D9.5 - Report on Dissemination Activities and Update of the Dissemination Plan v2

Deliverable No.	D9.5	Due Date	30-SEP-2021
Type	Report	Dissemination Level	*Public (PU)*
Version	1.0	Status	Final
Description	This deliverable reflects and formalizes the events, scientific actions and industrial dissemination planned. In this document, a comprehensive description of the PIXEL's role in every industrial niche, scientific forum and public exposure in order to maximize both innovation and impact.		
Work Package	WP9		

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History

Date	Version	Change
20-Nov-2019	0.1	ToC – drawing directly from D9.4
6-Sept-2021	0.2	First content added
17-Sept-2021	0.3	2nd round of contributions added
23-Sept-2021	0.4	Last round of contributions added
24-Sept-2021	0.9	Version sent to Internal Review
29-Sept-2021	1.0	Version submitted to EC portal.

Key Data

Keywords	Dissemination, Communication, KPI, report, virtual presence, event, publication, webinar, closure event.
Lead Editor	Ignacio Lacalle (UPV).
Internal Reviewer(s)	Miguel Ángel Llorente (PRO), Athanasios Chaldeakis (PPA).

Abstract

This deliverable has been created in the context of the Work Package 9 (*Exploitation, Dissemination and Communication*) of the H2020-funded project PIXEL (Grant No. 769355).

In this document we have summarised the actions taken in the second (and last) execution period of PIXEL regarding communication and dissemination. Besides, the document reflects the update of the Dissemination Plan that was delivered in month M6 and updated in M18, and that has been slightly adapted due to the consequences of COVID-19 pandemic outbreak.

First, a global explanation of how those consequences have affected the Dissemination Plan and which corrective actions have been put in place is made.

Later, a full report on the dissemination actions performed by the project from M19 until M41 takes place. The report is divided according to the different type of dissemination activities described in the predecessor document from where this deliverable comes (deliverables D9.3 and D9.4). Namely, the actions are split into: communication, scientific dissemination and industrial dissemination. Further sub-divisions are included for the sake of readability and introduced as sub-sections in the document.

Summary of main resulting figures are provided below:

- Communication
  - More than 600 followers in total, having Twitter as the most prominent channel.
  - 38 videos uploaded to YouTube channel, summing up to 2k+ views and 50+ hours visualised.
  - Website continuously updated, reaching 22k+ visitors and 70k+ total visits.
- Scientific Dissemination
  - 15 papers published in conference proceedings and posters.
  - 4 papers published in relevant scientific journals.
- Industrial Dissemination:
  - 46 events actively participated by the Consortium, where 12 partners were present.
  - Liaison with other project standing out as one of the main focus of action.

Besides, a couple of new sections have been added, related to the specific actions performed to increase PIXEL's impact and outreach: Webinars and Closure Event.

Finally, conclusions and metrics are provided to globally understand how PIXEL project has performed in terms of dissemination. An updated schedule of forthcoming events to be observed by the PIXEL Association is included as well.

Statement of originality

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Acronym	Explanation
CA	Consortium Agreement
COREALIS	Capacity with a pOsitive enviRonmEntal and societAL footprInt: portS in the future era
CSA	Coordination and Support Action
DX.Y	Deliverable Y of work package X
EC	European Commission
ESPO	European Sea Ports Organisation
ETP	European Technology Platform
EU	European Union
GA	Grant Agreement
ICT	Information and communication technologies
IoT	Internet of Things
IMO	International Maritime Organization
IP	Intellectual Property
MX	Month X of execution of the project
OBOR	One Belt One Road
PEI	Port Environmental Index
PIXEL	Port IoT for Environmental Leverage
R&D	Research and Development
SJR	Scimago Journal & Country Rank
SMP	Small and Medium Ports
TX.Y	Task no. Y within WP no. X
WP	Work Package

1. About this document

The idea behind this deliverable is to report about the dissemination and communication activities performed by PIXEL partners between November 2019 and September 2021.

The report is provided according to the sections, tables, formats and plan established in M18 through the deliverable D9.4. Despite new things have been introduced in the whole dissemination management and execution, the basis is kept and the global storyline is being respected and followed.

1.1. Deliverable context

Table 1. Deliverable context

Topic	Description
Objectives	This deliverable must be considered as highly transversal, not being addressed to any particular goal of those listed in the GA. Nevertheless, following and updating the Dissemination/Communication plan is crucial for the impact creation of the outcomes of the project. A report on the activities assists in realising the impact and success of the project plan.
Exploitable results	PIXEL supporting material created in the context of this deliverable cannot be considered Exploitable Results themselves, but they will surely contribute to the dissemination of the results of the project and to maximizing its scope and coverage in both academic and industrial fields. This deliverable reflects the communication and dissemination that has been given to the identified KERs (4 final products).
Work plan	Associated tasks: T9.1 – Communication and impact creation: This deliverable reports about the activities of communication through digital means performed in the period M19-M41. T9.2 and T9.3 – Scientific and Industrial Dissemination: D9.5 reflects the update on the strategy to be undertaken by both the scientific and industrial partners with regard to dissemination, as well as, the activities already conducted till M41. T9.4 – Exploitation and Business plan: Deliverable D9.8 is more focused on T9.4, but in this document the relation with innovation is remarked and clearly the whole exploitation line had to be aligned with industrial dissemination and communication.
Milestones	N/A
Deliverables	D9.3: The predecessor document. The Dissemination Plan has been the master document taken into account to perform the activities that are reflected in this deliverable. D9.4 followed and updated D9.3. D9.5 (this document) is the final update of the report on Dissemination and Communication, that covers all activities till the end of the project. D9.8 and D9.5 are intimately related, as the actions among WP9 tasks have done in a cooperative way, and many of the results cited in this report (business-focused content, product pages, innovation videos, horizon results platform and some indusrital events preparation) are directly coming from the Innovation pathway.
Risks	This deliverable does not match any of the identified risks according to the GA, but concerns arise about the impact of it to the dissemination of PIXEL. Not reaching the expectations of quality and utility of the Dissemination plan, could mean an insufficient spread of the results of the project.

2. Dissemination plan

The general objective of PIXEL's Dissemination Plan has been to organise in a coherent way the activities leading to maximise impact for the overall project. The main objective for each partner within that plan has been to have a structured, complete and achievable business model strategy and a proper communication of results.

The period covered by this report has been anomalous compared to the M1-M19 period of the project. This is because the months M25 to M41 (actually, to the end of the action) have been strongly marked by the effect of the COVID-19. The outbreak of the pandemic that has been whipping Europe since March-2020 (M23 of PIXEL), drastically changed a huge part of the dissemination structure as it had been known till that moment.

> The majority of events that PIXEL was tackling were cancelled due to **COVID-19** associated restrictions, and it was foreseen that the team would not be able to attend to face-to-face events for a certain time.
>
> Especially remarkable was the cancellation of TRA2020, the biggest event planned to be attended by PIXEL partners in 2020 (if not in the whole project), the IoTWeek 2020 and IoTWeek 2021. In both of them, PIXEL was planning to have a booth with a working demo and also to have scientific publications associated and to be presented.

Despite that fact, the PIXEL WP9 team has strived to stick to the Dissemination Plan established by D9.3 (and updated via D9.4) as much as possible. Concerning the communications, the usage of social media and the rest of proper channels (website, YouTube, etc.) has been maintained (even increased during this period). Regarding scientific dissemination, although being true that it has been difficult to put teams together as smoothly as in pre-pandemic scenarios, the team has been able to produce enough number of articles for (virtual) conferences and for selected journals. It is remarkable that the quality has not been decreased but improved, achieving a final percentage of approval of ~80%.

With regards to Industrial Dissemination (the most affected due to events cancellation/postponement), some strategies (that were already foreseen in the original Dissemination Plan) were reinforced aiming at covering the audience of former face-to-face events. Those actions have been Webinars, Virtual dissemination, social media presence and recording and uploading of more videos to the YouTube channel, all of it accompanied by marketing campaigns that were put in place during the last year of the project.

3. Report on dissemination activities

3.1. Report on communication activities

3.1.1. Website

The PIXEL website is the main element of visibility of the project towards the outside world. It was significantly improved from the first release in terms of content, visualization and added functionalities, and was reported in deliverable D9.4. In this update, the general layout remained, but we have included much more useful content as the project evolved (e.g., deliverables, conference presentations, newsletters, etc.).

The base tool for edition purposes is still WordPress CMS, the theme didn't change, but some additional plugins were installed (as well as additional content).

The target audience was already identified in previous releases, it is wide and encompasses different profiles:

- *Project partners*: besides any internal collaborative tool, the project consortium's face is the website which includes any relevant information and updated results
- *European Commission*: any related personal staff, including Project Officer, should have a fast access to project information, deliverables and other material.

- *H2020 related projects*: PIXEL is framed in the 'Port of the Future Network', with other 2 RIA projects (Corealis, Port-Forward) and one CSA (DocksTheFuture).
- *Specific industrial partners*: PIXEL is devoted to ports, therefore our primary stakeholders are those working in or for ports, and the way they can benefit in terms of technology improvement for IoT and environmental awareness. This obviously determines the used language in our communication materials.
- *Specific research/academic partners*: PIXEL proposes state-of-the-art technologies architectures and applications (models and predictive algorithms) related to IoT and derive insights by exploiting real time sensor data as well as historical data. Results are primarily communicated in form of conferences and papers, but they are all listed in the website.
- *General audience*: public in general, with a special interest in research projects

Apart from project partners and the EC, probably the target audience most interested in the outcomes of the PIXEL project relates to port authorities, as they somehow act as a hub to bring together different stakeholders from the port ecosystem, thus it was important to present the information (content) is a way that seemed attractive and useful to them.

3.1.1.1. Main updates from the previous version

In short, the main updates that have been included from the last release (D9.4, Oct 2019) to this final release (D9.5, Sept 2021) are the following:

- The *video* in the landing page has been updated to better reflect the challenges and outcomes provided by PIXEL

- *Twitter news (feeds)* are updated continuously (at least weekly) to track real time changes in the project and related ones.

- The *slider* in the front page has been updated several times with relevant events (e.g., awards, webinars, etc.)

- The *project related info* in the front page was updated with the 4-month extension (last amendment)

- The *Project Consortium* web page was also updated as one partner *changed* its legal entity (now called Port Network Authority of the Eastern Adriatic Sea, APT)

- The *newsletter plugin* increased the number of subscribers, especially during the last months due to the PIXEL webinars

- The *Advisory Board* web page was also updated, as one member left out whereas a new member stepped in

- The Menu about *Use Cases* was updated to include a new use case related to *Terminal Schedule Analysis for Social Distance Maximisation.* This was a potential measure proposed that might help manage pandemic situations and was accepted by the EC in the last amendment.

- The *Publications Menu* has been one of the most active ones

  o All public deliverables are now available through the website, except for the final ones released in September (they will be uploaded in the website the first week of October)

  o All research papers from Oct 2019 to Sept 2021 are available (8 new), except for the most recent ones for which we are waiting final acceptance or publication details

- o All conferences from Oct 2019 to Sept 2021 are available (24 new). The conferences include agenda, presentation (slides) and, if possible, the link to the video in PIXEL YouTube channel. The last webinar (final closure will be added the first week of October)

- o Local media updates were few (3 new)

- o In terms of *marketing*, the latest *leaflet* and *poster* were updated by November 2019; since then, only the **newsletters** were also updated in the website (4 new)

- The *Events Calendar* has been also updated periodically with all relevant events to PIXEL, mainly conferences, plenary meetings, participation in webinars and PIXEL webinars.

- The Webinars Menu was newly created during the last months of the project to provide help in dissemination purposes and provide a central point to search for information, register for the event and watch the recorded sessions through a link to our YouTube channel.

- The *Products* Manu was newly created at the end of the project to support and communicate the innovation and exploitation work performed in WP9. It helps better understanding PIXEL from a business perspective.

3.1.1.2 Website structure and content

The landing page (https://pixel-ports.eu) is depicted via Figure 1. PIXEL landing page (website) shows its main design. The different components of the landing page are titled with arrows; in *green* you can see the ones that have been updated since the last release. Some general comments:

- The main background image is 'corporative' for all our current marketing material. It is displayed in a form of slider presenting the next upcoming relevant event.
- The PIXEL video is a vivid an important content presenting PIXEL; it has been updated in the recent months after a great effort of the consortium to provide a more industrial and result oriented perspective of the project. All videos from PIXEL are available through our YouTube channel, and are suggested once the PIXEL video has finished.
- Links to social networks are available, but a Twitter feed is included to automatically generate updated content. Twitter is by far the most active social network in PIXEL, and the website depicts the latest four tweets.
- Pilot ports are also easily found in the webpage, so that users directly see the target ports.
- At the bottom of the landing page, any relevant information (contact, project duration, GA reference number, etc.) is provided. It also includes the optional subscription to the PIXEL's newsletter, as well as the Data Protection Policy aligned with the GDPR.
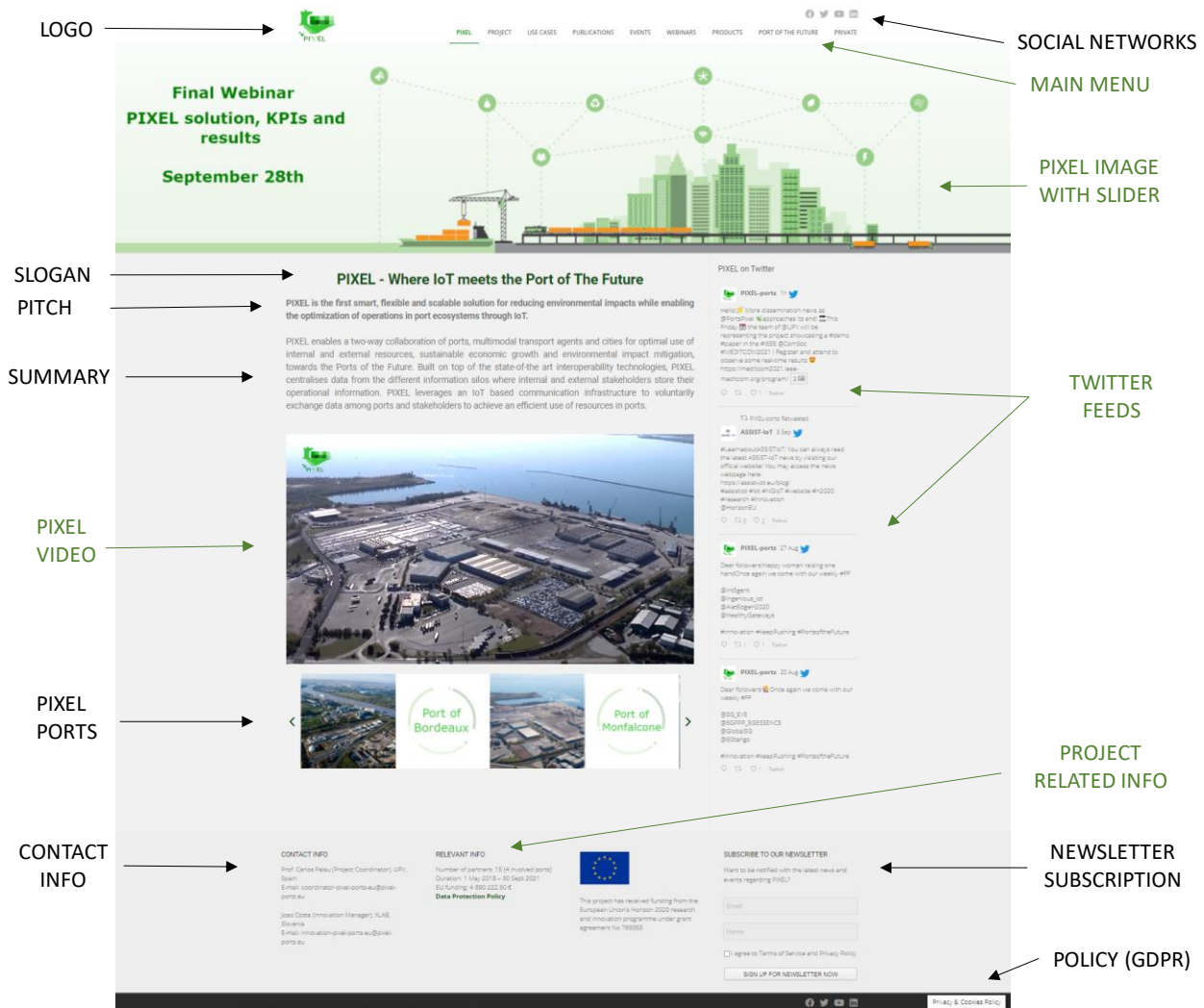
Figure 1. PIXEL landing page (website)

The main menu (top right area) has been changed and enriched in several ways. It will be described below.

