SMALL AND MEDIUM PORTS ACTIVITIES MODELLING: INTRODUCTION TO THE PIXEL APPROACH

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CATIE

Solutions pour la société numérique

PIXEL Project Overview

- **Key Numbers:**
  - Number of partners: 15 (4 involved ports)
  - Duration: 1 May 2018 – 30 April 2021
  - Funding: European Union's Horizon 2020 research and innovation program (grant agreement No 769355)
- **Purpose:**
  - Allows small and medium ports to quantify and then reduce their environmental impact in a versatile and multi-actor context.
- **Methodology:**
  - User centered design in order to produce a tool useful under actual conditions of use.

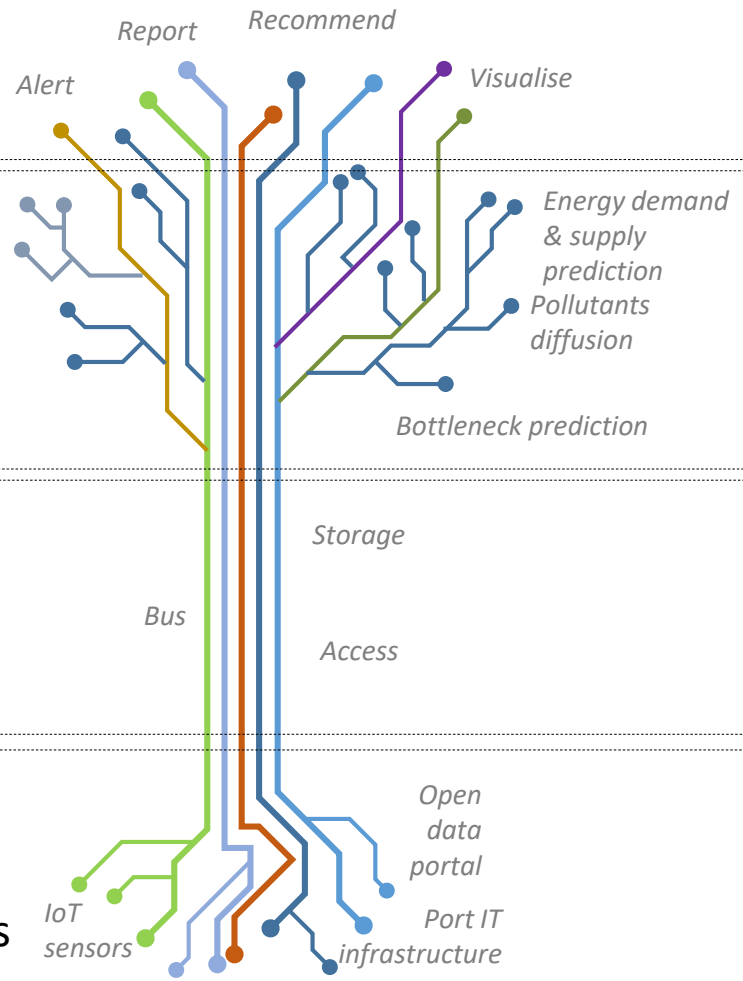
PIXEL Platform Overview

Diffusion
Bring the relevant information to the subscriber through the relevant channel

Modelling
Convert raw data to useful information about port activities to predict impact

Management
Support data processing through an open, robust and modular platform

Acquisition
Collect heterogeneous data from multiple sources through live data stream connectors



