

# **SMART AND DIGITAL PORTS The Ports Of The Future**



**Port de Barcelona**

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# SMART AND DIGITAL PORTS

## The Ports Of The Future

01

### Introduction

Current trends and drivers

02

### Port Innovation

Innovation in the Port of Barcelona, Smart Realities

03

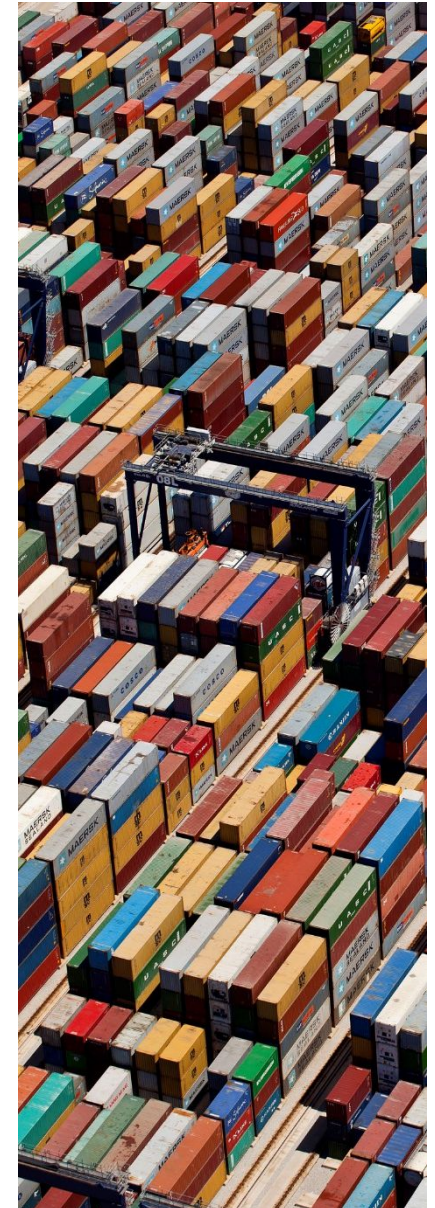
### What the Future Holds

Future trends and new developments.

