PIXEL USE CASES
Terminal Schedule Analysis for Social Distance Maximisation

Introduction

During the outbreak, PIXEL analysed altogether with the EC representative (appointed to the project) the possibility of introducing a **new pilot** in the project addressed to help maritime ports to **improve prevention and management of pandemic situation**.

Several options were analysed, and after a thorough observation of PIXEL traits and ports' needs due to the pandemic, a new task was devised to be included as a PIXEL pilot. The proposed pilot relates to an **enhancement of the PAS model** results (already available by PIXEL) to be deployed in the **Port of Monfalcone**.

Objectives

The Port of Monfalcone is interested on evaluating how the COVID-19 **social distancing measures** can be introduced in the pilot as a tool to **monitor the density of workers** in the port, with potential for **port operators** to manage their operations.

COVID-19 measures to be taken by a port include, among others, guaranteeing a maximum density of workers in an area during a specific timeframe to respect social distancing. The goal is that a port operator could observe the **evolution** during the week and being able to **compare with a not-pandemic scenario**, otherwise can be a scenario to show how PIXEL frameworks can be profitably extended in other fields.

Benefit for ports

For the extrapolation to other ports, actual actions in the port may be **changes in shift plans for personnel and machinery** so that the work would be redefined to **minimise** social aggregation at different areas of the port, therefore **decreasing contact and virus spread** among workers. This is not the scope in this pilot considering the time restrictions before finalising the project.

The technological achievement of this plan will be two-fold beneficial:

- *It will help one European port to better cope with COVID-associated **social distancing restrictions***
- *It will serve to demonstrate the flexibility of PIXEL as a platform, allowing the **agile integration of new services** on-demand*

Advanced IoT architecture

The architecture proposed draws from the **PIXEL architecture**, with *ad-hoc* adaptations and fine-tuning addressed to cover the requirements of the density of workers'

application. In that regard, PIXEL followed an approach based on globally accepted reference architectures for industrial IoT applications such as **RAMI, IIRA** and **IoT-A**. Different functionalities are therefore specially targeted to address the Use Case:

- ***Data provisioning***: *several data sources, such as, **vessel calls** and **port parameters and restrictions** are of vital importance to be integrated in the PIXEL platform.*
- ***Data concentration and accommodation***: *unified formats are here specially interesting and necessary, therefore the open approach of **FIWARE Key Performance Indicator (KPI)** data models will be used.*
- ***Data storage***: *The **Information Hub** of the PIXEL architecture, built upon the Elasticsearch database, is designed to be high performant and scalable, and the data is stored to support long-term queries.*
- ***Terminal supply chain simulation***: *The adapted version of the PIXEL **PAS model** developed in PIXEL is able to model the schedule and performance of the terminal operations needed to effectively operate a vessel (load/unload) and the operations involved, including the time allocated, energy consumed, machinery used and personnel devoted to that purpose.*
- ***Model orchestration and visualization***: *as any other model of the PIXEL platform, it is managed by the **Operational Tools framework** and the results are visualized through the PIXEL **Dashboard**.*
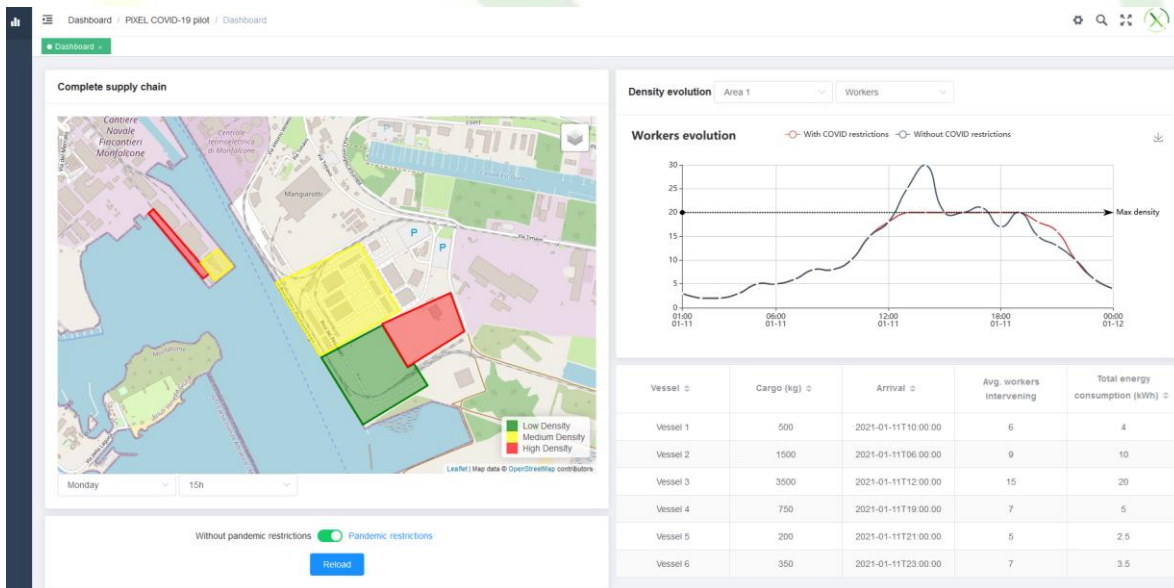
Involved PIXEL ports
Port of Monfalcone