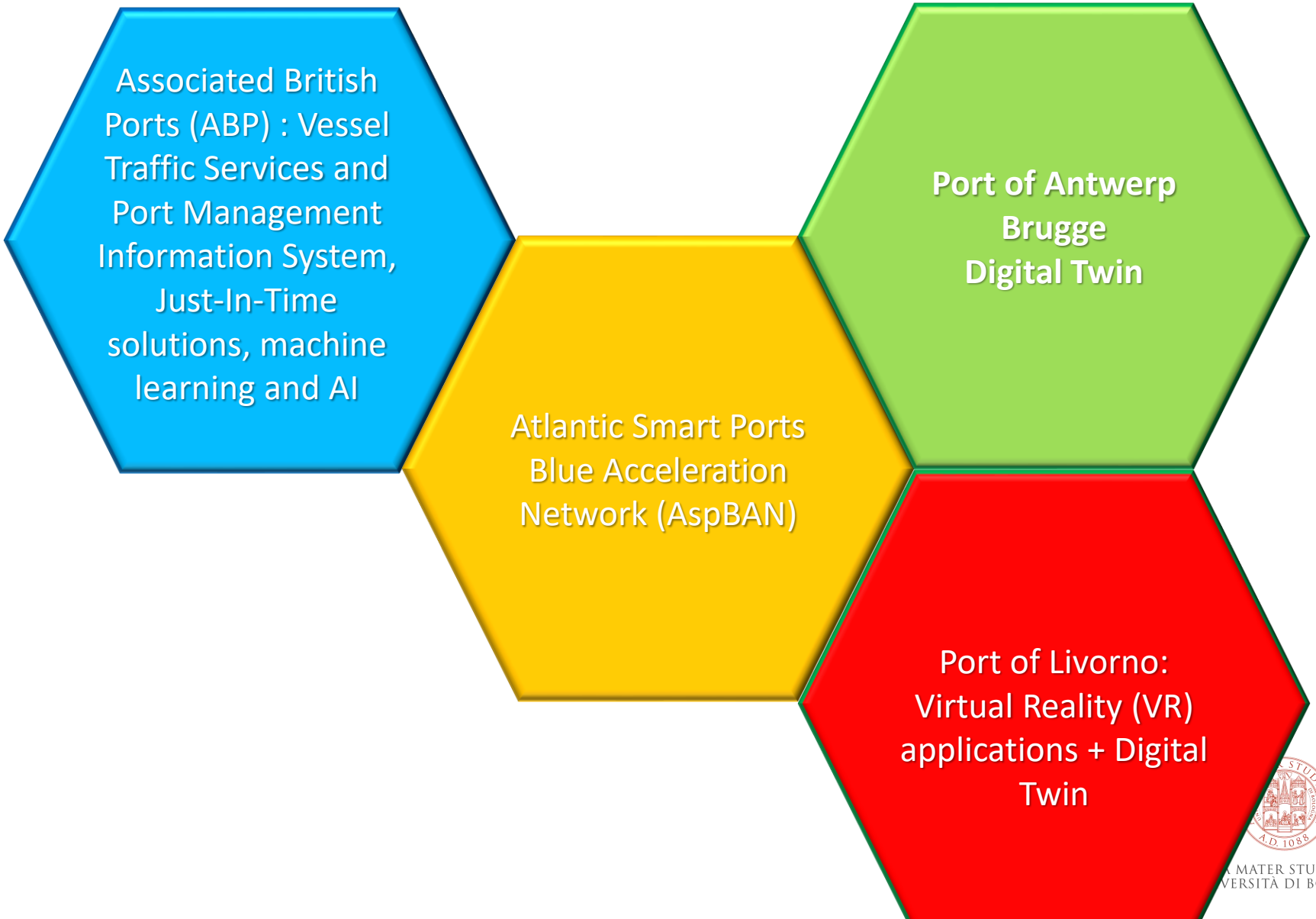
Integration of different systems, interoperability, multimodality

What About Seaports?



Source of pictures: Terminal picture by Seshu B. on Unsplash; Istock via Unsplash

What Is A Smart Port?



