H2020 - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

ICT-14-2016: Big Data PPP: cross-sectorial and cross-lingual data integration and experimentation

BigDataOcean

"Exploiting Oceans of Data for Maritime Applications"

D8.5 – Final Dissemination, Communication and Stakeholder Engagement Report

Workpackage:	WP8 – Dissemination and Communication Activities
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BigDataOcean Project Profile

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Partners

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universitätbonn	Rheinische Friedrich-Wilhelms-Universitt Bonn (UBONN)	Germany
R&D NESTER	Centro de Investigacao em Energia REN – State Grid, S.A. – R&D Nester (NESTER)	Portugal
hcmr ΕΛΚΕΘΕ	Hellenic Centre for Marine Research (HCMR)	Greece
UBITECH ubiquitous solutions	Ubitech Limited (UBITECH)	Cyprus
FOINIKAS SHIPPING COMPANYNE	FOINIKAS Shipping Company (FOINIKAS)	Greece
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Executive Summary

This document reports the BigDataOcean dissemination and communication activities carried out during the 2nd reporting period of the project (M16-M30) and provides an overall view on the indicators accomplished during the full duration of the project. To assess the achievement of the objectives, all of the period's activities are quantified and assessed against the KPIs and plan set in the previous D8.4 "Communication and Stakeholder Engagement Report and Plan for Second Reporting Period".

Strong emphasis has been put on activities towards engaging stakeholders mainly from the maritime industry, while not neglecting the wave energy community. Positive results have been achieved, not only in terms of awareness but also in terms of impact. As an example, such dissemination and communication activities enabled the BigDataOcean platform evaluation by more than 1100 individuals, and as highlighted in the deliverable D6.5, 70% of the ones engaged in the last evaluation phase were related with stakeholders from the maritime and energy industries.

The number of dissemination events attended addressing industrial stakeholders has also increased. More than 2/3 (about 70%) of the events (29 in total) have attendants coming from the maritime and energy related communities, the main BigDataOcean targeted end-users. As a direct consequence, the number of industry contact points has grown more than 400% (from 59 at M15 to 309 at M30). BigDataOcean communication has also reflected a positive impact. For instance, the number of followers in social channels increased nearly 45% (from 176 to 255 in a similar period, reaching 431 followers in total) and the unique visitors to the website 124% (from 2707 visitors at M15 to 6051 at M30).

	Mechanism	Achieved KPIs	Score Index[1]
Dissemination	D1 "Organisation of project events"	3/3	1.25
	D2 "Participation to conferences and workshops"	3/3	1.63
	D3 "Publications"	3/3	1.29
	D4 "Community building/ engagement with stakeholders"	3/3	1.26
	D5 "Collaboration and synergies with projects"	2/2	1.83
	D6 "Internal dissemination in partner's networks"	3/3	1.21
	D7 "Standardisation contributions"	2/2	2.25
Communication	C1 "Project's Website"	3/3	1.17
	C2 "Social media presence"	1/3	1.90
	C3 "Website Content"	3/3	1.12
	C4 "Traditional media"	1/1	1.13
	C5 "Communication material"	8/8	1.87

[1]A score higher than 1 means that the BigDataOcean activities surpassed the average envisaged the KPIs (all were considered to have the same impact weight, e.g. conference papers have the same weigh than journal papers). $Score = \frac{\frac{A_1}{T_1}+\cdots+\frac{A_N}{T_N}}{N}$, where A_1 refers to the value achieved for the first KPI of the considered dissemination or communication mechanism, T_1 is the target value for the same KPI and N is the number of KPIs associated to that mechanism.

The table above illustrates the project performance in face of the different dissemination and communication mechanisms:

- **Dissemination:** All goals defined for the second reporting period have been achieved and even surpassed as highlighted by the score index. A special importance has been given to Maritime Industry related events, and additionally to what has already been highlighted, activities such as webinars, hackathons, and training sessions have been promoted to foster participation of the community.
- **Communication:** Most of the pre-defined goals were achieved. Among the most relevant achievements is the number of press-releases (9), the growing number of unique visitors, and the interaction with website content through for instance, blog posts (42). Even if not all the social media presence KPIs have been met, we can consider that this kind of communication mechanism was positive. 1099 interactions in social media have been registered in this period when the plan only accounted for 208, a clear demonstration of interest by the community.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

BDO	BigDataOcean
DoA	Description of the Action
D*x.y*	Deliverable *y* from Task *x*
KPI	Key Performance Indicator
T*x.y*	Task *y* from Work package *x*
WP	Work package

1 Introduction

1.1 Objective of the Deliverable

This deliverable reports the final results of WP8 "Dissemination and Communication Activities".

Focusing on the second reporting period, it addresses all the tasks within the work package, detailing and accounting all dissemination, communication and stakeholder engagement activities performed during the last 15 months of the project. In detail, D8.5 has the objective to report the activities conducted to enlarge the community, establish a solid online presence, and reach a number of publications at both industrial and technical level. Interaction with standardisation bodies and the organisation of specific events such as hackathons are also to be reported. Finally, it provides a detailed report about the data collected and generated during the project, describing how it will be shared and opened after the project's completion.

To assess the achievement of the objectives, D8.5 quantifies all activities and will match the progresses facing the indicators that have been defined in the DoA, and later revised in the D8.4, to acquire and engage more stakeholders from the maritime industry. To note that in face of the pilot 4 focus on energy production, also energy-related stakeholders are targeted.

1.2 Relation with other Tasks and WPs

This deliverable is strongly related with Task T8.1 "Dissemination, Communication and Maritime Stakeholders Engagement Planning", where dissemination and communication plans with targeted key performance indicators (KPIs) are defined. These plans were updated, together with new KPIs, in Deliverable D8.4, to which this document refers as a mean to evaluate the objectives of WP8. This deliverable clearly defined dissemination and communication according to European Commission guidelines:

- **Dissemination:** public disclosure of the results of a project across any medium. It is the process of promoting and generating awareness about the project from the very beginning. Its aim is to make the project results known to various stakeholder groups in a targeted way.
- **Communication:** related to taking measures for promoting the project and its results to a multitude of audiences including the broad public, while engaging in a two-way exchange of information.

These definitions are maintained throughout the present deliverable.

Despite the relation with other project activities, there is a relevant correspondence to Task T6.7 "Pilots' Evaluation, Lessons Learnt and Impact Assessment", from WP6. Many of the dissemination and communication activities contributed to reach more than 1100 users and engage them in the evaluation of the BigDataOcean results.

1.3 Structure of the Document

Besides this introductory section, this deliverable is structured as follows:

- **Section 2** describes the **Dissemination Activities** of BigDataOcean. Focusing on the period from M16 to M30, it starts with a description of envisaged vs. achieved targets for all

KPIs relating distinct dissemination mechanisms, as set in D8.4. A metric for the final numbers achieved in the full duration of the project is also presented. Each of those dissemination mechanisms is individually analysed in the subsections of Section 2. These are the following:

- Organisation of project events;
- Participation to conferences and workshops;
- Publications;
- Community building/ engagement with stakeholders;
- Collaboration and synergies with projects;
- Internal dissemination in partner's networks; and
- Standardisation contributions.

- **Section 3** concerns the **Communication Activities** of the project. The same approach of the preceding section, comparing the envisaged vs. achieved targets for all KPIs was followed. The defined communication mechanisms are detailed in each of the subsection of 3, and are the following:
    - Project's website;
    - Social media presence;
    - Project's blog; and
    - Traditional media and communication material.
- **Section 4** provides a report about the **Data Collected and Generated During the Project**, indicating how it will be shared and opened after the project's completion. The full list of the datasets and their description is presented in Annex I of deliverable D5.6 "BigDataOcean Platform Final Release".
- **Section 5** concludes the document.

