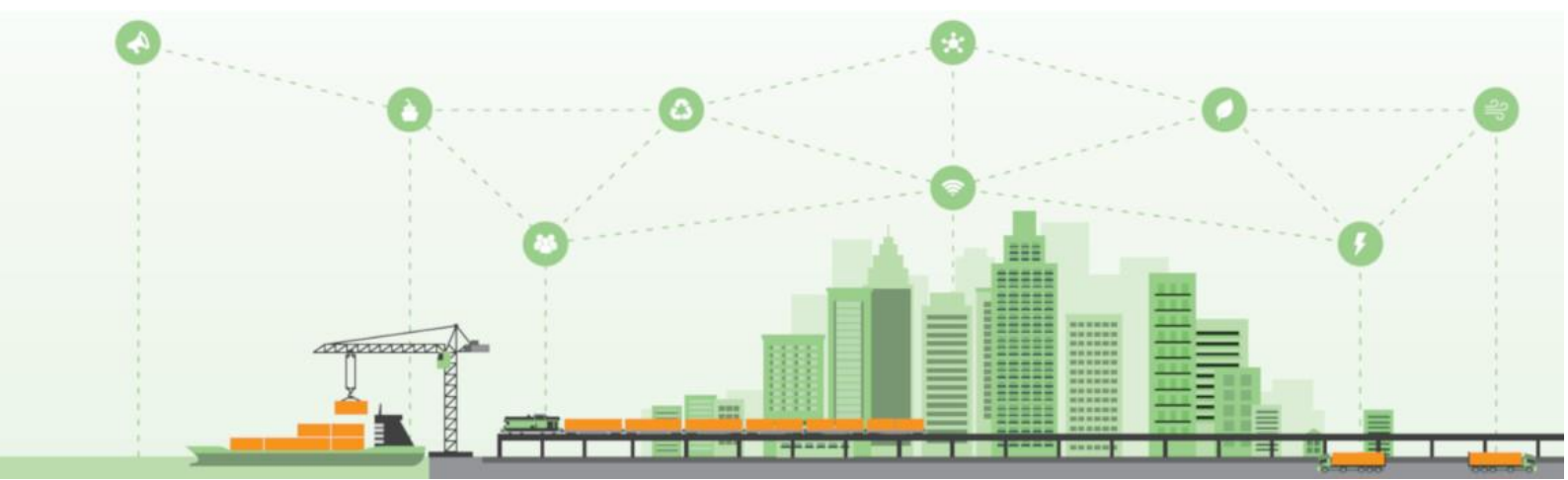# Where IoT meets the Port of the Future

4^{td} NEWSLETTER

FEB 2021

Summary

Welcome to the **fourth** PIXEL newsletter,

We are delighted to present our fourth **newsletter** aimed to provide an **update** on the activities carried out since the third release (July 2020). The PIXEL partners have shown their **resilience** during the pandemic situation and have been able to **hugely advance** towards the last stages of the PIXEL project.
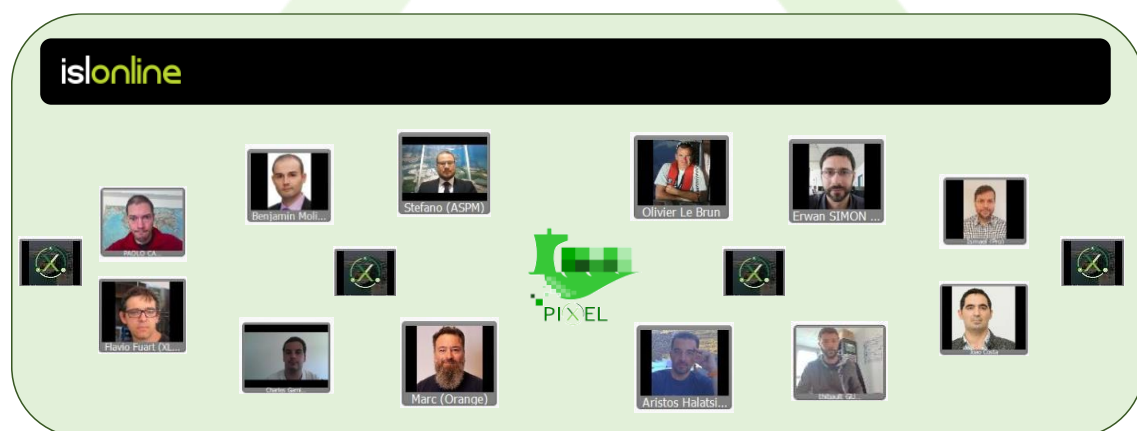
During the last six months, all partners have strived for achieving the planned goals even though the restrictions and issues associated to COVID-19 have been consistently present. Not only the ports have struggled with access to key premises (preventing installation from its natural pace), but all partners have faced issues related to teleworking, mandatory devotion to operative-business tasks, etc. All of the previous circumstances lead PIXEL Consortium to propose an extension of the action timeline to the European Commission. In order to finalise the scheduled activities and to generate the expected impact, the project will take 5 more months than expected.