The Smart Port: A Conundrum?

- No uniform empirical model
- No uniform definition

Smart?

Smartphone: “a mobile phone that performs many of the functions of a computer”

Smartcity: “a place where traditional networks and services are made more efficient with the use of digital solutions for the benefit of its inhabitants and business”

smart economy, smart citizens, smart governance, smart mobility, smart environment and lifestyle

Smart contract: “a computerized transaction protocol that executes the terms of a contract. The general objectives ... are to satisfy common contractual conditions (such as payment terms) ... and minimize the need for trusted intermediaries”

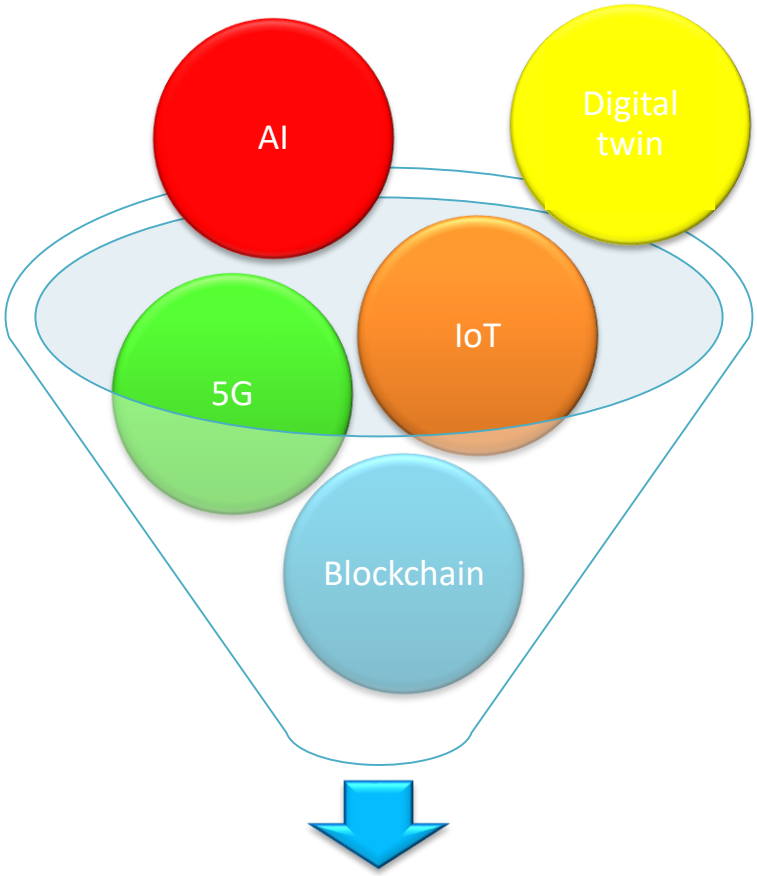
Smart Ports Alliance (SPA):

- “A smart port equips the workforce with the relevant skills and technology to facilitate the movement of goods, delivery of services and smooth flow of information”,
- “A port that uses automation and innovative technologies including Artificial Intelligence (AI), Big Data, Internet of Things (IoT) and Blockchain to improve its performance”.

Belmoukari - Audy – Forget, “Smart port: a systematic literature review”:

- “an effective, efficient, safe, and sustainable port [that] creates added value”,
- an “intelligent port [that] is an alternative for effective decision support through the mobilization of new information and communication technologies (ICT) and decision support systems”.

Not merely a database or a single window where to share data,
but an application of the so-called Industry 4.0



