Interconnected & Smart Ports

January 18th 2024,

6th Hemispheric Conference on Logistics, Innovation & Competitiveness

IPCSA
International Port Community Systems Association

NETWORK OF TRUSTED NETWORKS
Connecting and sharing data globally between ports and cross border

PROTECT

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Nico De Cauwer

- IPCSA Secretary-General (since May 1st 2023)
  - official Expert in Transport & Logistics domain within UN/CEFACT
  - Member of IMO's FAL Committee & IMO's Expert Group on Data Harmonization (EGDH)
  - Member of the Data Collaboration Committee of IAPH
- Business Architect Digitalisation & Innovation, Port Community Solutions, within Port of Antwerp-Bruges.

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Who is IPCSA ?

IPCSA
International Port
Community Systems
Association

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“A Community of Communities”

52 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

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International Port Community Systems Association

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IPCSA MEMBERS 2023

dbh Logistics IT AG

SOGET Fluidity for your business

Autorità di Sistema Portale del Mar Ligure Orientale Porti di La Spezia e Marina di Carrara

DAKOSY

MCP plc Port Community Systems

DPCS Djibouti Port Community Systems

Kale Logistics Technology that Transforms

be smart. get connected.

portbase

Autorità di Sistema Portale del Mare Adriatico Orientale Porti di Trieste e Monfalcone

PORTIC

mgi Logistics IT Experts for faster and more secure flows

THE PORT OF LOS ANGELES

epuertobilbao

LOGINK 国家交通运输物流公共信息平台 National Public Information Platform for Transportation&Logistics

PORT OF PRINCE RUPERT LINKING A WORLD OF OPPORTUNITY

Procomex Alliance for the Modernization of Foreign Trade Logistics

بوابة المقطع MAQTA GATEWAY

PORTEL Servicios Telemáticos

Port of Antwerp Bruges

ISRAEL PORTS Development & Assets Company

BULGARIAN PORTS INFRASTRUCTURE Co.

Puertos del Estado

PORTNET الشباك الوطني الوحيد لتبسيط مساطر التجارة الخارجية Guichet Unique National des Procédures du Commerce Extérieur

DUBAI TRADE

constanza port

Port of Rotterdam

DT World

PORT ST. MAARTEN GROUP OF COMPANIES

BARBADOS PORT INC.

TANGER MED PORT AUTHORITY

Autorità di Sistema Portale del Mar Adriatico Centro Settentrionale Port of Ravenna

Port of Amsterdam

Algeciras Port

PORTS of GENOA VADO LIGURE ▪ SAVONA ▪ PRA' ▪ GENOVA

Port Autonome d'Abidjan Une Référence Internationale

porto de sines

HPA Hamburg Port Authority

valenciaport Autoridad Portuaria de Valencia

TRADE-VAN

polski pcs

Indian Ports Association

CNSI

HPCS

IPCSA International Port Community Systems Association

LE HAVRE port HAROPA

SEGUCE TOGO Société d'Exploitation du Guichet Unique pour le Commerce Extérieur du Togo

portall TRANSPARENCY ALL THE WAY

RAK PORTS

North Sea Port Together. Smarter.

SEGUCE RDC

ANP الوكالة الوطنية للموانئ Agence Nationale des Ports

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VISION & MISSION

VISION

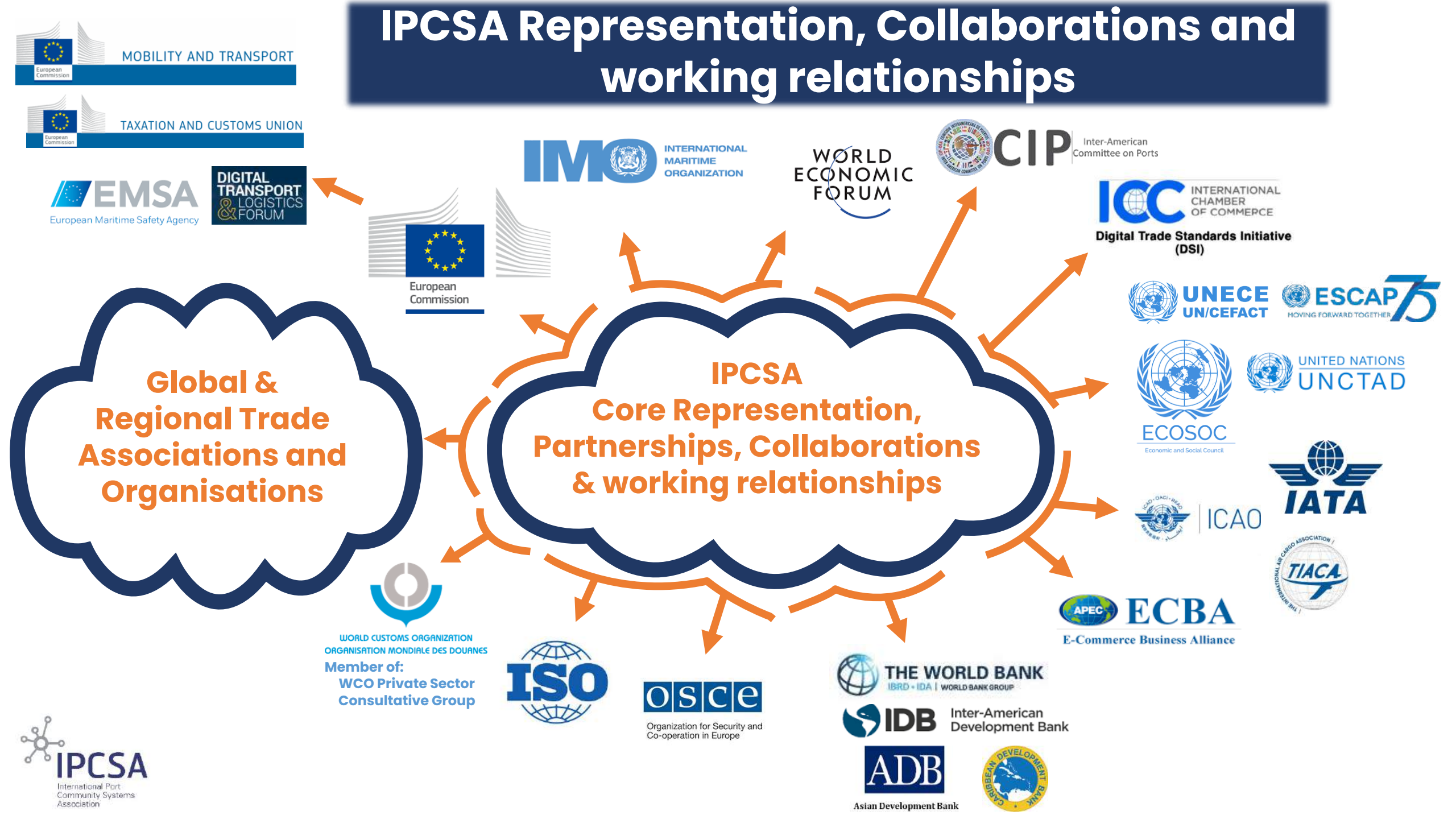
The world needs **sustainable**, **secure** and **seamless** trade and logistics in order to thrive and prosper. Sharing more and better data throughout the supply chain is key in fulfilling this need.
We believe that Community systems like PCS's and Single Windows play a vital role in the logistics digital ecosystem and can accelerate the adoption and scale of digitalisation.
We believe that IPCSA, as a neutral body, is needed to play an essential role in influencing the conditions for PCS and Single Windows to operate .