04

### Final Remarks

The challenges

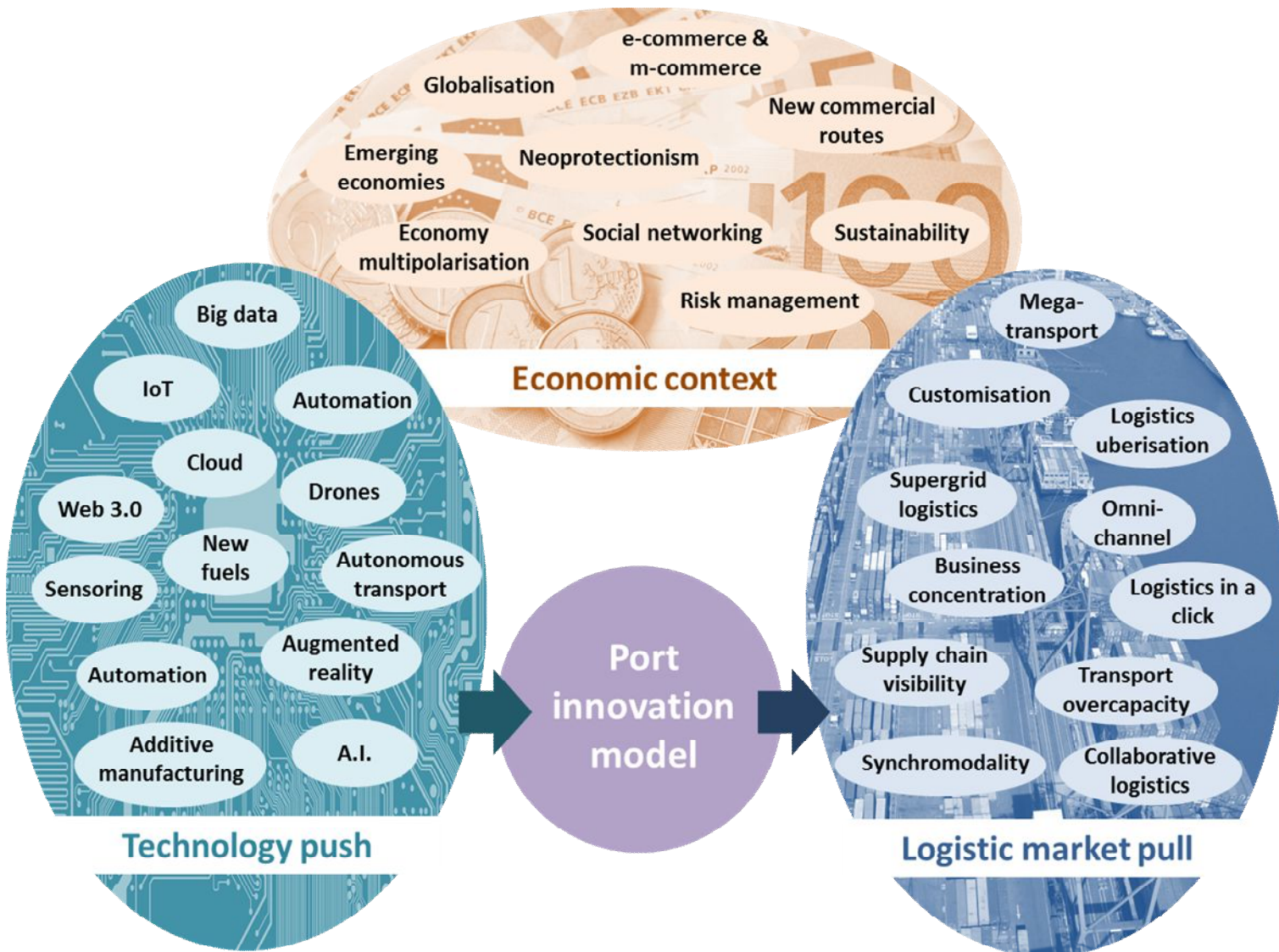




# 01

## Introduction

### The Port Innovation Model





# 01

## Introduction

Port of Barcelona's mission and vision

### MISSION

To **contribute** to the  
**competitiveness** of our  
**hinterland** by providing  
**efficient services**  
responding to its needs for  
**maritime transport, land  
transport and logistics  
services.**

### VISION

Barcelona: the  
**European** port  
**solution** in the  
Mediterranean.





# 01

## Introduction

What is innovation?

Innovation is to transform **new ideas** in **value** for the port community, its **clients** and the **society**





# 01

## Introduction

What is the difference ? Smart vs. digital

**Smart** innovation concept can be applied to the **back office** for innovation activities, that is, the data collection, analysis and automation aspects.

**Digital** innovation concept can be applied to the **front office** of innovation activities, that is, their relational, collaboration and participative aspects.