2 Dissemination Activities

The dissemination plan of the BigDataOcean project, depicted in Figure 1, comprises three different phases ("Phase I: Raise Awareness", "Phase II: Inform and Interact" and "Phase III: Promote") which aim to achieve six different objectives over time. Taking this into consideration, this section reports the dissemination activities conducted during the second reporting period of the BigDataOcean project (i.e. M16 to M30), comprising, therefore, the two last phases of the dissemination plan and aiming to achieve the following objectives:

I. Ensure maximum visibility of the project in the target audiences via appropriate key messages;
II. Timely diffuse the scientific and technological knowledge generated in the project within and beyond the project's consortium;
III. Establish liaisons with other projects and initiatives for knowledge and innovation transfer;
IV. Engage the targeted audiences to get feedback and validate the project's results;
V. Attract potential users / clients and stimulate the appropriate market segments to support the project's exploitation strategy; and
VI. Encourage the development of further outcomes in new initiatives.

BigDataOcean Phases / Dissemination Mechanisms	Phase I: Raise Awareness (M1-M12) Diss. Obj. I, III Activities' Intensity: Low Target Audiences: ALL	Phase II: Inform and Interact (M13-M24) Diss. Obj. I, II, III, IV Activities' Intensity: High Target Audiences: ALL	Phase III: Promote (M25-M30) Diss. Obj. II, III, IV, V, VI Activities' Intensity: High Target Audiences: ALL
(D1) Organisation of Project Events	D1.I) Organisation of workshops in scientific conferences	D1.II) Organisation of workshops in scientific conferences, industry events & fairs; Organisation of hackathon	D1.III) Organisation of workshops in industry events; Organisation of hackathon & demo events
(D2) Participation to Conferences & Workshops	D2.I) Participation to events; Presentation of project scope; Interaction with participants	D2.II) Presentation of project's results to events; Representation in booths	D2.III) Presentation of project's results and business case to events; Representation in demo sessions
(D3) Scientific Publications	D3.I) Publication of position papers / review papers in conferences	D3.II) Publication of methodology papers in conferences	D3.III) Publication of overall project's results in journals & industry magazines
(D4) Community Building / Engagement with Stakeholders	D4.I) Establishment of contact points; Liaison with industry communities and networks; Promotion of project's communication material; Interviews	D4.II) Validation of results with key stakeholders in events / online; Interaction with industry communities and networks; Invitation to project's events	D4.III) Creation of network of potential users; Promotion of project's application stories; Invitation for demos; Training webinars
(D5) Collaboration and synergies with projects	D5.I) Synergies identification; Establishment of contact points; Exchange of ideas & intentions	D5.II) Periodic bilateral exchange of news & results, Joint presence in events	D5.III) Joint engagement in events / demo days
(D6) Internal Dissemination in partner's networks	D6.I) Project's links & news in partners' website, social media accounts, newsletters	D6.II) Inclusion of projects' results in partners' events	D6.III) Demonstration of results in partners' premises; Training; Reuse of results
(D7) Standardisation Contributions	D7.I) Registration / participation to relevant working groups; Alignment with existing standards	D7.II) Participation to working groups' telcos and events; Presentation of project's outcomes	D7.III) Participation to working groups' telcos and events; Presentation of project's demos

Figure 1: BigDataOcean Dissemination Plan (from DoA)

To achieve these objectives during "Phase II: Inform and Interact" and "Phase III: Promote", from M16 to M30, seven dissemination mechanisms were used, which are also referred in Figure 1. As presented in Table 2-1, the targeted values for **all KPIs have been achieved not only for the second reporting period (M16-M30) but also for the full duration of the project**. The following sections detail the results associated to each dissemination mechanism.

Table 2-1: Dissemination monitoring and evaluation measurements for the second period

Dissemination Mechanism	Related KPIs	Target M16-M30	Achieved M16-M30	Achieved M1-M30
D1 "Organisation of project events"	Number of workshops organised	4	5	14
	Number of hackathons organised	2	2	2
	Number of demo events	4	6	6
D2 "Participation to conferences and workshops"	Number of attended events	19	29	50
	Number of events with project's presentation	14	19	30
	Number of project's demo booths	3	6	6
D3 "Publications"	Number of conference papers	7	13	21
	Number of journal papers	4	4	4
	Number of articles in trade press	16	16	16[2]
D4 "Community building/ engagement with stakeholders"	Number of industry contact points	241	250	309
	Number of industry communities informed about the project	22	30	38
	Number of webinars	4	5	5
D5 "Collaboration and synergies with projects"	Number of projects with synergies	4	8	19
	Number of joint activities	3	5	12
D6 "Internal dissemination in partner's networks"	Number of internal partners' events	9	14	15
	Number of links to the project's website	14	15	51
	Number of training sessions	4	4	4
D7 "Standardisation contributions"	Number of working groups	2	7	8
	Number of project's presentations in standardisation meeting (online of offline)	5	5	6

2.1 Organisation of project events

During the second reporting period, five workshops and six demo events were organised by the BigDataOcean partners, which comprised demonstrations of the platform in general and each of the four developed pilots in particular (see Table 2-2).

Given the logistic difficulties and cost saving needs, some of the events have been co-hosted within larger events such as conferences. For instance, Pilot 2 events were conducted in the Mongoos[3] annual meeting, during the dedicated "Operational Oceanography Downstream Services" workshop that took place in Genoa, Italy on the 5th - 6th of December 2018 (M24). The Pilot 2 service and the BigDataOcean platform in general were subjected to the analysis of the Mediterranean oceanographic community and important feedback and evaluations were collected. Indeed, the events associated to the pilot services counted with the presence of the respective stakeholders (including participants

[2] This metric was not available in the first reporting period, thus the value of M16-M30 is equal to the M1-M30

[3] http://www.mongoos.eu/home

from Maritime and/or Energy industries) and several evaluations and important feedback was collected as a contribute to WP6.

Table 2-2: Dissemination events - Mechanism "Organisation of project events"

Event	Date	BDO Focus	Participants
Workshop Within EGOV-CeDEM-ePart 2018 conference	M21	BDO platform in general	Big Data Community, Researchers and Academia and Industry in General
Demo Event Within EGOV-CeDEM-ePart 2018 conference	M21	BDO platform in general	Big Data Community, Researchers and Academia and Industry in General
Workshop within Mongoos annual meeting	M24	Pilot 2	Maritime Industry and Mediterranean oceanographic community
Demo Event within Mongoos annual meeting	M24	Pilot 2	Maritime Industry and Mediterranean oceanographic community
Workshop At ANEK and FOINIKAS premises	M28	Pilot 1	Ship owners, maritime operators, maritime equipment constructors, representatives from the transport and logistics industries
Demo Event At ANEK and FOINIKAS premises	M28	Pilot 1	Ship owners, maritime operators, maritime equipment constructors, representatives from the transport and logistics industries
Workshop within Maritime Big Data Workshop	M17	Pilot 3	Representatives from Transport and Logistics industries, Port Authorities, Law Enforcement and Coastguards
Demo Event within Maritime Big Data Workshop	M17	Pilot 3	Representatives from Transport and Logistics industries, Port Authorities, Law Enforcement and Coastguards
Hackathon At FCT/UNL premises in Caparica, Portugal	M29	Pilot 4	Energy related Research and academia
Demo Event Co-dated with the IEEE CEISEE conference	M29	Pilot 4	Research and academia
Workshop At REN premises in Santarém, Portugal	M30	Pilot 4	Offshore renewables services providers, one zone concessionaire, oceanographic research centres, energy producers, data providers, Portuguese transmission system operator, other public entities (e.g. Directorate-General for Maritime Policy)
Demo Event At REN premises in Santarém, Portugal	M30	Pilot 4	Offshore renewables services providers, one zone concessionaire, oceanographic research centres, energy producers, data providers, Portuguese transmission system operator, other public entities (e.g. Directorate-General for Maritime Policy)
Hackathon At NTUA premises in Athens, Greece	M30	BDO platform in general	Research and academia

It is also worth mentioning that to maximise the benefit of the stakeholders and their agendas, some events followed each-other in agenda, for instance, the workshop after the demo event. This

arrangement provided more support for a fruitful discussion and engagement with the stakeholders. Such arrangement was the case for two of the Pilot 4 related events organised at REN premises in Santarém, Portugal (Portuguese Transmission System Operator, https://www.ren.pt). In Figure 2 illustrates both pilot 4 demo events (the second was organised by Uninova in the frame of the IEEE CEISEE conference).