MISSION

Make sure that **Port Community System Operators (PCSO), Single Window Operators (SWO)** and **Sea and Air Port Authorities** are able to deliver the maximum value in global and regional trade & logistics by:

"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 Representation, Collaborations and working relationships



Things to consider when implementing a PCS

Don’t think ‘technology first’: it’s not an IT-project but a change management project

Stakeholder awareness and ‘Community building’

Technology comes at the end, proven solutions are there

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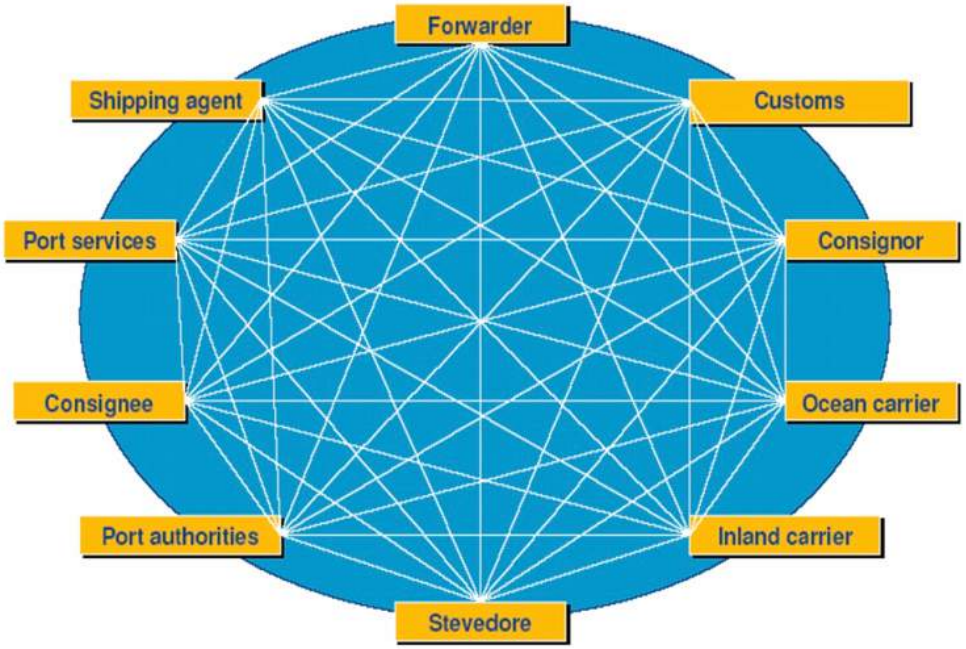
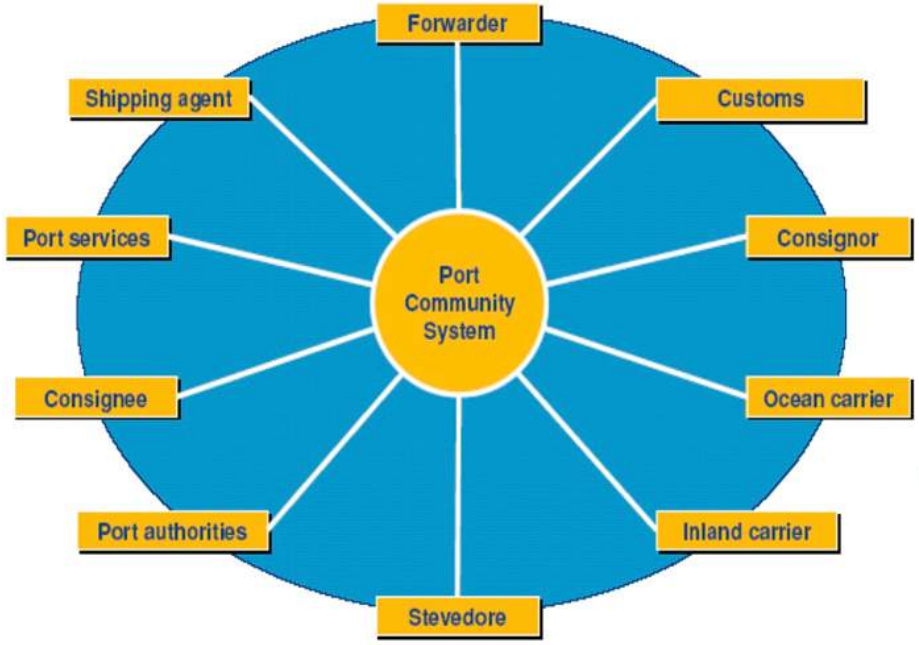
a Port Community System (PCS) proves its benefits when b2g and b2b processes go ‘hand in hand’

Neither of the two or more or less important, but also neither of them should be forgotten





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Benefits of a Port Community System (PCS)

PCSs are there as an essential and pivotal part of efficient supply chains.

PCS-services help to **streamline and facilitate international trade operations** by offering :

- **Customs** compliance & clearance
- Import & Export **Documentation**
- **Maritime** services for arrival, stay and departure of vessels in a port
- **Cargo** services for (un)loading and gate-movements

- Other transparency and **visibility** services
- Other regulatory **compliance & reporting**

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Smart Ports / Port of the Future - Innovation in action

How does a port gives shape to the concept of a Smart Port ?

an example from the

Port of Antwerp Bruges

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Ports are a catalyst towards a sustainable future
Port of Antwerp Bruges

“We must dare to pioneer”

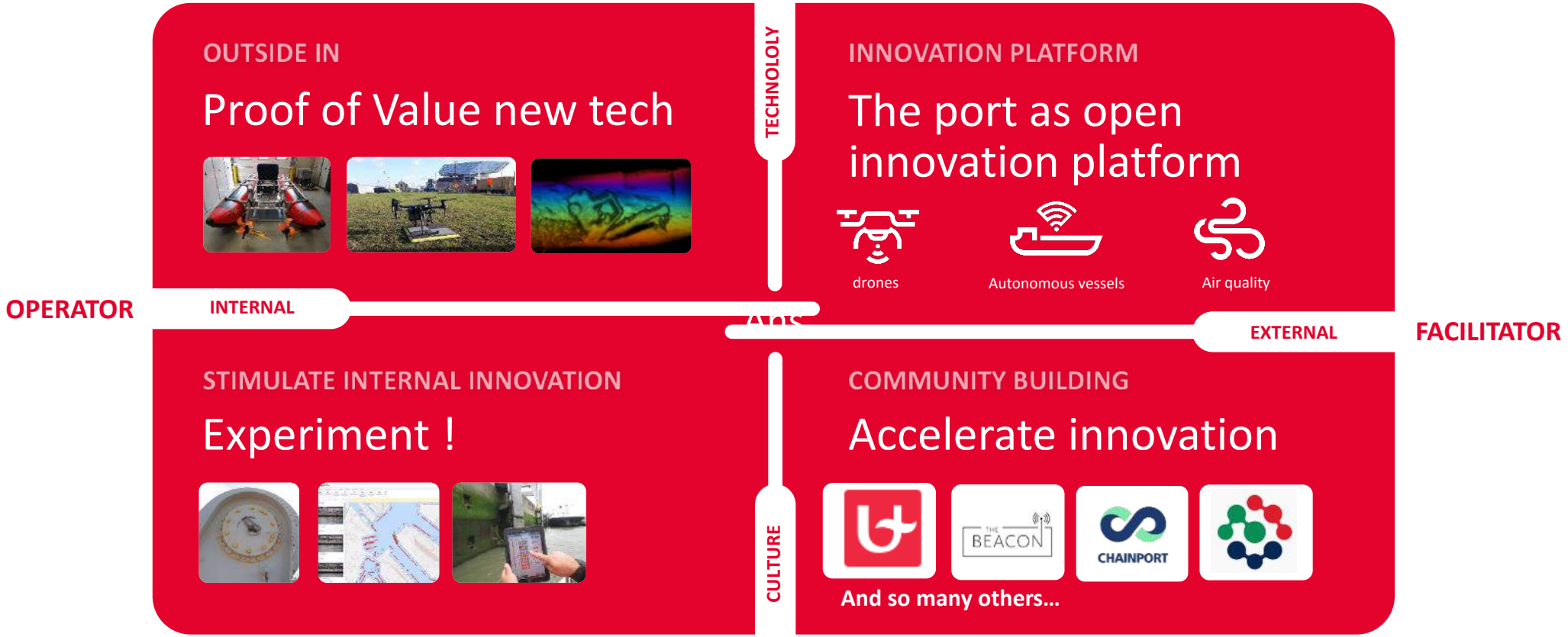
Role of digitalisation ?