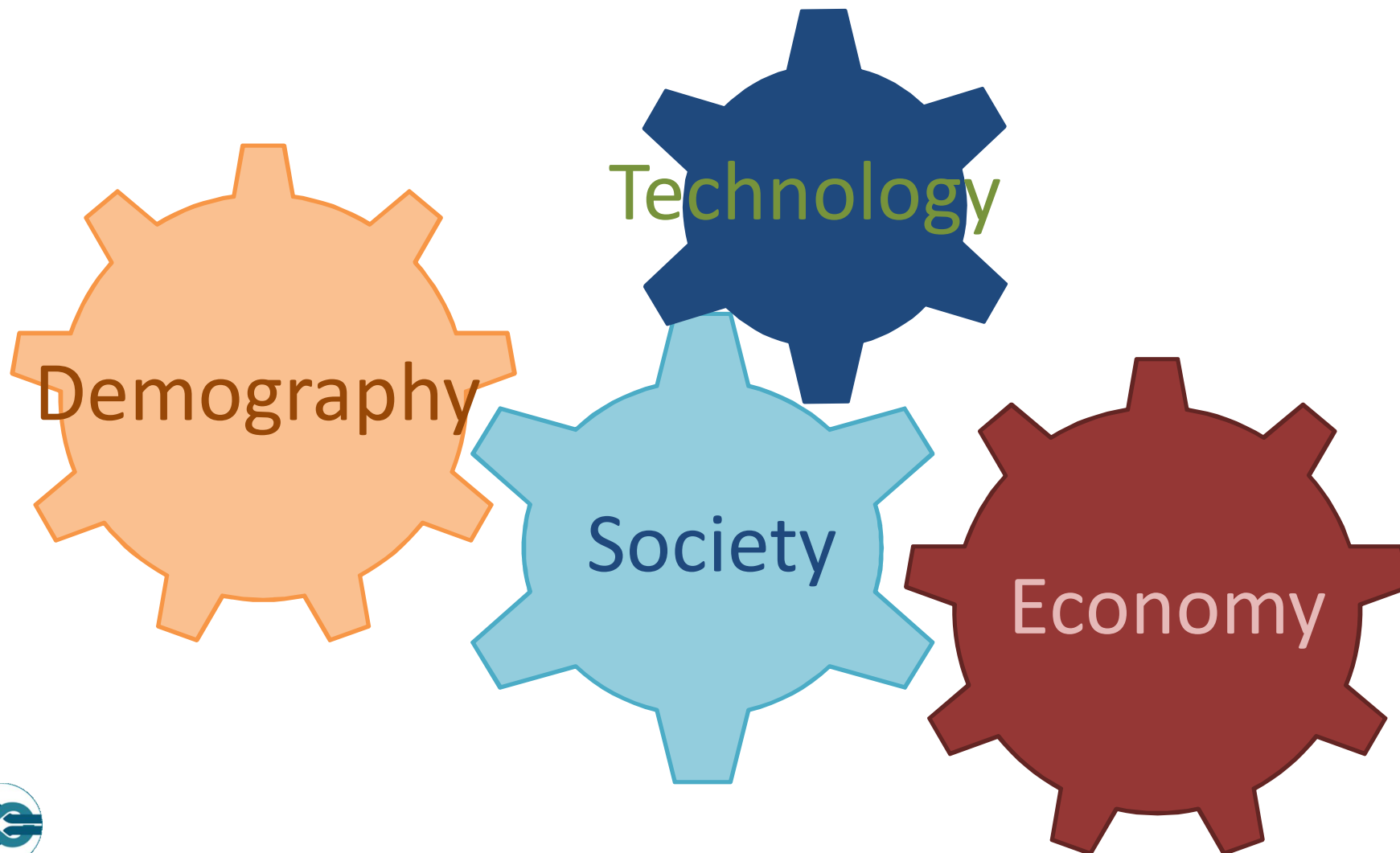




# 01

## Introduction

Four drivers that change the context of how ports will be developed.

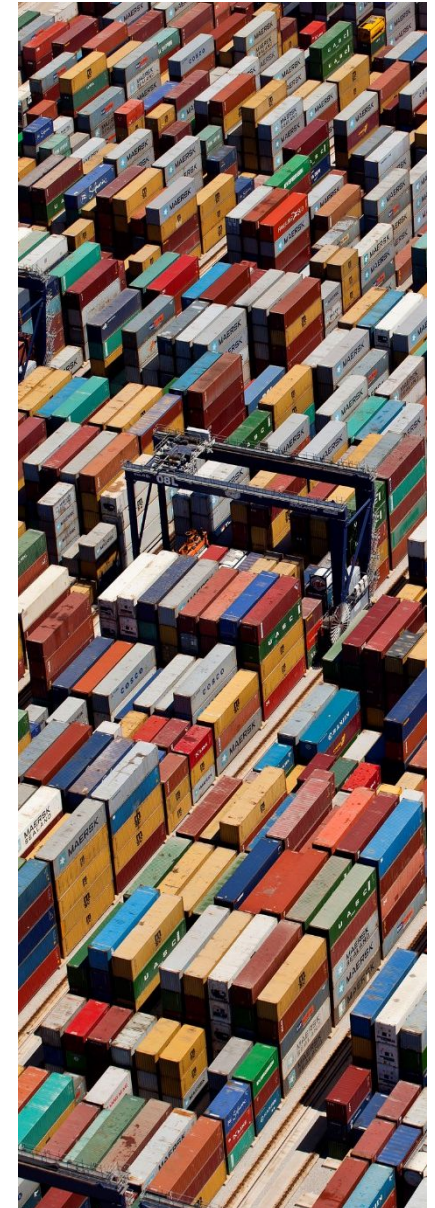




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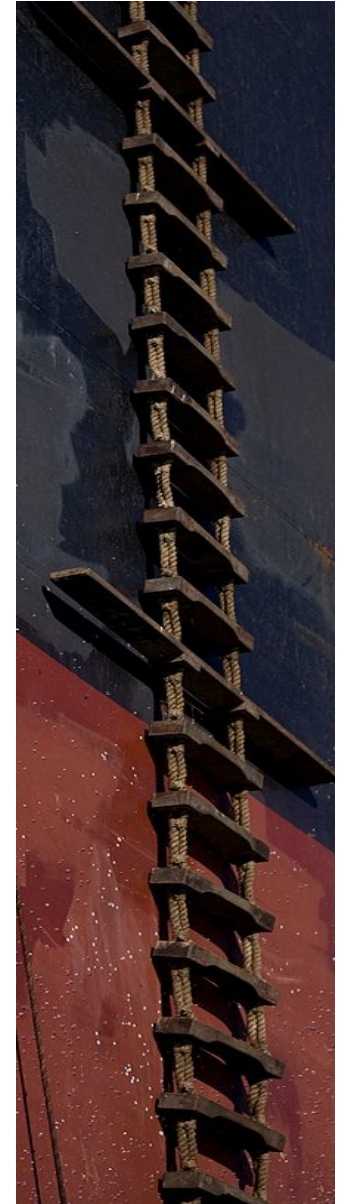
## 02