Figure 2: Pilot 4 associated events. Demo event organised at UNINOVA (left) and workshop organised by R&D NESTER with the support of the REN.

Additionally, two hackathons were organised. The first one took place at the Faculty of Science Technology of Nova University of Lisbon on 13/05/2019 where student of the Renewable Energy Technologies course were challenged to find the best location on the Portuguese coast to develop a wave energy farm using the services associated to Pilot 4 (see Figure 3). The students had 30 minutes to find the best location and to characterise the respective wave energy resource in terms of annual energy generation and minimum, average and maximum power output. A total of 51 students participated in this event, supervised by two Professors of that University. The second hackathon took place at the National Technical University of Athens Campus on 06/06/2019 with the students of the Big, Open and Linked data course of the "Digital Innovation and Startups Enterpreneurship" postgraduate program course in combination with the AEGIS project. Initially there was a demonstration of the tools of the AEGIS and BigDataOcean platform. Thereafter the students were asked to perform specific data querying and visualisation tasks for both platforms. For the BigDataOcean platform, the students were challenged in one hour to present interesting join queries from the datasets available in the BigDataOcean platform. A total of 14 people participated in this event, supervised by one professor and one PhD student of the university.

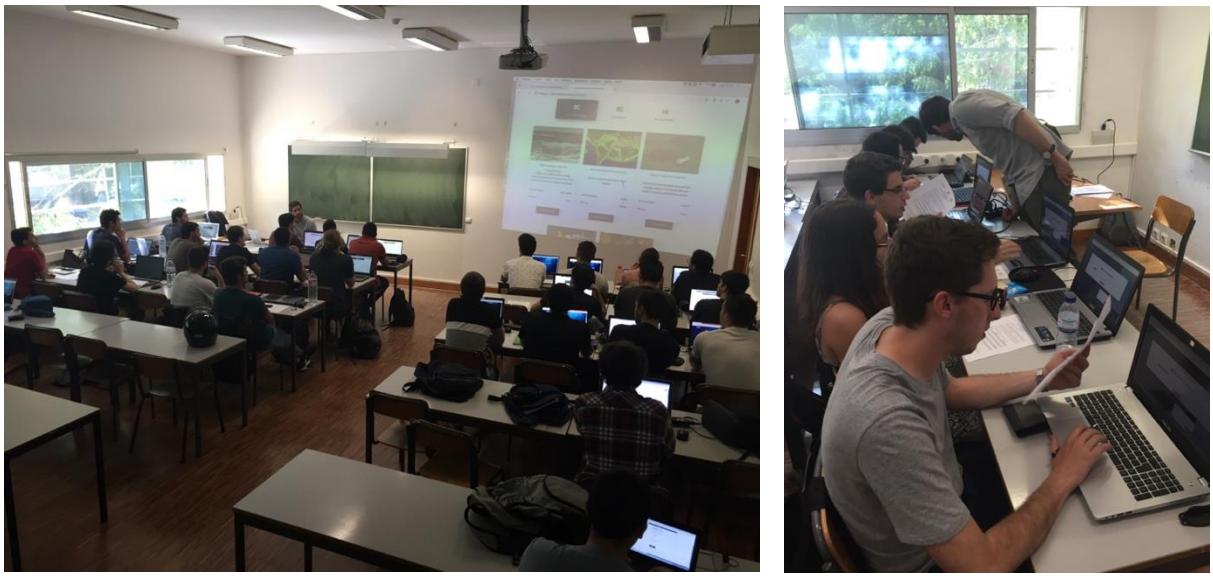

Figure 3: Energy hackathon at Faculty of Science and Technology of Nova University of Lisbon (FCT/UNL) on 13/05/2019

2.2 Participation to conferences and workshops

Figure 4: Presentations of the BigDataOcean project at the European Maritime Day[4] (left) and at the IEEE Intelligent Systems 2018 – Data driven industry session (right).

[4] https://twitter.com/EuroGOOS/status/1129027801821138945

The dissemination mechanism "Participation to conferences and workshops" was mainly focused on the engagement and acquisition of Maritime and Energy industries related users, future customers and other stakeholders. Table 2-3 describes the 29 dissemination events attended during the second reporting period. Presentations about the project took place in 19 of them (two of the are illustrated in Figure 4). Regarding the target audience, it is not always possible to isolate a single set of stakeholders attending an event, hence frequently more than one is indicated, and Table 2-3 highlights (shadowed rows) that the **majority of these events were related with the Maritime and Energy Industries**. In fact, as illustrated in Figure 5, more than 2/3 (about 70%) of the events (29 in total) had attendants coming from the maritime and energy related communities, the main BigDataOcean stakeholders. If to these events we added the ones locally organised at partner's premises already reported in section 2.1, the ration would improve further.

Table 2-3: Dissemination events associated to mechanism "Participation to conferences and workshops"

Name	Date	Location	Type	Target Audience	Involved Partners	Project Presentation
Maritime Big Data Workshop	05/2018	La Spezia, Italy	Workshop	Maritime Industry, R&A	EXMILE	YES
BDVA PPP Meetup	05/2018	Sofia, Bulgaria	Forum	Big Data Community	LINKS	NO
BDVA AG27	06/2018	Brussels, Belgium	Forum	Big Data Community	LINKS	NO
European Conference on Semantic Web	06/2018	Crete, Greece	Conference	R&A	UBONN	YES
Posidonia 2018	06/2018	Athens, Greece	Exhibition	Maritime Industry	NTUA, EXMILE, HCMR, UBITECH	YES
SEST 2018	09/2018	Seville, Spain	Conference	R&A and Energy Industry	NESTER	YES
Ocean Business 2018	09/2018	Lisbon, Portugal	Exhibition	Maritime Industry	NESTER, UNINOVA	NO
SMM Hamburg	09/2018	Hamburg, germany	Trade fair	Maritime Industry	EXMILE	NO
BDVA AG28	09/2018	Brussels, Belgium	Forum	Big Data Community	LINKS	NO
IEEE Intelligent Systems 2018 – data driven industry session	09/2018	Madeira, Portugal	Conference + BDO Exhibition	R&A, Big Data Community, and local Maritime Industry	UNINOVA, NTUA	YES
EGOV-CeDEM-ePart 2018 conference	09/2018	Krems, Austria	Conference	Big Data Community, R&A and Industry in General	NTUA	YES
Business2Sea 2018	11/2018	Porto,	Exhibition	Maritime	NESTER	NO