Smart Port

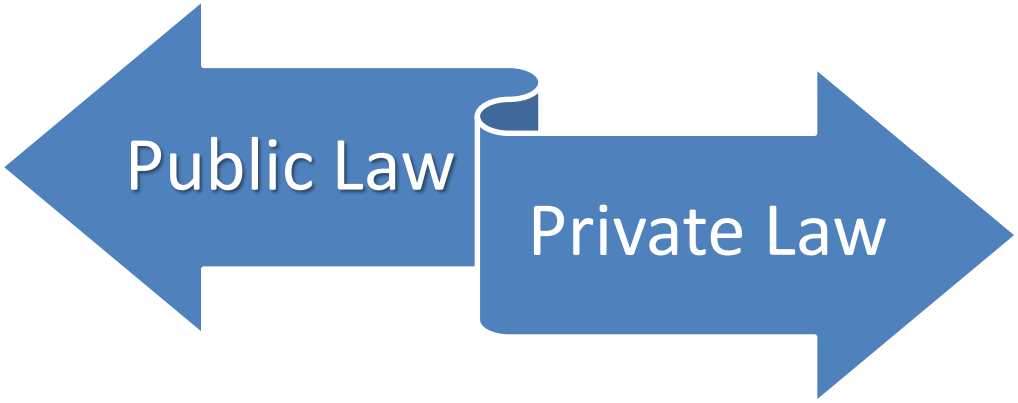
Use of automation and innovative technologies for mobilizing new information and support decisions

- effectiveness,
- efficiency,
- safety,
- sustainability
- creation of added value

Who can be held liable in case of failure in the interpretation of the data and the prediction of the future situations?

On whom lies the responsibility for the final decision (the AI system and its manufacturer/provider or the Port Authority)?