### Port Innovation

Global trends affecting port innovation

#### Impact on port activity

- Infrastructure as a commodity
- Focus on information services (big data, analytics,...)
- New business models
- New governance model
- Collaboration
- New transport revolution





## 02

### Port Innovation

Innovation organizational structure at Port de Barcelona

#### At port authority level:

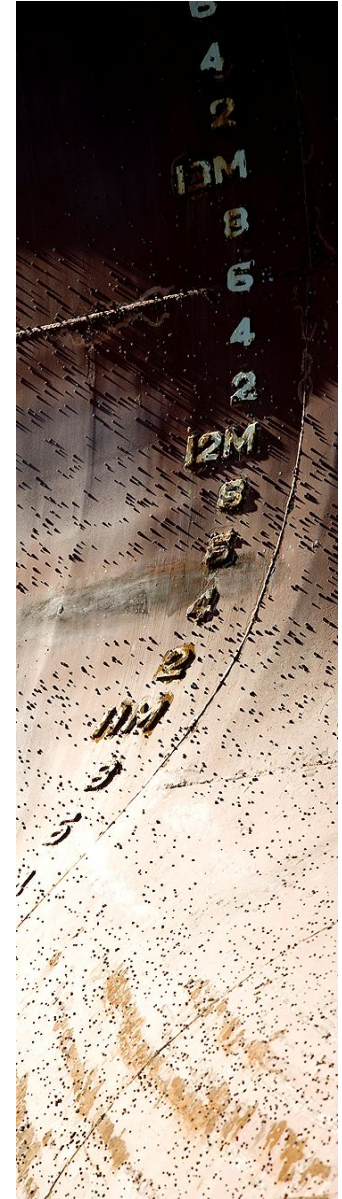
- Innovation manager
- R+D+I internal committee
- Digital council

#### At port community level:

- Working group for strategy and innovation

#### Strategic projects:

- Digital project
- Innovation project
- Participation in EU funded innovation projects





Port de Barcelona

02

## Port Innovation

Some “strategic” innovation projects



Barcelona Europe South Terminal





Port de Barcelona

02

## Port Innovation

Participation in EU financed projects



DEVELOPMENT OF THE  
CONNECTION  
LYON-MADRID  
ON THE MEDITERRANEAN  
CORRIDOR



CORE  
LNGas  
hive

Moll Prat Rail  
Terminal



CLEANPORT



BARCELYON  express

Adaptation of the Port of  
Barcelona rail network  
to standard (UIC) gauge

Reinforcement of Short Sea  
Shipping in the Port of  
Barcelona through the  
development of a maritime  
station





## 02

### Port Innovation

From Smart City to... Smart Port

#### Smart Governance



Makes an efficient management of public resources.

- It is transparent.
- Encourages participation.
- Guarantees physical and legal security
- for the benefit of the citizen and the economy...

#### Smart Mobility



Local and international multimodal accessibility.

- The modes of transport.
- Infrastructures and ICT.
- Traffic management.
- Efficiently, integrated, sustainable, innovative and safe.

#### Smart Environment



- Protects and is respectful with its surroundings.
- Promotes measures to reduce pollution.
- Makes efficient management of natural and energy resources.
- It is energy sustainable.

#### Smart Economy



It is the economic engine of its area of influence and generator of common value.

- Create wealth.
- Energizes the labor market.
- It facilitates the internationalization and competitiveness.
- Drive innovation and entrepreneurship.

#### Smart People



There is a good port-city integration that enhances ...

- the diversity
- learning, creativity and participation of people
- culture
- social cohesion
- the tourist attraction of its surroundings

#### Smart Living



- Cultural installation
- Healthy conditions
- Individual security.
- Quality of housing
- Educational facilities.
- Tourist attraction.
- Social cohesion.