The 'project information' option is decomposed in various items:

- *Overview*: brief overview of the project with all relevant info
- *PIXEL concept*: PIXEL vision and mission
- *Objectives*: the seven PIXEL objectives briefly listed and summarized
- *Impact*: the five PIXEL impacts briefly listed and summarized
- *Consortium*: PIXEL consortium, with logos, description and links. During the last year of the project, the associated legal entity related to the port of Monfalcone (ASPM) changed to APT.
- *Advisory Board*: list of port related experts helping PIXEL to improve. One member was replaced during the second half of the project.
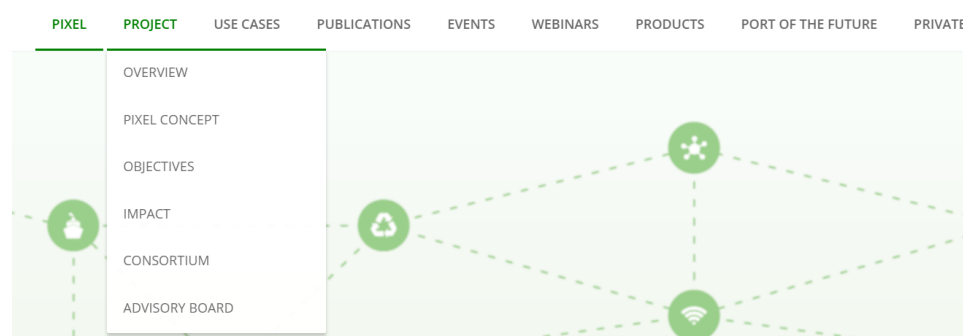
Figure 2. Project related information in the Main Menu

The project 'use cases' describes the five use cases in PIXEL: (i) energy management in GPMB, (ii) Intermodal transport in Monfalcone, (iii) Port-city integration in THPA and PPA, (iv) Port Environmental Index as a cross-use case for all four ports, and (v) Terminal schedule analysis for social distance maximisation. For each use-case, there is a summary PDF file that users can download. The last use case was added in the latest amendment as during the pandemic the EC made a request to propose direct or indirect solutions to better manage the situation in companies given the restrictions.
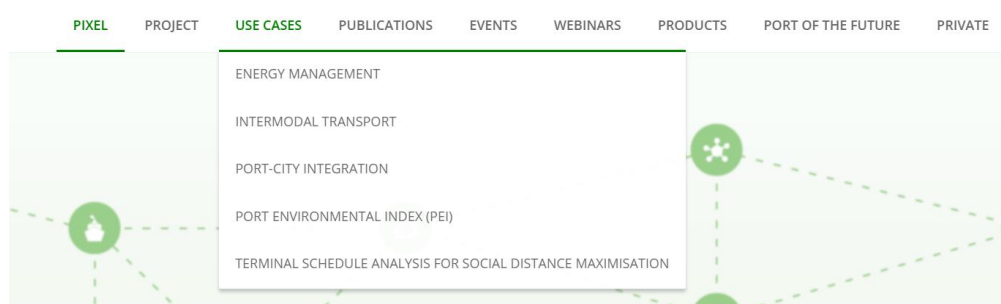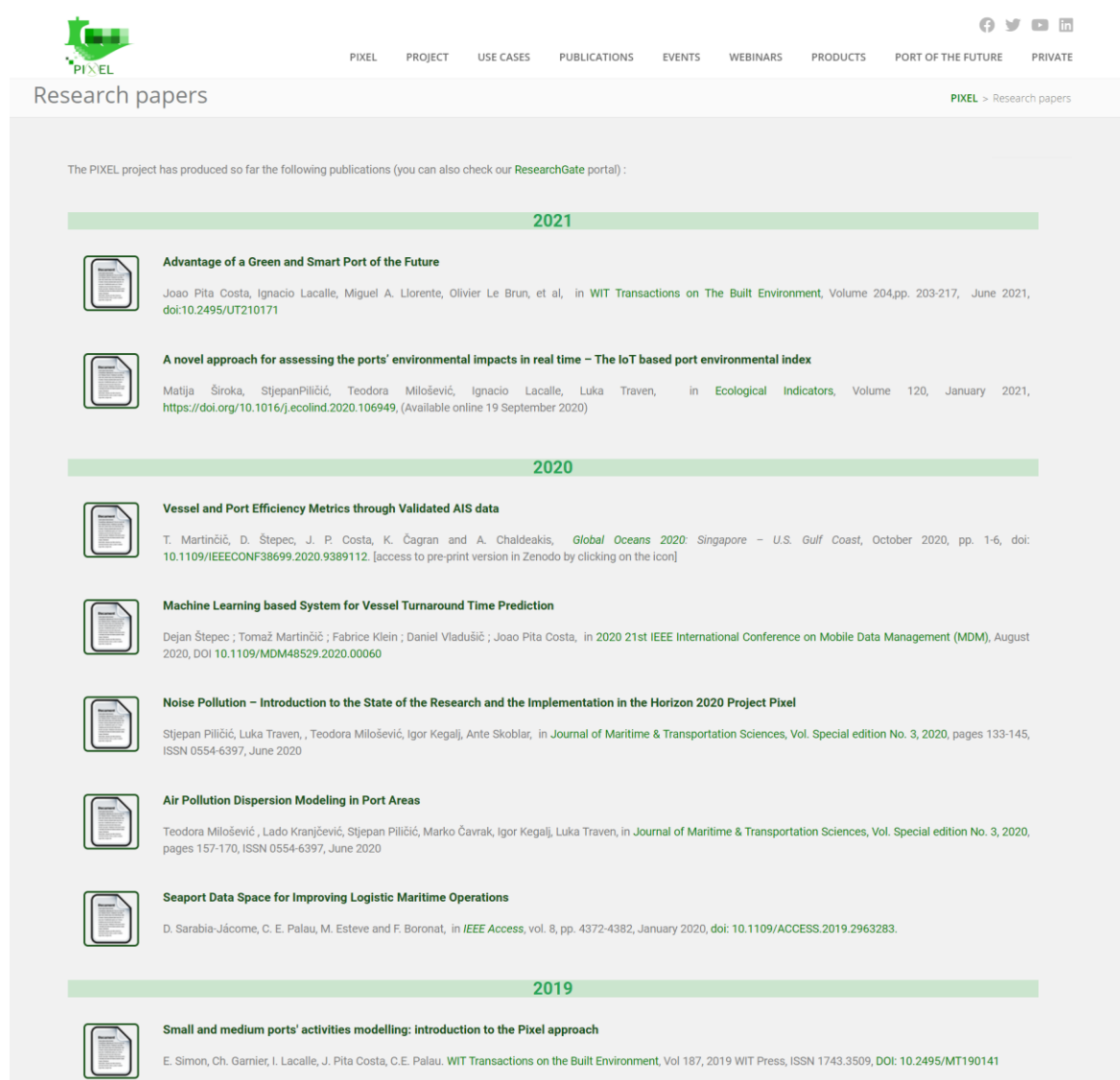
Figure 3. Use cases in the Main Menu

The 'publications' section is probably the most important one as it presents the outputs of the project, as they were produced. PIXEL was dedicated to bring its outputs as soon as they were available to the research and industrial community. This means that the website published all public deliverables as soon as they were released, without waiting to the end of the project and the comments from EC reviewers to produce final versions. Except for the deliverables that will be released by the end of the project (September 2021), all public ones can be found in PIXEL's website. The pending ones will be uploaded the first week of October.
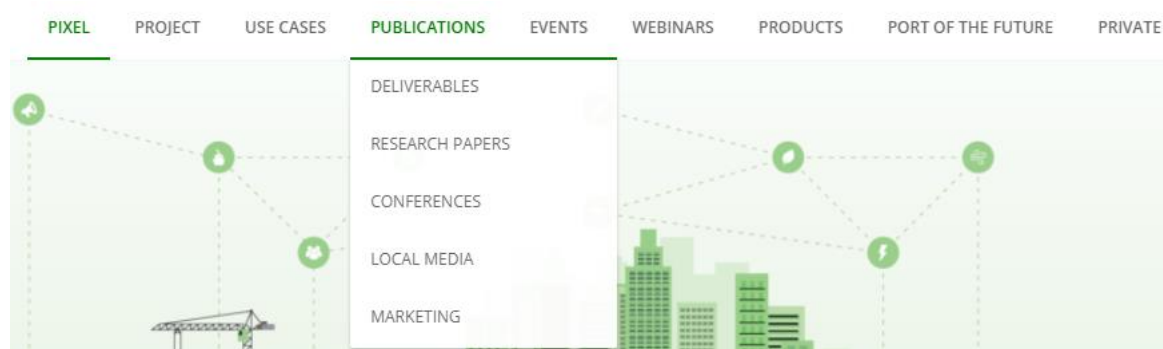
Figure 4. Publications in the main Menu

The same approach applies for the research papers, and conference presentations. So far 8 new research papers were uploaded in the website, but some others are pending of acceptance or final publications details.

Figure 5. Latest Publications uploaded in the PIXEL website

Related to conferences, we have also included in this section participation in webinars and PIXEL webinars. In fact, during the second half of the project almost every participation/contribution was online, very few conferences followed a hybrid (face-to-face and online) approach. So far 24 new participations in conferences have been added. For each participation, there is a link to the corresponding website, agenda, presentation slides and presentation video (available in our YouTube channel).
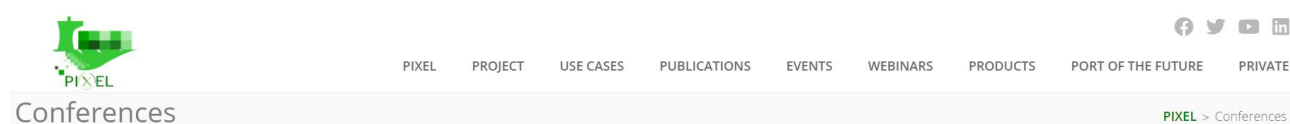
Figure 6. Latest Conferences in the PIXEL website

Local media communication material and marketing material (logo, leaflet, poster, roll up and newsletters) are also provided under the *Publications* menu. The most relevant aspect here is the generation of 4 newsletters since the previous release (deliverable D9.4).

The *Events* entry in the main menu allows to track relevant events in a form of Calendar with links to a more detailed information page (WHAT, WHEN, WHERE, WHO, WHY) containing a brief summary and photos. Such events were, for example, plenary meetings, scientific and industrial conferences, webinars, etc.
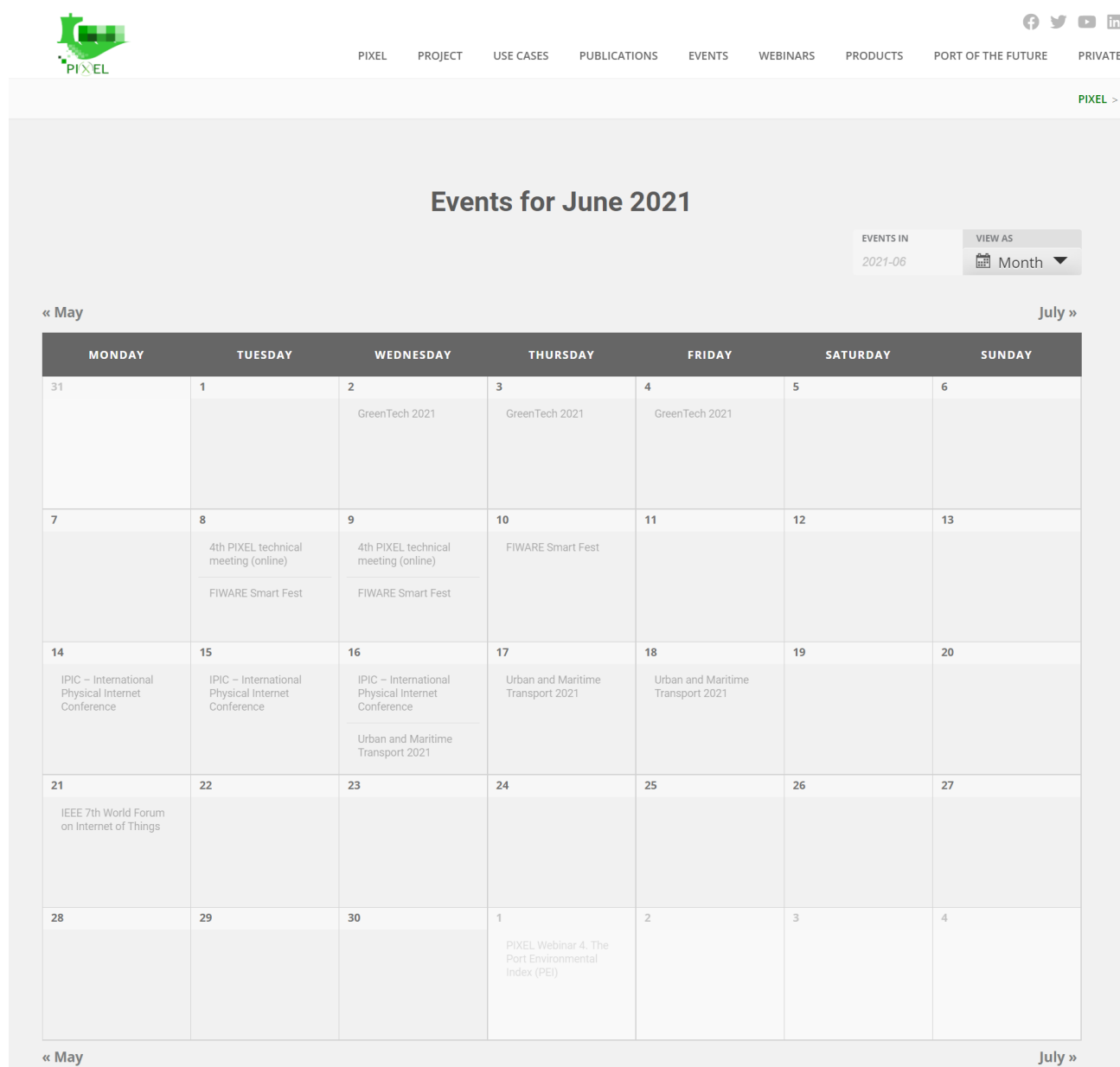
Figure 7. Events and calendar in the PIXEL website

The next entry in the Main Menu relates to the (PIXEL) *Webinars* and is new from the previous release (D9.4). In the last stage of the project when results were ready to be adopted by external entities, the consortium made a series of 5 webinars in order to disseminate the PIXEL outcomes and engage other ports using our technology. The newsletter mailing-list was used to invite all subscribed participants, but also other external contacts we made throughout the project. All sessions were recorded and are available through our website; it provides the link to the video in our YouTube channel. At the time of writing this deliverable there is only one missing webinar (closure event) that will be done by the end of September (28th). The video will be uploaded and made available during the first week of October.

Figure 8. PIXEL webinars in PIXEL website

Another section has been also added in the Menu during the last months, called Products, and relates to the work done in the tasks of innovation and exploitation within WP9. From a business perspective, it is important to clearly communicate which are the products that the project is releasing after its official end. Each product is somehow an aggregation of several innovations, and 5 main products have been considered:

- PIXEL product: it basically refers to the infrastructure IoT platform that allows other models to run
- PEI: Port Environmental Index
- PAS: Port Activity Scenario
- MDA: Maritime Data Analytics
- BDE: Big Data Engine
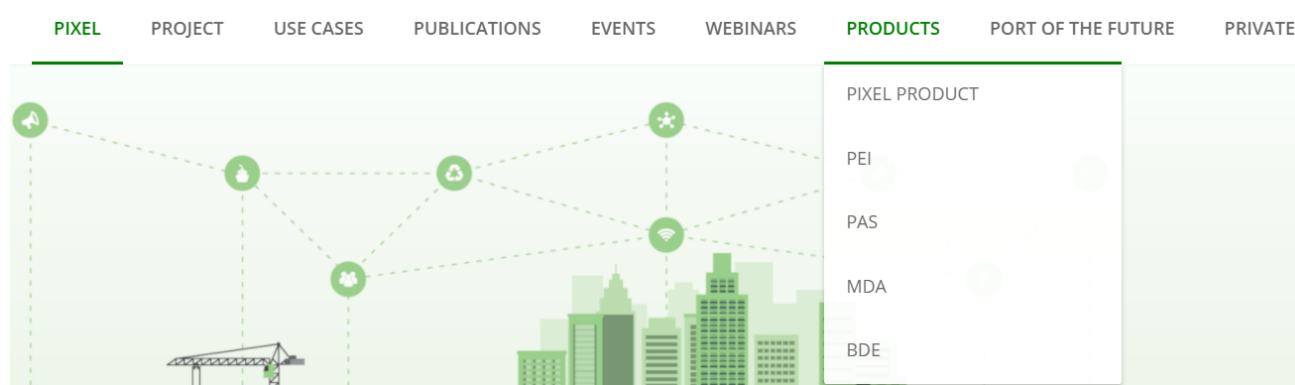
Figure 9. Products in the Main Menu

For each product web page, there is a common structure to describe it:

- Teaser: short description
- Technology: includes used technology, a descriptive video from our YouTube channel, and a schema (Figure) of the product
- Benefits: lists the main benefits of the product
- Impact: list the main expected impacts by using the product
- Keywords: relevant keywords about topics covered that might help in further searches

The *Port of the Future* section is dedicated to the cluster of projects involved: 2 RIAs (Corealis and PortForward) and the CSA (DocksTheFuture). This web page was mainly informative and agreed among the cluster, the interactions among the different projects were done by conferences (first half of the project) and webinars (Second half of the project, due to the pandemic)

The *Private* section was intended for internal use, to allow accessibility of intermediate software results during the project. This was useful during the first half of the project; as soon as the software became finalised, it was shifted to other platforms (e.g., *github*, *Dockerhub*) with proper related documentation in *Readthedocs* (https://pixel-ports.readthedocs.io/en/latest/).

3.1.1.3 Additional functionalities

The PIXEL website includes a set of additional functionalities:

- *Traffic Security*: the website includes a SSL certificate in order to browse securely from any fixed or mobile device

- *Privacy*: following the GDPR, the website includes proper management and clearly states the terms of service, privacy and cookies policy. Cookies are only used for building statistics of website usage. Most of current Wordpress cookie related plugins include the necessary GDPR Cookie consent.
- *Statistics*: There are several ways to get statistics usage. Probably Google Analytics is the most common one, but the information is stored on external servers. The open source alternative (even if there are several) is *Matomo*, formerly known as *Piwik*, but also requires an external server. This tool is quite powerful and was tested during the first months of the project, but after comparing it with other options, and considering there was no strong need for details, the consortium decided to use a simple *Statistics plugin* within Wordpress, which stores the information internally (hits, top visitors, browsers, etc.) and is very easy to manage. A short report provided by this plugin is provided in the next section.
- *Access security*: since the second half of the project the website includes a plugin that limits the login attempts when they are identified as an attack. This is notified to the administrator who can eventually write specific blacklists by IP address or user. This is really important and should be taken seriously, as there are many attempts continuously.

3.1.1.4 Website metrics and impact

Hereby the Consortium provides a wide vision of the user's traffic in the PIXEL website, as an overview of what was happening on the site from the beginning of the new website (March 2019) until the end of the project (Sept 2021), except for the last month as we had to stop to collect all data. The *WP statistics plugin* allows getting historical data and it is possible to compare different timeframes (month, year and whole project lifespan). In fact, every month results were collected and provided to the consortium in the shared repository.