Vision without action is a pipe dream,
Action without vision is a nightmare

(Japanese proverb)

Our digital innovation strategy

Make the journey towards a ‘smart port’ actionable



Port of Antwerp Bruges

The smart port defined

Five foundational pillars guarantee the long-term impact

Integrated port operations

Adaptive modal shifts

Cybersecurity

Impact on climate and ecology

Digital talent and ecosystems

Port of Antwerp Bruges

DIGITAL NERVOUS SYSTEM

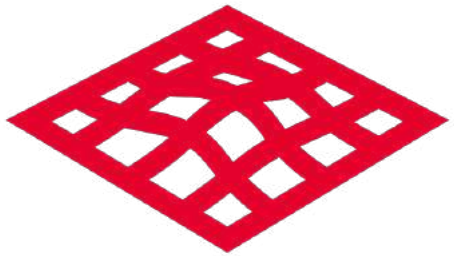
sensor devices inspired by the five senses

The metaphor to make a smart port tangible

Digital nervous system for efficient, safe and sustainable operations

Drones

To extend our reach



Sensors

To collect relevant datasets

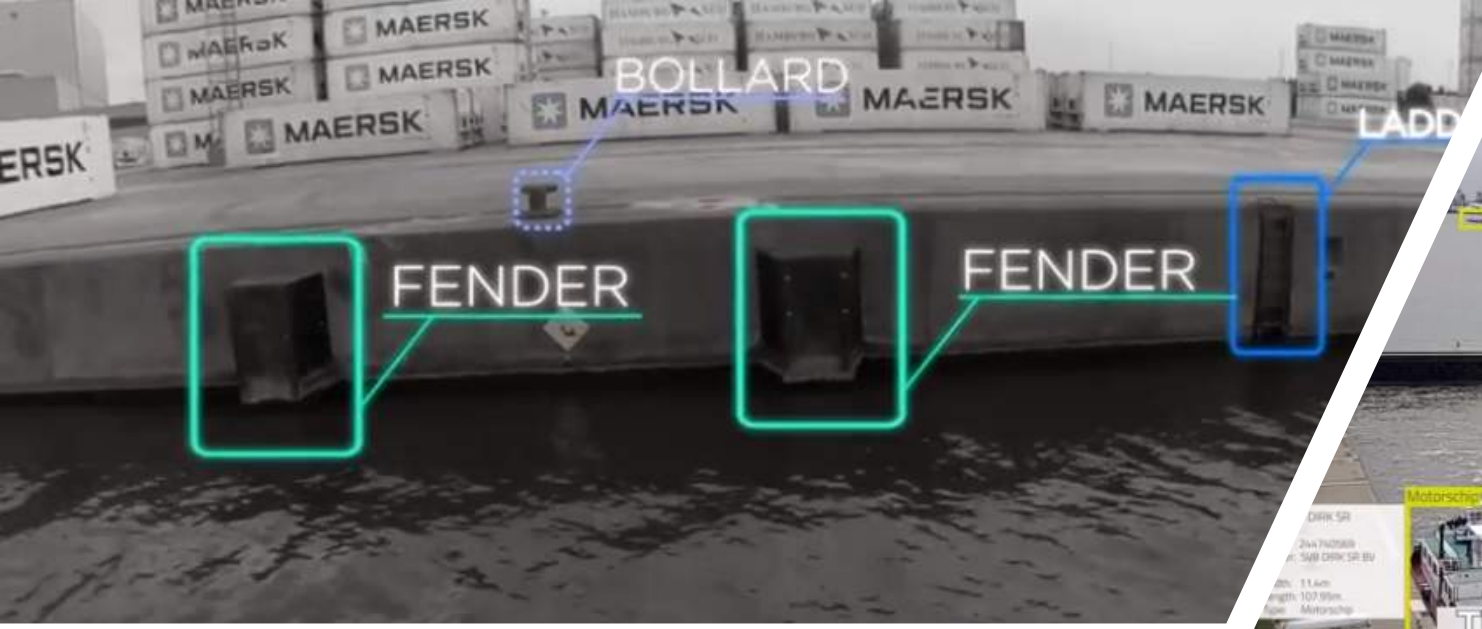
5G / Lora

For real time access to data and video feeds

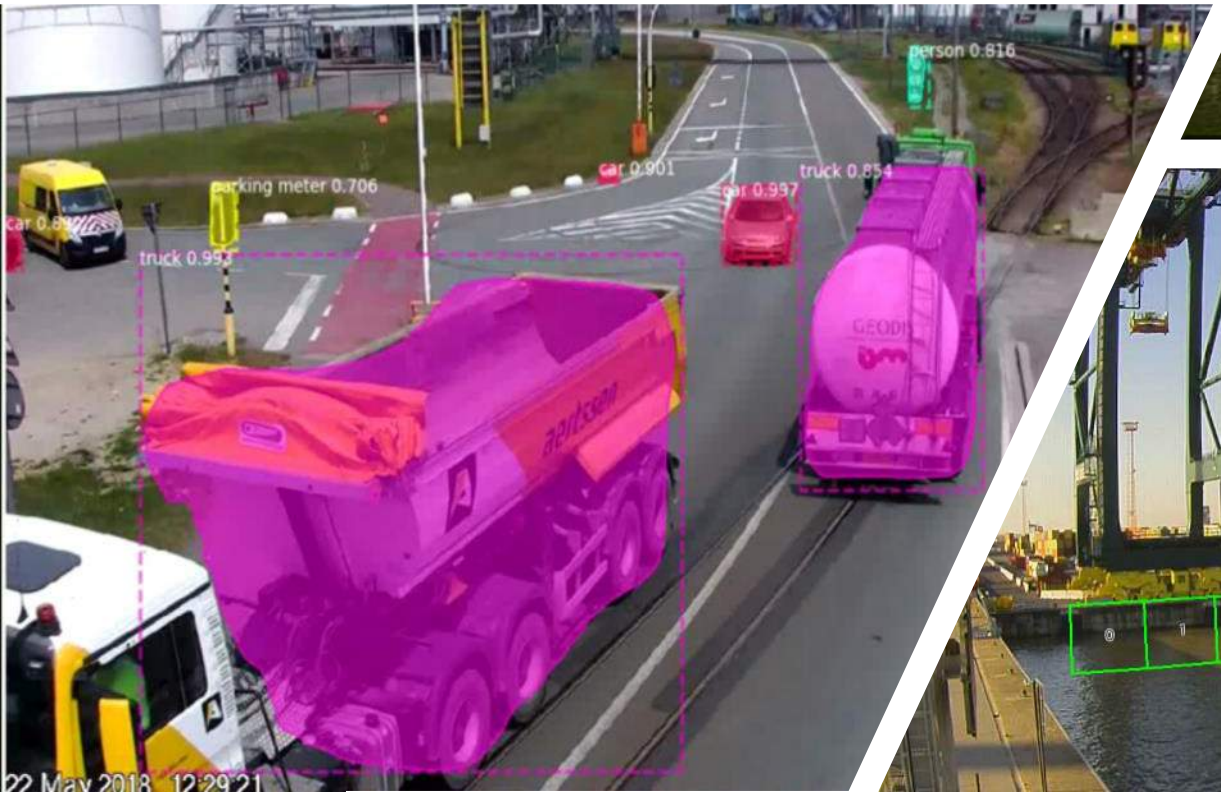
Digital twin

For situational awareness in context tailored to the need of the target audience

Port of Antwerp Bruges


BOLLARD
FENDER
FENDER
MAERSK

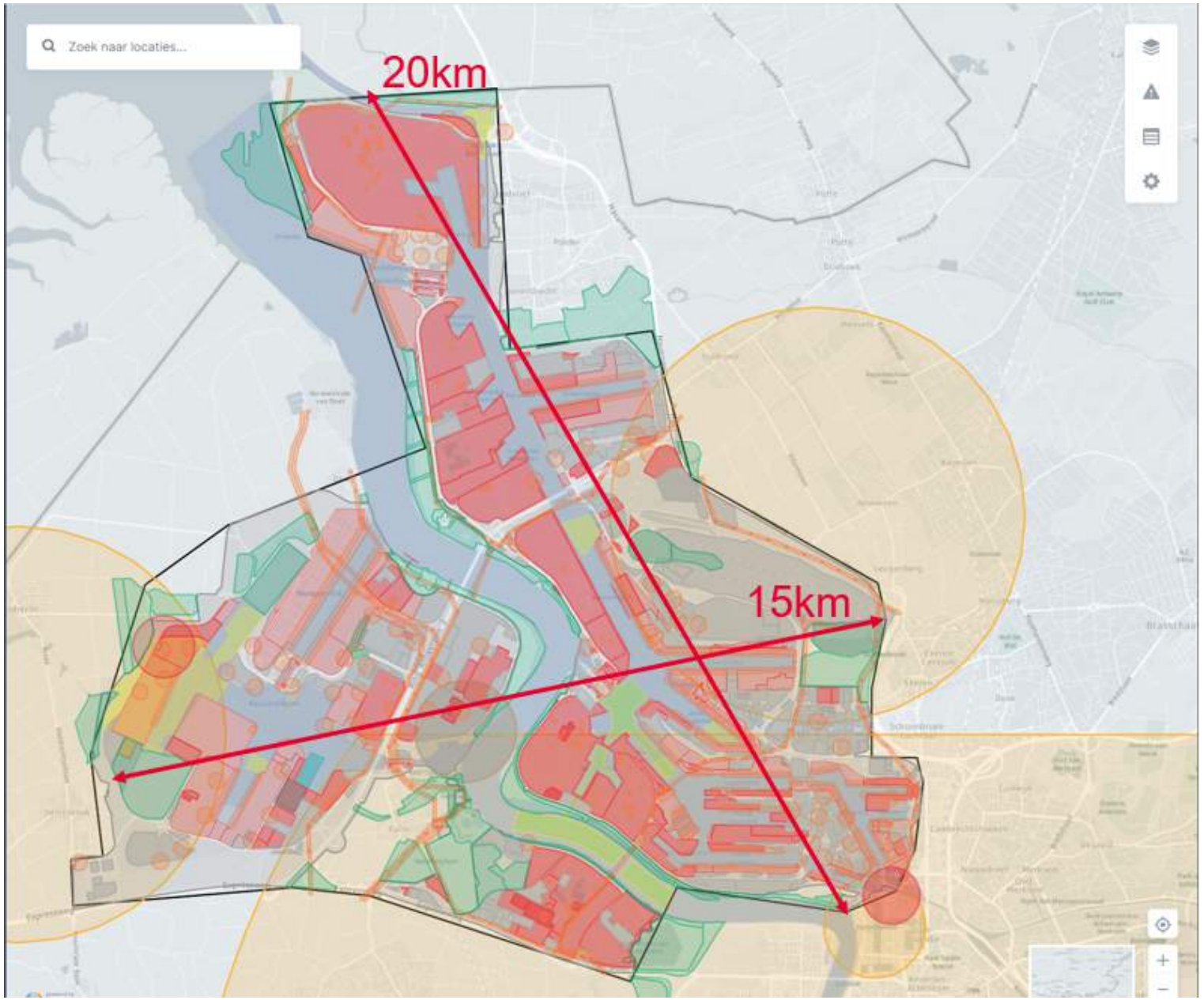
These are just some examples of questions
that people came up with spontaneously.


person 0.816
car 0.901
truck 0.854
parking meter 0.706
car 0.997
truck 0.993
22 May 2018 12:29:21