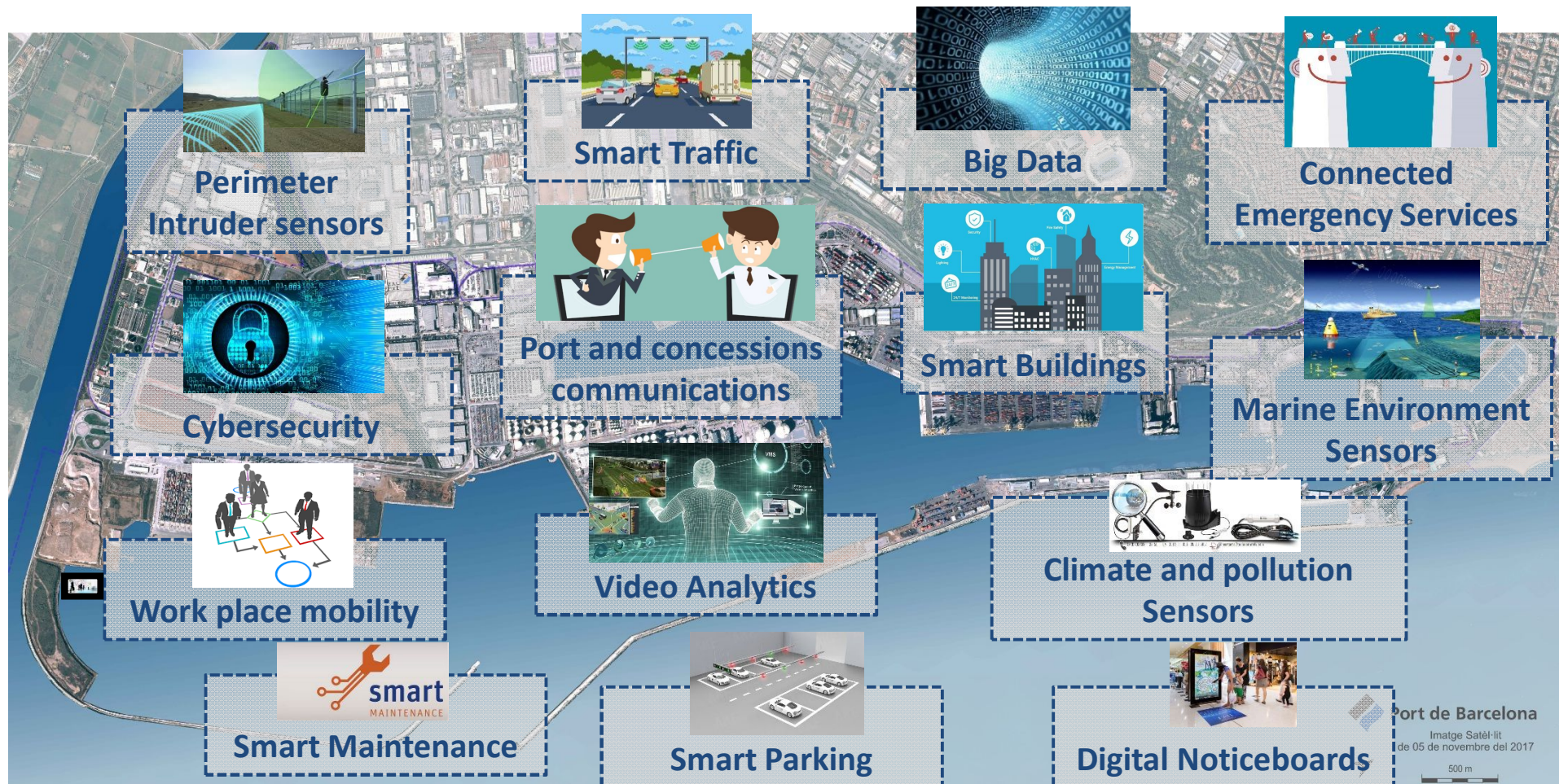




# 02

## Port Innovation

### Port of Barcelona: Smart Port Main Axes







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02

## Port Innovation

Smart realities: some examples



20.000 VEHICLES PER DAY





Port de Barcelona

02

## Port Innovation

Smart realities: some examples



## ACCESS TO TERMINALS

### Terminals of:

 Containers

 Vehicles

 Depots

 Passage (Ferris)