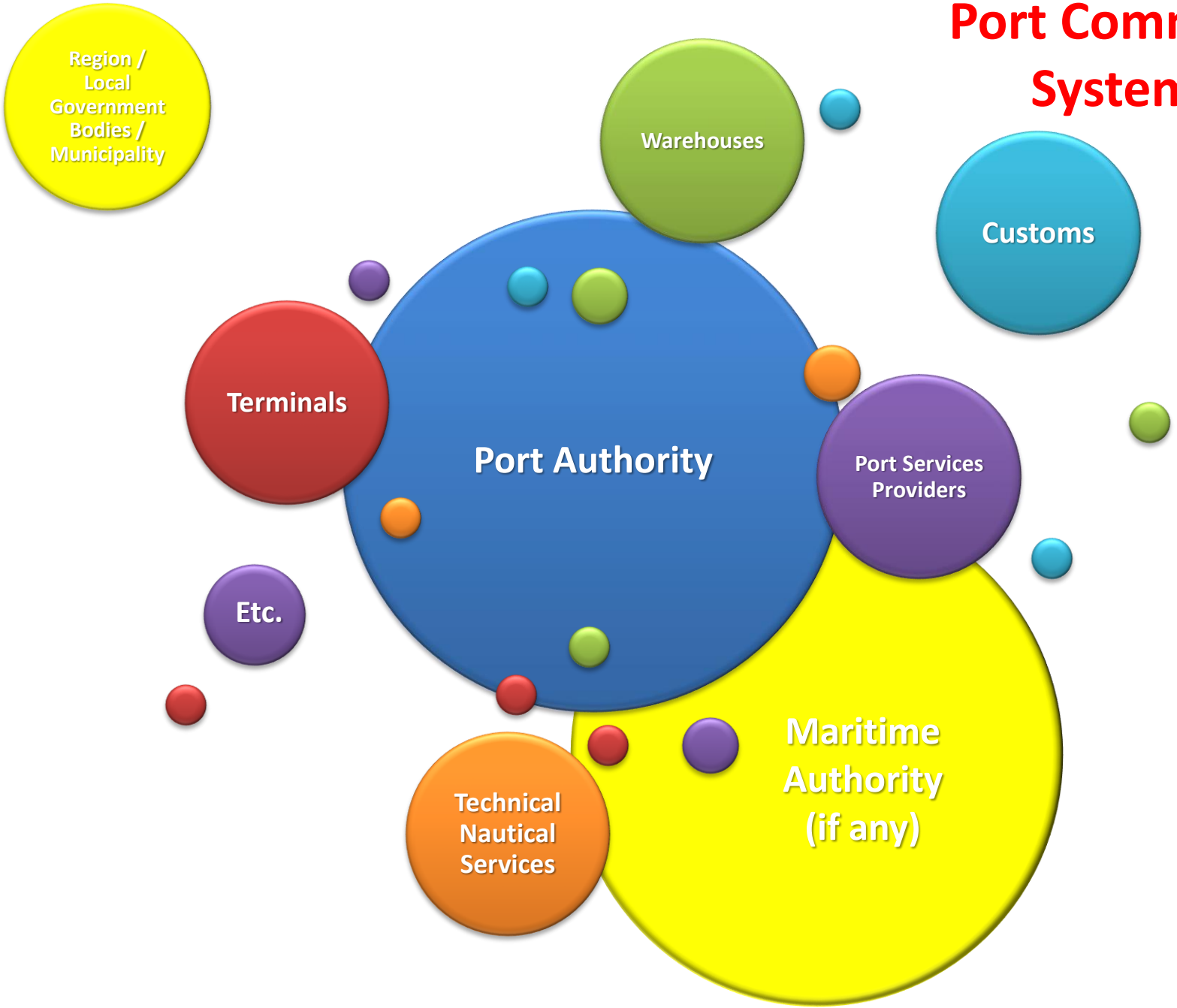
Current Challenges



- No uniform model and regime for seaports, but
- Potentially different Authorities and entities (within the port and outside it) whose functions can overlap or that need to be involved
- Goal: integrated and interoperative system
- Seaport as part of a multimodal-logistics system

- Regime of the relationships among the different subjects
- Regime of liability

Port Community System (PCS)



Who is liable?

What is/are the applicable regime/s of liability?

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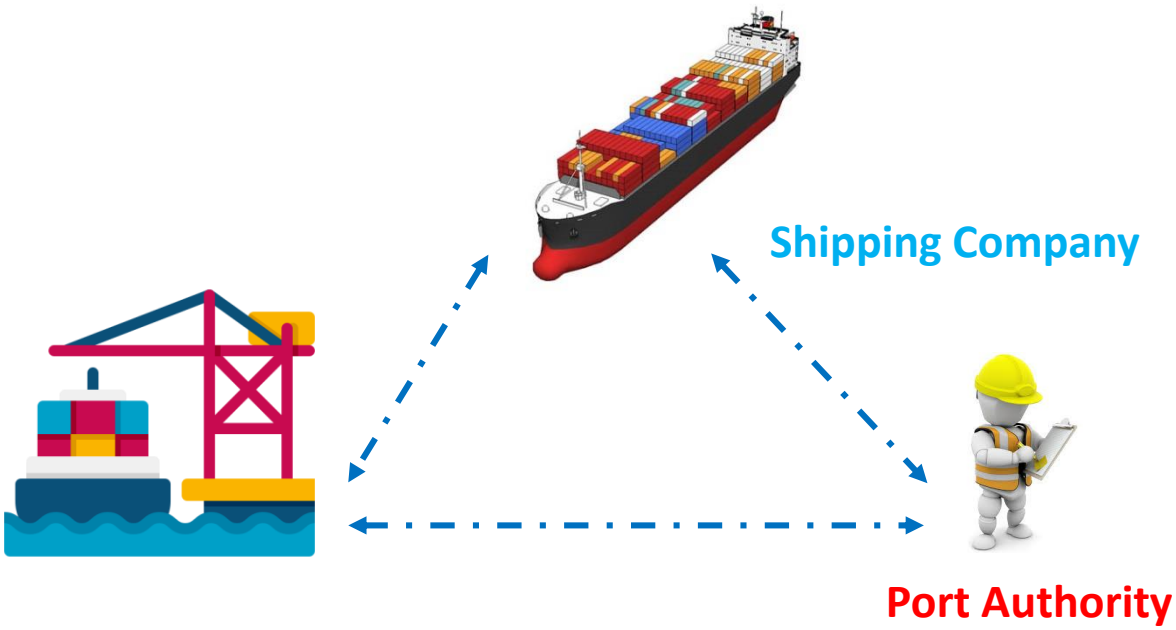


Sources of the pictures: Cargo ship icons created by Flat Icons - Flaticon

What is/are the applicable regime/s of liability?