M S C

DRONES

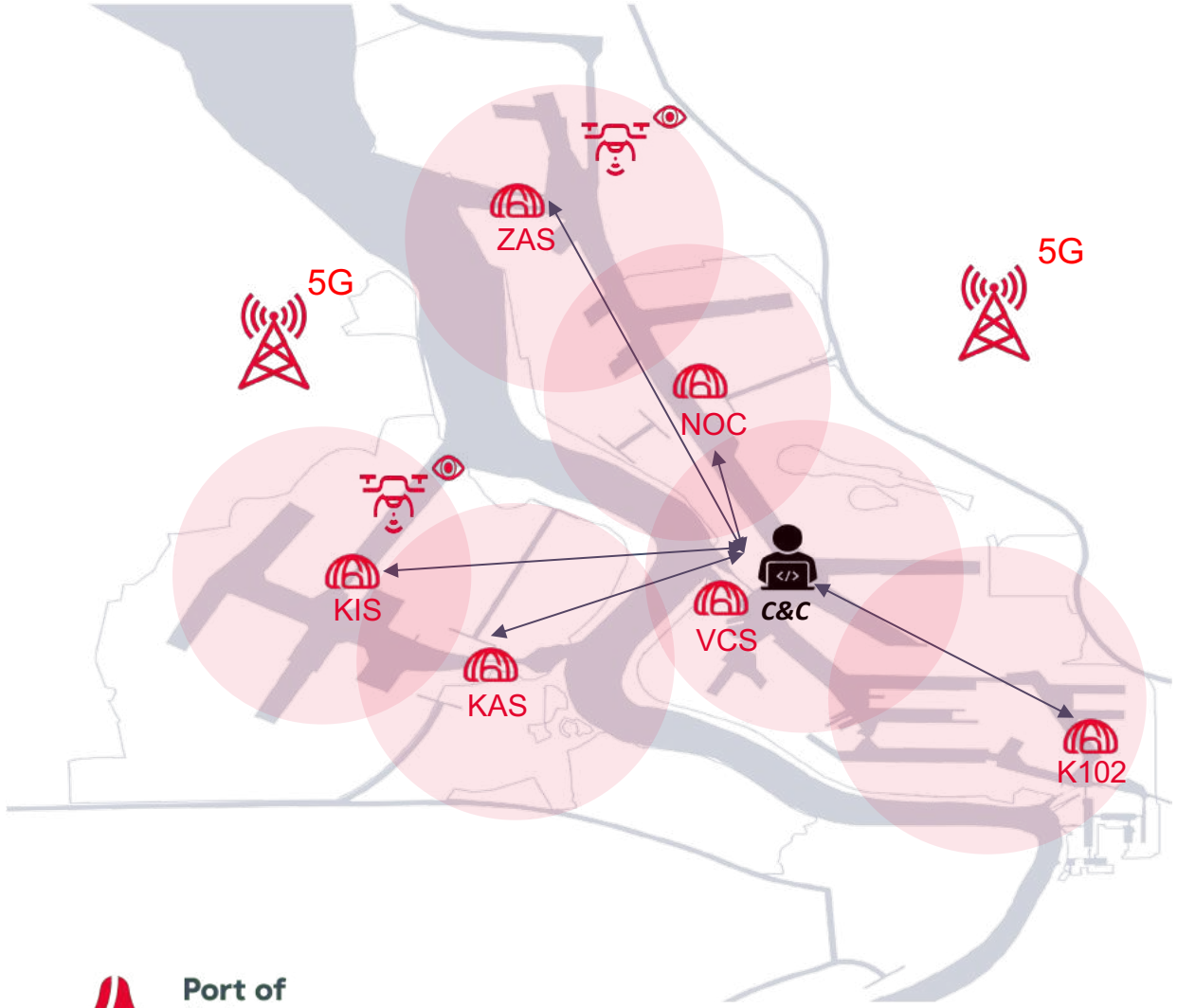
Port of Antwerp-Bruges Geozone



- 120km2 port area
- 2de largest seaport in Europe
- 900+ companies
- 15000 seagoing vessels & 50000 inland vessels/year
- Second largest chemical hub in the world
- 60+ windmills
- 1 airport (CTR-overlap)
- 2 airfields / 2 heliports
- Nuclear Powerplant
- High tension lines
- Nature reserves

Complex Port Area & **Geo Zone**

Fast forward to 2023



- Netwerk of a**utomated** drones in PoAB
- Drone as a service: 18 flights a day 24/7
- Authorization to fly above water - BVLOS
- Central coordination and control center
- Communication via dedicated 5G network

D-HIVE

SkeyDrone

DRONEMATRIX

proximus

MADE IN BELGIUM

Federale Overheidsdienst Mobiliteit en Vervoer

Directoraat-generaal Luchtvaart

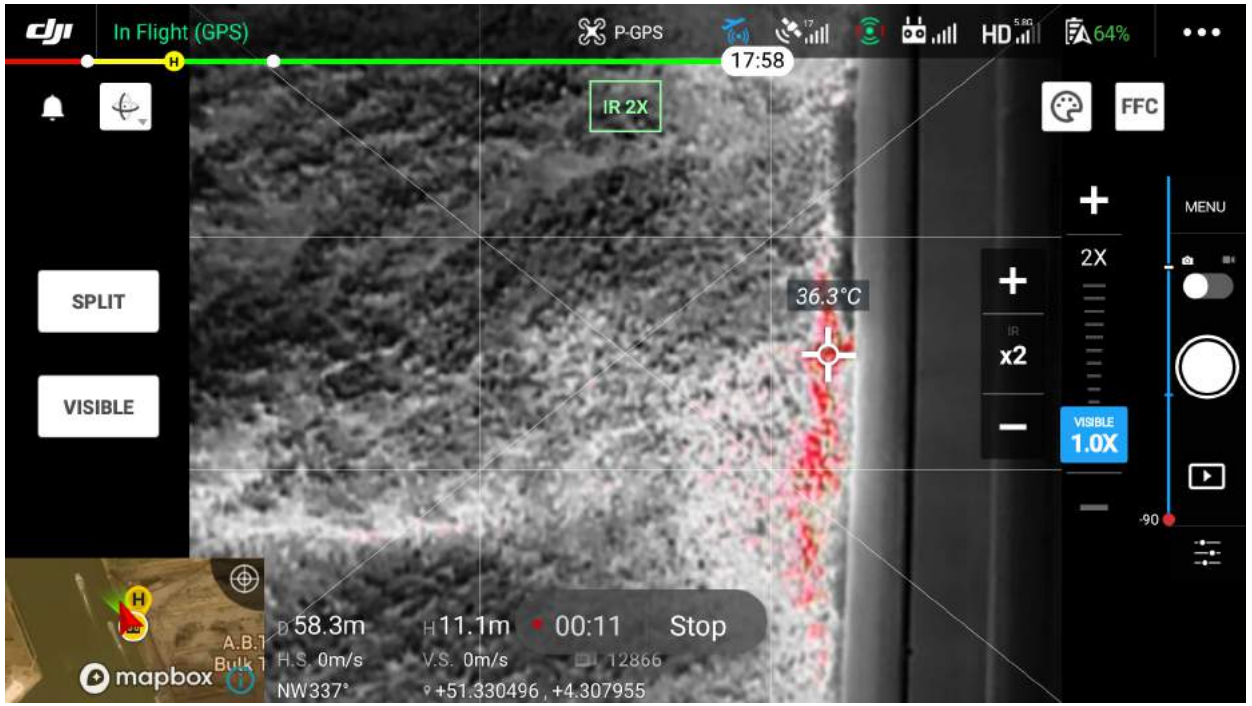
Port of Antwerp Bruges

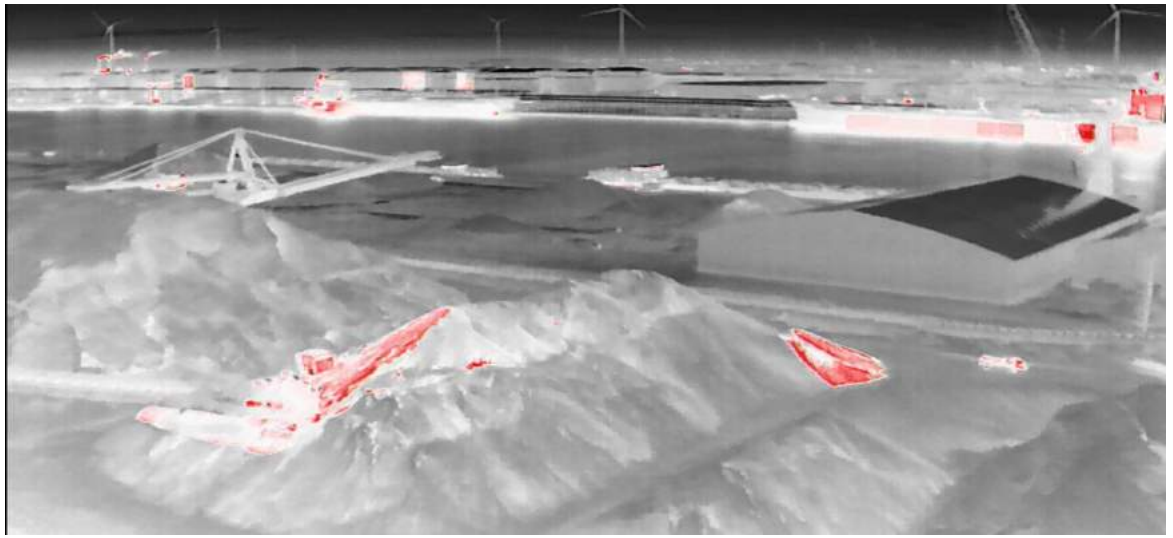
- BVLOS & ATOL
- 8km radius
- 30min flight time
- >7Bft & IP55
- RGB & IR 4K-video
- Integration in port camera network
- 6 base stations throughout the port