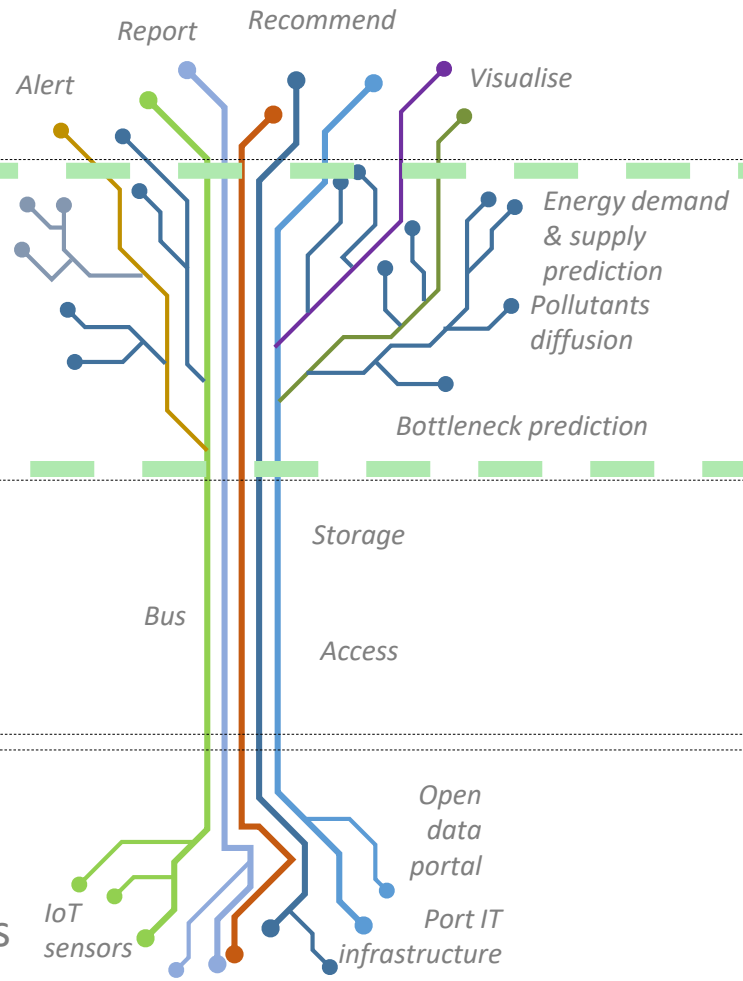
PIXEL Platform Overview

Diffusion
Bring the relevant information to the subscriber through the relevant channel

Monitoring & Modelling
Convert raw data to useful information about today and model port activities to predict future impact

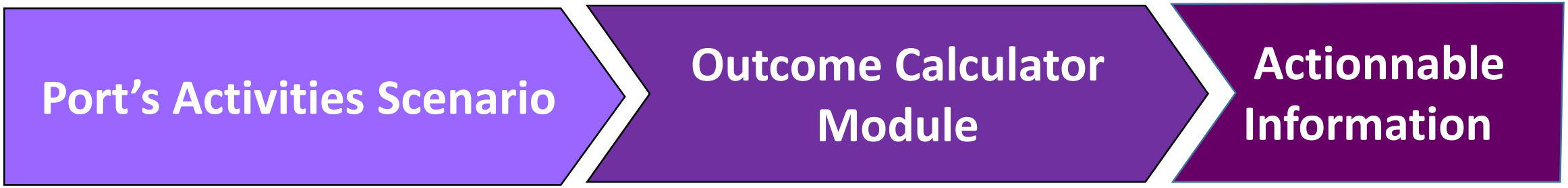
Management
Support data processing through an open, robust and modular platform

Acquisition
Collect heterogeneous data from multiple sources through live data stream connectors