Sector-specific

Horizontal

Sector-specific Rules

1991 United Nations Convention on The Liability of Operators of Transport Terminals In International Trade, not in force:

Art. 1, let. a): «"operator of a transport terminal" (hereinafter referred to as "operator") means a person who, in course of his business, undertakes to take in charge goods involved in international carriage of goods in order to perform or to procure the performance of transport-related services with respect to the goods in an area under his control or in respect of which he has a right of access or use. However, a person is not considered an operator whenever he is a carrier under applicable rules of law governing carriage».

A Port Authority however would not fall within this definition

Art. 1, par.6 and 7, RR, not in force:

«6. (a)“Performing party” means a person other than the carrier that performs or undertakes to perform any of the carrier’s obligations under a contract of carriage with respect to the receipt, loading, handling, stowage, carriage, keeping, care, unloading or delivery of the goods, to the extent that such person acts, either directly or indirectly, at the carrier’s request or under the carrier’s supervision or control. (b) “Performing party” does not include any person that is retained, directly or indirectly, by a shipper, by a documentary shipper, by the controlling party or by the consignee instead of by the carrier.

7. “Maritime performing party” means a performing party to the extent that it performs or undertakes to perform any of the carrier’s obligations during the period between the arrival of the goods at the port of loading of a ship and their departure from the port of discharge of a ship. An inland carrier is a maritime performing party only if it performs or undertakes to perform its services exclusively within a port area».

Terminal operators acting as carrier’ agents

Art. IV.2 H-VR:

«2 . Neither the carrier nor the ship shall be responsible for loss or damage arising or resulting from:

(a) Act, neglect, or default of the master, mariner, pilot, or the servants of the carrier in the navigation or in the management of the ship. (…)

(g) Arrest or restraint of princes, rulers or people, or seizure under legal process. (…)

(q) Any other cause arising without the actual fault or privity of the carrier, or without the fault or neglect of the agents or servants of the carrier, but the burden of proof shall be on the person claiming the benefit of this exception to show that neither the actual fault or privity of the carrier nor the fault or neglect of the agents or servants of the carrier contributed to the loss or damage».

- Under the H-VR the carrier is liable towards the cargo interest for the terminal operator's misconduct when the latter acts as the former's agent or servant.
- The carrier should not be considered liable in case of malfunctioning of the Smart Port's technologies for which the Port Authority is responsible.

Has the cargo interest a direct action in tort towards the Port Authority?

Applicable domestic law

What is/are the applicable regime/s of liability?

Sector-specific

Horizontal

Domestic law both for Port Authorities and terminal operators

Horizontal Rules

Basis of liability

Contractual / Tort Liability

Product liability

Who is responsible towards the ship / cargo interest in case of malfunctioning of the Smart Port System?

The relevant steps and proposals within the EU Digital Strategy

- 2020: White Paper on Artificial Intelligence
- 20 October 2020: European Parliament resolution with recommendations to the Commission on a civil liability regime for artificial intelligence (2020/2014(INL))
- 3 May 2022: European Parliament resolution on artificial intelligence in a digital age (2020/2266(INI))
- 21 April 2021 – Proposal for a regulation of the European Parliament and of the Council on laying down harmonized rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts (COM(2021)0206 – C9-0146/2021 – 2021/0106(COD)) – **EU Artificial Intelligence Act**
- Sept. 2022: Commission's Proposal for a directive of the European Parliament and of the Council on adapting noncontractual civil liability rules to artificial intelligence – **AI liability directive**

Principles on which the proposed package of rules is based:

- Human centric and trustworthy artificial intelligence
- Risk-based approach
- Improvement of the functioning of the internal market by laying down uniform requirements for non-contractual civil liability for damage caused with the involvement of AI systems
- Reduction of legal uncertainty for businesses developing or using AI regarding their possible exposure to liability and prevent the emergence of fragmented AI-specific adaptations of national civil liability rules

European Parliament resolution of 20 October 2020 with recommendations to the Commission on a civil liability regime for artificial intelligence (2020/2014(INL)

- Commission's proposal for a civil liability regime for AI based on Article 114 TFEU;
- Common strict liability regime for high-risk autonomous AI systems
- Operators of a high-risk AI system held liable when such systems cause harm or damage to the life, health, or physical integrity of a natural person, to the property of a natural or legal person, or cause significant immaterial harm resulting in a verifiable economic loss.