Hit statistics and average visitors

Below the hits are presented in a three-way approach: (i) total hits, to get an overall picture, (ii) hits during the first half of the project –part of it-, and (iii) hits during the second half. We think that in this way it is easier to compare the data across time.

The total number of visits is **67933**, whereas the number of visitors is **21538**. This means that the average user browses through at least *3 pages on every visit*. The average number of visits per day is approximately **54**. Compared to the previous deliverable, *20* visits per day were reported as average, so the number has been significantly increased. Note also that the initial target was 2000 visits for the entire project duration, so this goal was already reached in the first half of the project and shows the difficulty in providing accurate estimations in advance. It is also important to note the increase in visits during the last months of the project, probably due to (i) more results –deliverables, conferences- available in the website, and (ii) more efforts in communication and dissemination of the consortium – webinars, transferability offers, etc.-.
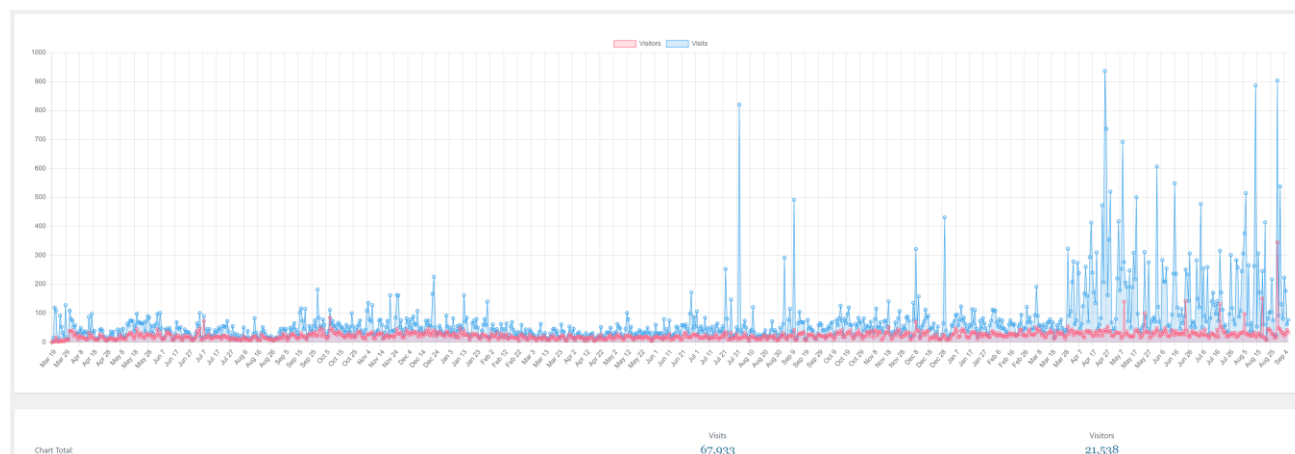
Figure 10. Website hits (whole project)

AS it can be seen, the official website of the project has gained traction towards the end of the project, coinciding with the creation of the "Product" pages and the inclusion of the new version of the commercial video of the project. Remarkably, two peaks can be observed a two very relevant moments in PIXEL: July 2020, when the platform was released and a considerable amount of information was being introduced in the website and also in January 2020, just in the moment where the mid-term review of the project took place.
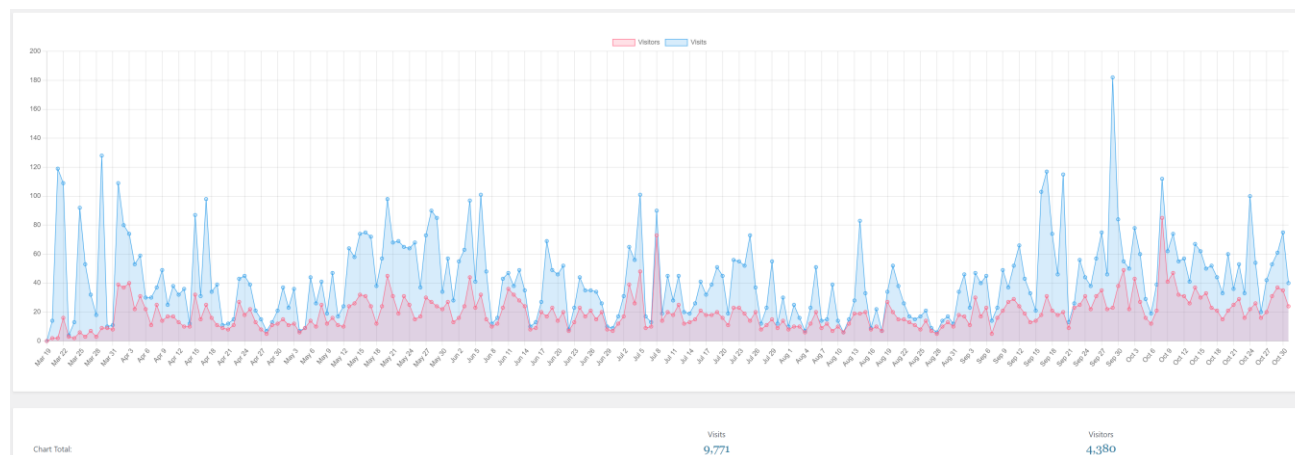
Figure 11. Website hits (March 2019- Oct 2019)
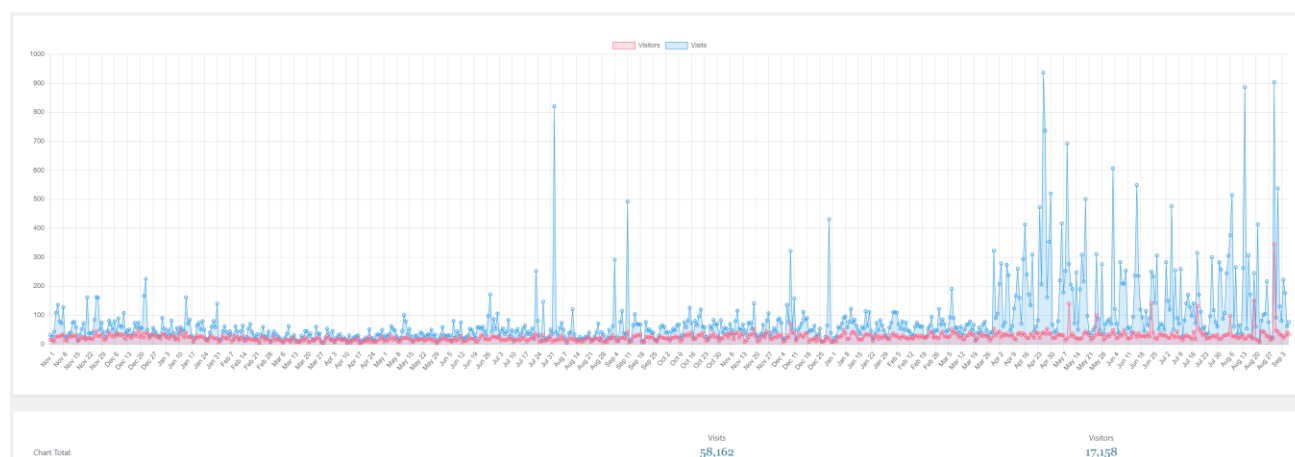
Figure 12. Website hits (Nov 2019-Sept 2021)

<u>*Top referring sites*</u>

For this metric the results of the three timeframes are very similar, thus we present only the overall set of figures below. As for the previous release (D9.4), most of the users are accessing the PIXEL website **directly** (16702), then via the **google search engine** (2914) and also via **Twitter** (162). There is a strong link between website and Twitter as there is a feed embedded in the landing webpage. The second PIXEL social network, LinkedIn, which appeared in the previous release in the top-10 ranking, is no longer here. One may say that this social network has not have relevant impact, whereas our collaboration with WPSP has been successful (5th position in the ranking below), as we were able to include PIXEL in their website (https://sustainableworldports.org/project/collaborative-project-pixel/).

The second general search engine, Bing, only provides 64 occurrences. Yahoo!, DuckDuckGo and Yandex are also supported, but no relevant position in the ranking. XLAB, a PIXEL partner, has been successful in attracting users to visit our website, and is in the 10th position of the ranking.

Rating	Site Url	Site Title	Server IP	Country	References
1	pixel-ports.eu	PIXEL – Where IoT meets the Port of the Future	85.13.146.184	—	16,702
2	www.google.com	Google	216.58.213.196	—	2,914
3	t.co	t.co / Twitter	104.244.42.133	—	162
4	baidu.com	百度一下，你就知道	39.156.69.79	🇨🇳	148
5	sustainableworldports.org	World Port Sustainability Program	83.217.75.76	🇧🇪	109
6	cordis.europa.eu	CORDIS	European Commission	185.3.44.3	🇳🇱	89
7	sg.shuct.net	Google Global Ranking	161.117.125.79	🇸🇬	76
8	www.pixel-ports.eu	PIXEL – Where IoT meets the Port of the Future	85.13.146.184	—	16,702
9	www.bing.com	Bing	204.79.197.200	—	64
10	www.xlab.si	XLAB	XLAB	91.217.255.44	—	47

Figure 13. Website referrers (whole project)

Top pages

Below are presented the hits in a three-way approach: (i) total top pages, to get an overall picture, (ii) top pages during the first half of the project –part of it-, and (iii) total pages during the second half. We think that in this way it is easier to compare the data across time.

The most visited page (by far) is the **landing page**, with 22693 visits (4866 in the previous release D9.4). The second one is no longer the **Consortium** page (1414) - as for the previous release D9.4-, but the **Deliverables** page (1493), closely followed by Overview (1484) and Consortium (1414). Probably this is caused by the upload of PIXEL deliverables already showing some outcomes from the projects.

The other pages are Conferences (1134), Advisory Board (1038), Port of the Future (1008), PIXEL Concept (930), Objectives (766) and Energy Management (751).

ID	Title	Link	Visits
1	Home Page	/	22,693
2	Deliverables	/?page_id=30	1,493
3	Overview	/?page_id=488	1,484
4	Consortium	/?page_id=22	1,414
5	Conferences	/?page_id=588	1,134
6	Advisory Board	/?page_id=434	1,038
7	Port of the Future	/?page_id=26	1,008
8	PIXEL Concept	/?page_id=330	930
9	Objectives	/?page_id=520	766
10	Energy Management	/?page_id=387	751

Figure 14. Top pages (whole project)

As it can be observed, Energy Management (use case) page is among the TOP 10 in # of visits. This fact must be interpreted as a high interest from the community to this realm of action (environment-energy-ports). In addition, the Advisory Board and Port of the Future network pages appear as highly ranked pages due to its relation with external members that have been endorsing PIXEL work and advances.

ID	Title	Link	Visits
1	Home Page	/	4,866
2	Consortium	/?page_id=22	336
3	Overview	/?page_id=488	308
4	Deliverables	/?page_id=30	307
5	Port of the Future	/?page_id=26	222
6	Conferences	/?page_id=588	205
7	PIXEL Concept	/?page_id=330	189
8	Advisory Board	/?page_id=434	188
9	Data protection	/?page_id=724	163
10	Objectives	/?page_id=520	156

Figure 15. Top pages (March 2019- Oct 2019)

ID	Title	Link	Visits
1	Home Page	/	17,827
2	Deliverables	/?page_id=30	1,186
3	Overview	/?page_id=488	1,176
4	Consortium	/?page_id=22	1,078
5	Conferences	/?page_id=588	929
6	Advisory Board	/?page_id=434	850
7	Port of the Future	/?page_id=26	786
8	PIXEL Concept	/?page_id=330	741
9	Objectives	/?page_id=520	610
10	Energy Management	/?page_id=387	596

Figure 16. Top pages ((Nov 2019-Sept 2021)

3.1.2. Video

3.1.2.1. Strategy

As indicated in D9.3 and in D9.4, the creation of audio-visual material in PIXEL was given a paramount importance in the overall dissemination strategy. A list of expected videos to be published generated by partners was created and has been followed to the letter. In addition, with the advent of COVID-19 outbreak, digitalising the dissemination was the only viable option, thus the YouTube channel of the project became one of the main portals to the outside world to let the community realise the advances of PIXEL. Altogether with the website, the generation of videos has been the main focus of the team in T9.1 to continuously produce new, attractive content.

For generating an organised, traceable, recognisable structure of videos, the team decided to catalogue them in four main groups:

- Overview videos
- Technical modules
- Partner presentations
- Other

Within them, several specialisations (see below) were identified that drove the uploaders to create 8 different playlist containing, at least, one video each.

Apart from the initial planning (that included 25 planned videos to be created), the scope of this communication channel has been enlarged due to the introduction of new topics:

- PIXEL webinars (scheduled and designed to soothe the cancellation of face-to-face events)
- Online presentations. Many congresses/conferences (especially after Summer 2020) decided not to cancel their planned events but to hold them online (virtually), so that dissemination and networking would still be possible. Although the estimated impact and outreach of PIXEL presentations on such events was deemed less, partners in T9.2 and T9.3 still looked for actively presenting PIXEL content at those events. The PIXEL YouTube channel has also been populated with the videos recorded of PIXEL partners' presentations as long as the organisers gave permission to do so (almost all cases).

Finally, the new, final commercial video of PIXEL was designed, recorded and delivered during the last period (around M37) of the project. Details on this process can be found at 3.1.2.3.

The next section outlines the list of videos uploaded in the second half of the project (M19-M41):

3.1.2.2. Videos created M19-M41

Table 2. Report on PIXEL Video Channel – M19 to M41

id	Full description	Diss. Domain	Date of publishing	Partners	Type of contribution
#V.P.E.1	Prof. Traven from MEDRI explains and presents the baseline logic under the Port Environmental Index and the methodology used to create the index. Conducted under lecture/.ppt format.	Environment	21-Nov-19	MEDRI	Ppt preparation Video recorder Link
#V.P.T.2	CATIE explains and presents the energy model of the PIXEL project and how it can be successfully used in ports for energy management. Conducted under lecture/.ppt format.	PIXEL Logistics	29-Jan-20	CATIE	Ppt preparation Video recorder Link

#V.P.T.3	INSIEL presents and shows a demo on how to use the intermodal transportation model of the PIXEL project using the PIXEL dashboard. Shared screen demonstration video.	PIXEL Logistics	7-Feb-20	INSIEL	Video recorder Demo of the tool. Link
#V.P.T.4	PEOPLE presents the Port City Environmental model Conducted under lecture/.ppt format.	PIXEL Logistics	7-Feb-20	PEOPLE	Ppt preparation Video recorder Link
#V.P.E.2	CREOCEAN presents the air pollution model and how it is integrated in the PIXEL dashboard. Conducted under lecture/.ppt format.	Environmental	17-Feb-20	CREO	Ppt preparation Video recorder Link
#V.P.T.5.	Extract of the webinar related to the PIXEL Project organized jointly by DocksTheFuture and ALICE platform about The Future of Ports: vision 2030 – Bringing together innovative technologies, tools and policies through an EU network (substituting TRA2020 event). Conducted under lecture/.ppt format.	PIXEL Logistics	7-Jul-20	UPV	Ppt preparation Video recorder Present. at virtual event Link
#V.P.I.2	UPV describes with a technical explanation, the concept of the PIXEL Operational Tools module, what it is, and how it works Conducted under lecture/.ppt format.	ICT-IoT	7-Jul-20	UPV	Ppt preparation Video recorder Link
#V.P.I.3	Overview presented by ORANGE at a FIWARE event of how EU projects help fight the climate change. Presented physically (recorded) for a virtual event.	ICT-IoT	5-Aug-20	ORANGE	Present. at virtual event Link
#V.P.T.6	CATIE describes a core model from the PIXEL project (PAS) covering the modelling of the supply chain to forecasting energy consumption and analysing historical data (PAS for energy). Presented using slides in a virtual event.	PIXEL Logistics	19-Oct-20	CATIE	Ppt preparation Present. at virtual event Link
#V.P.I.4	(Off-voice generated) Overview of the solution proposed by the PIXEL H2020 project - Technical flow among models/modules. Conducted under lecture/.ppt format.	ICT-IoT	17-Nov-20	PRO	Ppt preparation Script to generate voice Link
#V.P.N.11	The first Webinar of the project explained what is the need, who are the partners, how we plan to address the need, description of the solution, and what is the impact we plan to have. Conducted under lecture/.ppt format.	PIXEL global	14-Jan-21	PEOPLE, UPV, PRO	Script preparation Invitation to mailing lists and other audience Ppt preparations Webinar chairing

					Virtual presentations Video recording Link
#V.P.N.12	UPV makes a presentation of PIXEL Overview in terms of cooperation by CSA DocksTheFuture for the final event of the CSA. Conducted under lecture/.ppt format.	PIXEL global	12-Feb-21	UPV	Ppt preparation Video recorder Link
#V.P.N.14	The second Webinar of the project explained the use cases and User stories, models, algorithms and port activities scenario. Conducted under lecture/.ppt format.	ICT-IoT	12-Feb-21	PEOPLE, CATIE, XLAB, INSIEL	Script preparation Invitation to mailing lists and other audience Ppt preparations Webinar chairing Virtual presentations Video recording Link
#V.P.I.5	Marc Despland from Orange explains and describes in a technical way the data acquisition layer of the PIXEL project. Conducted under lecture/.ppt format.	ICT-IoT	26-Feb-21	ORANGE	Ppt preparation Video recorder Link
#V.P.I.6	Marc Despland describes and explains in a technical way the security framework of the PIXEL project, focusing on the components that make it up. Conducted under lecture/.ppt format.	ICT-IoT	26-Feb-21	ORANGE	Ppt preparation Video recorder Link
#V.P.I.7	XLAB describes and explains in a technical way the PIXEL Information Hub which is used as a central repository of the PIXEL platform. Conducted under lecture/.ppt format.	ICT-IoT	26-Feb-21	XLAB	Ppt preparation Video recorder Link
#V.P.I.8	Keynote presentation made in the Huawei Industrial Digital Transformation Conference (ONLINE) in March 2021. Conducted under lecture/.ppt format.	ICT-IoT	6-Apr-21	CERTH	Ppt preparation Video recorder Link
#V.P.I.9	Overview of the PIXEL project conducted by Marc Despland from Orange for the Salon de la Research, an event hosted by Orange (this year ONLINE). Presented physically (recorded) for a virtual event.	ICT-IoT	7-Apr-21	ORANGE	Ppt preparation Video recorder Link
#V.P.N.15	High lever overview of PIXEL project and its link with the Port of the Future Network conducted by the coordinator of the project Carlos Palau.	PIXEL global	4-May-21	UPV	Ppt preparation Present. at virtual event Link