 Truck Parking





Port de Barcelona

02

## Port Innovation

Smart realities: some examples



**+150 CAMERAS**







## 02

### Port Innovation

Smart realities: some examples



# ENVIRONMENTAL CONTROL METEO & SEA

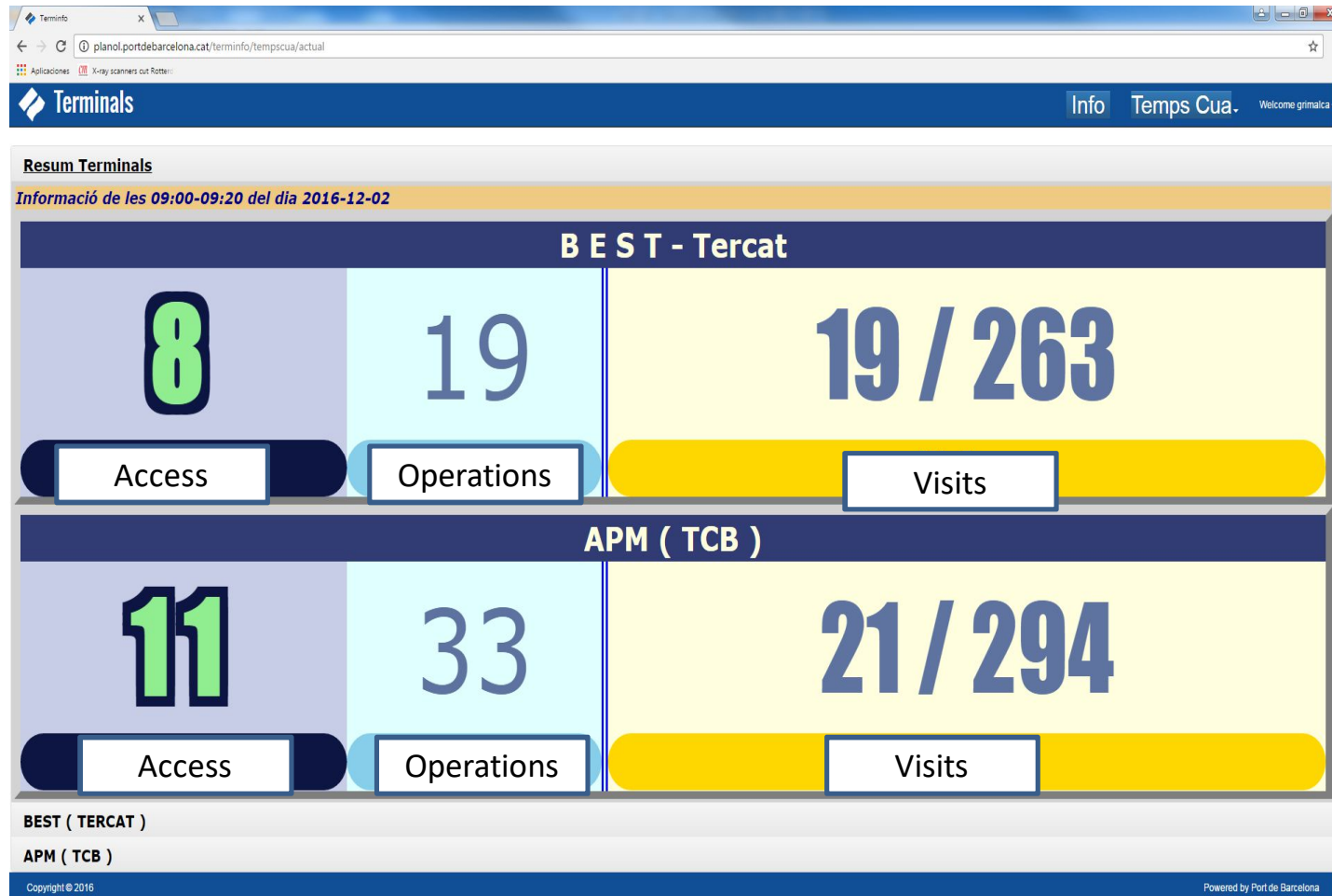




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### Port Innovation

Smart realities: some examples

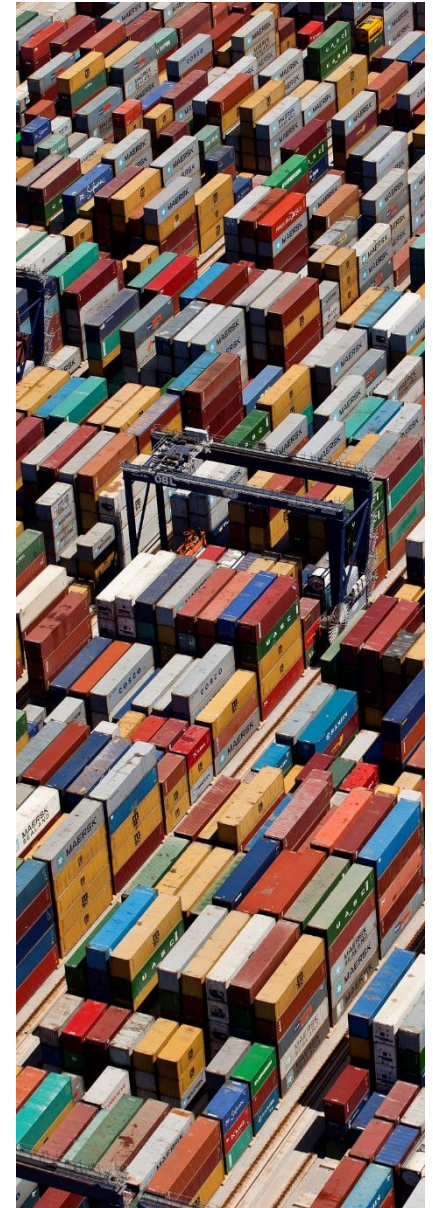




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# 03

## What the Future Holds

Future trends and new developments.