Port of Antwerp Bruges

Incident prevention

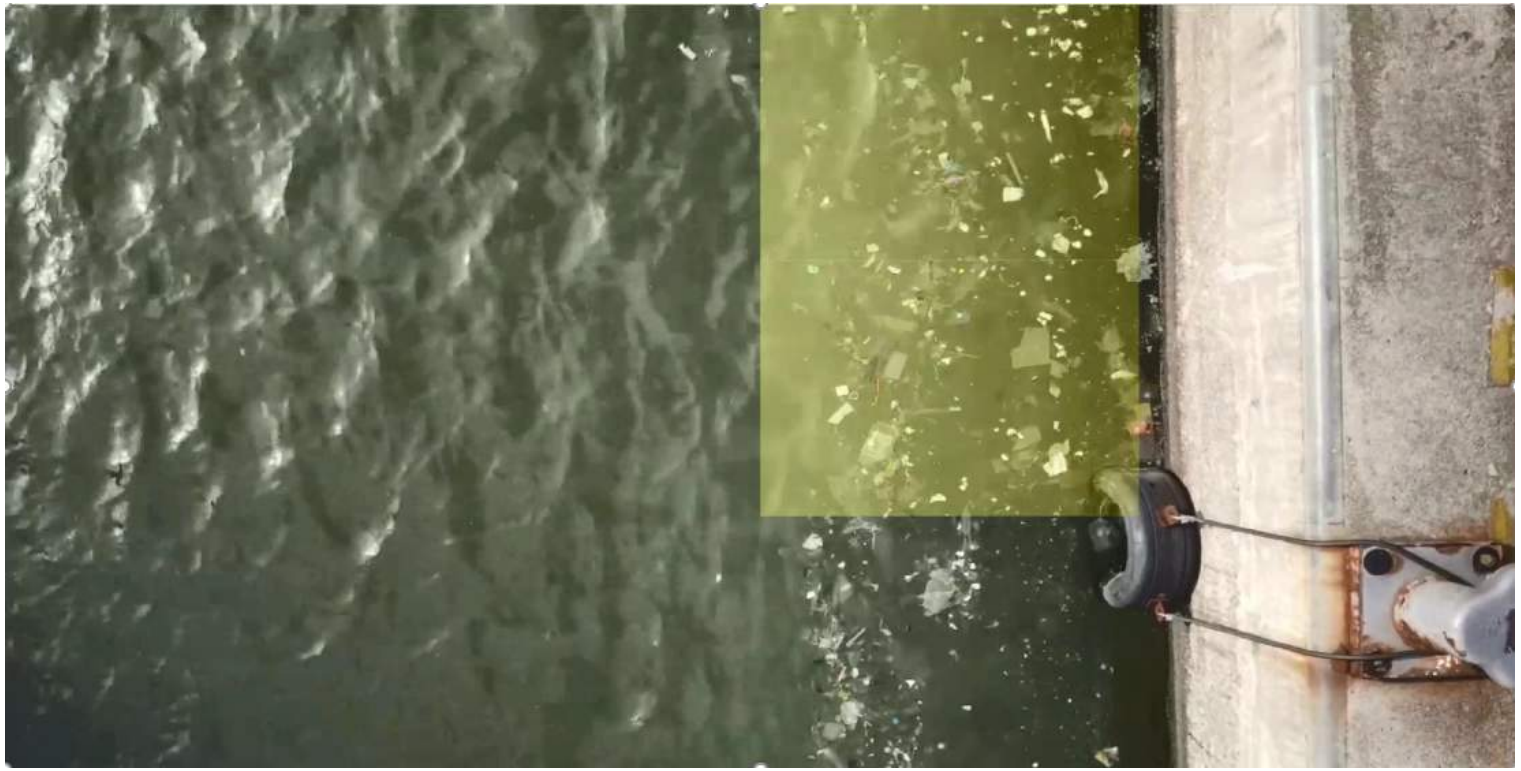
Potentional heat pocket detection in coal ore cargo



