Defining ports in the digital age

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The International Association of Ports & Harbors
www.iaphworldports.org
ABOUT IAPH

• Founded in 1955
• Today:
  • 170 ports
  • 140 associated members
  • 90 countries
• Role:
  • Leadership through collaboration
  • Raising global standards through exchange of know-how
  • Interest representation (IMO, ILO, UNCTAD, UNEP, ECOSOC, WCO)
• Change process:
  • New constitution and structure since 2017
  • Content driven by World Ports Sustainability Program
Port’s mission

Creating value for a port's surrounding economy in a **sustainable way** should be at the centre of any development.

The mission of a port is to help the surrounding economy, industry, consumption and distribution to become **more competitive and sustainable**.

As these targets are achieved, there will be **more cargo to handle**.
Key role of sustainability

Guaranteeing sustainable growth from the economic, social and environmental point of view is a priority for ports.

Key role of Innovation & digitalization
Key role of sustainability

World Ports Sustainability Program
WPSP areas of interest and SDGs
Ports can become real **hubs of digitalization** where all stakeholders bring together data into **digital platforms**, allowing a far more **efficient and secure** logistics chain and **connecting industry**.
Impact of digitalisation on port activity

Digitalisation is one of the biggest game changers for transport and logistics

- Logistics processes can be **optimised**
- Transport infrastructure can be used in a more **efficient way** (By monitoring the real use of infrastructure and the real needs for maintenance, ports can rationalise infrastructure investments and their maintenance)
- Enhance the **safety and security** of the supply chain (early warning, real-time alerts and optimised checks)
- Improve the service to the passengers in the port (through Apps and other digital services)
- Enhance **environmental performance** (through a better use of transport infrastructure and transport means -trucks, trains and ships-)
- Tool in creating awareness of the **carbon and environmental footprint** of a given supply chain.

Companies can use it in the development of their supply chain sustainability strategies.

Digitalisation can only deliver if all stakeholders, public and private, cooperate and share information.

Ports can be the neutral platform that gives all stakeholders the trust needed.
Impact of digitalisation on port activity

What ports need to do?

• Turn traditional Port Community Systems (PCS) into **real data sharing platforms**

• Provide an adequate level of **digital connectivity** (high capacity broadband, WIFI and 5G)

• Adapt **training programmes** to the changing job reality

• Rethinking of **port operations** due to the automation and semi-automation processes and developments in the different modes of transport

• Address **cybersecurity**

The shipping/port industry is under pressure to adopt innovative digital technologies.

Ports and terminals are heavily interconnected with different stakeholders.

Ports and terminals need to work together with all stakeholders and have overall supply chain perspective.
Main conclusions

- For the maritime and port sectors, it is imperative to implement disruptive technologies to stay operationally efficient and environmentally friendly in current and future business circumstances.

- In order to keep up with the cutting-edge technologies, the maritime and port sectors will need to hire more IoT specialists from outside of their sectors.

- There are more examples that companies from different sectors start providing transport and logistics services, such as Google’s development of self-driving car and, Rakuten’s (e-commerce conglomerate) announcement of research of unmanned cargo ships.

- If there is no self-reformation, the maritime and port industry will find more game changers from outside industries.
A Port Community System:
• is a 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.
• optimises, manages and automates port and logistics processes through a single submission of data and connecting transport and logistics chains.

How ports are facing digitalisation?

Port Community Systems

EXPORTER  IMPORER

SHIPPING AGENCY  FREIGHT FORWARDER  CUSTOMS

PORT AUTHORITY  OCEAN CARRIER

CONTAINER DEPOT  TERMINAL OPERATOR  INLAND CARRIER

FORELAND  HINTERLAND
Port Community Systems
Portic: Port of Barcelona PCS

Created in 1999 by the Port Authority of Barcelona (APB) and the Port Community Associations.

Mission
- Improve the Shipping Transport Documentary Processes.
- Promote new Information Technology improvements.
- Improve Competitiveness among the stakeholders within the Port Logistics Community.

PORTIC is a private entity shared with public shareholders.
5th generation port: the Smart Port

Source: Deloitte (2017)
The next step: Smart ports concept

**LOGISTICS**
- Real-time information
- Traceability
- Automation and robotisation
- Physical and technological integration infrastructure
- Efficiency and predictability
- Seamless freight transport
- Smart maintenance
- Non-intrusive inspection

**MOBILITY**
- Connected vehicle
- Sustainable transport
- Autonomous transport
- Intermodality and syncromodality
- Smart traffic management
- Mobility management
- Connected infrastructure roads and rails
- Advanced parking

**GOVERNANCE**
- Transparency
- e-Administration
- Security
- Cybersecurity
- Business models
- Digital platform
- Enabling tech
- Strategy and management

**ENVIRONMENT**
- Circular economy
- Pollution reduction
- Waste management
- Energy efficiency
- Energy production
- Water management
- Alternative fuels
- Biodiversity

**PEOPLE**
- Port city
- Passengers
- Port heritage
- Diversity
- Social cohesion
- Nautical cluster
- Training and knowledge

**ECONOMY**
- Economic impact
- Competitiveness
- Employment
- Routes and connections
- Open innovation
- Cost reduction
- Financing
The next step: Smart ports concept

- Perimeter Intrusion Sensors
- Smart Traffic Management
- Marine Environment Sensors
- Connected Emergency Services
- Digital Information
- Telecommunications Infrastructure
- Video Analytics
- Passenger Guidance
- Automation
- Big Data
- Cybersecurity
- Smart Parking
- Climate and Pollution Sensors
- Workplace Mobility
- Smart Buildings
- Smart Maintenance

Adequate legislation
Established processes and procedures
Digital training
ChainPORT
What the future might hold


In the absence of foreknowledge, we can only imagine various futures and the implications of each. We posit four possible futures:

- **Digital disruption** is a world in which the current industry is disrupted by new players who leverage digital, data, and analytics to optimise the end-to-end value chain
- **Digital reinvention** envisages that the current industry digitises aggressively and provides new value-adding services to its customers
- **Third wave of globalisation** assumes other economies, like India and Africa, realise their manufacturing and export potential, while digital reduces friction in global supply chains and spurs continued trade growth
- **“Peak container” and consolidation** imagines a future in which trade wars, geopolitical tensions, and “near-shoring” result in the peaking and absolute decline in international trade, forcing players to further consolidate
Digital disruption

Digital reinvention

Trade demand

1-1.5X
MULTIPLIER

“Slow and steady” trade growth

Modest additional containerisation

~25%

Shorter, more diverse supply chains (e.g., India to China, Africa to Europe)

China manages slowdown, India does not achieve “breakout” growth

Sector economics

Scale economies lose salience, flexibility is valued

Smaller ships, more point-to-point, less transshipment

Digital, data, and analytics a fundamental driver of value

Considerable automation across value chain (ships, ports, rail, trucks)

Industry structure

4-5 major incumbents and “long tail” of point-to-point players

Vertical integration enables digitisation and provision of E2E supply chain services

Freight forwarding radically shifted to a digital model

The future is digital

Responses of TT Club directors (8 November 2017)

Digital Reinvention
- 59%

Digital Disruption
- 41%

Third Wave of Globalisation
- 39%

"Peak Container" and Consolidation
- 6%

Thank you

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