

PIXEL

Port IoT for Environmental Leverage

PORTS

Where IoT meets the Port of the Future



ADDRESSING TOMORROW'S CHALLENGES

The Limitation

Small and medium ports have **limited budget, infrastructure and staff**, the digital transformation of the maritime industry should consider all its hubs and provide them with tools to successfully achieve the established objectives.

The Performance

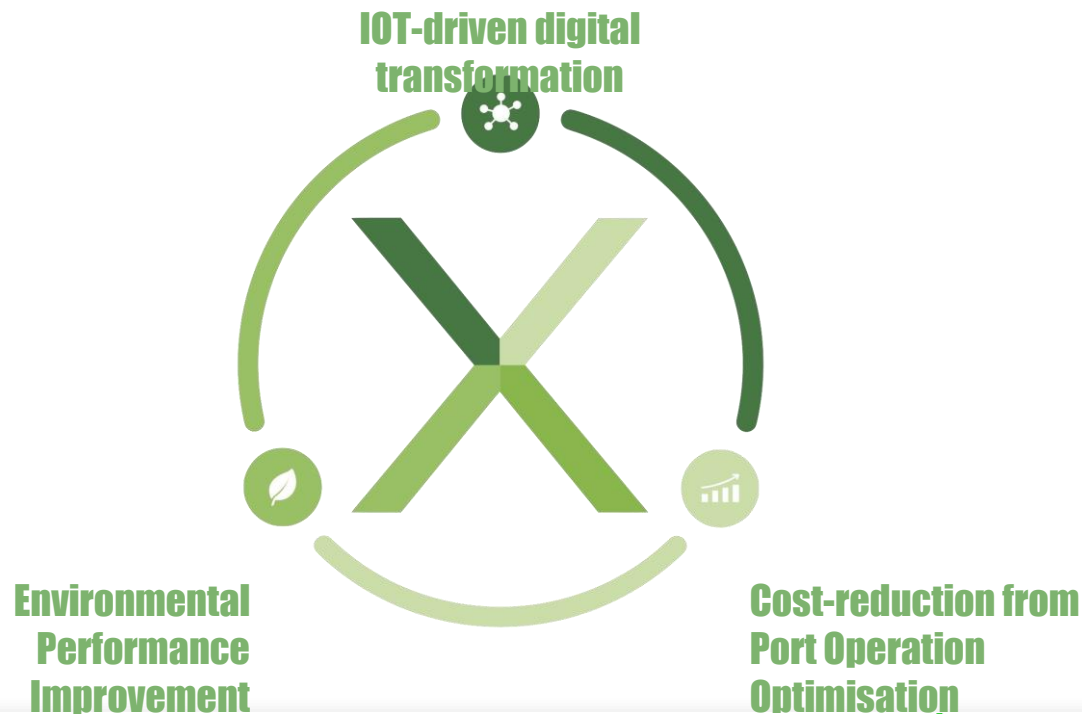
The Climate Crisis awareness and Green Deal common aims push forward requirements for a more **efficient environmental performance** by all actors in the maritime industry. This transformation is difficult for much of the stakeholders.

The Cost

The competitiveness of the port and the cost of the improvement of its sensor and server infrastructure to allow for a **baseline digital transformation** that can also help in reducing costs of the major port operations.



PIXEL IS IMPROVING THE ENVIRONMENTAL PERFORMANCE BASED ON THE OPTIMISATION OF PORT OPERATIONS FROM THE IoT-DRIVEN DIGITALISATION



Joao Costa, XLAB
PIXEL Closure Event



The Project has received funding from the European's Union Horizon 2020 research innovation program under GA No. 769355