	Presented at a virtual event organised by COREALIS.				
#V.P.N.16	The third Webinar of the project explained the PIXEL Platform.	PIXEL global	17-Jun-21	UPV, PRO, PEOPLE	Usual actions of a webinar (see above). Link
#V.P.I.10	Ignacio Lacalle from UPV gave a presentation about the advantages of a Green and Smart Port of the Future, and how PIXEL is contributing towards it. Conducted under lecture/.ppt format.	ICT-IoT	21-Jun-21	UPV, ALL	Ppt preparation Present. at virtual event Link
#V.P.I.11	Short video in which Marc Despland from Orange presented PIXEL as use case within the FIWARE Smart Fest webinar. Conducted via presentation in a virtual event.	ICT-IoT	25-Jun-21	ORANGE	Ppt preparation Present. at virtual event Link
#V.P.N.17	The fourth Webinar of the project on the Port Environmental Index (PEI) was presented and described.	PIXEL global	2-Jul-21	PEOPLE, MEDRI, CERTH	Usual actions of a webinar (see above). Link
#V.P.I.12	Rafael Vaño from UPV explain a use case developed within PIXEL to monitor COVID 19 restrictions in port terminals. The video was presented at the IEEE 7th World Forum on Internet of Things (2021) Conducted under lecture/.ppt format.	ICT-IoT	16-Jul-21	UPV	Ppt preparation Present. at virtual event Link
#V.P.N.18	Final summary video created for promotional and dissemination purposes. This video has come up as one of the main assets for PIXEL dissemination, becoming the front material at PIXEL's landing page on the website.	PIXEL global	22-Jul-21	ALL	Script design Work with professional audio-visual content company Delivery of the video Link
#V.P.E.3	KER 1 – Port Environmental Index. Video generated to summarise one (out of the four) product(s) coming out from PIXEL. Conducted under lecture/.ppt format.	Environment	13-Sep-21	XLAB	Work done under Exploitation/Innov task Preparation and record. Link
#V.P.T.7	KER 2 – Maritime Data Analytics Video generated to summarise one (out of the four) product(s) coming out from PIXEL. Conducted under lecture/.ppt format.	PIXEL Logistics	13-Sep-21	XLAB	Work done under Exploitation/Innov task Preparation and record. Link
#V.P.T.8	KER 3 – Port Activity Scenario Video generated to summarise one (out of the four) product(s) coming out from PIXEL.	PIXEL Logistics	13-Sep-21	XLAB	Work done under Exploitation/Innov task Preparation and record. Link

	Conducted under lecture/.ppt format.				
#V.P.I.14	KER 4 – Big Data Engine Video generated to summarise one (out of the four) product(s) coming out from PIXEL. Conducted under lecture/.ppt format	PIXEL ICT-IoT	13-Sep-21	XLAB	Work done under Exploitation/Innov task Preparation and record. Link

The material produced has been aligned with the strategy and also it has been enlarged. Summarising:

- **3 Partners** presentation video:

- **14 Technical videos**, including the clear description (including technology, use, cases, deployments, etc.) of the different modules (layers of the architecture) and models (and predictive algorithms) that have been developed in PIXEL.

- **8 videos about the application of PIXEL technology** to improve/optimise logistics processes at ports, including energy, Port Activity scenarios, etc.

- **3 videos about the environmental** impact reduction and monitoring related to the Port Environmental Index. Here, it is worth mentioning that PEI-related dissemination has been focused on scientific work (papers, congress presentations, fairs, technical reports) rather than on practical – recordable – applications due to the low-TRL research nature of that work.

- **7 videos of PIXEL presentation** in general, either at PoF network-organised events or at own-organised webinars.

It is worth remarking that these figures are provisional at the date of closing this deliverable (28th September). It is planned that, at least, **2 more videos** will be uploaded to the channel by the time the project will finish: 30th September:

- #V.P.I.15: Recording of the presentation of a demonstration paper in event IEEE MEDITCOM 2021 made by UPV on mid-September 2021.
- #V.P.N.21: Holding and Recording of the 5tht Webinar of the project - CLOSURE EVENT to be conducted on September 28th, 2021.

3.1.2.3 New commercial video

According to the Grant Agreement, the PIXEL communication supporting material, needed to be renewed by the middle of the project, including a new official video of the project, as part of this material. This moment corresponded to the submission of the previous deliverable (D9.4), therefore such action was note reported by then.

At the moment of submission of D9.4, the work of delivering the new official video of PIXEL was at an advanced status by the Consortium. The script was already defined and some instructions were given on how to proceed with such recording.

However, two actions took place that led the team to pause the works on the commercial video:

- **Orientation and production:** The script prepared and the works done were oriented to explain the platform, relate the models performed and provide an introduction of the pilots to be performed. At that point (Autumn-2020), not much information was yet available about actual deployment and use-cases results and look & feel. Therefore, realising the previous, and observing that the project should create a visually attractive piece, it was decided that the script would be improved using actual results of the pilots and the creation of the video would be in charge of an external audio-visual services provider.

- **Pandemic outbreak**: Several meetings were planned to in-situ footages and planning for designing the video script and recording. The decrease of rhythm in the project due to COVID-19 and the impossibility of holding such meetings in a face-to-face fashion, redounded on delays to actually kick start the recording of the video.

Once the action was re-taken, the video was designed and scripted and the works with the external video producer company was interacted with to deliver the final product.

The video was designed with the following ideas in mind:

- It must give a professional message. Homemade videos from partners have been included hugely in the channel to elaborate different contents but this video should be done from a "commercial-like" perspective.
- It must follow PIXEL's colour palette, official supporting material design style and fonts.
- It must show real images of our ports.
- It must allow external viewer to understand PIXEL pilots with technical details, including information about specific technologies, data and objectives.
- Relate the Business models that have been devised for the PIXEL final product.
- Provide contact details for setting up free trials.

Here below some images (screenshots) extracted from the final commercial video:

Figure 17. PIXEL promotional video samples (I)
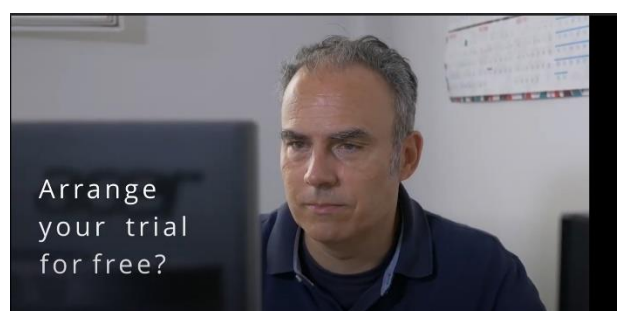
Figure 18. PIXEL promotional video samples (II)

This process lasted about 2,5 months and the material that can be consulted is the following:

- Script used
- Off-voice recorded (attached in Appendix A).
- Final video: Link here.

3.1.2.3 Statistics and other information

Regarding the YouTube channel itself, it has been the portal used to "officially" deliver PIXEL videos. All videos were uploaded as soon as they were recorded and got approval from the authors and from the congress/conference where PIXEL presentations were made (if applying). There is a total of **38** videos in the YouTube channel and they are organised according to their nature. For the structure, **8** playlists have been created that contain all of PIXEL material on this part.
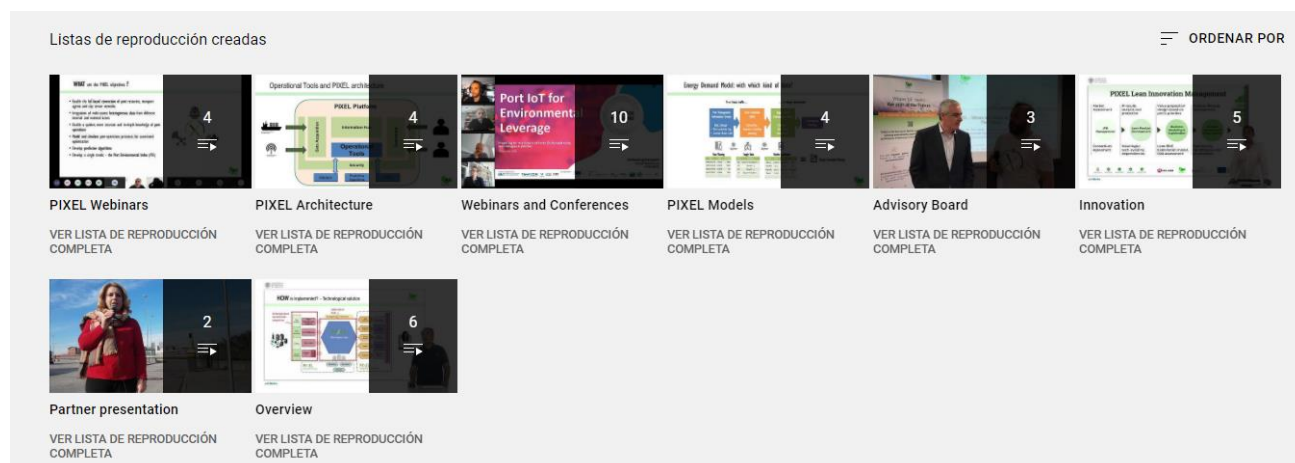
Figure 19. YouTube channel playlists

Graphics of view evolutions are depicted in the following figure, regarding the impact (in numbers) that the channel has up to today: 38 videos have been uploaded, that sum up a total of 216 (at September 24th, 2021) views, for 52,7h watched and 39 permanent subscribers to our content.
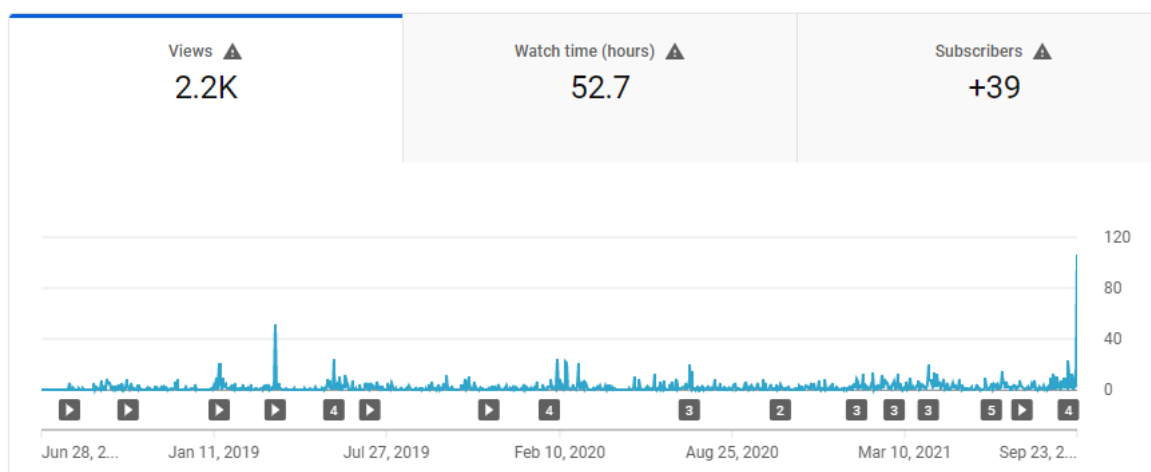
Figure 20. YouTube simple stats

3.1.3. Social networks

Table 3. Social networks report

PIXEL Social Media Channels	
Twitter	Tweets: **728** Following: **470** Followers: **437**
YouTube channel	Videos: **38** Views: **2047**
LinkedIn	Network: **139** Visitors to the PIXEL Company Page: **567** Updates (reactions) to the PIXEL Company Page**:** **1321**

Strategy and recommendations described in deliverable D9.4 have been followed during all M19-M41 period.

3.1.3.2 Twitter

Twitter is the social network that has been more extensively used by PIXEL to communicate with global external audience. This has been the channel through which task T9.1 partners have posted the advances of the project, have reacted to other entities' movements, have published news and events, and, in general, have made use of, in order to let the people know PIXEL.

For feeding Twitter, we have all recommendations, timetables and tips exposed in deliverable D9.4 (see previous sections) plus including multimedia content (diagrams, images, figures, news) that are internally validated by the T9.1 leader and the Innovation Manager of the project.

A summary of the Twitter statistics that have been achieved (every 2 months) during the period M19-M41 is the following:

	M19&M20	M21&M22	M23&M24	M25&M26	M27&M28	M29&M30	M31&M32	M33&M34	M35&M36	M37&M38	M39&M40	M41
Tweets	15	16	7	17	19	19	22	27	27	28	12	3
Impressions	20k	20k	12k	16k	10k	10k	12k	16k	16k	13k	12k	3k
Visits	178	118	69	154	107	121	458	1076	2372	1114	1100	499
New followers	13	9	14	27	9	16	18	39	36	19	24	15

3.1.3.3 LinkedIn

For feeding LinkedIn, the team of T9.1 has been following all recommendations, timetables and tips exposed in the document D9.4 plus including multimedia content (diagrams, images, figures, news) that are internally validated by the T9.1 leader and the Innovation Manager of the project.

A summary of the **LinkedIn Company Page** statistics that have been achieved (each 2 months) during the period M28-M41, can be seen in Figure 21 and Figure 22.
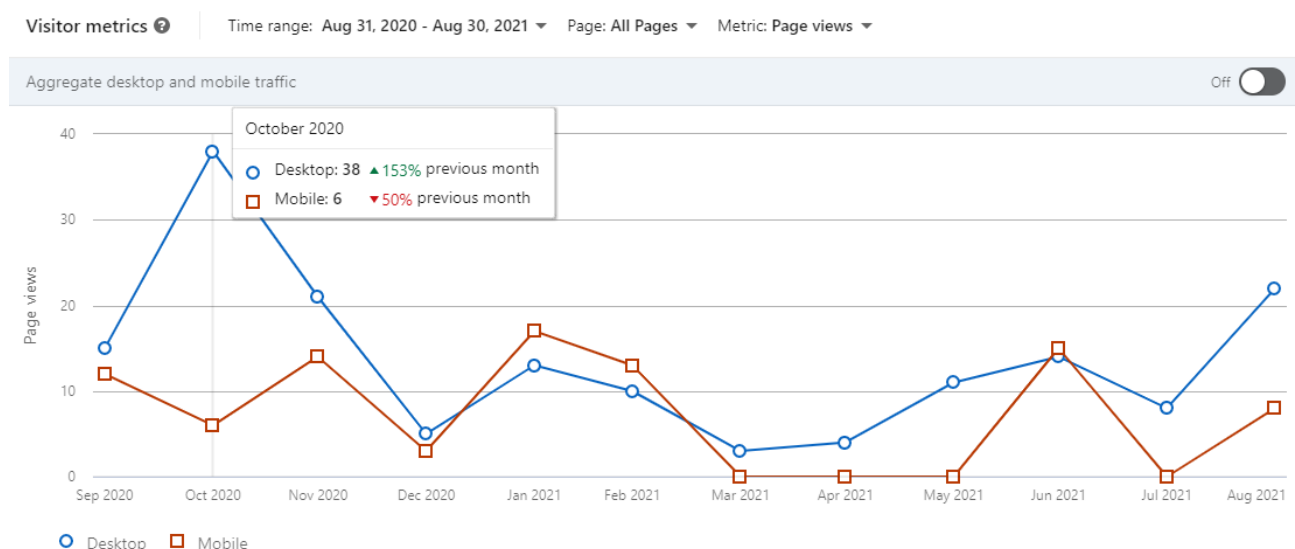
Figure 21. Analytics LinkedIn - # of visitors

In addition, in the graphs below some relevant aspects can be observed about the profile of the visitors to the LinkedIn page of the "company" PIXEL PORTS during the last year (Sept 2020 – Sept 2021) of the project:
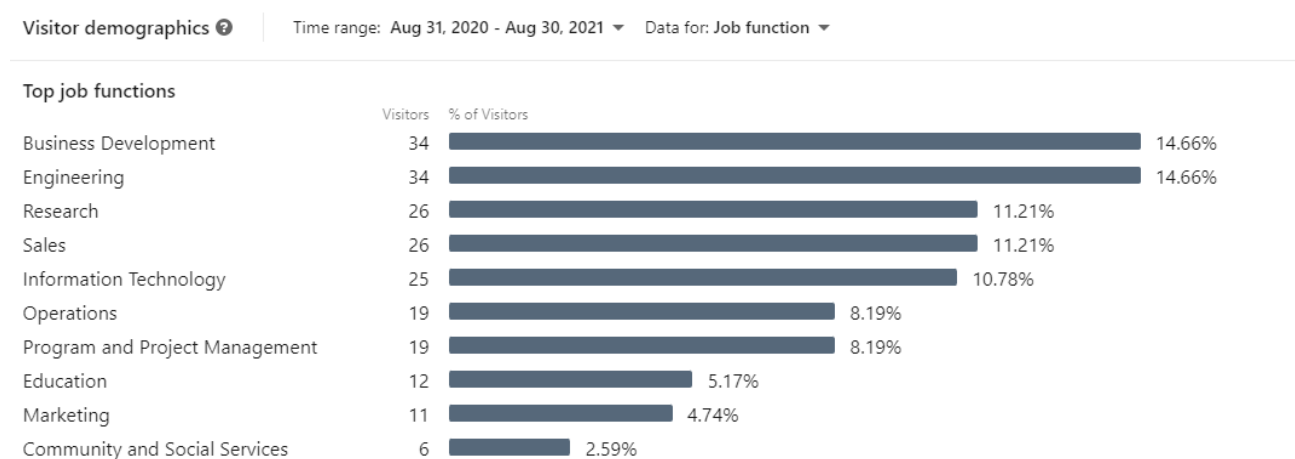
Figure 22. Analytics LinkedIn – visitors job function