**“In the coming years, some disruptive innovation in transport may appear, which can revolutionize logistics”**





# 03

## What the Future Holds

### The Physical Internet (PI) concept

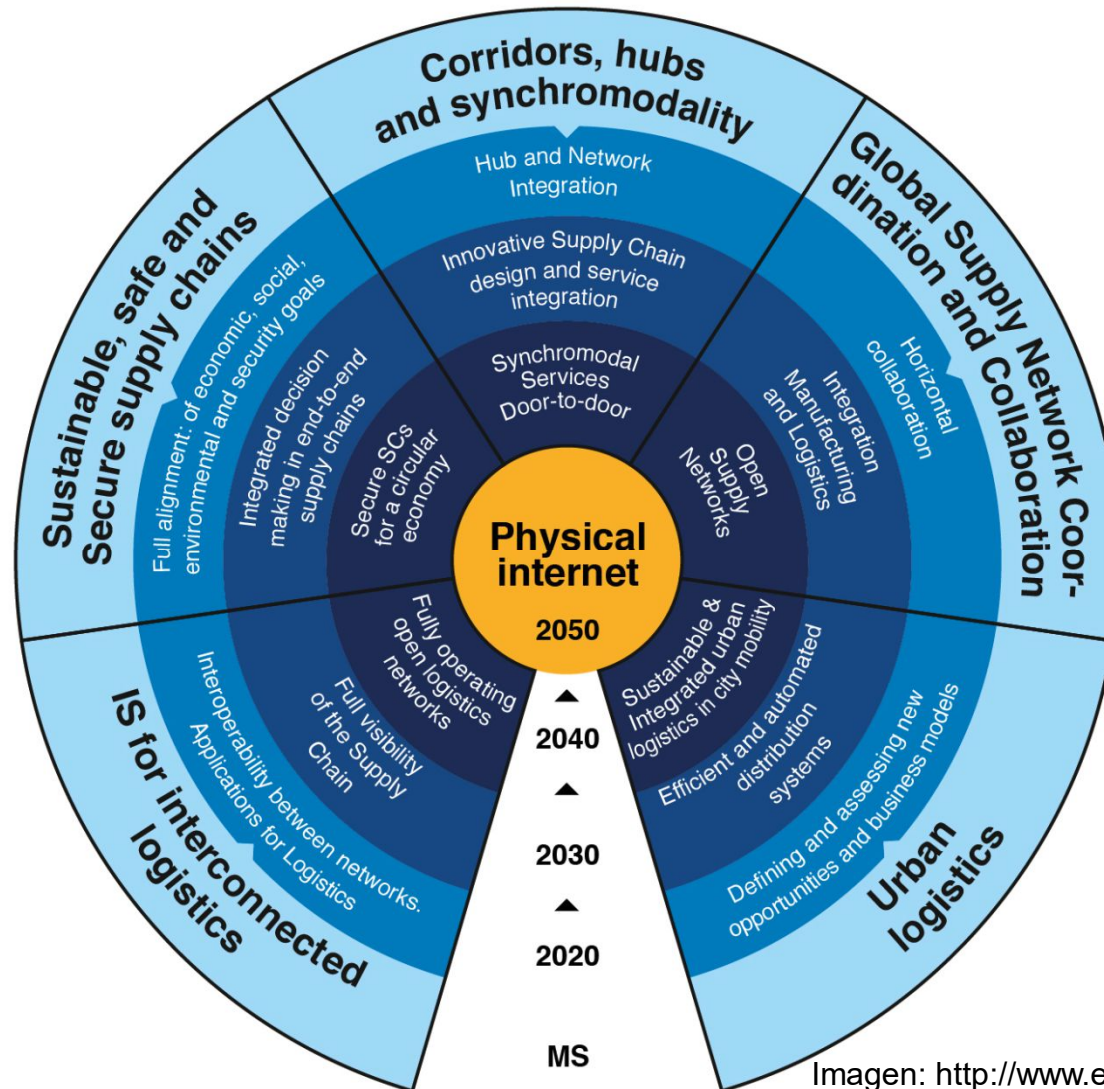


Imagen: <http://www.etp-logistics.eu>





# 03

## What the Future Holds

### Blockchain as a disruptive technology in the supply chain

#### Validation

- ✓ Auditability
- ✓ Transparency
- ✓ Traceability
- ✓ Clear responsibility
- ✓ Control by units

#### Automation

- ✓ Efficiency
- ✓ Issuance and reception of documentation
- ✓ Distribution of information
- ✓ Risk management

#### Configuration

- ✓ Smart Contracts / Conditioned contracts
- ✓ Contract update in real time
- ✓ Create new business models







# 03

## What the Future Holds

Future trends and new developments in logistic.

### Supply Chain Trends

- Syncromodality
- Logistic startups
- Collaborative logistics
- Physical internet
- Alliances
- Sustainability

### Manufacturing Trends

- 3D Printing
- Recycling
- New Materials
- Digital Contents

### Vehicle Trends

- Autonomous ships
- Autonomous trucks
- Tube logistics
- Mega ships
- Electric vehicles
- Alternative fuels







# 03

## What the Future Holds

Future trends and new developments.





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Future trends and new developments.







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## What the Future Holds