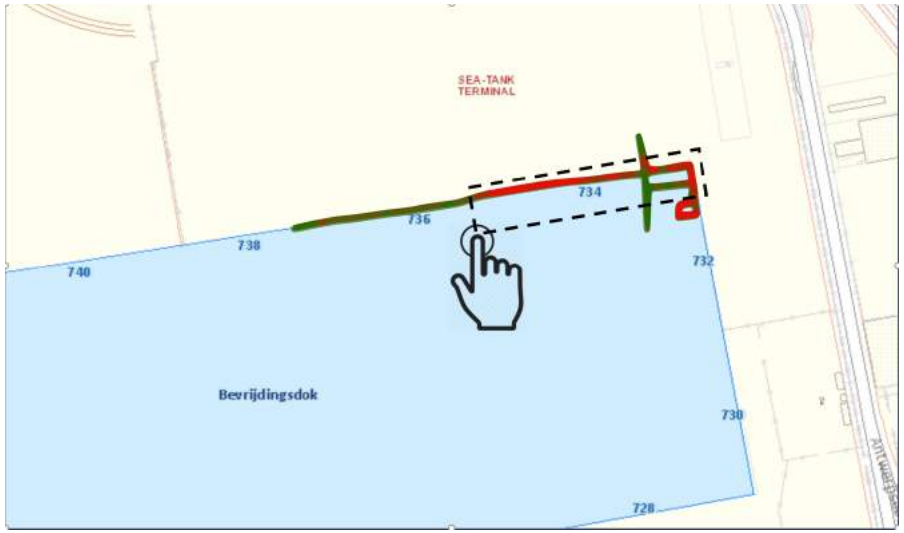


Port of Antwerp Bruges

Floating debris detection



Computer Vision of floating debris detection



Port of Antwerp Bruges

Infrastructure inspection

Port of Antwerp Bruges

INTERNET
OF THINGS

Smart Docking

Measuring movements of moored container ships

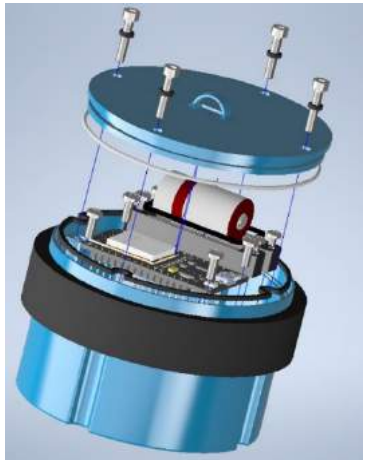
Port of Antwerp Bruges

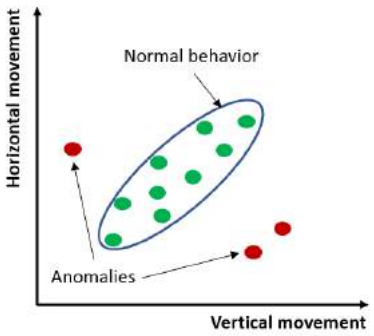
Smart Bollards

innovative alert system

Port of Antwerp Bruges

iBollard: innovative alert system





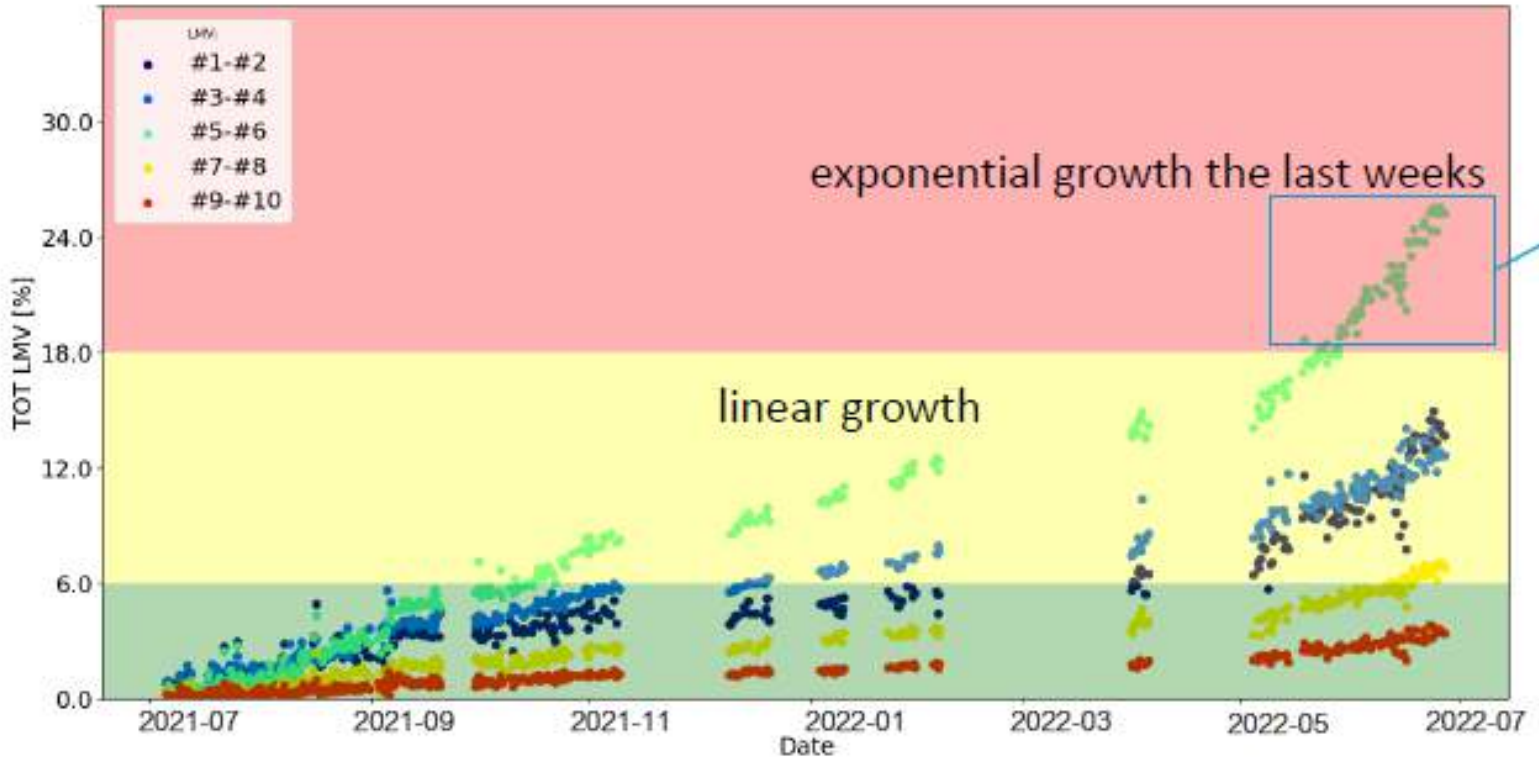
Wireless accelerometer & intelligent data processing

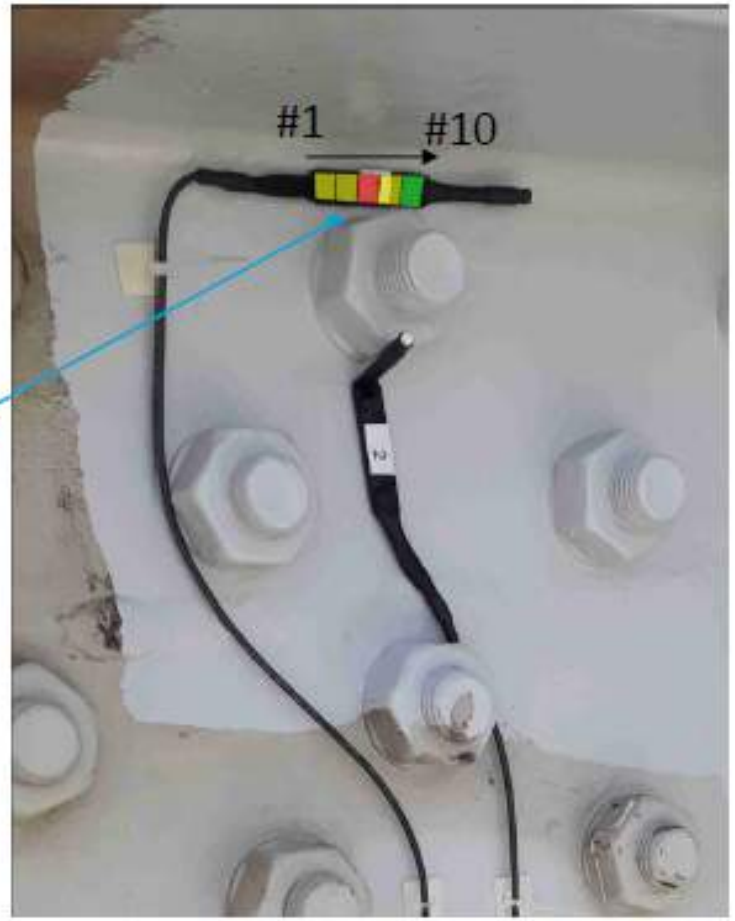
Bridge Monitoring

Port of
Antwerp
Bruges

Bridge Monitoring: monitoring crack growth using variations in the magnetic field