Name	Date	Location	Type	Target Audience	Involved Partners	Project Presentation
		Portugal		Industry		
EBDVF18	11/2018	Vienna, Austria	Forum	Big Data Community, R&A	LINKS	YES
2018 IEEE OES Autonomous Underwater Vehicle Symposium	11/2018	Porto, Portugal	Symposium	Maritime, Industry, R&A	EXMILE	YES
UBICOMM	11/2018	Athens, Greece	Conference	R&A	NTUA, EXMILE	YES
1st European Ocean Observing System Stakeholder Conference (EOOS event organised by the EMODnet, European Marine Board and EuroGOOS Secretariats in close collaboration with wider stakeholder community)	11/2018	Brussels, Belgium	Conference	Maritime, Industry and Standardisation Community	HCMR	NO
Annual Meeting of Marine Technology 2018	12/2018	Athens, Greece	Forum	Maritime, Industry and R&A	EXMILE	YES
ICT 2018: Imagine Digital - Connect Europe	12/2018	Vienna, Austria	Exhibition	R&A and Industry in General	NTUA, EXMILE, HCMR, LINKS, UBITECH	NO
MonGOOS Annual meeting	12/2018	Genoa, Italy	Conference	Maritime, Industry, R&A	HCMR	YES
Jerico Next, Steering Committee meeting	02/2019	Helsinki, Finland	Meeting	Maritime, Industry, R&A	HCMR	YES
BDVA AG31	02/2019	Brussels, Belgium	Forum	Big Data Community	LINKS	NO
Copernicus In-Situ TAC General Assembly meeting	03/2019	Brest, France	Meeting	Maritime, Industry, R&A	HCMR	YES
COMPIT'19	03/2019	Tullamore, Ireland	Conference	Maritime, Industry, R&A	EXMILE	YES
European Maritime Day 2019	05/2019	Lisbon, Portugal	Exhibition	Maritime Industry	NESTER, UNINOVA	YES
Gradana Second School	05/2019	Thessaloniki, Greece	School	R&A	UBONN	YES
DoCEIS19	05/2019	Lisbon, Portugal	Conference	R&A	NESTER, UNINOVA	YES
NITEC'19	05/2019	OSLO,	Conference and	Maritime	EXMILE	NO

Name	Date	Location	Type	Target Audience	Involved Partners	Project Presentation
		NORWAY	Exhibition	Industry		
IEEE OCEANS 2019	06/2019	Marseille, France	Conference / Exhibition	Maritime, Industry, R&A	EXMILE	YES
2nd HIMIOFOTS	06/2019	Athens, Greece	Meeting	Maritime, Industry, R&A	HCMR	YES

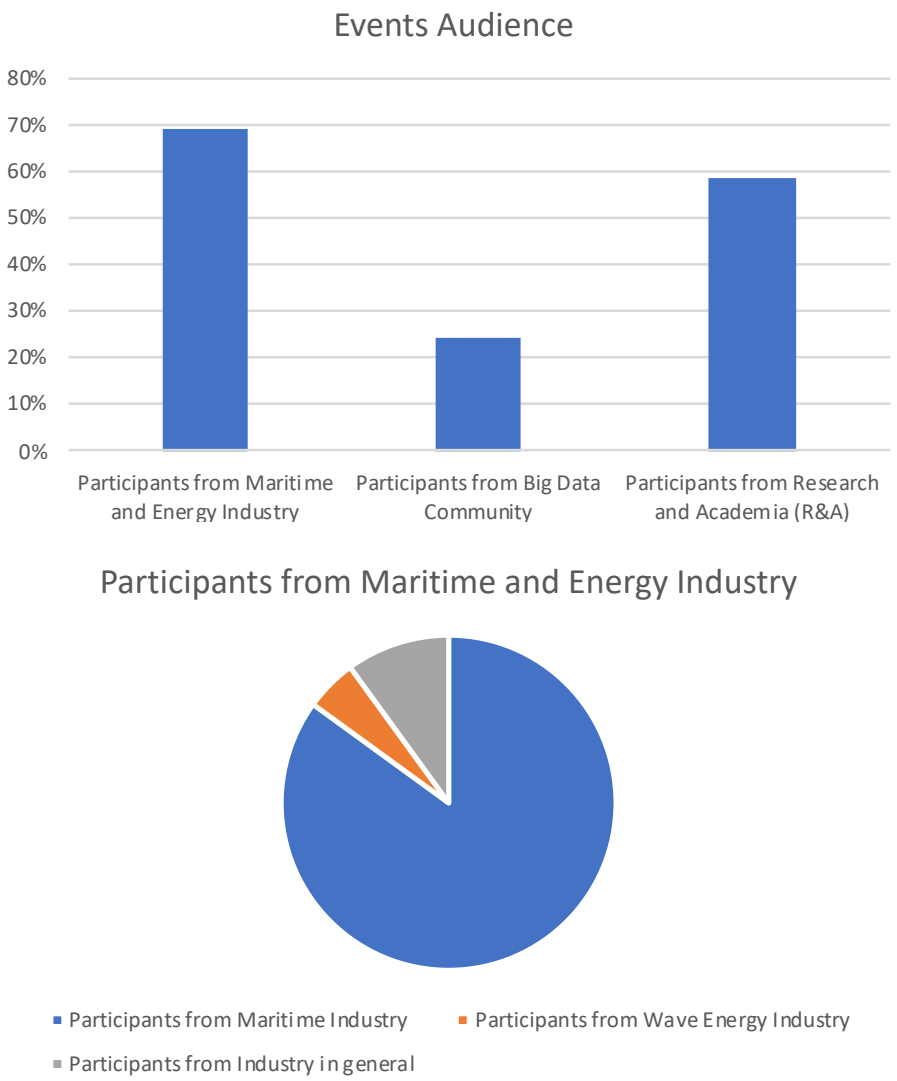

Figure 5: Analysis of Attended (External) Events

Under the context of the reported dissemination events and again with a major emphasis on the maritime industrial community, six project booths were also carried out in:

- Posidonia 2018[5],
- IEEE Intelligent Systems 2018[6],

[5] http://posidonia-events.com/landing/posidonia-2018/

- 12th Annual Meeting of the Marine Technology[7],
- ICT 2018[8],
- European Maritime Day 2019[9], and
- NITEC'19[10].

In Posidonia 2018 (Figure 6), EXMILE (MarineTraffic) presented the BigDataOcean project at the exhibition, which took place at the Metropolitan Expo in Athens, Greece, in June 2018. More specifically, two presentations took place at the booth of MarineTraffic as part of BigDataOcean project. The first presentation, a joint effort from NTUA and UBITECH, showcased the fault prediction and proactive maintenance pilot progress. The second presentation, run by EXMILE, pertained to the use of Big Data for the detection of abnormal vessel behaviour, specifically in the context of the BigDataOcean project.

In IEEE Intelligent Systems 2018, the BigDataOcean project was presented (**Σφάλμα! Το αρχείο προέλευσης της αναφοράς δεν βρέθηκε.**) and a booth carried out (Figure 7) on a joint activity with the EU funded project Boost 4.0. Several Maritime Industry related local authorities were present and got to know about the project. These local authorities then invited BigDataOcean partners to visit Madeira port and discuss about the future use of the BigDataOcean platform in their operation.

Figure 6: BigDataOcean presence at Posidonia 2018

[6] http://qris.uninova.pt/news/ieee-international-conference-intelligent-systems-2018

[7] http://www.elintconference.gr/2018/index.html
[8] https://ec.europa.eu/digital-single-market/en/events/ict-2018-imagine-digital-connect-europe
[9] https://ec.europa.eu/maritimeaffairs/maritimeday/en
[10] https://nitec19.com/

Figure 7: BigDataOcean booth at IEEE Intelligent Systems 2018

The 12th Annual Meeting of the Marine Technology (Figure 8), organised from Hellenic Institute of Marine Technology, attracted more than 500 maritime professionals and gave BigDataOcean the opportunity to boost the project's reach. EXMILE had the opportunity to explain how the project aims to cover the gap between shipping operations and digital transformation and answer key questions for the shipping industry at the BigDataOcean booth.