First, the job function of LinkedIn visitors (ordered) helps understand which are the profiles that have been more attracted to PIXEL messages and opportunities. Observing the distribution, it is clear that people in areas of management and business development are interested in PIXEL the most. This makes sense, considering the clear innovative approach that the project brings that may be used by Innovation departments to nurture new business lines or enhance the current ones on their companies. Immediately after, Engineering people are interested on PIXEL due its eminently technological nature, proposing an IoT architecture applied to a real set of stakeholders. Finally, researchers (e.g., other EC-funded projects) are also interested in PIXEL posts.
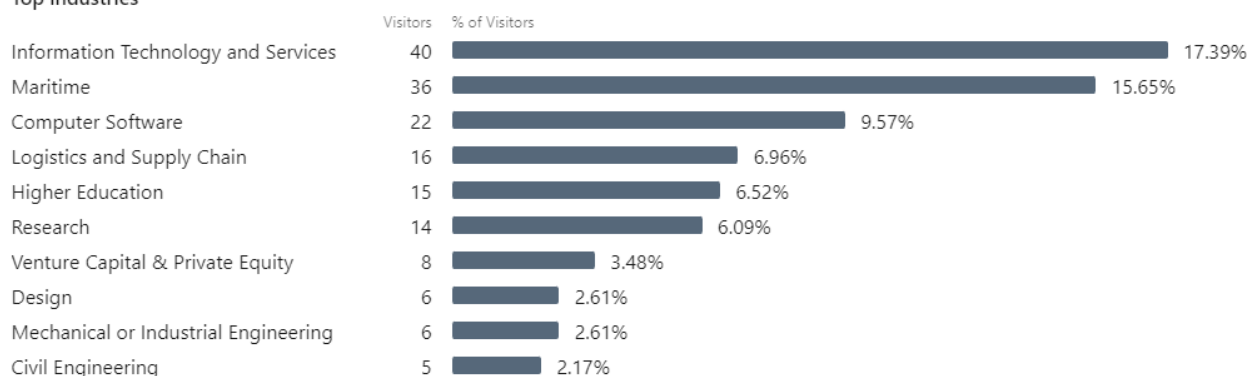
Figure 23. Analytics LinkedIn – visitors Industries

Second, the Industry ordering (# of visitors) allows to interpret which have been the markets that have been more reached via this communication channel. The two most relevant industries are Information Technology and Services and Maritime sector. It is appreciable that these two are the main pillars of PIXEL work (altogether with logistics, that ranks #4), therefore it can be confirmed that the messages have been properly designed to address the target audience.

Finally, the next image shows the evolution of PIXEL followers in LinkedIn during the last 12 months of the project:

Figure 24. Analytics LinkedIn – # of followers

3.1.4. Webinars

As announced in previous sections (and previous management deliverables), in order to soothe the cancellation of many events that PIXEL was planning to actively participate (presenting advances), a series of webinars was planned.

A special task force was created to organise, design, prepare, distribute, chair and record the webinars to ensure a full coverage of the process. This task force was composed by PEOPLE (taking over a prominent organiser role), UPV (as main supporter, infrastructure provider and WP leader guidance) and XLAB (Innovation Manager to validate the content and audience).

The proposed structure was to organise a total of 5 webinars to cover the main areas of PIXEL solutions. Balanced distribution in time was considered, realising that this action was started on September 2020. It was also decided to bring external speakers to relate their experiences/perspective related to PIXEL. The webinar series was structured as follows:

- Webinars with **Industrial orientation:**
  - 1) PIXEL presentation
  - 5) PIXEL solution as a whole, KPIs and results -> Finally embedded within the Closure Event
- Webinars with **Scientific orientation**:
  - 2) Technical explanation of user stories, models and algorithms
  - 3) PEI explanation webinar
  - 4) Live webinar explaining WP6 technical modules

And the agreed timeline was the following:

1)

Topic	PIXEL presentation
Date	January, 13th, 2021
Speakers	UPV PRO
Moderator	PEOPLE

2)

Topic	User stories
Date	February, 12th, 2021
Speakers	CATIE INSIEL XLAB
Moderator	PEOPLE

3)

Topic	PEI
Date	June, 10th, 2021
Speakers	MEDRI CERTH
Moderator	PEOPLE

4)

Topic	Technical modules
Date	June, 17th, 2021
Speakers	ORANGE PRO DataPorts project
Moderator	PEOPLE

5)

Topic	PIXEL Closure Event
Date	Sept., 28th, 2021
Speakers	UPV CERTH XLAB
Moderator	PEOPLE

Figure 25. Webinars planning

For preparing each of those, some tables containing relevant information were used. First, a descriptive table was created relating the main topic of the webinar, what value it brings to the attendants, targeted audience and the goal of that webinar (in Table 4 an example is provided – there are 5 of them in total).

Table 4. Webinar case description template

Webinar case for Webinar no. 1	
What the seminar will be about	The Webinar will be a general presentation of the PIXEL: i. What is the need, ii. Who are the partners, iii. How we plan to address the need, iv. Description of the solution, v. What is the impact we plan to have.

What value the webinar brings to whoever will be attending the seminar.	It will inform the industry about a new product and the potential it has.
Audience targeted	i. Port executives, ii. Port environmental managers, iii. Regional government environmental managers., iv. Specialized journalists
What we want to achieve	i. We want to inform the industry about the new product, ii. We want to get some feedback on the needs in case we have missed any (and if not be able to incorporate in PIXEL, we might take into account for PIXEL 2.0).

In addition a clear preparation-communication steps were set for each webinar of the series. Diverse partners were in charge of taking over tasks. One example is found in Figure 26a On another note, realizing that webinars are used to host virtual events and broadcast them to view-only attendees, several options for the "live session" (in terms of tools to be used) were analysed. Whereas YouTube stream was initially considered, the final decision should come from two options: Zoom or Ms Teams (see Figure 26b). MS Teams was selected due to various reasons, the most prominent being the fact that the Project Coordinator (UPV) holds an enterprise tenant of O365 and it was straightforward to manage the webinar that way.

Action	Date
Presentation	13.01.21
Rehearsal	11.01.21
Slides	07.01.21
Speech draft	07.01.21
Q&As	07.01.21
Personalized e-mails	05.01.20
General e-mails	20.12.20
Populate on site	20.12.20
Brochure	20.12.20
Topics	20.12.20

Figure 26. (a) actions distribution; (b) webinar tools to select

Some screenshots are attached below corresponding to the first 4 webinars. 5th will be conducted after the internal review of this deliverable (September 28th):
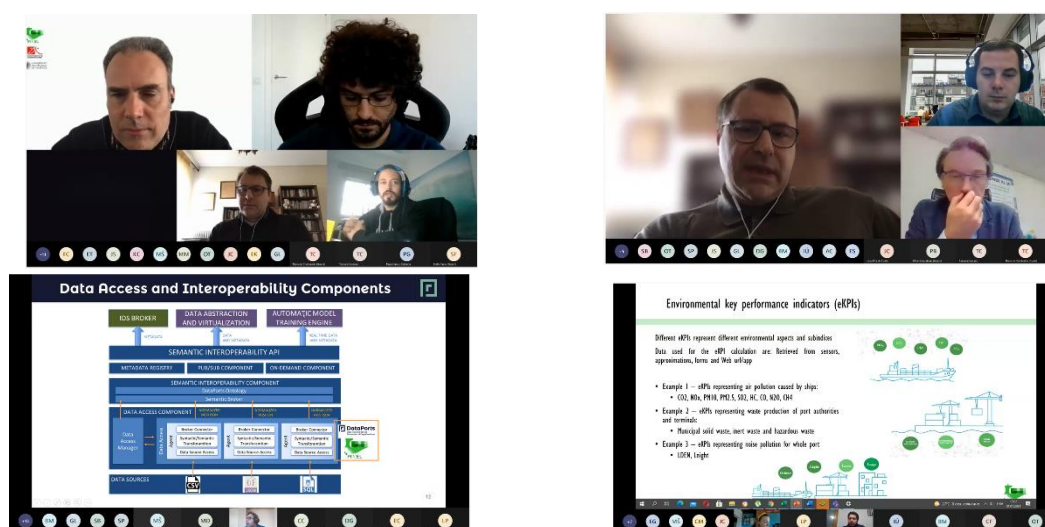
Figure 27. Webinars of PIXEL

3.1.5. Supporting material

Unfortunately, the second half of the project execution was clearly influenced by the pandemic outbreak, with various consequences at many different levels. One of those was the unavailability to attend face-to-face events, were the need of supporting communication material becomes evident.

For this period, PIXEL had planned the creation of Posters, caps, mugs or other material in case of holding physical showcases and workshops. In addition, special presentation material such as cover folders, etc. were also expected to be provided. As the previous was not necessary, the creation of supporting material followed a different direction.

1. First, the generation of visual material associated to PIXEL events was increased. Every time that a (virtual) meeting of the project was about to be held, a webinar was announced or a newsletter was to be issued, a poster and a social network banner were created so that partners could share it among their network. Special mention here must be given to the poster for the Final Closure Event of PIXEL (second row of images in Figure 28), that was hugely distributed through every digital channel of the project during the last weeks of the action. Some samples are provided below.

Figure 28. Some posters created for PIXEL events

2. Following the big amount of work exerted within T9.4, one of the materials generated was a renewed presentation template. This was created with the intention to elaborate a final, refined image of PIXEL towards the last round of actions: virtual congress presentations, meetings with external entities (such as AIVP, other ports, ESPO, etc.) and to produce the Key Exploitable Results summary pitch. Below can be found some slides that are part of the presentation template.

Figure 29. Some slides of renewed PIXEL presentation template

3.1.6. Communication KPIs evaluation M1-M41

Table 5. Communication KPI's evaluation

Diffusion channel	Time / update	Final expected number	Current number and evaluation
Website	Updated every month	Number of accesses to the website Total of 2.000	Current: 70.641 (22.189 single visitors) This KPI has been met and surpassed.
Social networks	Twitter	1 Tweet per week / 1 FB post per month. 400 total followers. 500 total tweets	437 followers; 728 tweets This KPI has been met and surpassed.
	YouTube	**25 videos**. 2000 views.	38 videos; 2047 views This KPI has been met and surpassed
	ResearchGate	20 presentations. 2000 views	ResearchGate already evaluated in section 3.1.3
	LinkedIn	Profile Views: (updates of PIXEL Company Page) 1000 Network: +500	Network: 91 contacts + 48 followers = 139, Updates: 1321 Network number is far to meet the objective, that was very inflated.
	Facebook	Views: 3000 Mentions: 100	Facebook is no longer a PIXEL channel (see D9.4).
Digital newsletters	Every 6 months	Number of subscribers: 50	Current number: 58 This KPI has been met and surpassed.
Project reports	As soon as deliverables are available	Visits to "Deliverables" page Average of 20 per deliverable Total expected of: .760	Current value: 1.535. This KPI has been met and surpassed.
Web Portal	As soon as new developments and results are available	Number of news: 6 total news in the project	More than 10 events are included. 2 entries of news, Creation of Products page with 4 KER PIXEL products This KPI has been met
Media communication	Entire project duration	Number of expected press releases 15	A total of 8 press releases were made. This KPI was not met, although the Consortium considers the quality of the publications (on WPSP webpage, AIVP webpage, etc.) more relevant than the quantitative number.

3.2. Report on Scientific Dissemination activities

3.2.1. Publications

3.2.1.1. Scientific publications

The PIXEL Consortium has been committed to publishing the results of its findings in peer-reviewed journals as well as top-notch scientific and technical conferences in the field. To that end, Q1 scientific journals (the top 25% journals in the field) are targeted, with occasional publications in Q2 journals (the top 50%).

The idea has been to adhere to those commitments, and the occasions where papers have been presented to scientific journals that was the case. However, it is worth to mention that during M1-M41 (all the project duration), the actual focus has been producing excellent scientific results and communicate them to the community, via diverse fora. The events and congresses that our papers have been addressed, are heterogeneous and at this moment of the project, priority has been given to the most fit target audiences, in order to select the recipients of our work. Therefore, the most predominant scientific publication channel has been congresses and conferences (generating proceedings) rather than journals.

This is also related to the level of practical application of the solutions developed by PIXEL. Having focused (especially in the second half of the project) on pilot deployments (even creating a new pilot related to COVID-19 in ports) rather than on "basic science".

Table 6. Global statistics – articles publication

	Presented	Accepted	Success rate	Published	IoT/ICT (presented)	Environment (presented)	Logistics (presented)	Global (presented)
With congress	19	15	78.94%	11 (4 pending)	5	6	5	6
No congress	4	4	100%	4				

Total PIXEL papers accepted (and presented) in conferences, therefore published in proceedings: **15**

Total PIXEL papers published in Q1/Q2 journals: **4**

In general, PIXEL Consortium considers all the previous a sound success.

In the table of the next page, (Table 7) the results obtained with regards to article publication in period M19-M41 have been summarised, while the table preceding (Table 8) provides a summary of the status of all PIXEL publications (total figures).

For tracking and planning scientific publications (equal than for other dissemination activities) an Excel sheet-based tool has been used, in which all the information associated to each initiative we tackle, is gathered (call for papers we address to).

Table 7. Publications PIXEL M19-M41

Title	Authors	Lead partner	Conference / Journal	Event dates	Deadline subm.	Status	Publication_Date
A novel approach for assessing the port's environmental impacts in real time - the IoT based Port Environmental Index	MatijaŠiroka, StjepanPiličić, TeodoraMilošević, IgnacioLacalle, LukaTraven	MEDRI	Ecological Indicators (Elsevier)	-	4th June 2020	Published	19th September 2020
Framework and methodology for establishing Port-City policies based on real-time composite indicators and IoT: a practical use-case	Ignacio Lacalle, Andreu Belsa, Rafael Vaño and Carlos E. Palau	UPV	MDPI "Sensors" Special Issue "IoT-enabled Smart Cities"	-	2nd July 2020	Published	24th July 2020
Iot based real-time assessment of atmospheric emission from ports: a case study of the passenger terminal in the Port of Piraeus, Greece	MEDRI, UPV, XLAB	MEDRI	Atmospheric Environment	-	Open	Submitted	-
Influence of meteorological conditions on noise dispersion in the Port of Thessaloniki	Stjepan Piličić 3 , Igor Kegalj 3 , Eirini Tserga 4 , Teodora Milošević 3 , Roberto Žigulić 1 , Ante Skoblar 1 , and Luka Traven 2	MEDRI	De Gruyter (open access)	-	Open	Published	12th August 2020
Machine Learning based System for Vessel Turnaround Time Prediction	Dejan Stepec, Tomaz Martincic, Fabrice Klein, Daniel Vladusic, Joao Pita Costa	XLAB	2nd Maritime Big Data Workshop as part of the 21st IEEE International Conference on Mobile Data Managment	Presented in the virtual event 1st July 2020	1st July 2020	Published	7th August 2020
Leveraging IoT and prediction techniques to monitor COVID-19 restrictions in port terminals	Rafa Vaño, Ignacio Lacalle, Benjamín Molina, Carlos E. Palau	UPV	IEEE WFIoT	28 June 2021	15-feb-21	**Paper presented - publication pending**	
Monitoring the environmental impact of TEN-T ports operations – current status and commonly used performance indicators	Georgia Aifadopoulou , Orestis Tsolakis1, Matija Široka , Teodora Milošević2 and Annie Kortsari	CERTH/MEDRI	ICTR 2021	2/3 Sept 2021	30th April	**Paper presented - publication pending**	
The Advantage Of A Green And Smart Port Of The Future	Joao Pita Costa1, Ignacio Lacalle2, Miguel Angel Carmona3, Leonidas Ptsikas4, Gilda De Marco5, Charles Garnier6, Alex Gherghina7, Olivier Le Brun8, Orestis Tsolakis9	ALL	UMT 2021	16/18 June 2021	16th March	Published	6th September 2021

Port Digitalization through an Activities Scenario Model as a First Step for a Digital Twin of Port	Charles Garnier1, Erwan Simon1, Joao Pita Costa2, Leonidas, Ptsikas3, Ignacio Lacalle4, Carlos E. Palau4	CATIE	IPIC 2021	14/16 June 2021	18th May	**Paper presented - publication pending**	
Functioning prototype of IoT and composite indicators for smart port environmental monitoring	Ignacio Lacalle, Rafael Vaño, Carlos E. Palau, Teodora Milosevic, Stjepan Pilicic, Matija Siroka, Eirini Tserga	UPV, MEDRI, THPA	MEDITCOM 2021	10 Septeber 2021	21 April	**Paper presented - publication pending**	
Scale-model showcase to monitor environmental impact in ports using IoT and low-resource equipment	Ignacio Lacalle, Rafael Vaño, Carlos E. Palau	UPV	MEDITCOM 2021	10 September 2021	21 April	Rejected	

Details on those publications (as well as links to downloadable files) can be found on this page within the PIXEL website: https://pixel-ports.eu/?page_id=564

As indicated in the Data Management Plan (last version – final- in D2.4), all publications in PIXEL are published in a green open access fashion. Therefore, either the editor version or a pre-print version are available for downloading.