European Parliament resolution of 3 May 2022 on artificial intelligence in a digital age (2020/2266(INI):

- high-risk AI systems: strict liability regime + mandatory insurance cover;
- other activities, devices or processes driven by AI systems that cause harm or damage: fault-based liability + presumption of fault on the part of the operator, unless the latter is able to prove that it has abided by its duty of care.

Sept. 2022: Commission's Proposal for a directive of the European Parliament and of the Council on adapting non contractual civil liability rules to artificial intelligence (**AI liability directive**)

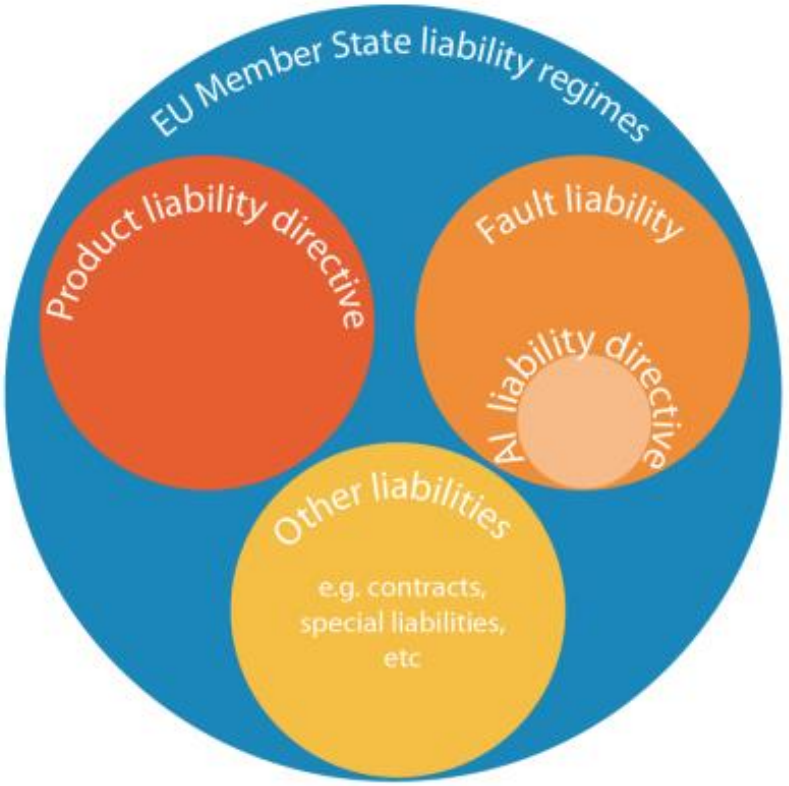
Revision of the PLD

Tort Liability Regime

Strict liability for defective products

«Non-contractual civil law claims for damages caused by an AI system, where such claims are brought under fault-based liability regimes».

Figure 1 – Liability regimes in the EU



Source: European Commission, 2022.

Definitions (based on the EU Artificial Intelligence Act)

'Artificial intelligence system' (AI system) = software that is developed with one or more of the techniques and approaches listed in Annex I and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with.

The subjects:

- '**Provider**' means a natural or legal person, public authority, agency or other body that develops an AI system or that has an AI system developed with a view to placing it on the market or putting it into service under its own name or trademark, whether for payment or free of charge;
- '**User**' means any natural or legal person, public authority, agency or other body using an AI system under its authority, except where the AI system is used in the course of a personal non-professional activity;
- '**Operator**' means the provider, the user, the authorised representative, the importer and the distributor.

- Claim for damages = a non-contractual fault-based civil law claim for compensation of the damage caused by an output of an AI system or the failure of such a system to produce an output where such an output should have been produced;
- Claimant = a person bringing a claim for damages that:
  a) has been injured by an output of an AI system or by the failure of such a system to produce an output where such an output should have been produced;
  b) has succeeded to or has been subrogated to the right of an injured person by virtue of law or contract; or
  c) is acting on behalf of one or more injured persons, in accordance with Union or national law.