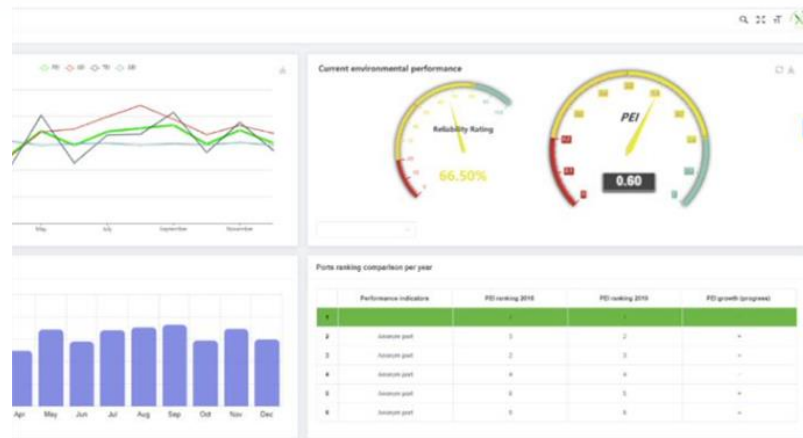
PORT ENVIRONMENTAL INDEX



Today's environmental challenges must fit real global needs, enhanced by legislation and standards - Ports need clear understanding of their **overall environmental performance**

Ports can **optimise their use of resources** to include the appropriate monitor of environmental-related activity and act on it

PEI is a global indicator of the impact in ports that permits the ports to have a **real-time measure of their environmental footprint** and to **plan actions** to reduce it to desired levels



*Emissions
to the
atmosphere*

*Emissions of
wastewater*

*Noise
emissions*

*Production
of waste*

*Light
pollution*

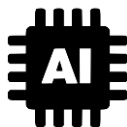
*Odour
emissions*



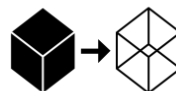
ONE SOLUTION, MANY BENEFITS



Quantitative real-time
measure of the **port**
environmental performance
using the existing sensor
infrastructure



Powerful AI algorithms
improving business
intelligence from **Maritime**
Data Analytics from
vessel calls and AIS



Digital transformation of
the port supporting
Energy, Pollution and
COVID19 Simulation



Comprehensive and
flexible **Big Data**
Information Hub
with APIs

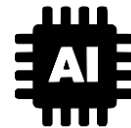


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Horizon Results Platform



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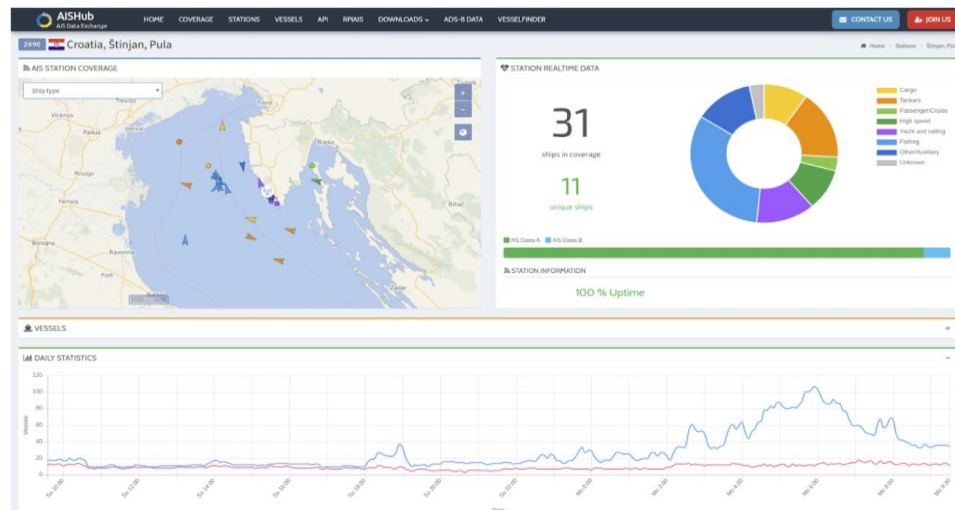
ONE SOLUTION, MANY BENEFITS



Intelligent road traffic modelling and predictions for a **greener and more efficient** port-city relation