3.2.2. Other scientific dissemination actions

Whereas the main action regarding Scientific Dissemination consists of attempts to publish articles in relevant journal and event proceedings, these are not the only initiatives that have been tackled in T9.2 in the period M19-M41. According to the Dissemination/Communication plan, several other works have been covered by PIXEL, to ensure a proper scientific dissemination, generating visibility and engagement and contributing to the community, following the project's open publication mentality. As a quick summary, the following have been listed:

Other Diverse actions:

- **Press releases**: Several press releases have been made so far related to PIXEL objectives and advances. These initiatives are considered Scientific Dissemination, as they are embedded into technical magazines or websites and the majority of the audience has a scientific background and motivation. This type of dissemination is very interesting for PIXEL considering that, inserting our content in a piece of news, can reach a higher number of readers than, for example, on-purpose visitors to our website. Furthermore, having presence in relevant media, confers more sense of pervasiveness to the project:
    - CATIE was interviewed by the magazine "L'Europe en Nouvelle Aquitaine", where the partner explained PIXEL benefits and traits towards the digitisation of ports and their quest towards innovation (link).
    - Mention by Project Coordinator in the main page of the Universitat Poltècnica de Valencia narrating new innovative port projects (link).
    - PIXEL was included in an official article/press release in the website of WPSP. In particular, in their list of recommended projects striving towards sustainability in maritime ports (link).
    - An article about PIXEL's use case in the Friuli-Venezia-Giulia region was published in a local newspaper, promoted by SDAG and INSIEL partners (link).
    - PIXEL was included as a contributor to the "Fighting Climate Change with FIWARE" thanks to the application by ORANGE (link).
    - AIVP published a press article about how PIXEL may help to achieve sustainable port cities, aligned with their Agenda 2030 (link). In addition, PIXEL joint AIVP as a partner.
    - PIXEL was mentioned as one of the projects that is collaborating with the RIA DataPorts via a press article published on the official website of that project (link).
    - PIXEL appeared as one of the recommended, EC-funded projects in the latest European Commission Report about Blue Economy, in particular in the category of Green Ports (link).
    - The works on using AIS data to estimate vessel arrival, departure, position, etc. that have been done in PIXEL were reflected in XLAB's (PIXEL partner) official blog in their entry: "Is there such thing as too much data?" (link).

Education

- **Lectures at university and at official government sites**: One of the impacts that PIXEL can show about Scientific outreach is to engage young researchers and students to pursue an academic career
    - PIXEL visited and disseminated its advances (and distributed supporting material) physically to the Department of Sustainable Development and Protection of Soil, Air and Sea of the Republic of Croatia (link).
    - One student from partner XLAB presented his Master Thesis about Vessel Turnaround Time Prediction of PIXEL (link) at the University of Ljubljana.
    - MEDRI's young researcher PhD student, Stjepan Piličić presented PIXEL project on April 8th, 2021 at Faculty of Medicine, University of Rijeka. Participants followed the presentations online.

> o Prof Carlos Palau recorded a presentation of the project that has been published and forwarded through internal channels in the faculty of Universitat Politècnica de València.

Figure 30. PIXEL at Education facilities

- **PhDs started**: Another important KPI to measure PIXEL Scientific Dissemination success is PhDs program being kick-started and tackled by new students about the technical aspects of the project (more about KPIs in the next chapter). In the period M19-M41, 2 new PhD programs have started by people working directly in the project. One of them is related to the environmental technical part of the project and another one related to the architectural and IoT part of PIXEL (about computing of PIXEL agents at the edge of the network and the potential applications of the advances of the project on other fields).

Open source contributions:

To address environmental issues towards enhancing a global, community-wide knowledge, it has been important for PIXEL to rely on Open Source solutions. It allows to reduce the cost of the production of the project with the reuse of available solution, but also to contribute reducing the cost of future projects providing them some part of the code produced for PIXEL development. The use and contribution to open source is also a way to share knowledge and experience to address the topic that PIXEL has been working on.

These are the diverse approaches that PIXEL has tackled vís-a-vis open source:

- o Using open source solutions: The idea is to identify existing open source solutions that could be reused to address our needs. Usually it concerned tools that we can rely on in order to build our own solution. This has been WIDELY adopted by PIXEL, that has hugely relied on already-existing open source solutions to build its architecture, models and agents upon.
- o Sharing solutions: Publishing part of the results as Open Source in order to allow other people to reuse it for their own needs.
- o Contributing to open source initiatives: This has been clearly the most difficult path to assess and perform, as Open Source initiatives have their own governance and objectives. It is not easy for a European research project to actually find the perfect initiative that could be interested by a part of their work and that to develop a community that will continue to support the solution after the end of the project. However, some work has been carried out by PIXEL partners during the period M19-M41 that is reflected in the following paragraphs.

Using Open Source solutions

To create the PIXEL platform, we have decided to mainly rely on Open Source solutions in order not to "re-invent the wheel" in the project. The objective of the PIXEL platform is to provide a solution reusable and interoperable to collect and compute data using algorithms that could be shared between heterogenous actors.

The architecture of the PIXEL platform as described in D6.1 relies mostly on Open Source:

- o Data Acquisition Layer is based on FIWARE architecture and components using the FIWARE Context Broker as the core part of this layer.
- o Information Hub is based on a solution developed by XLAB for another project: FAIR (Facility for Antiproton and Ion Research). The solution itself rely on Open Source technology like Elasticsearch, Kafka, Zookeeper in order to provide a reusable Data Lake facility.
- o Security Layer completely relies on FIWARE components (Wilma, KeyRock) to provide the security features we need to address the project
- o Operational Tools and Dashboard are specific to the PIXEL project but relies on Open Source framework and engine for their developments like VueJS
- o Data Model used on the PIXEL project are based on the FIWARE Smart Data Model definition in order to share the experience of the community to represent the data.

Sharing solutions:

PIXEL is a Consortium of 15 partners that share the IP of the different elements produced during the project. To decide which elements of the project could be shared with the community, an analysis was conducted on WP9 to elaborate a table of Key Exploitable Results, the IP associated and the PIXEL Partner that owned it, and if they wished to propose it as Open Source. The main results of those analysis are presented in D9.6, D9.7 and D9.8.

Those different elements could be regrouped on different main categories and are exposed on the PIXEL project GitHub repository.

- o The Platform: the different software components created for the PIXEL project, and the integration of existing open source resources used to build and enable the platform. This is the core of the PIXEL project.
- o The Data Models: The data structure used to represent the data in a PIXEL standard way. Those Data Model could be a fork of existing FIWARE models or models created by FIWARE. All those data models represent the PIXEL Data Model. All the models and algorithms rely on those data format to access the data.
- o NGSI Agents: The peace of software dedicated to import a particular data source in the PIXEL platform using FIWARE NGSI API and PIXEL Data Models. Some agents are dedicated to private data source and there are no needs to share them with the community.
- o Models and Algorithms: The different models and predictive algorithms used to compute the data imported in the PIXEL Platform to produce KPI like the PEI. This is the scientific contribution of the PIXEL project to the environmental topic.

Contributing to open source initiatives

Contributing to open sources initiatives is actually not an easy task for EC-funded actions. First, the most indicated initiative/standardization group must be found. Afterwards, project partners must decide which part of the project might be subject of contribution. Finally, a process (that are usually not straightforward) might be initiated. For doing so, the procedure entails negotiating with external entities the adoption of PIXEL contribution and packaging it to fit the requirements of the initiative. Most of the time it is also a requirement to guarantee that PIXEL will ensure the support of its contribution, which is not easy nor simple on a time limited project. A solution to that answer has been provided now by PIXEL via the foundation of the Association, but still a long way is still in front of the Association to be able to guarantee such support.

During the duration of the project, the following actions have been achieved:

- Obtain a letter of intent from the **FIWARE Foundation** that a reduced set of PIXEL Data Models will be considered to be incorporated within the corpus of FIWARE Data Models as long as they will be compatible with the NGSI-LD specification (currently they are not as we have not used that specification in PIXEL).
- PIXEL has become a member of AIVP, and is in continuous contact to analyse further contribution to the port-cities network from the PIXEL Association (aligned with their Agenda 2030).

- PIXEL has become an official member of ALICE-ETP, which is holding a number of innovative initiatives in the sector such as the Physical Internet (among others).

Beyond the previous, one thing has been made clear by PIXEL WP9 partners: we have identified what we wanted to share with the community and have published it in our GitHub repository

In addition, PIXEL partners have identified a list of initiative that could be interest by our contribution. Some of those contribution could be ported directly by partners to ensure the adoption in an appropriate initiative. For the other one, it will be to the charge of the structure that will continue PIXEL Association to manage the candidatures.

Table 8. Open source initiatives -future contribution

Initiative	PIXEL Module	Description	Status
ORANGE	PyNGSI	Orange has decided to include the PyNGSI Framework to its OpenSource initiative and to continue to support it with an evolution to NGSI-LD. The Framework will be proposed to the FIWARE community	Publish on Orange open source repository
FIWARE	DataModel	The data models developed for PIXEL derived from the FIWARE data models are compatible with NGSIv2. The main issue is that now FIWARE are migrating to NGSI-LD that offer a new approach to represent Data Model. Our partner Orange (Marc Despland) is a member of the FIWARE Technical Steering Committee in the chapter SmartDataModel. It is planned to rewrite the VesselCall DataModel (among others) to match NGSI-LD standard.	Will be initiate by ORANGE for VesselCall – should be manage by the Foundation for the other model after migration to NGSI-LD
FIWARE	DAL Orchestrator	The DAL Orchestrator is to specifics to PIXEL to be proposed as a Generic Enabler and the PIXEL Project can't fulfil the FIWARE Requirement to publish it as a GE	Should be managed by the PIXEL Association
FIWARE	NGSI Agents	For all NGSI Agents we can initiate discussion with the data source owner to propose the transfers of the NGSI Agent. But as our agents are only compatible with NGSIv2 that start to become obsolete the contribution is less interesting. With the migration of PyNGSI to NGSI-LD and the evolution of the DataModel it will be easier.	Should be managed by the PIXEL Association after migration to NGSI-LD
AI4EU	Road traffic predictions module	The module is well packaged and could work without the PIXEL platform	Not yet proposed, should be manage by the PIXEL Association – led by partners UPV, XLAB
PIXEL Association	Port Environmental Index	The Port Environmental Index it the key module that should be distributed by the PIXEL Foundation	Need the PIXEL Association
PIXEL Association	PIXEL Platform	The PIXEL Platform is composed of a set of open source elements. It is a generic platform to manage the port environmental index computation.	Need the PIXEL Association.

3.2.3. Scientific Dissemination KPIs evaluation M19-M41

Following the instructions depicted in the deliverable D9.4, the table below reflects the results of the evaluation of the Scientific Dissemination status, at the first half of the project. As it has been indicated, this evaluation is performed every 4 months, but for the sake of simplicity in this report, they have all been condensed in a single table, that intends to inform about the global evolution during M19-M41

Table 9. Scientific dissemination activities KPI M1-M41

Dissemination activity	Key Performance Indicator (KPI)	Target value (Total)*	31-oct-19			30-sep-21		
			Current value	% of accomp.	Evaluation	Current value	% of accomp.	Evaluation
Scientific papers publication	Number of submitted papers	10	11	110%	3	23	230%	3
	Number of papers published in international referenced journal	5	1	40%	2	4	300%	3
	Number of papers publshed in international conferences		1			11		3
	Number of PIXEL different authors contributing to scientific papers	10	12	120%	3	18	180%	3
	Average number of different partners authoring each paper	2	1,67	83,5%	2	2,67	133,5%	3
Scientific Social Media	Number of followers in ResearchGate	30	7	23,33%	-	22	73,33%	1
	Number of reads in ResearchGate	150	(RG count) 89	59,33%	2	(RG count) 1580	1580,00%	3
Scientific Dissemination events	Number of participated scientific events	6	4	66,67%	2	8	1053,33%	3
	Number of posters at scientific events	2	0	0%	0	2 (WFIoT, MEDITCOM)	100%	2
Organization of scientific actions	Organization of webinars	3	0	0%	0	5	200%	3
	Organization of technical workshops for external audience at University		0			1		
	Average number of participants to each organised event	20	0	50%	0	26,2	131%	2
Open source contribution	Number of projects outcomes available as open source	>5 single components	0	0%	1 N/A	12 repositories in GitHub	240%	3
	Number of contributions to open source initiatives	>3	0	0%	1 N/A	5 (pyngsi, datamodels)	167%	3
Others	Number of PHD (presented or ongoing work) o TFG related with the project	5	4	80%	2	6	120%	2
	Number of new R&D Projects requested following PIXEL work	1	0	0%	1 N/A	2	200%	3
	Collaboration with other R&D projects	4	2	50%	2	4	100%	2

3.3. Report on Industrial Dissemination

The General objective is extracted from the Grant Agreement: "to organize in a coherent way the activities leading to maximize impact for the overall project. The main objective for each partner is to have a structured, complete and achievable business model strategy and a proper communication of results".

The specific objectives are:

- *"To exhibit PIXEL prototypes in primarily industrial events.*
- *"To transfer PIXEL results to operations and product development departments."*

Industrially, this dissemination will be accompanied with presence in international port and maritime solutions fairs ... , going together and being upheld by these pilot host ports involved in the project, promoting and exhibiting PIXEL advances and benefits."

Following the GA and the Dissemination Plan in deliverable D9.3, the target groups (table below) that have been taken into account to prioritize Industrial Dissemination have been:

Table 10. The target groups. The Port / Industrial sector and others

Primary - Customers in the port industry sector
The Port authorities of:
• The PIXEL partner's ports: Thessaloniki Port Authority (TPH), Piraeus Port Authority (PPA), Grand Port Maritime de Bordeaux (GPMB), and Azienda Speciale per il Porto di Monfalcone (ASPM, now APT).

• The Small and Medium sea Ports (SMP) and inland Ports of the three ports participating countries: Italy, Greece, Spain, France and oversea territories.
The stakeholders in the port area of the PIXEL ports: • The terminal / port operators (car, cruise, container, passenger, bulk). • The shipping agency / company, association, research centre and industry.
The stakeholders of the Small and Medium sea Ports (SMP) and inland Ports of the three ports participating countries: • The stakeholder activities related for landing / storage / transportation: containers, liquid bulk, dry bulk, energy industry, bio-industry, petrochemical (LNG, biofuel, oil, chemistry), off-shore, cruise…
Secondary - Intermediate actors, e.g. industry and port associations
The European and worldwide Port associations: l'Union des Ports de France (UPF), - The British Ports Association (BPA), The European Sea Ports Organisation (ESPO),…
The European industry / company associations (logistics, transport, manufacturers, environment)
The European ships associations
The others than ports (airports, generic multimodal terminals and transportation, coastal cities)

3.3.1. Update on Industrial Dissemination plan

Since March 2020 and the beginning of the health crisis due to COVID 19 and until now, access and travel restrictions in European states and countries of the other continents in order to contain the spread of the virus, have resulted in the cancellation and the postponement of events and symposiums for the industry sector. Many of the industrial events (workshop / seminar, conference, Trade fair / exhibition, case study site) we had initially planned (referring to the GA) to attend and present our work and development could not take place and we had to modify our initial dissemination strategy by:

- Participating in other industrial events than the ones we initially planned (GA).
- Presenting PIXEL work by adapting most of the time to an online format.
- Adapting PIXEL presentation to the audience and the purpose of the conference (technical and/or commercial aspects).

A follow-up and an update of the confirmation or postponement of the industrial events have been carried out throughout this health crisis (cf. Table 17).

3.3.2. Participation at events M19-M41

In the next pages we are describing the Dissemination events attended by the PIXEL Consortium in the whole second half period of the project (M19-M41).

For tracking and planning events attendance we have been using the same Excel sheet-based tool already described in the Deliverable 9.4 in which we are gathering all the information associated to each initiative we tackle.

The structure of the tool is the following:

- We created some columns to represent information of the paper proposal: date, event, place, concept.
- We created some columns to identify the type of event: scientific/industrial, IoT/environment/logistics.
- We created some columns to indicate PIXEL's role: participants, leader, presentation/participation.

All this structure is accompanied with a legend of colours to represent the status of each event. This is related to the two initial columns. These two represent: initial status (if it was tracked/came without having it planned) and final status (if the event was finally attended or not). This helped the WP9 team to analyse, at the end of the project, the level of commitment with the original plan (GA) and it also allowed to react and change the planning accordingly during (adapting to the health situation [COVID-19] since March 2020 and still in progress) the project execution.