The defendant can be either a provider, an operator or a user.

What about Port Authorities or terminal operators?

The solution depends on the single system, i.e. where they use it under their authority:

- Port Authorities having implemented AI systems within their smart ports should be considered as users,
- Terminal operators have implemented AI systems within their terminal or – being part of a smart port – can be however considered to use an AI system under their authority, they should be considered as users

they can be sued by the claimant (along with the provider), provided that the conditions laid down by the proposed directive are met.

Duty of disclosure of relevant evidence on: the provider or manufacturer or distributor, importer, a user or a third person, for the three latter however provided that: (a) they place on the market or put into service a high-risk AI system under their name or trademark; (b) they modify the intended purpose of a high-risk AI system already placed on the market or put into service; (c) they make a substantial modification to the high-risk AI system.

Failing the defendant to comply with the Court's requests, **its non-compliance with a relevant duty of care is presumed**, but it can rebutted.

Regime of liability differentiated for high-risk AI systems and not high-risk ones

An AI system is considered high-risk where both of the following conditions are fulfilled:

a) the AI system is intended to be used as a safety component of a product, or is itself a product, covered by the Union harmonisation legislation listed in Annex II;

b) the product whose safety component is the AI system, or the AI system itself as a product, is required to undergo a third-party conformity assessment with a view to the placing on the market or putting into service of that product pursuant to the Union harmonisation legislation listed in Annex II.

Presumption of the casual link between the defendant's fault and the output produced by the AI system **or the failure** of the AI system to produce an output, where all of the following conditions are met:

a) the claimant has demonstrated or the court has presumed the fault of the defendant, or of a person for whose behaviour the defendant is responsible, consisting in the **non-compliance with a duty of care** laid down in Union or national law directly intended to protect against the damage that occurred;

b) it can be considered **reasonably likely, based on the circumstances of the case**, that **the fault has influenced the output** produced by the AI system or the failure of the AI system to produce an output;

c) the claimant has demonstrated that the output produced by the AI system or the failure of the AI system to produce an output gave rise to **the damage**.

In the case of a **claim for damages against a provider of a high-risk** or a person subject to the provider's obligations, the complainant has further to demonstrate that the provider or, where relevant, the person subject to the provider's obligations, failed to comply with any of the following requirements, taking into account the steps undertaken in and the results of the risk management system:

a) the AI system is a system which makes use of techniques involving the training of models with data and which was not developed on the basis of training, validation and testing data sets that meet the quality criteria referred to in [Article 10(2) to (4) of the AI Act];

b) the AI system was not designed and developed in a way that meets the transparency requirements laid down in [Article 13 of the AI Act];

c) the AI system was not designed and developed in a way that allows for an effective oversight by natural persons during the period in which the AI system is in use pursuant to [Article 14 of the AI Act];

d) the AI system was not designed and developed so as to achieve, in the light of its intended purpose, an appropriate level of accuracy, robustness and cybersecurity pursuant to [Article 15 and Article 16, point (a), of the AI Act]; or

e) the necessary corrective actions were not immediately taken to bring the AI system in conformity with the obligations laid down in [Title III, Chapter 2 of EN 27 EN the AI Act] or to withdraw or recall the system, as appropriate, pursuant to [Article 16, point (g), and Article 21 of the AI Act].

- In the case of a **claim for damages against a user of a high-risk AI system**, it is necessary for the claimant to prove that the user
  a) did not comply with its obligations to use or monitor the AI system in accordance with the accompanying instructions of use or, where appropriate, suspend or interrupt its use pursuant to [Article 29 of the AI Act]; or
  b) exposed the AI system to input data under its control which is not relevant in view of the system's intended purpose pursuant to [Article 29(3) of the Act].
- In the case of a claim for damages concerning a high-risk AI system, a national court shall not apply the presumption laid down in paragraph 1 where the defendant demonstrates that sufficient evidence and expertise is reasonably accessible for the claimant to prove the causal link mentioned in paragraph 1.
- In the case of a **claim for damages concerning an AI system that is not a high-risk AI system**, the presumption laid down in paragraph 1 shall only apply where the national court considers it excessively difficult for the claimant to prove the causal link mentioned in paragraph 1.