Figure 8: BigDataOcean booth at the 12th Annual Meeting of Marine Technology

In ICT 18 (Figure 9), which is a huge research and innovation event focused on the European Union's priorities in the digital transformation of society and industry that attracts more than 6,000 visitors from around the world, BigDataOcean project organised a project exhibition booth on 4-6 December

2018. The BigDataOcean consortium members had the opportunity to meet with several hundreds of visitors at the project's exhibition booth. The consortium members had the chance to highlight the challenges and the objectives of the project, give a brief description of its key achievements and explain how the platform will assist maritime stakeholders to perform Big Data Analytics. Discussions were about the project's platform and its services and the project's offerings were received with high interest from the booth's visitors, which were further engaged to evaluate the platform and provide useful feedback to the consortium. Additionally, the exhibition booth enabled BigDataOcean to reinforce the synergies with other projects active in the digital transformation of the mobility domain. During the 1st day of the event Dr. Spiros Mouzakitis had the chance to promote the platform and its offered services in a short radio interview with The Austrian Broadcasting Corporation (ORF). A twitter video[11] from EU Data Economy enabled BigDataOcean to promote project's potentials to address key questions of the maritime industry such as how data can be used to enhance maritime security and detect threats at sea, or how can we reduce the oil spill impact to the environment. A total number of 31 organisations (maritime companies, data centres, universities, software houses) were engaged and had a chance to see a demo of the BigDataocean platform and the pilot applications. The participants registered to the platform as well the project newsletter in order to trial the next version of the platform and the pilot applications.

Figure 9: BigDataOcean booth in ICT 18 event

In the European Maritime Day, apart from the presentation carried out (**Σφάλμα! Το αρχείο προέλευσης της αναφοράς δεν βρέθηκε.**), the BigDataOcean project also offered a both (Figure 10) where several participants demonstrated interest not only in the four developed pilots but also on the platform in general as a Big Data enabling technology to be explored by other entities. More specifically, some participants from the Maritime Industry enquired about the possibility of using the BigDataOcean platform as a service provider based on data owned by the respective entities,

[11] https://twitter.com/Dataeconomy_EU/status/1070260314913021952?s=19

following a similar approach to the one supporting Pilot 3. Several contacts were exchanged, and conversations are still in progress. Additionally, evaluations of the BigDataOcean platform by external users were carried.

Figure 10: BigDataOcean booth at the European Maritime Day

In NITEC'19 (Figure 11), EXMILE was awarded for the Maritime Security and Anomaly Detection services (i.e., Pilot 3 services) during NATO's Defence Innovation Challenge. Additionally, a BigDataOcean project booth took place at this event. This gave BigDataOcean consortium members the chance to meet NATO executives and other industry leaders in the national security domain, increasing our networking with maritime industry and sharing our thoughts on hot topics including the detection of dark targets and identification of illegal transhipments. Feedback from attendees confirmed there was interest in data fusion and anomaly detection.

Figure 11: BigDataOcean booth in NITEC'19

2.3 Publications

During the second reporting period, 33 publications were achieved. These publications can be clustered in "Articles in Trade Press" (16), "Journal Papers" (4) and "Conference Papers" (13) and are presented in the following lists.

Articles in trade press – answering to a direct recommendation of the first review report to reach more industrial community. Under this category, BigDataOcean counts full articles and smaller post informing about the project or project activities.

- 1 article at ANEKORAMA
- 1 article at Renovaveis Magazine
- 1 article at Safety at Sea magazine
- 2 posts at MarineTraffic Blog
- 1 post in Economia.gr (October-November 2018 issue)
- 1 post announcement in Elnavi (June 2018 issue)
- 1 post Liberty Press (website)
- 1 post http://www.elintconference.gr/ (website)
- 1 post in Maritimes.gr (website)
- 1 post announcement in Naftemporiki (June 2018)
- 1 post announcement in Newsfront, New Building Report (October 2018 issue)
- 1 post announcement in Nautical Chronicles (August-September issue) + post in their website
- 1 post in Piraeus365 (website)
- 1 article in Efoplistis[12]
- 1 article in World Maritime News (website)[13]

Journal papers

- Spiliopoulos, G., Vodas, M., Zissis, M., Chatzikokolakis, K. (2019). ROTA: A big data knowledge discovery pipeline for defining "roads of the sea". In IEEE Transactions on Big Data (*under review*).
- Chatzikokolakis K., Zissis, D., Spiliopoulos, G., Tserpes, K. (2019). A comparison of supervised learning schemes for the detection of Search and Rescue (SAR) vessel patterns. In Springer GeoInformatica *(published)*
- Kontopoulos, I., Chatzikokolakis, K., Zissis, D., Tserpes, K., Spiliopoulos, G. (2019). Real-time Maritime Anomaly Detection: Detecting intentional AIS switch-off. In nternational Journal of Big Data Intelligence. (accepted, under revision).
- Mannarini G., Carelli L., Zissis D., Spiliopoulos G., Chatzikokolakis K.: Preliminary Inter-comparison of AIS Data and Optimal Ship Tracks. TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation, Vol. 13, No. 1, doi:10.12716/1001.13.01.04, pp. 53-61, 2019

[12] The article has been submitted and the approval for publication is pending

[13] The article has been submitted and the approval for publication is pending

Conference papers

- Chatzikokolakis, K., Zissis, D., Vodas, M., Spiliopoulos, G., Kontopoulos, I. (2019). A distributed lightning fast maritime anomalydetection service. In 2019 IEEE OCEANS.
- Chatzikokolakis, K., Zissis, D., Spiliopoulos, G., Tserpes, K. (2018). Mining Vessel Trajectory Data for Patterns of Search and Rescue. In EDBT/ICDT Workshops (pp. 117-124).
- Kontopoulos, I., Spiliopoulos, G., Zissis, D., Chatzikokolakis, K., Artikis, A. (2018, August). Countering Real-Time Stream Poisoning: An architecture for detecting vessel spoofing in streams of AIS data. In 2018 IEEE 16th Intl Conf on Dependable, Autonomic and Secure Computing, 16th Intl Conf on Pervasive Intelligence and Computing, 4th Intl Conf on Big Data Intelligence and Computing and Cyber Science and Technology Congress (DASC/PiCom/DataCom/CyberSciTech) (pp. 981-986). IEEE.
- Chatzikokolakis, K., Zissis, D., Spiliopoulos, G. (2018). Vessel Profile Indicators using Fuzzy Logic Reasoning and AIS. In International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies, UBICOMM.
- Xidias, E., Zissis, D., (2018). Real Time Autonomous Maritime Navigation using Dynamic Visibility Graphs. In IEEE OES Autonomous Underwater Vehicle Symposium.
- Chatzikokolakis, K., Zissis, D., Vodas, M., Tsapelas, G., Mouzakitis, S., Kokkinakos, P., Askounis, D. (2019). BigDataOcean Project: Early anomaly detection from big maritime vessel traffic data. In 18th Conference on Computer Applications and Information Technology in the Maritime Industries, COMPIT'19.
- Mannarini, G., Carelli, L., Zissis, D., Spiliopoulos, G., Chatzikokolakis, K. (2019). Preliminary inter-comparison of AIS data and optimal ship tracks. In 13th International Conference on Marine Navigation and Safety of Sea Transportation, TransNav 2019. (*to appear*)
- Ducruet, C., Berli, J., Zissis, D., Spiliopoulos, G. (2019). An AIS data analysis to study the European maritime network connectivity and spatial distribution. In 27th Annual Conference of the International Association of Maritime Economists (IAME). (*to appear*)
- N. Amaro, R. A. Lopes, J. M. Pina, C. Agostinho, F. Abreu, and D. Torrado, "A Methodology for Assessing the Impact of the Interannual Variability of Wave Energy Resource on Electrical Energy Conversion," in 2018 International Conference on Smart Energy Systems and Technologies (SEST), 2018, pp. 1–6. DOI: 10.1109/SEST.2018.8495676
- Kokkinakos, Panagiotis, Spiros Mouzakitis, and Esther Garrido. "Transforming Decision and Policy-Making through Big Data." *EGOV-CeDEM-ePart 2018* (2018): 327.
- Tsapelas G., Mouzakitis S., Kokkinakos P., Michalitsi A., Skalidakis S., Askounis D., Miltiadou D., Pitsios S. and Perakis K., Enabling collaborative, data-driven intelligence for the Maritime Sector, 12th Int. Conf. on Mobile Ubiquitous Computing, Systems, Services and Technologies, UBICOMM 2018, November 2018, Athens, Greece
- H Jabeen, N Tahara, J Lehmann. "EvoChef: Show Me What to Cook! Artificial Evolution of Culinary Arts". International Conference on Computational Intelligence in Music, Sound, Art (2019)
- H Jabeen, R Dadwal, G Sejdiu, J Lehmann. "Divided we stand out! forging cohorts for numeric outlier detection in large scale knowledge graphs (conod)". European Knowledge Acquisition Workshop, 534-548 (2018)