With regards to technical advances, the pilots have been the main focus of the Consortium. The PIXEL platform was successfully installed on-premises in the four ports of the project. Additionally, first results and validations started to take place in parallel to the integration of data, NGSI agents and models.

The Port Environmental Index (PEI) algorithm has been successfully deployed in the Port of Thessaloniki. The rest of the ports will follow. Besides the expressed interest of **external entities** in the application of the PEI, the results have been showcased in several events, including liaised activities with our sister projects (COREALIS and PortForward) and the CSA DocksTheFuture.

COVID-19 and its lockdown opened a time for **challenges and opportunities**, and the PIXEL team exerted special effort to keep the quality of the work by means of **continuous online interactions, virtual meetings, participations in webinars and other activities**, including the Kick-Off of our own series of webinars.

The PIXEL team

Technical achievements and deliverables

During the last few months of the project, following **achievements** have been performed:

- **Installation of the PIXEL platform** as a whole in the three ports participating in the Consortium. Making use of advanced concepts of virtualisation and containerisation, PIXEL is already functional in the four ports of the project: Bordeaux, Monfalcone, Thessaoliniki and Piraeus.
- Enhance of the technical documentation associated to PIXEL solution. Specifically, a complete *Readthedocs* has been prepared including technical descriptions, installation manuals, etc.
- Most planned **NGSI agents** have already been **integrated** in the PIXEL installations of the pilot ports using the **DAL orchestrator**.
- The **installation of planned sensors** for the PEI and other modules has been finalised in all ports. Below (in this page), some evidences are showcased.
- Participation in the **closing event of the CSA DocksTheFuture**, witch which PIXEL has maintained a continuous participation throughout the last 3 years.
- Contacts with **external ports** for **Proof-of-Concept** testing has already been launched, with some of them already **engaged**.
- **Acknowledgement** of external bodies to the work carried out in PIXEL. In particular, the most relevant action: one representative of **AIVP** (José Sánchez) has joined PIXEL as a new member of our **Advisory Board**.
- Participation in **webinars** and **scientific dissemination** due to the blocking situation of face-to-face events being cancelled during these months. Two research papers have been published and other two have been submitted.

Only one new **deliverable** has been released since July 2020: **D2.8**: Project Management Report.

PIXEL is extended!

The pandemic COVID-19 has affected greatly the capacity of PIXEL partners to normally conduct the scheduled activities in the work plan. Majority of partners are facing situations like having the staff working from home or not having at full disposal of material elements to conduct effective actions.

Thus, some actions are very limited as they require travelling and/or face-to-face interactions Dissemination activities (and the whole WP9) are hugely affected as all forthcoming events are being cancelled (among them, some of the most important for the project in its lifetime). Besides, communication with external entities (e.g. Advisory Board, equipment providers) is more difficult and slower than usual, some of the providers have stopped activity till the end of the crisis (e.g. sensor vendors).

Additionally, telecom operators and public entities are redirecting workforce to network management due to increase in requirements to telework or public bodies cannot continue with contracting procedures.