Powerful AI algorithms improving business intelligence from **Maritime Data Analytics** from vessel calls and AIS



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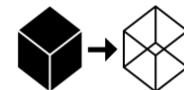


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ONE SOLUTION, MANY BENEFITS



Advanced simulation tools for **energy balance** between demand and production



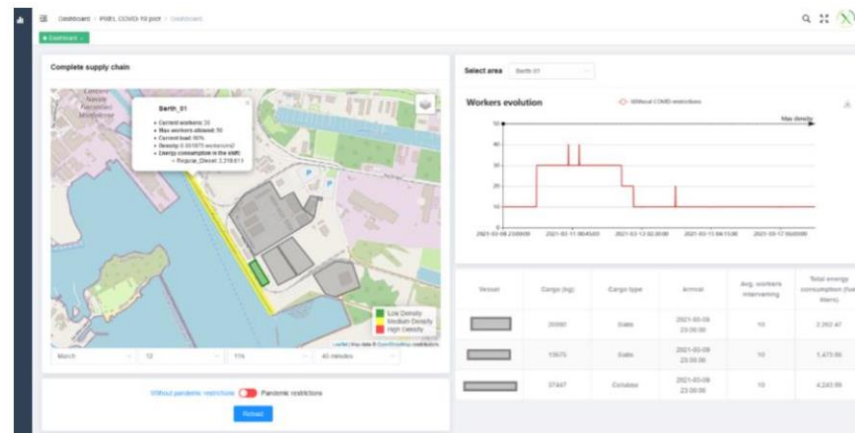
Insightful computational models for **environmental pollution** from sensing data



Planning tools to address **COVID19 regulations** at the port in real-time



Potential to add new models with a **Maritime Model Orchestrator**



ONE SOLUTION, MANY BENEFITS



Comprehensive and flexible **Big Data Information Hub** with APIs



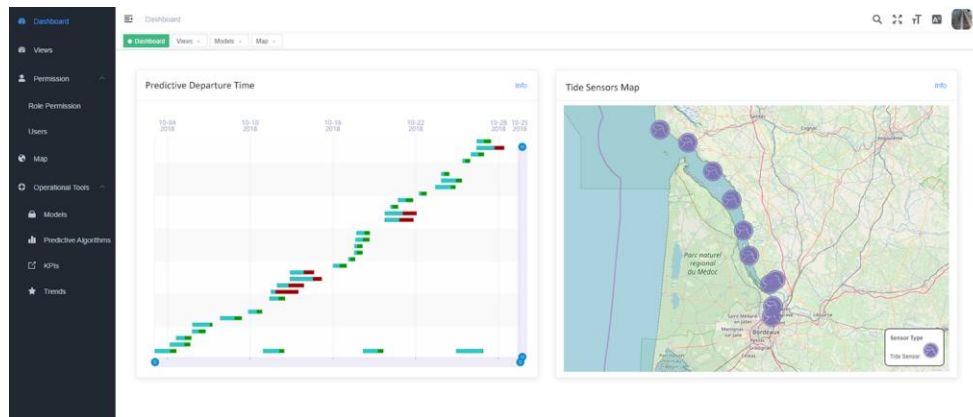
Open source **IoT Data Acquisition Agents** based on smart city technology