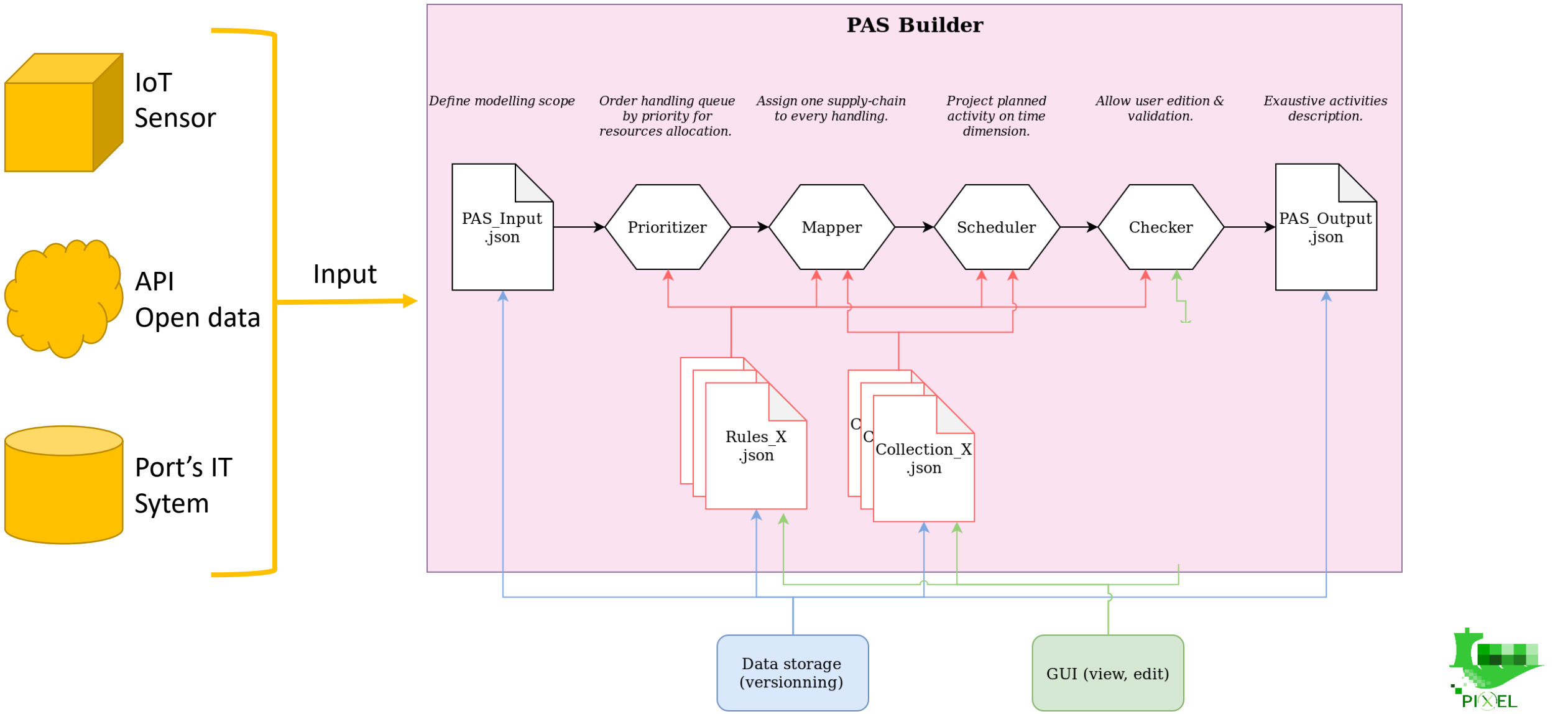


PIXEL Modelling Approach

- **Concept:**
  - Convert raw data into actionable knowledge through chained elementary transformations.
- **Steps:**
  - Build the PAS → For a considered scope of hypothesis (input), list every port's atomic operational actions and project them across the time dimension.
  - Calculate the outcome → Determine the resources needs and externalities for every atomic operation.