2.4 Community building / Engagement with stakeholders

The dissemination mechanism addressed in this section is in fact related with all the remaining mechanisms and can be seen as an output of the entire dissemination strategy. Taking this into consideration, at least, 250 industry contact points were developed from several industries contacted and informed about the project. As a result, during the second reporting period, at least, 30 industry

communities were informed about the BigDataOcean project and are following the project's social media (e.g. Twitter):

- Portuguese Port Authorities Association (see Figure 12);
- The Mediterranean Operational Network for the Global Ocean Observing System (MONGOOS);
- The Copernicus Marine Environment Monitoring Service In Situ Thematic Assembly Centre (CMEMS IN-SITU TAC);
- The Copernicus Marine Environment Monitoring Service Mediterranean - Monitoring Forecasting Centre (CMEMS MED MFC);
- The Hellenic Integrated Marine Inland water Observing, Forecasting and offshore Technology System (HIMIOFOTS);
- European Global Ocean Observing System (EuroGOOS);
- European Marine Observation and Data Network (EMODnet);
- European Marine Board;
- European Network of Transmission System Operators
- Big Data Value Association (BDVA);
- Big Data Europe;
- Big Policy Canvas project community;
- EIT Digital;
- Alliance for Internet of Things Innovation;
- World Port Hackathon community;
- Assistance Mechanism for the Atlantic Action Plan;
- Union of Greek Shipowners and Greek shipping community
- Hellenic Shortsea Shipowners Association
- Public Sector Innovation
- OpenTransportNet (OTN) community
- Smart Cities and Urban Mobility communities
- W3C Big Data Community Group
- W3C Algorithmic Modelling Community Group
- W3C Open knowledge-driven service-oriented system architectures and APIs (KiSS) Community Group
- NATO Communication and information agency
- Research Data Alliance
- Hellenic Institute of Marine Technology
- European Shippers' Council
- Marine Technology Society
- IEEE Oceanic Engineering Society
- RINA - Marine Classification Society
- DNV-GL - Marine Classification Society

Figure 12: Engagement with the president of the Adminstration of Madeira Region Ports and member of the Portuguese Port Authorities Association, following the BigDataOcean presence and booth at IEEE Intelligent Systems 2018.

This dissemination mechanism also comprises five webinars executed during the project. See in Figure 13 the announcement published by the Big Data Value Association for the webinar about the BigDataOcean platform in general, that took place on 04/06/2019. These five webinars (one for the platform in general and one for each pilot) were used to collected valuable feedback and evaluations and to increase engagement with users, future costumers and other stakeholders, as it was the case of Pilot 2 webinar (Figure 14) with the participation of representatives from Environmental Protection Engineering S.A. and Hellenic Petroleum. In this webinar HCMR presented the service to the participants, explained the features of the implemented applications and how they could be used for the benefit of their companies e.g. supporting their emergency response activities in case of oil spill accidents. The users expressed their comments and questions, while they were also trained in the use of the service at each case scenario. The pilot webinars occurred on May (Pilot 1 and Pilot 3) and Jun (Pilot 2 and Pilot 4) 2019.

Figure 13: Announcement for the webinar about the BigDataOcean platform in general[14]

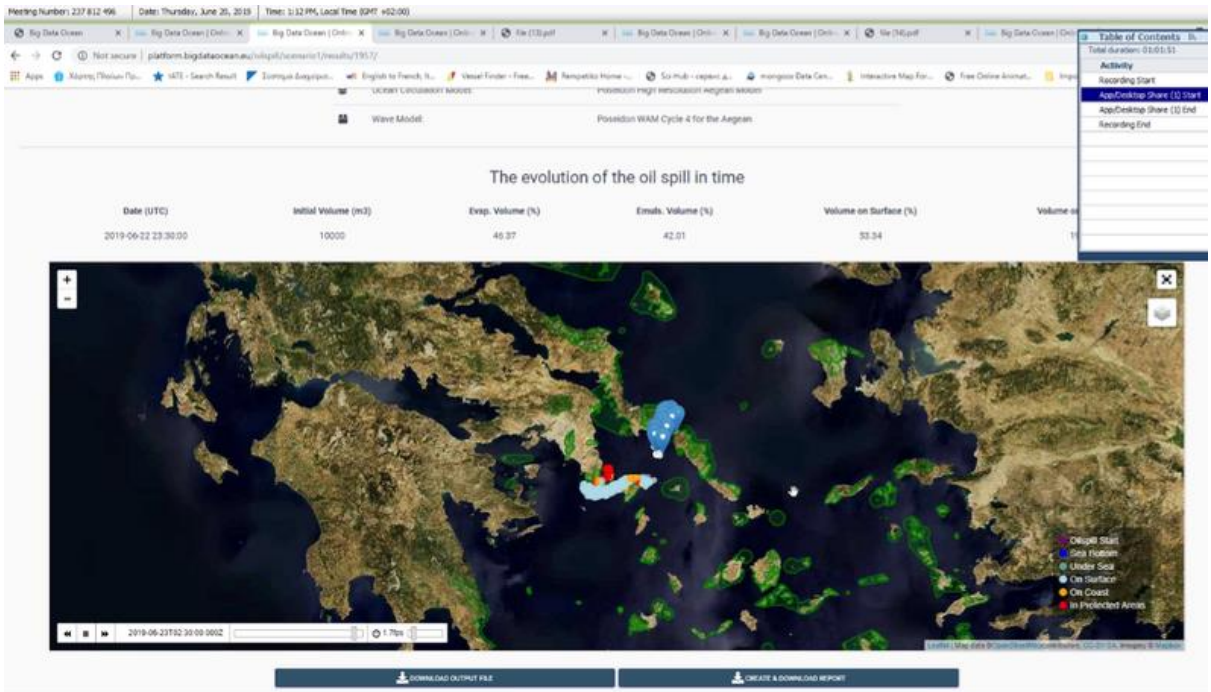

Figure 14: Image from Pilot 2 webinar

2.5 Collaboration and synergies with projects

During the second period, BigDataOcean project strengthened its collaboration and synergies with other projects. In particular BigDataOcean collaborated with the following projects:

- MASTER[15]: Co-organisation of workshop (BMDA 2019[16]).

[14] https://twitter.com/BDVA_PPP/status/1133439698989473794

- Track & Know[17]: Co-organisation of workshop (BMDA 2019).
- datAcron[18]: Co-organisation of workshop (BMDA 2019).
- AtlantOS: Joint publication between members of BDO and AtlantOS consortia.
- BigPolicyCanvas[19]: Joint workshop on "Decision and Policy Making Through Big Data" (part of the EGOV-CeDEM-ePart 2018 conference[20]).
- AEGIS[21]: Joint workshop on "Decision and Policy Making Through Big Data" (part of the EGOV-CeDEM-ePart 2018 conference).
- BOOST4.0[22] (booth at IEEE Intelligent Systems 2018)
- Smart4Health[23] (Joint activity to launch the new "Hub for Digital Engineering" that was visited by the Portuguese and Dutch Prime Ministers on 03/04/2019 – see Figure 15)

Figure 15: Synergy with other projects that promoted the visit of the Portuguese and Dutch prime ministers[24]

As illustrated, one of these synergies that we are most proud, resulted that together with the Smart4Health and the projects composing the new DIH "Hub for Digital Engineering" at UNINOVA,

[15] http://www.master-project-h2020.eu/
[16] http://www.datastories.org/bmda19/
[17] https://trackandknowproject.eu/
[18] http://www.datacron-project.eu/
[19] https://www.bigpolicycanvas.eu/
[20] http://depts.washington.edu/egcdep18/#/
[21] http://www.aegis-bigdata.eu/
[22] https://boost40.eu/
[23] https://www.smart4health.eu/
[24] https://www.facebook.com/bigdataocean/photos/a.1888597064758378/2368418506776229/?type=3&theater

we managed to introduce in the Dutch and Portuguese Prime Ministers agendas, Mark Rutte and Antonio Costa, a small slot about BigDataOcean.