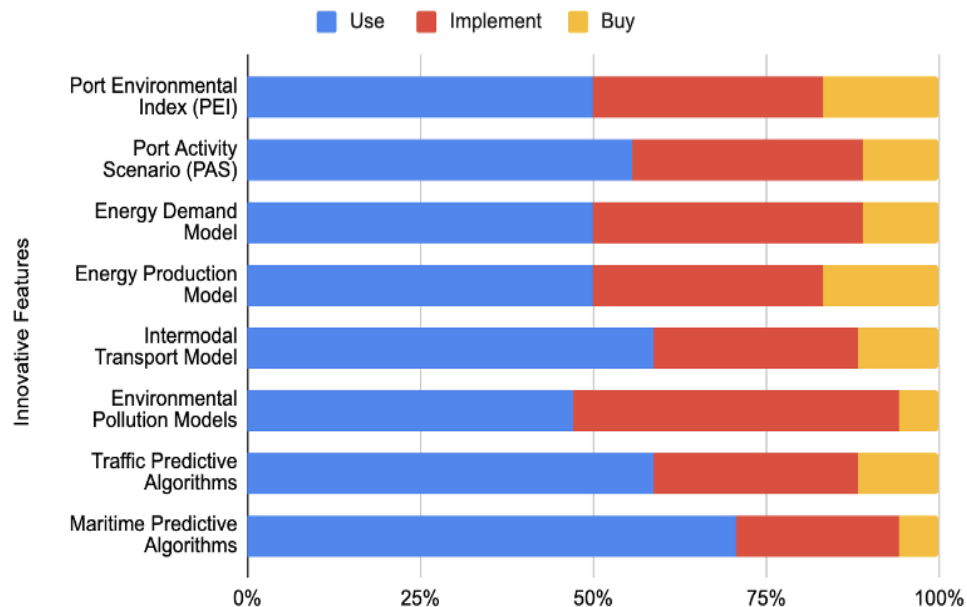
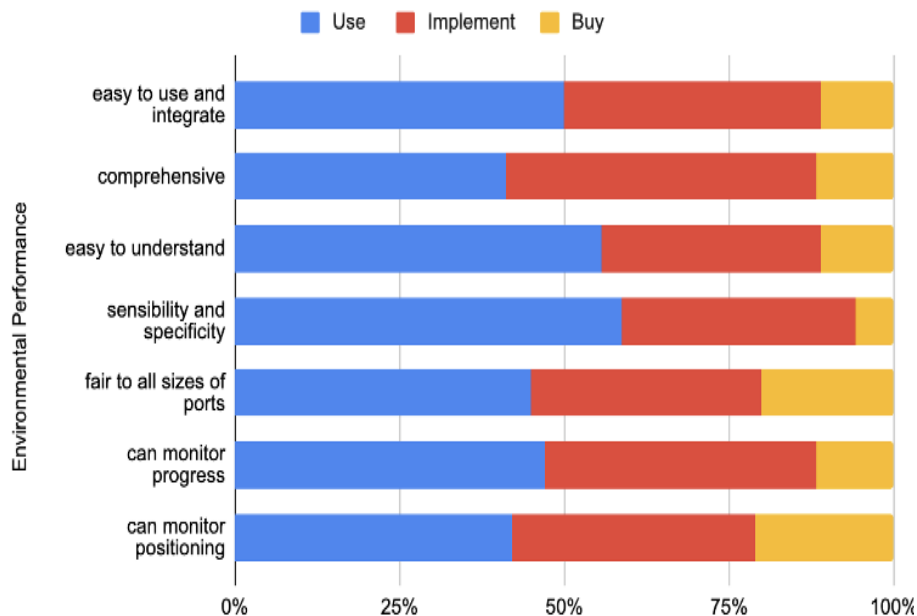
Potential for new functionality with a **Maritime Model Orchestrator**