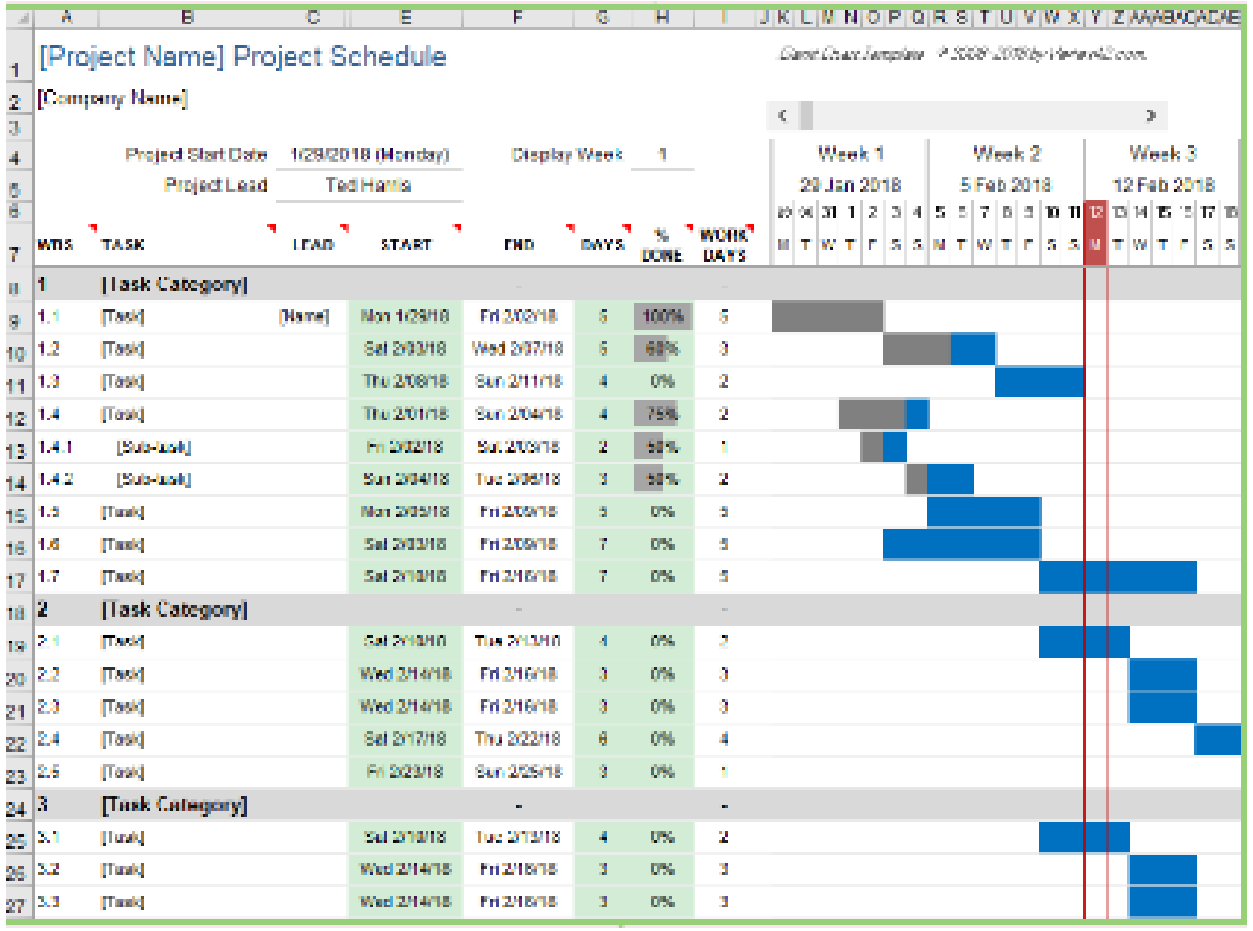


Port's Activities Scenario construction



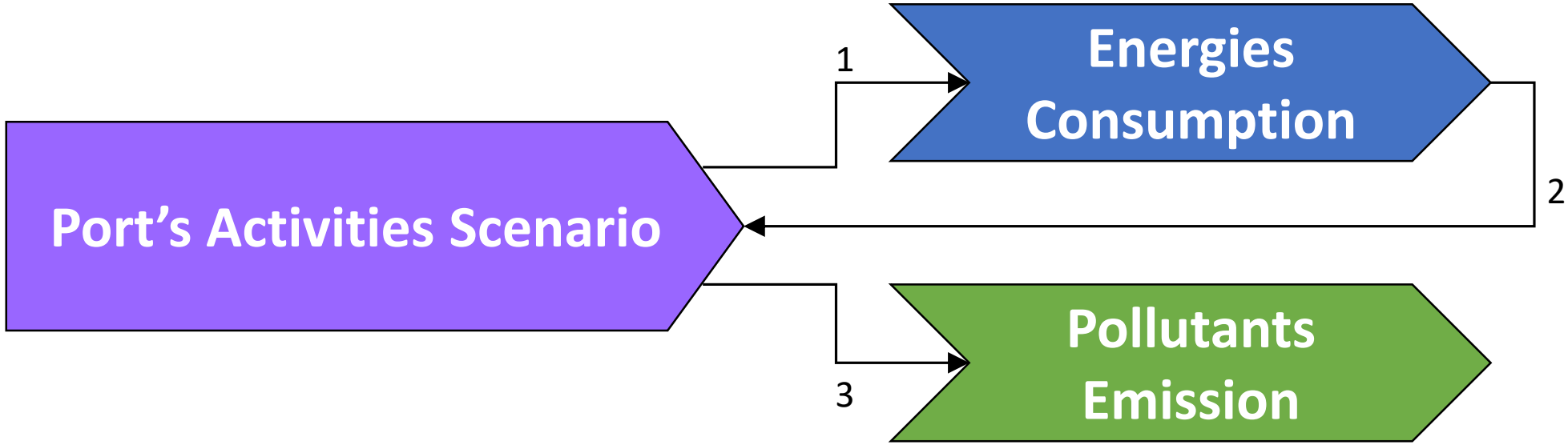
POR. ACT. SCEN MODELLING OUTCOME

- **CONCEPT:**
  - All activities across time with there relation (parents, priority…) → Gantt diagram.



PIXEL MODULARITY

- **CONCEPT:**
  - If it respects the data-models, any *Out. Calc. Mod.* can re-inject transformed data into the *Port. Acti. Scen*.
  - There is no limit to the number and type of *Out. Calc. Mod.* that can be chain to a *Port. Acti. Scen*.
  - An open “app store” could have been possible.



PIXEL FLEXIBILITY

- **CONCEPT:**
  - The modelling scope is inherited of the *Port. Acti. Scen*'s input scope.
  - By providing different type of input scope, different modelling use-case can be achieved.

Input scope	Modelling Use
Live data stream	Monitoring
Past certified data	Assessment
Estimated future data	Predictive
« What if » scenario	Confront alternatives

PIXEL ADAPTIBILITY

- **CONCEPT:**
  - Model's output accuracy & precision scales with the data quality (both input and port's parameters).
  - User can freely choose his optimal balance in the complexity / exactitude trade-off.

	Minimalist setup	Recommended Setup
Input	Boats' call data (FAL form)	+ billing data (dock AT…)
	Port Management Information System connection	+ IoT/Sensor (weather station, PV production, road congestion…)
Parameters	Not working days & hour information	Fine shifts' description
	Supply-chain described as a whole (only one step)	Fine supply-chain description (atomic operation)
	Machine specification without dependency to the context (as the cargo type)	Speed, throuput and unit consumption for each suitable cargo type

PIXEL Partners

Get more information and show your interest!

Web: https://pixel-ports.eu/
Tweeter: https://twitter.com/PortsPixel
and YouTube, Facebook, LinkedIn
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Thank You.
Any questions?

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