- : RFV2.20210104 | Strip 1
  - Exponential change of the field the last weeks





VILLARI

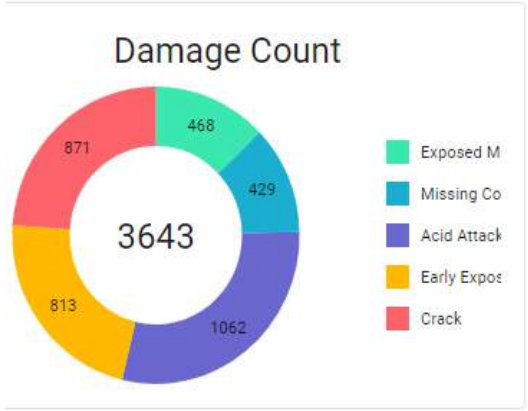
AI inspections

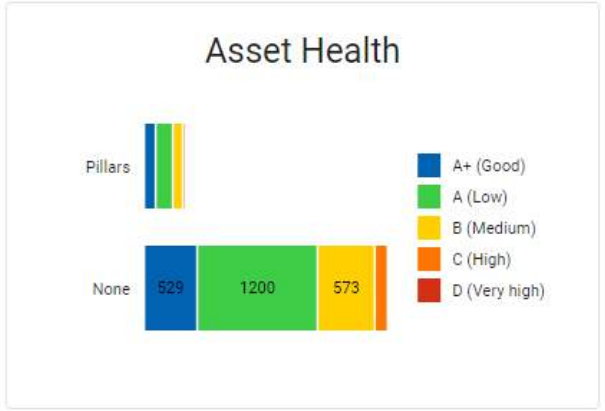
Port of Antwerp Bruges

Jetty inspection with water drones & AI

MAVISOFT

OVERVIEW | 3D MODEL | DATA | REPORTS





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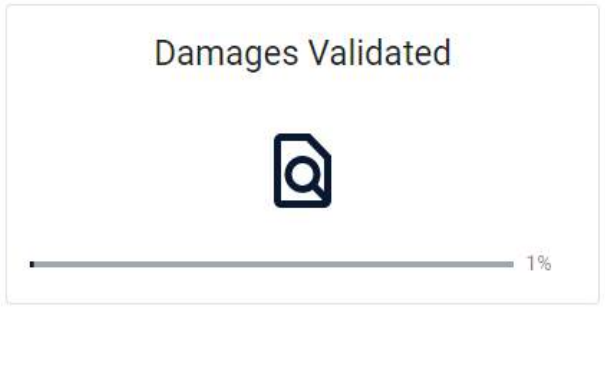
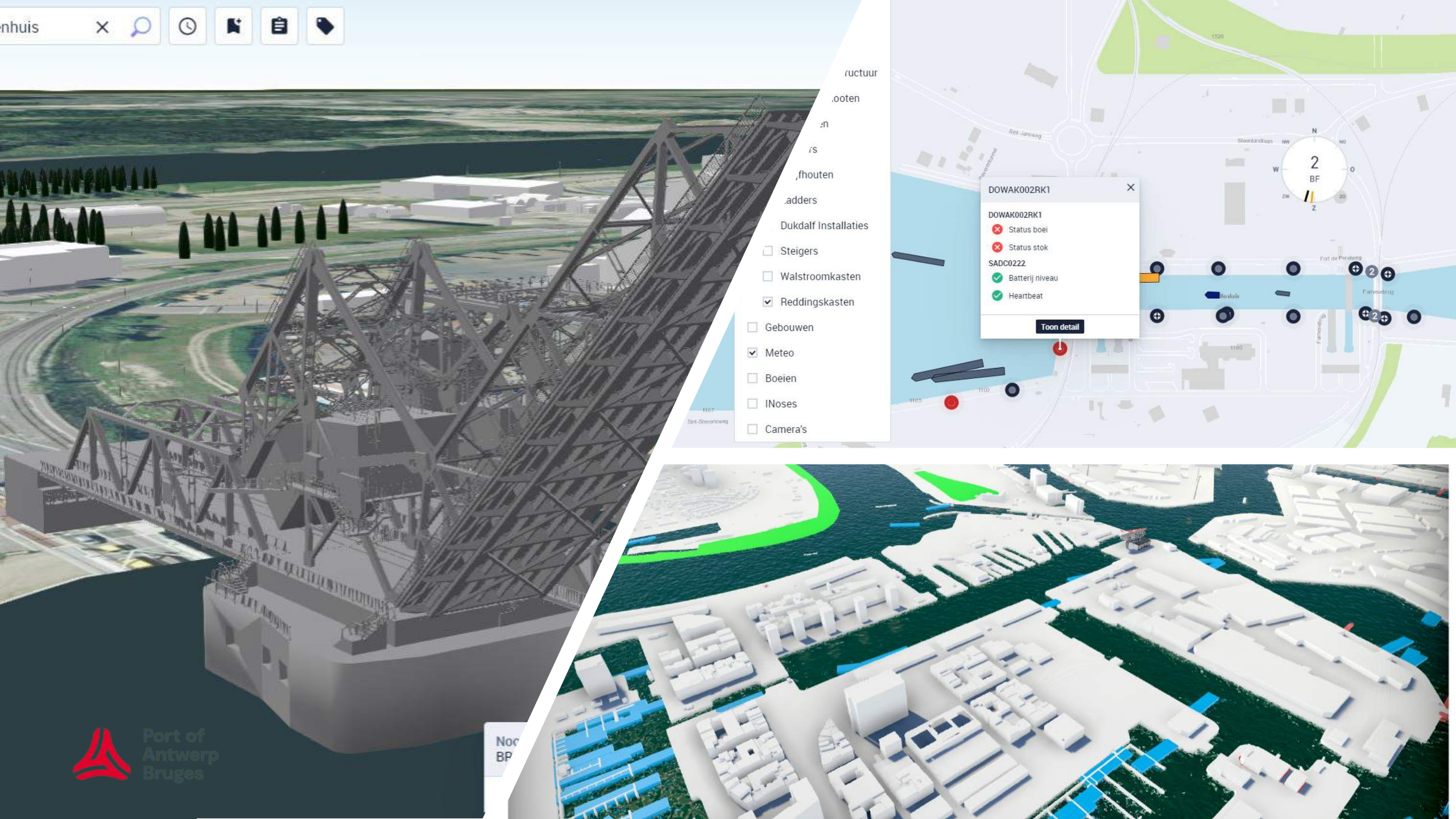
Status	Inspection Complete
nspection	23-08-2021
t Report	report_667.pdf
Uploaded	200



A twin of the port: from analog to digital

Port of Antwerp Bruges


nhuis
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looten
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Dukdalf Installaties
Steigers
Walstroomkasten
Reddingskasten
Gebouwen
Meteo
Boeien
INoses
Camera's
DOWAK002RK1
DOWAK002RK1
Status boei
Status stok
SADC0222
Batterij niveau
Heartbeat
Toon detail
2
BF
Port of Antwerp Bruges

CAPSTONE PROJECT

SENSORS

CAMERA

LoRa

FIBER

RADAR

DRONE

NETWORK DATA STREAMS

5G

ENTERPRISE ASSET MANAGEMENT

NAUTICAL PLANNING

GEOSPATIAL

DATA PLATFORM

TIMESERIES

OWN DATA

THIRD PARTY DATA

COMBINED DATA

AI

MACHINE VISION

REAL TIME

USER EXPERIENCE

APICA

Leveraging the power of data

we don’t need one single key that fits all …

… but we need everyone’s key to open the (supply) chain !!

It’s all about “the ease of doing business” and a PCS is just that

and don’t forget:
“You need to change, in order to stay the same !”

If you’re ready to embark on your PCS or Single Window journey… join the IPCSA Family ✊ !

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NETWORK OF TRUSTED NETWORKS
Connecting and sharing data globally between ports and cross border

PROTECT

THANK YOU

Please send e-mails or questions you may have

as we always are welcome for discussion and collaboration

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https://ipcsa.international