Easy **dashboard, & alerts** with potential to PCS integration



REACHING OUT TO EXPECTATIONS

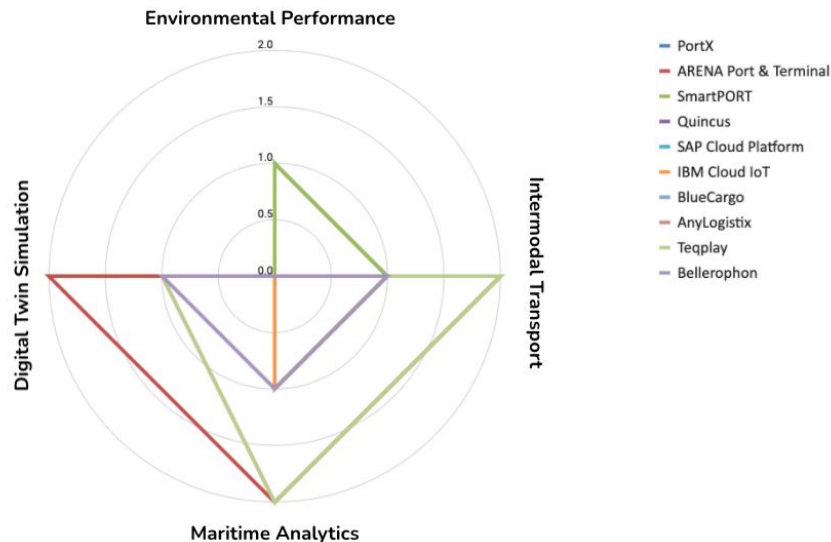
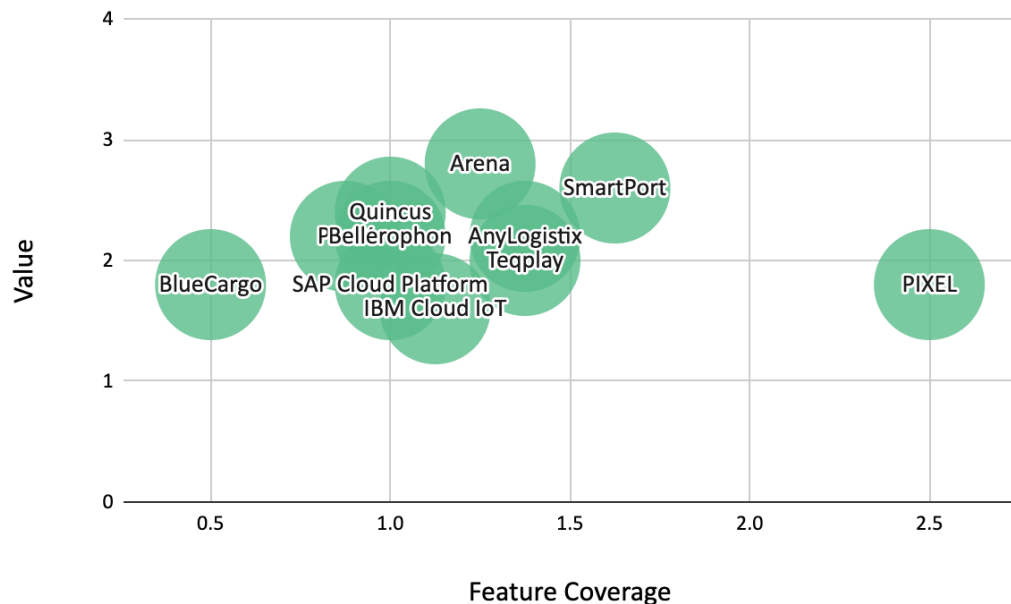


PIXEL OFFER TO BEST FIT YOUR NEEDS & BUDGET

	Cloud-based SaaS				On-premise	
	Basic	Advanced		High-End	Basic	High-End
	Cloud Basic	Cloud Energy	Cloud Green	Cloud Gold	Server Basic	Server Gold
	€	€€	€€	€€€	€€	€€€
Port Environmental Index	✓	✓	✓	✓	✓	✓
Energy Simulation Toolset	✗	✓	✗	✓	✓	✓
Pollution Simulation Toolset	✗	✗	✓	✓	✓	✓
New Data Acquisition Agents Development	€	€	€	✓	€	✓
Premium Customer Support & Training	€	€	€	✓	€	✓
PCS Integration	€	€	€	€	€	✓
Premium Maritime AI Services €						



A PROMISING COMPETITORS' LANDSCAPE



WHAT ARE THEY SAYING ABOUT PIXEL



Lucija Kolar

Complementarium

“The PEI is indeed very challenging representing a huge progress in combining diverse sciences to achieve the results”



Rafael Socorro

ACCIONA Construcción S.A.