Considering the previous, PIXEL had a thoughtful discussion with the representatives of European Commission and **an agreement was reached through which the official activities of PIXEL are extended to 30th September 2021** (instead of April 2021).

This has been formalised by December 2020 using the appropriate instrument devised to such actions: an amendment to the Grant Agreement.

Due to this 5-month extension, some key dates of the project are moved towards the Summer period.

PIXEL is now planning to finalise the pilots in the 4 participant ports by the end of **June 2021**.

Consequently, the impact analysis and exploitation will go on till September, when the project plans to make publicly available all their results (reports and code repositories).

The final review of the project will take place before the end of **November 2021**.

Project title: PIXEL- Port IoT for Environmental Leverage

Programme: H2020-EU.3.4. – SOCIETAL CHALLENGES – Smart, Green And Integrated Transport

Topic: MG-7-3-2017 – The Port of the future

Contract Number: 769355

EC funding: 4 890 222,50 €

Duration: 1 May 2018 – 30 April 2021   **30th September 2021**

Project Coordinator: Prof. Carlos Palau, UPV (cpalau@dcom.upv.es)

A new challenge: helping ports fight against COVID-19

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.
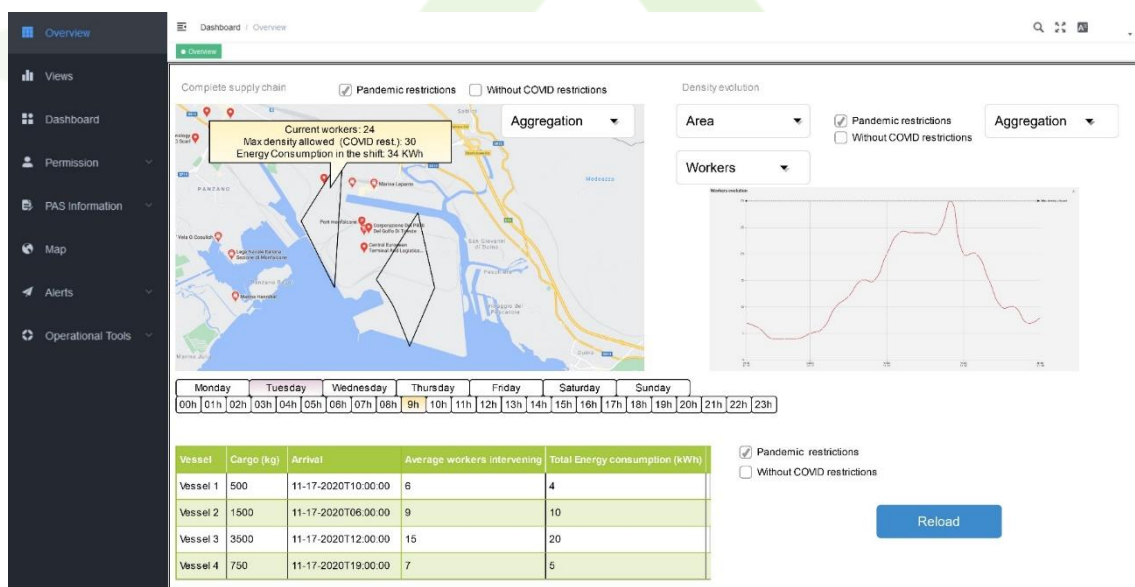
Several options were analysed during the months of May and June, and after a thorough observation of PIXEL traits and ports' needs due to the pandemic, a new task was devised to be included as a PIXEL pilot. Developments are already being done, advancing towards applying the PAS model results (already available by PIXEL) to be deployed in the Port of Monfalcone.

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.

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: (i) on the one hand, it will help one European port to better cope with COVID-associated social distancing restrictions and (ii) on the other hand, it will serve to demonstrate the flexibility of PIXEL as a platform, allowing the agile integration of new services on-demand.

PIXEL Webinar series

In the last stage of the project we are releasing new approaches and technologies ready to be implemented in ports of all sizes to fit you to the challenges ahead. They will seamlessly integrate in ports' infrastructure and provide them with a dynamic quantitative measure of environmental performance, leveraging the data sources and sensors already available at the port and potential new IoT devices.