The colour code used in the following tables is:

	Already attended.
	Originally to be attended – not attended
	Detected interesting event - Not identified in GA nor in D9.3 -
	Detected event in D9.3 - Dissemination plan - Not identified in GA - Come up during project execution – but finally not attended

Also, in red color, in the column "date" are the changes in the date of industrial events

Table 11. List of industrial events tracking M19-M41

Date	Event	Place	Concept	Involved partners
11/14-November-2019	ICHCA International 20/20 Cargo Vision Conf & Exh	Malta	Transport and Logistic Event	PRO
4/6-November 2019	Smart digital ports of the future - End-to-End Digitalization Integration	Roterdam	IoT - Technical Event	No participation due to Plenary meeting
8/10 November-2019	TF-SEA-Europe — Advances in European SEA Practice	London, UK	Environment	
15/16 November 2019	8th Conference on Marine Technology	Rijeka (Croatia)	PEI - Environment - Technical Event	MEDRI
28 November 2019	39th Scientific Symposium: Recent scientific achievements of the Teaching institute of public health	Rijeka (Croatia)	PEI - Environment - Technical Event	MEDRI
4/6-February-2020	EUROMARITIME Blue Growth Exhibition	Marseille (France)	PEI - Environment - Technical Event	CREOCEAN
3/4-March-2020	Ports 4.0	Riga, Latvia	Port transport Industry Event	CERTH
~~18/19 March 2020~~ **23/24 September**	IoT World	Paris	IoT - Technical Event	CATIE, ASPM, ORANGE
~~29 April 2020~~ **10-November-2020**	Port Development Conference	London (UK)		
~~13/15 May 2020~~ **Event cancelled**	TEN-T days	Sibenik (Croatia)	Transport and Logistic Event	CATIE, PPA, THPA, GPMB, MEDRI
30 June 2020	21st IEEE International Conference on Mobile Data Management (online)	**Virtual**	IoT – Technical Event	XLAB
23 July 2020	FIWARE Green Economy Day	**Virtual**	PEI - Environment - Technical Event	ORANGE
~~12/13 May 2020~~ **3/4-September-2020**	The IoT showroom SIDO	Lyon (FR)	IoT - Technical Event	CATIE, ASPM
2/4 September 2020	Virtual MariMatch event	**Virtual**	Transport and Logistic Event-	CATIE, XLAB, UPV
15 September 2020	OR62 Operational Research Conference	**Virtual**	Transport and Logistic Event-	CATIE
~~28/29 May 2020~~ **3-16-February-2021**	ESPO Conference 2020	Marseille (France)	Port transport Industry Event	CERTH, THPA, PPA
~~1/5 June 2020~~ **Postponed to 2021**	IoT Week 2020 - cancelled	Dublin (Ireland)	IoT - Technical Event	INSIEL, PRO, UPV
~~22/25 Sept 2020~~ ~~27/30-April-2021~~ **22/23 -Sept-2022**	INNOTRANS	Berlin	Transport and Logistic Event	SDAG, INSIEL, XLAB
2/4-Sept-2020	MariMatch 2020	Virtual	Transport and Logistic Event	XLAB
25/26-November-2020	NAFEMS 20 France Conference	Paris (France)	PEI - Environment - Technical Event	ASPM, XLAB
23/24 March 2021	Le Salon de la Recherche	**Virtual**	IoT - Technical Event	ORANGE

25 March 2021	Huawei Industrial Digital Transformation Conference	Virtual	IoT - Technical Event	CERTH
27th May 2021	BDVA DataWeek 2021	Virtual	IoT - Technical Event	UPV
27/28-May-2021	ESPO Conference 2021	Oslo, Norway	Port transport Industry Event	XLAB
16/17-May-2019	EuropeanEnvironmentalPortsConference 2021	Rotterdam (The Netherlands)		
2/4 June-2021	Green Marine GreenTech conference	Virtual	PEI - Environment - Technical Event	CREOCEAN
15/16-June-2021	IPIC 2021 - 8th International Physical Internet Conference	Virtual	IoT - Technical Event	CATIE
16/18 June-2021	UMT 2021 - 27th International Conference on Urban and Maritime Transport and the Environment	Virtual	PEI - Environment - Technical Event	XLAB, UPV, all
21 June 2021	IEEE 7th World Forum on Internet of Things	Virtual	IoT – Technical Event	
31 August / 3 September 2021	IoTWeek2021 – **cancelled**/moved to a virtual lightwieght fashion	Hybrid (Dublin, Ireland)	IoT - Technical Event	
2/3 September 2021	ICTR 2021 - 10th International Congress on Transport Research 2021	Rhodes (Greece)	Port transport Industry Event	CERTH
8/10 September 2021	FIWARE SmartFest	Virtual	IoT – Technical Event	ORANGE
3/11 September 2021	IUCN WORLD CONGRESS	Marseille (France)	PEI - Environment - Technical Event	CREO
7/10 September 2021	IEEE International Mediterranean Conference on Communications and Networking	Virtual	IoT - Technical Event and PEI event	UPV
17/18 September 2021	The 14th International Symposium on Intelligent Distributed Computing	Virtual	IoT – Technical Event	UPV
22-23 September 2021	GreenTech PortTechnology	Virtual	IoT - Technical Event	XLAB

Some evidences of the events that have been attended can be found at this page on PIXEL's website and also in social media channel posts accordingly.

In the period M19-M41, a total of 25 Industrial (or Industrial/Scientific) events have been actively attended by PIXEL partners. The distribution is the following:

- 9 related to Environmental actions (PEI or related environmental model of PIXEL presented).
- 11 related to IoT, ICT, Computing systems, etc. where PIXEL models, technological modules or architecture were presented.
- 5 related to pure Transport and Logistics realm.

* Note that the table above those events/fairs/conferences in which PIXEL has been actively disseminated. To PIXEL Consortium, "actively disseminated" must be understood as any event where PIXEL is pitched, presented to an auditorium, presented using slides, exposed via a poster, exposed via a scientific paper or outlined as keynote, invited speaker.

3.3.3. Liaison with Ports of the Future Network

One of PIXEL priorities has been to network with other H2020 projects with relevant objectives. An official request of collaboration was made to the leading partners of the relevant projects, at the start of the PIXEL project. Besides, join actions in terms of mailing lists addition, continuous communication and mutual invitation to relevant events was sough during the whole duration of the action.

Having this clear, the main interaction of the PIXEL project (and partners) with other initiatives has been through the called **"Ports of the Future Projects" network**, at least till M28 of PIXEL, where the CSA project ended. This naming was created after the Coordination and Support Action funded under the same topic than PIXEL: DocksTheFuture.

A **common joint integrated Dissemination Strategy** was planned in summer 2018 for all the projects, to maximize impact and visibility towards the Port of the Future. After a series of teleconferences among the CSA and the projects (having PIXEL represented by WP9 leader (UPV)), the plan was finalised. The summary of the plan was included in a predecessor document of this deliverable (D9.3).

Consequently, during the period M19-M41, PIXEL has been involved in several actions according to the plan and beyond (after the end of the CSA). To report the main work performed, there is a table below. The table includes the information about how PIXEL has participated in several initiatives both with DocksTheFuture and individually with other projects of the Ports of the Future Network.

Table 12. Liaison with Ports of the Future Network

Action and date	Promoted by	Participants	Description/comments
1st Dtf Expert Workshop - Evaluating Port-related projects – 19th May 2020	DtF	UPV, XLAB, PRO	PIXEL participated actively in the virtual session organised by the CSA to present their PCI-score tool to evaluate innovative port-related projects.
2nd DtF Experts Workshop – 26th May 2020	DtF	UPV, XLAB, INSIEL, APT, PEOPLE	PIXEL was the project selected to make a demonstration about the usage of DSS, PCI-score and transferability tools.
Presentation of Tools PCI-score and DSS to the world – DtF- 4th/5th June 2020	DtF	UPV, XLAB, INSIEL, APT, PEOPLE, GPMB, ORANGE, CATIE, PRO	PIXEL participated as attendee although the project related their experience using the valuable tools
Piraeus Demo/Training Webinar – June 1st 2020	COREALIS	UPV, PRO, XLAB, PPA	PIXEL participated as attendee.
TRA2020-substitution event (virtual) – 2nd July 2020	ALICE ETP and DtF	UPV, XLAB, PRO, THPA	PIXEL presented in this event the paper about the IoT platform of the project that should have been exposed on-site in TRA2020 (cancelled due to COVID-19).
Network of Excellence launching – presentation – 24th November 2020	DtF	UPV, PRO, THPA, APT, CREO	PIXEL made a presentation about the tight collaboration conducted with CSA DtF during 30 months and explained status of PIXEL advances.

COREALIS Closure Event – 23rd April 2021	COREALIS	UPV on behalf of PIXEL	PIXEL Project Coordinator made a pitch on the virtual event exposing PIXEL synergies with COREALIS.
DataWeek 2021 – 27th May 2021	BDVA	UPV on behalf of PIXEL	**(not a part of the PoF network action)** PIXEL was pitched by UPV at the Data Week 2021 organised by BDVA (current DAIRO) in their session: "Unleashing the potential of ports and maritime logistics via data-driven solutions: Opportunities and Challenges"
Networks of Excellence meeting-workshop- 15th July 2021	NoE	UPV on behalf of PIXEL	UPV presented PIXEL advances and synergies with NoE for the short and mid-term future.
PIXEL Closure Event 28th Sept 2021	PIXEL	COREALIS, PortForward and the Network of Excellence.	The projects of the cluster (through their Coordinators) were invited to participate in the closure event of PIXEL as external keynote speakers.

3.3.4. Industrial Dissemination KPIs evaluation M19-M41

The aim of dissemination activities in PIXEL is to help achieve the overall goals of the project and maximise the project's impact through a strategic approach. The task is to disseminate the PIXEL results to a wide range of industrial stakeholders who have an interest in, concern about or are affected by Transport & Logistics, Environmental and PEI, and ICT & IoT technologies and the PIXEL applications.

Key objectives include ensuring easy access to information and results for target groups, engaging with customers and providing demonstrations and developer tools.

A set of Key Performance Indicators (KPIs) has been defined (referring to the D9.4) to (i) maximise the visibility of the project and to (ii) measure the efficiency and effectiveness of industrial dissemination activities carried out during the whole life project process. KPIs measure progress and analyse the data to push toward higher goals and help create an analytical foundation for project management decision-making.

The KPIs commitment stated in the Grant Agreement (GA) are described below:

Table 13. Targeted values (industrial KPI) extracted from Pixel Grant Agreement (GA)

What	Description	KPI	From Whom
Workshops, showcases	Final dissemination workshop with presentation of PIXEL's results, open call for papers and industry session	Total of 2 over the project's lifetime	Scientific/industry community
Industry events	"Marketing-oriented" presentations at industry events (exhibitions and fairs e.g., TOC, SIL, SITL, CES) or in bilateral discussions with ports and related entities.	At least 2 per year	Industry community
On-site visits to field trial	Selected user and stakeholder groups, e.g. ports, public authorities or solution developers	At least 2 during project lifetime	Industry community
Clustering and liaising	Project Liaison Meetings, informing about PIXEL's results and establishing synergies with other relevant transport projects	2 during the project lifetime	Other related projects, CSAs and EC initiatives

The KPIs have been listed continuously. The assessment has been done using tools known from project and risk management where the achievement is classified in categories in order to follow the necessary implications from KPIs. This reporting data allow to analyse the dissemination activity and to plan responses/actions and then to evaluate and record effectiveness for the next period. The following table shows the classifications used within the progress assessment.

Table 14. Classifications used within the progress assessment of KPIs

Categories		General actions or measures
0	Immediate action necessary	KPI is below the expected value Improve the dissemination activities relevant to KPI
1	Needs further attention	KPI is slightly below expectations Further measures for improvement need to be discussed and addressed to partners
2	Good progress	KPI is on track with the dissemination plan and strategy No corrective actions are necessary Continue with the monitoring
3	Overachievement	KPI exceeds the expectations! The industrial dissemination plan is possibly under evaluated Shift or concentrate efforts to other tasks (dissemination or not) with lower performances

Following the instructions above and in deliverable D9.4, the table below reflects the results of the evaluation of the Industrial Dissemination status at the end of the project. As it has been indicated, this evaluation is performed every 4 months, but for the sake of simplicity in this report, it has been condensed in a single table that pretends to inform about the global evolution over the period M1-M41 (the M1-M18 column has been left in order for the reader to understand the evolution).

Table 15. Industrial dissemination activities. Set of KPIs and current values

Dissemination activity	Key Performance Indicator (KPI)	Target value (Total)*	Value at M18	Current value	% of accomp.	Evaluation
International industrial events (exhibitions, conferences)	Number of attended events where PIXEL is represented	**14**	21	46	329%	**3**
	Number of PIXEL people participating to events	**23**	15	22	95,65%	**2**
	Number of conferences where PIXEL is presented	**14**	12	40	285,71%	**3**
	Number of PIXEL partners participating to events	**8**	12	13	163%	**3**
	Number of follow-up activities resulting from the events	**Several per year**	Several	Several	-	**-**
	Number of events where promotional material were presented/distributed	**20**	4	11	20%	**Not a valid KPI due to COVID restrictions**
	Number of leaflets distributed	**100**	40	100	100%	**2**
Showcases at the test sites (x3)	Port of Monfalcone (it) Port of Bordeaux (Fr) Ports of Piraeus-Thesaloniki (Gr)	**1** **1** **1**	0	3	0%	**Done virtually internally, w/o audience**
	Number of participants to each organised showcase	**>10**	0	5 webinars with 23 average people	-	**Changed KPI**
Liaison with other European projects	Projects: CSA, ALICE, COREALIS, PortForward, DocksTheFuture, Etc	**4 per year (12 in total)**	9	21	175%	**3**
Interviews with targets	Number of interviews with end-user communities (target groups)	**4 per year (12 in total)**	3	7	58%	**1**

* Extracted from GA. , ** Not fully possible during the COVID-19 sanitary crisis.

3.3.5. Future schedule of events to be observed by Association

This section aims at reflecting on the future of the PIXEL Association with regards to Industrial Events that might be attended to disseminate and promote the results of the project.

The past 18 months have meant change and development in the events industry, in the activities of and public organizations and in the activities of maritime stakeholders (ports, industries and maritime traffic operators: technologies and practices, pragmatic and innovative solutions), but some questions are still to be answered: What is going to happen next following the pandemic context? And how is sustainability going to affect maritime "business world" and exchange/communication capacity?

Events are already starting to move back to face-to-face fashion, alternating online and physical presence in most cases. Communities will interact through this combination of experiences in ways that will increase their return on industrial investments and improve operations efficiency.

The priorities for the PIXEL' association are to increase the network of partners, stakeholders, operators and adopters of the tools developed by PIXEL. To this objective, it seems preferable to communicate on the operationality and effectiveness of PIXEL developments by targeting appropriate industrial events with these criteria:

- Events targeting worldwide customers (firstly in Europe, then Middle-East, Asia, America, and Africa regions) in the port industry sector.
- More valuable events for industrial business.
- Virtual events.
- In person events: smarter, more efficient, more sustainable.

Few interesting industrial events for PIXEL' association are scheduled in Europe next year, including:

o European Environmental Ports Conference 2022 (3rd to 4th May) – Rotterdam, the Netherlands): https://www.wplgroup.com/aci/event/european-environmental-ports-conference/

o IoT Week 2022 (June20th to 23rd) – Dublin, Ireland: https://iotweek.org/conference-2022/

o ESPO Conference 2022 – Valencia, Spain.

o ICPMS 2022: 16. International Conference on Port and Maritime Security (August 12-13), Venice, Italy : https://waset.org/port-and-maritime-security-conference-in-august-2022-in-venice.

o TRA 2022 (Lisbon,, 14th-17th November). – Transport Research Arena (PIXEL had two papers accepted and one booth reserved in the 2020 edition that was cancelled due to COVID-29 pandemic outbreak): https://traconference.eu/

One of the aims of the PIXEL Association will be to explore, identify and apply to attend relevant events like (but not limited to) the above listed.

3.4. Closure Event

The team in WP9 decided to take advantage of the date for the 5th webinar (Sept. 28th) to organise a wider event to serve as a Closure of the Project to the eyes of the external world.

The rationale behind this decision was three-fold:

- Showing to the community the final results of the project. The four products (encapsulated as such), a tour around the platform, the technical outcomes, etc. Although PIXEL has been present in many events and several scientific papers have been published (see previous sections), there has not been a forum where all PIXEL results have been explained together. In addition, by the time of the Closure Event, source code will already be available in open repositories so people attending will be able to get hands-on after the showcasing in the event.

- Engaging Maritime ports audience by bringing external keynote speakers that will be able to relate their experience with PIXEL. Also, stakeholders within the project are represented in the event to let audience know the advantages and impact of PIXEL developments on their day-to-day operations.

- To "officially launch" PIXEL Association. Up to the date of the event, the news of the creation of an NGO coming out of PIXEL product and Consortium has only been kept internal. The Consortium plans to announce it at the Closure Event.

It was decided that the event would last one whole morning and would follow a specific structure, creating a narrative and ending with the "launching" of the Association so that the audience will have clear that the PIXEL path has not ended, and we will still be active striving towards the Port of the Future.

The structure of sessions (including timeline of the agenda) was designed as follows:

- **PIXEL as a completed action**:
    - **Overall conclusion of the project**
        - Presented by the Project Coordinator to explain PIXEL conclusion, put up some figures, pilots achievements, partners outcomes, overall collaboration, papers, etc.
    - **Tour around the platform**
        - Presented by the Technical Coordinator of the project to showcase PIXEL dashboard, navigating through global spaces and models, explaining the traits of the IoT platform.
    - **User story and feedback**:
        - Presented by one port of PIXEL (GPMB), explaining the experience of having participated in PIXEL as part of the user design and pilot trial stakeholder. Describe PIXEL potentialities in ports.
    - **Market potential**
        - Presented by the Innovation Manager, describing KERs, PIXEL's 4 products, HORIZON results booster, where PIXEL has appeared so far (WPSP, …) etc.

- **External keynote speakers**
    - Mr. José Sánchez (from AIVP), to narrate PIXEL's perspective for governance-oriented entities, ports and cities.
    - Mr. Alexio Picco (from Network of Excellence), to relate potential PIXEL adoption in the research-coordination support action community.
    - Mr. Giannis Kannelopulous (from COREALIS – coordinating partner ICCS), and:
    - Mr. Olaf Poenicke (Coordinator of PortForward) to talk about PIXEL-Sister projects collaboration experience.

- **A PIXEL technical pill**
  - **PIXEL flagship's product: PEI**
    - MEDRI will present PEI concept, methodology, science and solution (briefly).
    - UPV introduces how the theory has been implemented in practice in the ports and informs how the solution looks like (a short demonstration).
  - **Scale model demonstration (see below)**

- **A PIXEL technical pill**
    - Presented by the Innovation Manager. Launching of the association. Members, how to contribute, goals, how to contact, how to request services…

Scale model demonstration:

The goal of introducing a scale model demonstration in the Closure Event was two-fold:

1. To take advantage of the system and prototype that had already been prepared for some previous events. Both in TRA2020 (cancelled in April 2020) and IoTWeek2021 (cancelled in July 2021 – became virtual and lightweight), PIXEL had arranged to hold booths with demonstrators of the technology. Most material was already prepared and the demonstration was designed and ready to be deployed. The Closure Event is the best opportunity to put that in practice.
2. To showcase a tiny maritime case flow, making use of data in real time (from sensors) and observing how a PIXEL model (in this case, the PEI – a subset, the SEI) works in real life.