“Each port is a complex environment and having such a replicable IoT solution easily integratable in the port infrastructure is a key aspect.”



Charalampos Platias

Greek Ministry of Maritime Affairs

“I mostly like the data-drive approach leveraging the IoT and its potential impact to decision-makers”



José M. P. Sánchez

AIVP (International Association Cities and Ports)

“Port and cities must learn to work together on smart technology and data-driven approaches., like the PEI, making this cooperation much easier and transparent.”



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THE INSPIRING TEAM THAT MAKES IT HAPPEN



Univ. Pol. Valencia

Project Coordinator and designer of PEI user interface and COVID pilot



INSIEL

The technical coordinators of the multimodal transport use case



CERTH

Expert coordinating the evaluation of PIXEL deployments and impacts



Port of Bordeaux

Innovative pilot port and leader of the PCS solution serving 20 french ports



Prodevelop

Technical Coordinator and designer of the platform user interface and integrations



CATIE

The designers of PAS and of the energy balance models



PEOPLE

Coordinator of the market assessment and PAS domain expertise



Port of Monfalcone

Small pilot port now part of the North Adriatic cluster with focus on intermodal transport



XLAB

Innovation Manager and responsible for the AI algorithms and InfoHub



Orange

The creators of the plug'n'play data acquisition agents



Port of Piraeus

Pilot port with sophisticated environmental sustainability strategy



SDAG

Dry port leveraging an age of digital transformation to bring innovation to intermodal transport



Med Fac Rijeka

The designers of the PEI methodology and the environmental pollution models



Creo Ocean

The designers of the environmental KPIs in the foundations of PEI



Port of Thessaloniki

Medium pilot port leading a port-city relationship optimisation



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A CONNECTED SEA OF OPPORTUNITIES



Carlos Palau

Project Coordinator
UPV, Spain
cpalau@upv.es



Miguel L. Carmona

Technical Coordinator
Prodevelop, Spain
mllorente@prodevelop.es



Joao Costa

Innovation Manager
XLAB, Slovenia
joao.pitacosta@xlab.si



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DO SOMETHING GREAT

PIXEL BRINGS OPPORTUNITY



First IoT integrated platform focused on the real needs and limitations of small and medium ports, scalable to large ports



Monitored Real-time Environmental Performance as a quantitative composite indicator computed from the IoT infrastructure



Secured dashboard with useful tools for decision support (real time monitoring and predictive analysis)



Data-driven optimization of operations through **smart models** (energy, pollution, port calls and multimodal transport)



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PIXEL BECOMES AN NGO BEYOND ITS LIFETIME

Objectives

- ★ Commercialisation of the PIXEL platform
- ★ Enhance the industrial standardisation of PEI
- ★ Participate as NGO in related project proposals

Activities

- ❖ Further develop the PIXEL solution(s)
- ❖ Support to technology adoption on-premises
- ❖ Communicate the value message of PIXEL over industrial events

Timeline

- ❑ Project started in May 2018
- ❑ PEI built in June 2019
- ❑ AIS-based predictive algs in 2019
- ❑ PAS and models available in 2019
- ❑ PIXEL platform ready in Dec 2020
- ❑ Platform deployed in May 2021
- ❑ Technology evaluated in Sep 2021
- ❑ Product launch in Sept 2021
- ❑ Association started in Sept 2021
- ❑ First contracts expected in Dec 2021



PIXEL TECHNOLOGY IS ALREADY BEING ADOPTED



Improvement of **environmental performance** of port activities



Increase of **renewables energy uptake** in use-cases at small, medium and large ports



Reduction of **operational and infrastructural costs** with better Port-City integration



Improvement of logistics through data analytics over **waiting time for vessels, on-time performance**



⚓ MONFALCONE • BORDEAUX • PIRAEUS • THESSALONIKI ⚓



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