2.6 Internal dissemination in partner's networks

In order to disseminate the project results in the partner's contact networks, 15 internal (inner-company) events were carried out. These events had the objective to disseminate and explain the project and its achievements internally, organising small debates, demonstration activities and training where appropriate so that user could work with the BigDataOcean Platform. This was done in the context of all 4 pilots where all the functionalities of the developed services were presented to partner's organisations and respective contact networks (see, for instance the internal event organised by HCMR for Pilot 2 - Figure 16). In addition, two events have been carried by UBONN for students where the BigDataOcean platform was presented (i.e. Computer Science Conference for University of Bonn Students in 2018 and 2019 at Bonn, Germany).

Figure 16: Internal Event associated to Pilot 2

As part of this dissemination mechanism is the promotion of the project in the different websites. At least 15 different links to the project's website can be reported:

- avin.gr
- anek.gr
- ubitech.eu
- emodnet.eu
- marinetraffic.com
- rdnester.org
- uni-bonn.de
- sansa-stack.net
- sda.tech
- big-data-europe.eu
- bdva.eu

- ren.pt
- uninova.pt
- bigpolicycanvas.eu
- ntua.gr

2.7 Standardisation contributions

This dissemination mechanism concerns the opportunity of aligning BigDataOcean activities with the ones of the standardisation bodies, aiming to observe, discuss and even influence emerging standards. Through its partners, BigDataOcean has been regularly represented and in close contact with a number of working groups from different Standards Development Organizations (e.g. ISO, UN/CEFACT), as well as Industry and Community Consortia (e.g. W3C, EOOS). Some examples include[25]:

- United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) expert working groups (data models, standards, implementation recommendations in transport and logistics and supply chains etc). Meetings and events from this group are open only to authorised or invited officials from member states and EXMILE (MarineTraffic) is a regular participant that, with the BigDataOcean support, is contributing to the discussion on standardised data formats and communication protocols, required for streamlining the information's flow, reducing friction and ensuring efficient exchange of maritime data between all stakeholders, users and systems.
- The Port Call Optimisation Task Force, which brings together key stakeholders from maritime and logistics sector and the International Harbour Masters' Association, United Kingdom Hydrographic Office and GS1, so as to bring standards from the nautical and logistics sectors together ensuring that the nautical data on board of vessels correspond to the information from the port, as well as the information used in the logistics chains. EXMILE (MarineTraffic) is a participant to this task force, taking the feedback received from the participation in the BigDataOcean piloting activities.
- The International Maritime Organization (IMO) supported Global Industry Alliance (GIA). This group is undertaking a number of information exchange and standardisation activities to which EXMILE is participating and contributing to harmonise marine information on board and ashore by electronic means. The problematic of big data has been raised and discussed with other organisations in IMO.
- W3C Big Data Community Group, where NTUA, is an active member and participant. This group explores emerging big data pipelines and discusses the potential for developing standard architectures, Application Programming Interfaces (APIs), and languages that will improve interoperability, enable security, and lower the overall cost of big data solutions. NTUA has brought the experience and knowledge from this group into the BigDataOcean project.
- W3C KISS (Knowledge-driven Service-Oriented System Architectures and APIS) Community Group that is created for sharing, elaborating and evolving knowledge-driven approaches for

[25] Only official organisations are listed.

system integration. BigDataOcean is a clear case study for this group, and NTUA has been promoting it though its regular participation in the group's activities.

- ISO/TC184/SC4 Industrial Data, where UNINOVA is an observatory member designated to represent Portugal, and is part of the Policy and planning committee, a working group responsible for counseling and planning the future activities of SC4. Naturally big data, especially in the shipbuilding sector is a concern and has discussed.
- European Marine Observation and Data Network (EMODnet), that consists of more than 150 organisations assembling marine data, products and metadata to make these fragmented resources more available to public and private users relying on quality-assured, standardised and harmonised marine data which are interoperable and free of restrictions on use. Participation in the first European Ocean Observing System Stakeholder Conference (Brussels, 21-23 November 2018). This EOOS event was organised by the EMODnet standards community (European Marine Board and EuroGOOS Secretariats in close collaboration with wider stakeholder community and with financial support from the European Commission).

These 6 examples meet the envisaged performance indicator ("Number of working groups" - 2) for the period. To note that, unfortunately, and despite BigDataOcean's team commitment already reported in deliverable D8.3, the CEN working group established to address standardisation in big data "CEN Workshop on Big Data[26]" has not progressed as expected due to the lack of support of the different communities originally engaged, e.g. Aquaculture.

Concerning the second performance indicator related with standardisation, i.e., the "Number of project's presentations in standardisation meetings (online of offline)", the approach taken following the CEN experience was to engage secondary standardisation-related groups. Taking projects' results directly to standardisation communities such as CEN and ISO need the support from the right standardisation actors, and despite the BigDataOcean participation via the project partners (as mentioned before), these communities have an agenda and pace of their own. Hence, to empower our presence and contribution, some of the formal presentations about BigDataOcean technologies and achievements have been directed to these secondary groups that have the mission to liaise and endeavour standardisation efforts. Below is a list of the groups to which formal presentations BigDataOcean have been given:

- Remote (online) presentation to the W3C KISS working group, explaining BigDataOcean, its architecture and service-oriented solutions.
- Presentation in BDVA[27] about the used standards and technologies (BDVA TC in November 2018 in Vienna). This group has strong connections with ISO/IEC JTC 1 WG9, on Big Data.
- Presentation of the BigDataOcean project and its interoperability problems made to the standardisation committtee of the Interop-VLab network (Interop VLab General Assembly, 2018). This group has the goal to follow-up the progress of standards in Enterprise Interoperability and promote the work developed in projects of the associated members to upcoming standards. This group has strong relations with ISO TC184/SC5, on interoperability.

[26] https://www.cen.eu/News/Workshops/Pages/WS-2016-14.aspx

[27] Task Force 6: Technical - TF6.SG6 Standardisation BigDataOcean

- Presentation of the BigDataOcean final results to the standardisation committtee of the Interop-Vlab network during the Interop VLab General Assembly, 2019 (see Figure 17). The presentation emphasised the architecture developed to handle big data and the strategies implemented to accommodate interoperability with other available systems and data repositories.
- Presentation of the BigDataOcean technologies and standards at the BDV PPP Summit and the 6th Technical Committee Meeting on the 26th of June in Riga.

In total BigDataOcean partners participate regularly to 7 working groups from official standardisation organisations and have engaged those or other standardisation related groups for 5 BigDataOcean presentations.

Figure 17: BigDataOcean presentation at Interop VLab General Assembly, 2019

3 Communication Activities

The second reporting period of the BigDataOcean project (i.e. M16-M30) expands to the last two phases of the communication plan set by the consortium members. More specifically, as illustrated also in Figure 18 (included in the Description of the Action annex to the contract), it covers the last nine months of Phase II: "Diffuse Knowledge" and Phase III: "Communication Culmination".