In the image below the schema of the scale model demonstration prototype can be observed:
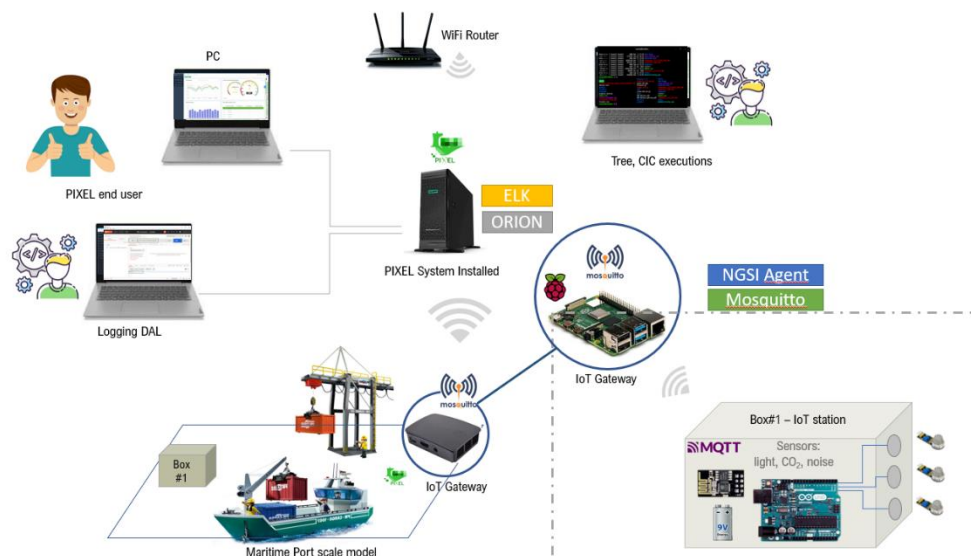

Figure 31. Scale model of PIXEL for Closure Event demonstrator

Some evidences of the demonstrator can be found in the following images:
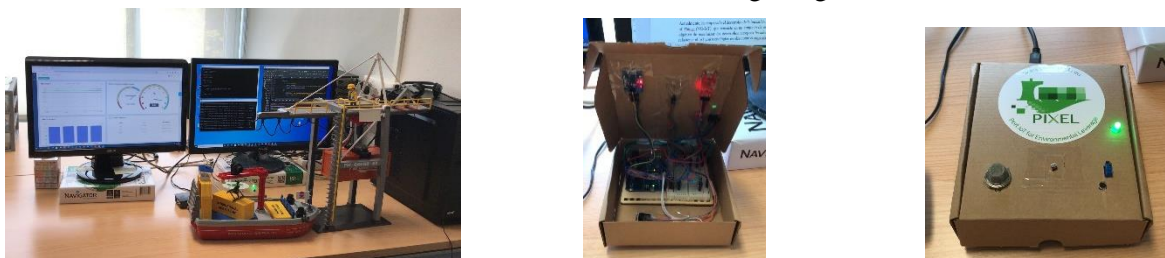
Figure 32. Scale model evidences

3.5. Dissemination Matrix update

	ICT & IoT			Transport & Logistics			Environmental & PEI		
	id	Description	Partners	id	Description	Partners	id	Description	Partners
SCIENTIFIC DISSEMINATION EVENTS	#S.I.1	Paper in "IEEE 5th World Forum of Internet of Things"	UPV	#S.T.1	Workshop with Port of Quebec	GPMB	#S.E.1	Paper in "Environmental Monitoring and Assessment"	MEDRI
	#S.I.2	Paper for OCEANS 2019	XLAB	#S.T.2	Paper in Maritime Transport Congress 2019	CATIE, UPV	#S.E.2	Paper in TRA2020 about PEI	MEDRI, UPV
	#S.I.3	Paper accepted in TRA2020 about IoT architecture	PRO, UPV, CATIE, CERT	#S.T.3	Presentation of article after #S.T.2	CATIE	#S.E.3	Paper in 8th Conference in Marine Technology - Air pollution	MEDRI
	#S.I.4	Paper in IDCS 2019	UPV, PRO	#S.T.4	Paper for event ICTR2021	CERTH, MEDRI	#S.E.4	Paper in 8th Conference in Marine Technology - Noise pol.	MEDRI
	#S.I.5	Presentation of article after #S.I.1 action	UPV	#S.T.5	Paper for event UMT 2021	ALL	#S.E.5	Presentation at ITS4 Climate Smart Mobility and Climate	CATIE, GPMB
	#S.I.6	Presentation of article after #S.I.4 action	UPV	#S.T.6	Presentation in event afer #S.T.5 action	UPV	#S.E.6	Paper in Ecological Indicators (Elsevier)	MEDRI, UPV
	#S.I.7	Paper in Sensors (MDPI)	UPV	#S.T.7	Paper in event IPIC2021	PEOPLE, CATIE, UPV, XLAB	#S.E.7	Paper about noise in Thessaloniki (De Gruyter)	MEDRI, THPA
	#S.I.8	Paper for event IEEE Mobile Data Mgmt.	XLAB	#S.T.8	Presentation in event after #S.T.7 action	CATIE	#S.E.8	Presentation in 8th Conf. On Marine Technology	MEDRI
	#S.I.9	Presentation of article afer #S.I.8 action	XLAB				#S.E.9	Presentation in 39th Scientific Symposium of Public Health	MEDRI
	#S.I.10	Paper for event IEEE WFIoT 2021	UPV						
	#S.I.11	Presentation of article after #S.I.10 action	UPV						
	#S.I.12	Paper in IEEE MEDITCOM 2021	UPV						
	#S.I.13	Presentation of article after #S.I.12 action	UPV						
	#S.I.14	Presentation in event 14th Symp. on IDC	UPV						
ON-SITE DISSEMINATION EVENTS	#I.I.1	Presentation in FIWARE Global Summit	UPV, ORANGE	#I.T.1	Workshop of the Atlantic Corridor - EU (DG MOVE) - Algeciras	GPMB	#I.E.1	Presentation at BlueMed days (smart-greenport-greenship)	CREO
	#I.I.2	Presentation in FIWARE Green Economy days	ORANGE	#I.T.2	DocksTheFuture Workshops with Experts	XLAB, PRO, CERTH	#I.E.2	Presentation at Euromaritime BlueGrowth exhibition	CREO
	#I.I.3	Presentation in Salon de la Recherche	ORANGE	#I.T.3	CID ALICE - Event with the CSA	UPV	#I.E.3	Presentation at NAFEMS France 2020	APT, XLAB
	#I.I.4	Presentation in BDVA DataWeek 2021	UPV	#I.T.4	Presentation at TEN-T Atlantic Corridor, Lisbon	UPV, GPMB	#I.E.4	Presentation at GreenMarine GreenTech conference	CREO
	#I.I.5	Presentation in FIWARE SmartFest	ORANGE	#I.T.5	Workshops and Mid-term Conference CSA	UPV, XLAB, ASPM, SDAG	#I.E.5	Presentation at IUCN World Congress	CREO
				#I.T.6	European Maritime Days with the CSA	XLAB			
				#I.T.7	Three Seas Initiative - 2019 Business Forum	XLAB			
				#I.T.8	Presentation at Export Summit (Greek Exporters Association)	CERTH			
				#I.T.9	Presentaton at MED Ports Casablanca	ASPM			
				#I.T.10	Presentaton at Transport Logistic in Munchen	ASPM, SDAG, INSIEL			
				#I.T.11	TOC Europe in Rotterdam	PRO			
				#I.T.12	Black Sea Ports & Shipping in Constanta	ASPM			
				#I.T.13	Baltic Ports Conference	CERTH			
				#I.T.14	Presentation at BILOG forum with the CSA	IPEOPLE			
				#I.T.15	Presentation at Virtual MariMatch event	XLAB			
				#I.T.16	Presentation at Huawei Industrial Digital Transf.	CERTH			
				#I.T.17	ESPO Conference 2021	XLAB			
				#I.T.18	Presentation in GreenTech Port Technology	XLAB			
VIRTUAL DIFUSSION CHANNELS	#VP.I.1	Architecture overview presentation video	PRO	#VP.T.1	SDAG presentation video	SDAG	#V.P.E.1	MEDRI presents the Port Environmental Index (.ppt) in general	MEDRI
	#V.P.I.2	Presentation of Operational Tools module of PIXEL	UPV	#VP.T.2	CATIE presents and explains Energy model	CATIE	#V.P.E.2	CREOCEAN explains air pollution model in PIXEL	CREO
	#V.P.I.3	Presentation of PIXEL at FIWARE Green Economy	ORANGE	#V.P.T.3	INSIEL presents hinterland multimodal transport model	INSIEL	#V.P.E.3	KER video - PEI	XLAB
	#V.P.I.4	Technical flow of PIXEL modules/models	PRO	#V.P.T.4	PEOPLE explains the Port Activity Scenario forms and idea	PEOPLE			
	#V.P.I.5	Presentation of Data Acquisition module of PIXEL	ORANGE	#V.P.T.5	UPV presents PIXEL at (substitution of) TRA 2020 - ALICE	UPV			
	#V.P.I.6	Presentation of Security module of PIXEL	ORANGE	#V.P.T.6	CATIE presents a paper about PAS for energy (recording)	CATIE			
	#V.P.I.7	Presentation of Information Hub module of PIXEL	XLAB	#V.P.T.7	KER video - PAS	XLAB			
	#V.P.I.8	Keynote presentation of PIXEL platform in HUAWEI	CERTH	#V.P.T.8	KER video - MDA	XLAB			
	#V.P.I.9	Presentation of PIXEL ICT platform in FIWARE event	ORANGE						
	#V.P.I.10	Presentation of paper #S.I.XX in UMT2021 event	UPV, ALL						
	#V.P.I.11	Presentation of PIXEL ICT platform in FIWARE event	ORANGE						
	#V.P.I.12	Presentation of paper #S.I.XX in WFIoT event	UPV						
	#V.P.I.13	Presentation of paper #S.I.XX in WFIoT event	UPV						
	#V.P.I.14	KER video - BDE	XLAB						
	#V.P.I.15	Presentation of paper demo # in MEDITCOM	UPV						

	id	Description	Partners
VIRTUAL DIFUSSION CHANNELS	#VP.N.1	First release of the website of PIXEL http://pixel-ports.eu/	UPV, IPEOPLE
	#VP.N.2	Promotional video of PIXEL	UPV, IPEOPLE
	#VP.N.3	Introductory video to PIXEL done by Coordination	UPV
	#VP.N.4	New website launched	All WP9 partners
	#VP.N.5	Innovation Manager video	XLAB (Innovation Manager), UPV
	#VP.N.6	AB members interview videos	UPV - AB members
	#VP.N.7	2nd round of supporting material: T-shirt, folder and new versions of poster and flyer	All WP9 partners
	#VP.N.8	Delivery of 1st PIXEL Newsletter	UPV
	#VP.N.9	Delivery of 2nd PIXEL Newsletter	UPV
	#VP.N.10	Delivery of 3rd PIXEL Newsletter	UPV
	#VP.N.11	Holding and Recording of the 1st Webinar of the project uploaded to Youtube channel	PEOPLE, UPV, PRO
	#VP.N.12	Recording of PIXEL presentation in the CSA final event	UPV
	#V.P.N.13	Delivery of 4th PIXEL Newsletter	UPV
	#V.P.N.14	Holding and Recording of the 2nd Webinar of the project uploaded to Youtube channel	PEOPLE, CATIE, XLAB, INSIEL
	#V.P.N.15	Recording of Project Coordinator presentation at the final event of COREALIS (PoF Network event)	UPV
	#V.P.N.16	Holding and Recording of the 3rd Webinar of the project uploaded to Youtube channel	PEOPLE, UPV, PRO
	#V.P.N.17	Holding and Recording of the 4th Webinar of the project uploaded to Youtube channel	PEOPLE, CERTH, MEDRI
	#V.P.N.18	Final Promotional video of PIXEL	UPV, ALL
	#V.P.N.19	Delivery of 5th PIXEL Newsletter	UPV
	#V.P.N.20	3rd round of supporting material: Poster of Closure Event	All WP9 partners
	#V.P.N.21	Holding and Recording of the 5th Webinar of the project - CLOSURE EVENT	ALL WP9 partners

Figure 33. Final Dissemination Matrix

4. Conclusions

The activities of Communication and Dissemination in PIXEL have been many and varied along the execution of the project.

On one side, the Communication part has followed a continuous evolution since the very beginning of the project. It has been made clear that the 3 most used (and successful channels) have been the website, YouTube channel and Twitter. All the three have outstandingly surpassed the expected KPIs and have achieved the creation of a PIXEL flow of information through which all of them are intimately connected.

Many different initiatives have also been performed about communication, among which webinars, poster creation, issuing newsletters and providing physical supporting material can be highlighted. The amount of reporting material (deliverables, papers, news, press articles, updates of the website, explanations) is huge and all resources are easily identifiable and findable via the main channels.

On another note, Scientific Dissemination experienced a slow start in the first 6-9 months of the project (as usual in this kind of projects). From M12 on (and specially on the second half of the project), the number of scientific articles was significantly increased, having reached the figure of 19 published pieces (15 in congresses/conference proceedings and 4 in Q1/Q2 relevant journals). These publications have been accompanied as well with press releases and short articles in websites (9 in total) and great contributions to the open source community. Apart from the publication of PIXEL source code in GitHub and the creation of on-purpose libraries (pyngsi), PIXEL has achieved to reach relevant open source initiatives like FIWARE and ALICE ETP, obtaining letters of intent and becoming member respectively.

As per what regards ResearchGate, PIXEL team decided to focus on delivering the results open via other (more official) channels like Zenodo. Some rationale behind is that more than three "RG projects" were initiated by partners and some papers were assigned to ones and others did not. In addition, RG is not an EC-endorsed channel and PIXEL team priorities formal public delivery. Some PIXEL publications are still held on the portals of the editors. This fact is expected to be corrected during the few posterior weeks after the end of the project.

Finally, with regards to Industrial Dissemination, these actions have been the most affected by the advent of COVID-19 pandemic outbreak. The majority of events that PIXEL was tackling were cancelled due to COVID-19 associated restrictions, and it was foreseen that the team would not be able to attend to physical events for a certain time. Especially remarkable was the cancellation of TRA2020, the biggest event planned to be attended by PIXEL partners in 2020 (if not in the whole project), the IoTWeek 2020 and IoTWeek 2021. In both of them, PIXEL was planning to have a booth with a working demo and also to have scientific publications associated and to be presented.

However, in spite of the previous, attendance to industrial events throughout the whole project still exceeded the threshold/target values (KPI) expected as the beginning of the project. PIXEL has been represented and presented in several relevant events (face to face or online workshop/conference) and the participation from PIXEL partners was very good. Among the previous the roundtable of Emergent Technologies on GreenTech 2021 at the very end of the project (23rd September 2021) stands out as the arena where –finalised- PIXEL innovations were outlined. Almost all the partners have already represented the PIXEL project in one or more industrial dissemination actions.

Regarding the provision of supporting material from PIXEL partners to potential contacts when attending events, the COVID 19 health crisis has strongly disrupted this activity. Then, most of the leaflet distributed were emailed to the target stakeholders. For the interaction with CSA and liaison with other European projects, the target value (12) regarding common actions/events/initiatives was clearly surpassed as this has been one of the main focus of the WP9 team. For the number of interviews with potential external end-users, we have set the objective as 12, and we have conducted 7. However, according to the partners of PIXEL, the fact of having gotten 4 letters of intent from external ports reflecting their strong interest on testing PIXEL tool (they were willing to perform trials but the time of the project expired before) **is considered a soothing** fact to this shortcoming KPI.

To sum up, the global results of the work package can be considered successful. PIXEL Consortium is committed to keep this dissemination work via the PIXEL Association in the future.

Appendix A. Off-voice commercial video

The environmental impact of port activities is an important concern in the scope of the ecological transition.

There are multiple initiatives addressing impact reduction but they typically fail due to lack of clarity or scalability.

Besides, resources to implement these initiatives are limited, especially in small and medium ports, which strive to prioritise environmental impact reduction without clear cost-effectiveness baselines.

PIXEL is the answer to these problems, integrating in a single platform all needed data leveraging IoT technologies for reducing emissions and impact.

PIXEL solution allows users to understand what are the problems, investigate their origin and establish actuations to reduce their consequences, in a continuous improvement cycle.

One of the key aspects of PIXEL is that it is born from small ports and designed to be scaled-up to all sizes, where multiple agents can collaborate towards a better management of ports' activities.

PIXEL is a secure-by-design solution that has been modularly built leveraging open source software such as FIWARE or Elasticsearch.

This fact will allow PIXEL to be extended and replicated according to particular needs, as well as upgraded and scaled from public open-source products supported by PIXEL members.

As a Consortium, PIXEL comprises a group of European Ports and logistic nodes, companies and research institutions with a strong link to local governments and global agencies, as AIVP

For instance, in the Port of Bordeaux, PIXEL predicts the energy demand considering vessel operations, suggesting the adaptation of solar panels deployment accordingly.

In the Port of Monfalcone, traffic congestion and trucks' parking management are significant problems, which might be measured, predicted and reacted beforehand to using PIXEL.

Similarly, the Port of Thessaloniki is exploiting PIXEL to reinforce the port-city interface fostering harmonisation focusing on vehicles flux thus reducing port emissions and carbon footprint.

In the Port of Piraeus, PIXEL manages to track growth in an ever-increasing cargo and passenger traffic scenario. PIXEL monitors the ships and cruises and to propose mitigation to increase the climate resiliency of the port activities by making them more environmentally sustainable.

All these benefits are registered and measured by PIXEL's unique Port Environmental Index, a composed indicator that models the port environmental performance based on multiple KPIs as ship emissions, waste, pollutants, etc. , providing a single indicator to make ports accountable under a formal methodology.

Additionally, a wildcard trait of PIXEL is its capacity to incorporate new services and functional requirements.

As an example, the Port Authority of Trieste has leveraged PIXEL to create a new service for organising social distances measures in the terminal yard in the fight against COVID-19 pandemic spread.

PIXEL is in continuous contact with renowned organizations involved in the Port of the Future quest, which have inspired the project to align our offerings with the most envisioning trends and standardisation initiatives in the sector.

PIXEL final results will be released by late 2021 and will be offered in a combined Open Source + Commercial structure to fulfil all port community needs.

This will allow the community to access, modify, recompile and make business out of the software developed during the project.

For a more advanced deployment, PIXEL will be offered as software on premises with consultancy hours and integration services or as cloud software with a wider catalogue of models, personalised support and on-premise training.

If you are interested in testing PIXEL in your port, please contact us and we will arrange a trial for free. Also, don't hesitate to follow our social media channels and join the PIXEL initiative!