PIXEL has planned a series of 5 webinars with the purpose to let diverse audiences know about the benefits and traits of our solution. The schedule has been settled as follows:

1. **PIXEL presentation** – *January 13th, 2021* – General presentation of the project, who are the partners, how the solution is addressed. Speakers: Project Coordinator and Technical Coordinator.
2. **Technical presentations of user stories, models and algorithms** – *February 10th, 2021* – The Webinar will be a presentation of the science behind the PIXEL project: Speakers: Leonidas Pitsikas (PEOPLE) and Charles Garnier (CATIE)
3. **Port Environmental Index (PEI)** – *June 2021* – Presentation of the flagship tool for ports' environmental impact monitoring and mitigation. Speakers: *to be announced*
4. **Architecture modules and platform installation** – *June 2021* – Explanation of the open source components of PIXEL and how to use them. Speakers: *to be announced*
5. **PIXEL solution, KPIsand project results** – *September 2021* – Final webinar that will wrap up PIXEL achievements Speakers: *to be announced*

The first PIXEL Webinar took place on January 13th, with a global success of a session where different audiences were targeted and interesting discussions arose. The Project Coordinator (Prof Carlos Palau) and the Technical Coordinator (Miguel Ángel Llorente) of the project explained PIXEL's approach towards the Port of the Future. Apart from overall details of PIXEL, we exposed what we achieved so far and depicted some hints on the future lines of work that can be exploited leveraging PIXEL results.

Meetings and PoF network

Several virtual **meetings** took place since July 2020 to coordinate and advance on the project, as well as to prepare the final results of the project towards the final review. Additionally, some relevant meetings tool place with the **PoF network**.

24/25 November 2020, Plenary meeting, Online

Sixth official Plenary Meeting of PIXEL. Celebrated virtually (via ISL conference links) due to the COVID-19 outbreak mobility constraints. The focus on the meeting were: running pilots, PEI deployment, assessment and evaluation and exploitation opportunities.

September 2020, The Operational Research Society, OR62, Sustainable Maritime Operations Stream

On 15 September, Mr. Leonidas Pitsikas (PEOPLE) presented on behalf of PIXEL altogether with representatives from our sister projects (COREALIS, PortForward) and the CSA DocksTheFuture.. The presentation was recorded in video and is uploaded at YouTube channel of the project.

24 November 2020, DTF Digital Conference

Started in January 2018, DocksTheFuture defined the vision of the Port of the Future in 2030 with the main goal to face issues related to the various challenges of the port of tomorrow.

On 24 November 2020, The CSA organised a webinar with title: "– Defining the concept of the Port of the Future 2030" that served as closing event for the CSA. Mr. Ignacio Lacalle (UPV) presented the work that PIXEL has done with the CSA and the sister projects during the duration of the Coordination and Support Action.
You can find more information (all presentations and videos) on the CSA webpage here.

Events

Even though face-to-face events have been cancelled during these months due to the Covid19 pandemic, PIXEL partners have participated in different **events** since Feb 2020, and obtained some acknowledgment from relevant external entities including PIXEL as part of their project portfolio.

June 2020, 21st IEEE International Conference on Mobile Data Management (online)

On June 30th, our PIXEL partner Tomaz from XLAB presented a Machine Learning based System for Vessel Turnaround Time Prediction used in our project. work. The whole session was recorded and set available at the MDM2020 Conference YouTube channel.

July 2020, FIWARE Green Economy Day

On 23 July 2020, Marc Despland (ORANGE) introduced PIXEL's Green approach for maritime ports in the FIWARE Green Day webinar, that gathered many experts in the field for discussing the role of its Open Source technology towards the Sustainable development goals.

September 2020, Virtual MariMatch International Maritime Event (online)

On 2-4 September, this event discussed hot topics of maritime innovation, open innovation panels and open networking opportunities. Charles Garnier (CATIE) showcased PIXEL in Track D: *Smart Ports, terminals and logistics.*