Future trends and new developments.



Imagen: <https://www.pinterest.es/tailileepor/>







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## What the Future Holds

Future trends and new developments.



Image: <http://www.scania.com/>



# 03

## What the Future Holds

Future trends and new developments.







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## What the Future Holds

Future trends and new developments.



Imagen: <https://www.flickr.com/photos/rolls-royceplc/>



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## What the Future Holds

Future trends and new developments.

HYPERLOOP



Imagen: <http://lexpansion.lexpress.fr/>





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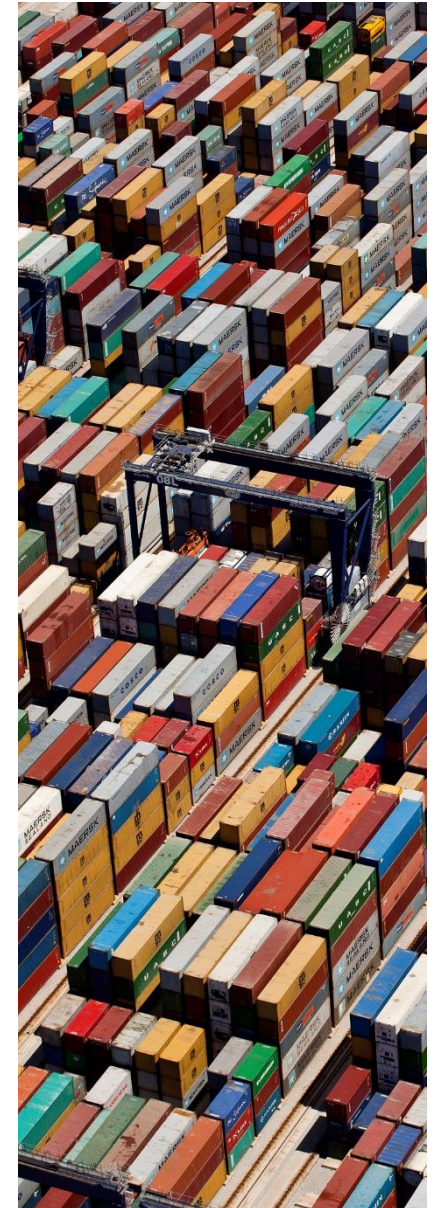
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## 04

### Final Remarks

#### The challenges

- Changes in logistics and maritime transport are happening ever faster and tend to automatize the transport of cargo and related information
- Ports play a key role in transport and must adapt to changes to become facilitators rather than operators
- For this adaptation, the ports must have adequate infrastructure, infostructure, envirostructure and socio-structure
- The future is exciting and will result in many of opportunities





[www.portdebarcelona.cat](http://www.portdebarcelona.cat)