What is/are the applicable regime/s of liability?

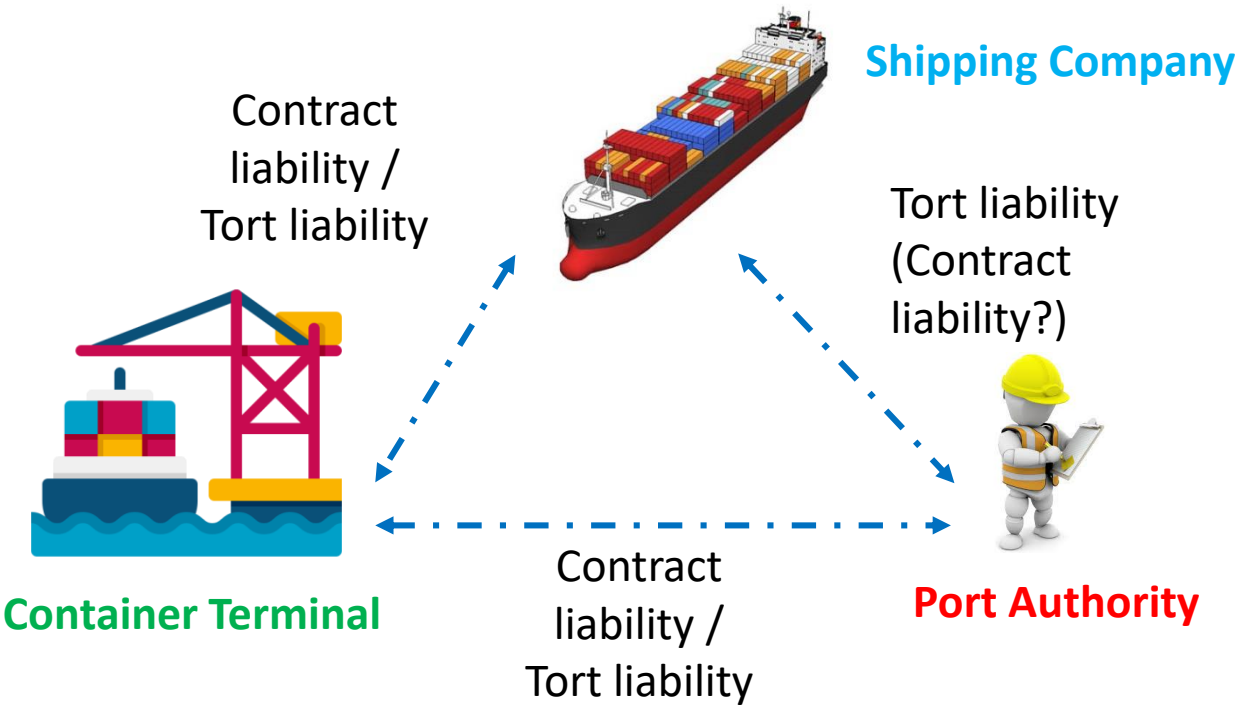
Sector-specific

Domestic law both for Port Authorities and terminal operators

Horizontal

PLD + domestic law both for Port Authorities and terminal operators

Compensation gaps



Sources of the pictures: Cargo ship icons created by Flat Icons - Flaticon

Who is responsible towards the ship / cargo interest in case of malfunctioning of the Smart Port System?

Can the terminal operator or the Port Authority be held liable in case the malfunctioning prevented the shipowners to comply with the Just in Time Arrival Clause?

Final Considerations

- When incorporated into an efficient and smart multimodal network, smart ports are key drivers for the future sustainable development from different points of view
- Need to enact technologically neutral Public Law and Private Law rules
- Uncertainty both at the domestic and at the EU / international level about the applicable regime/s of liability

Thank you for your kind attention!

Any questions?

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