BigDataOcean Phases / Communication Mechanisms	Phase I: Raise Awareness (M1-M12) *Comm. Obj. I, II, III, V*	Phase II: Diffuse Knowledge (M13-M24) *Comm. Obj. I, II, III, V*	Phase III: Communication Culmination (M25-M30) *Comm. Obj. I, II, III, IV, V, VI*
(C1) Project's Website	C1.I) Design & Development of an intuitive and responsive project's web site; Search engine optimization	C1.II) Regular update of the website content; Watch website's analytics to measure impact and provide content of interest	C1.III) Regular update of the website content; Clear visibility of results, demo / application material in an interactive way
(C2) Social Media Presence	C2.I) Establishment of presence in: Reproduce relevant content and monitor relevant hashtags; Upload public material; Follow influencers of the domain; Engage with other projects and initiatives	C2.II) Promote project's outcomes and events; Interact with followers to get feedback; Answer on comments and private messages on the various channels; Upload public material; Reproduce relevant content and monitor relevant hashtags	C2.III) Promote project's outcomes and events; Interact with followers to get feedback; Answer on comments and private messages on the various channels; Upload public material; Reproduce relevant content (more sporadically)
(C3) Project's Blog	C3.I) Deploy project's blog; Provide blog posts related to project's positioning & technologies	C3.II) Provide frequent blog posts to initiate discussions on specific issues relevant to the project to receive feedback	C3.III) Publish frequent blog posts to demonstrate and promote project's results
(C4) Traditional Media	C4.I) Press release to announce the project's launch	C4.II) Press releases to announce the significant events / results	C4.III) Press releases to promote the business case of the project's results
(C5) Communication Material	C5.I) Design logo and project identity; Prepare project factsheet, brochure, banner, e-Newsletter and promo video	C5.II) Prepare revised brochure, banner and frequent releases of e-Newsletter; Publish blogs / news in EU instruments (e.g. Cordis News, research*eu magazines etc.)	C5.III) Prepare final brochure, banner, frequent releases of e-Newsletter and video demonstrators; Publish blogs / news in EU dissemination instruments

Figure 18: BigDataOcean Communication strategy (from DoA)

For each phase, the BigDataOcean communication strategy is implemented through a set of communication mechanisms aiming to meet the corresponding communication objectives for that phase. The communication objectives of BigDataOcean are the following:

I. Create awareness of the project among the full range of potential adopters / users in the general public;
II. Provide a clear view of the project's concept, goals and results by formulating adapted key messages, and preparing communication material;
III. Create an active community of potential users and collect feedback to be taken into account by the project's activities;
IV. Prepare the ground for the exploitation of project's results;
V. Support targeted dissemination of the project's results; and
VI. Foster the wide adoption of the project's results in industry and society.

In the following subsections, the results of the communication activities during the second period are reported.

The communication results of the project are broken down to the project's communication mechanisms described in each of the following subsections, together with the actions taken by the project partners. Table 3-1 lists all the communication measurements determined for the second reporting period, the success criterion and the actual status. It can be verified that BigDataOcean has

shown an exceptional track for most of the measured activities, it **substantially increased communication activities throughout the second period and covered most targets for the second period but also some pending activities from the 1st period**.

Table 3-1: Communication monitoring and evaluation measurements for the second period

Dissemination Mechanism	Related KPIs	Target M16-M30	Achieved M16-M30	Achieved M1-M30
C1 "Project's Website"	Number of unique visitors	3 293	3 344	6051
	Average duration of visits (min)	2	2:42	2:28
	Number of page views	11 785	13 427	25 212
C2 "Social media presence"	Number of accumulative followers in social media channels	824	255	431
	Number of accumulative posts	942	101	159
	Number of interactions in social media	208	1 099	1 391
C3 "Website Content"	Number of sections dedicated to pilots	4	4	4
	Number of blog-posts in website	40	42	62
	Number of interactions	109	143	234
C4 "Traditional media"	Number of press releases	8	9	9
C5 "Communication material"	Number of project's factsheets/ brochures and banners	5	8	13
	Number of pilot specific posters and flyers	4	4	8
	Number of e-Newsletter	7	8	8
	Number of videos	1	4	5
	Number of blog posts in EC mechanisms	3	3	9
	Number of e-Newsletter registered users	200	298	350
	Number of times videos watched	100	329	329[28]
	Number of views per blog post	100	142	142[29]

3.1 Project's website

The project's website has been set up and running since the first month of the project. There BigDataOcean partners have listed general information about the project in home page, and in the about page, as well as updates related to the project's findings and the events where BigDataOcean partners participated (i.e. listed in news and events pages). Finally, the website offers to its visitors the capability to receive news relevant to the project and its piloting activities by registering to the

[28] This metric was not available in the first reporting period, thus the value of M16-M30 is equal to the M1-M30

[29] This metric was not available in the first reporting period, thus the value of M16-M30 is equal to the M1-M30

project's newsletter. Through the participation and the organisation of workshops and conferences, BigDataOcean partners promoted the project activities and redirected interested stakeholders to the project's website. These actions resulted in increasing website's visibility and the next figures, produced through Google Analytics, show that BigDataOcean website has a global reach (see Figure 19) with more than 3300 unique visitors (see Figure 20), accessing ~13k pages in total (see Figure 21) with average session duration more than 2:30 minutes (see Figure 22).

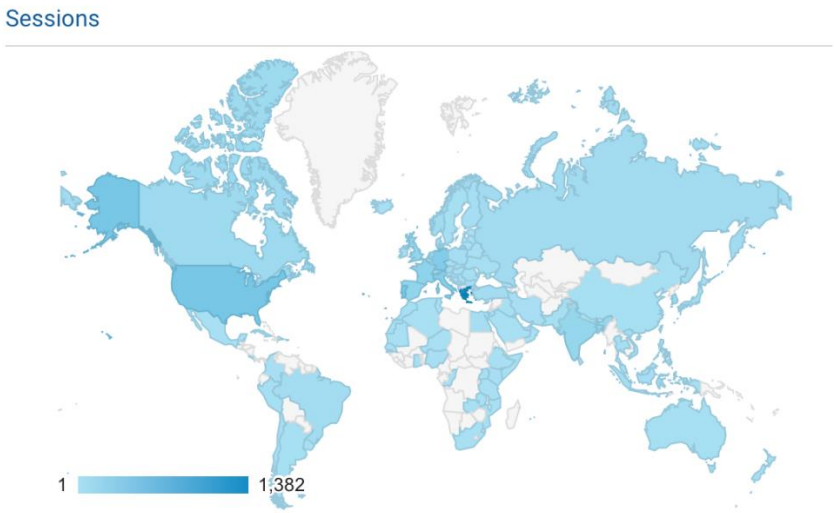

Figure 19: Session distribution per country

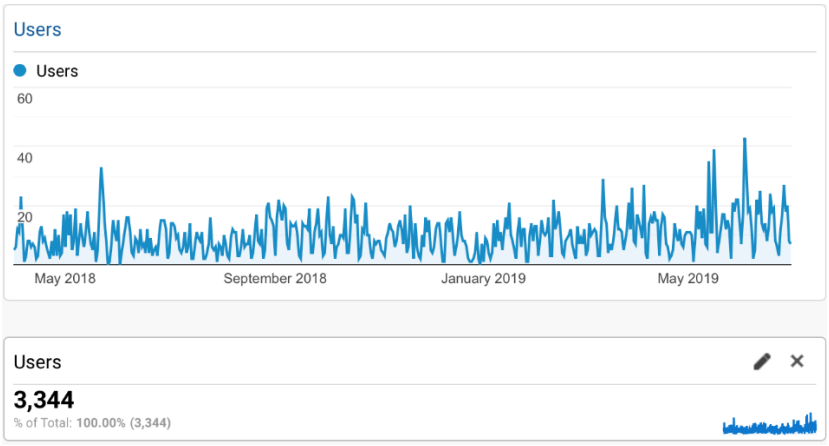

Figure 20: Visitors' distribution over time and total number of users

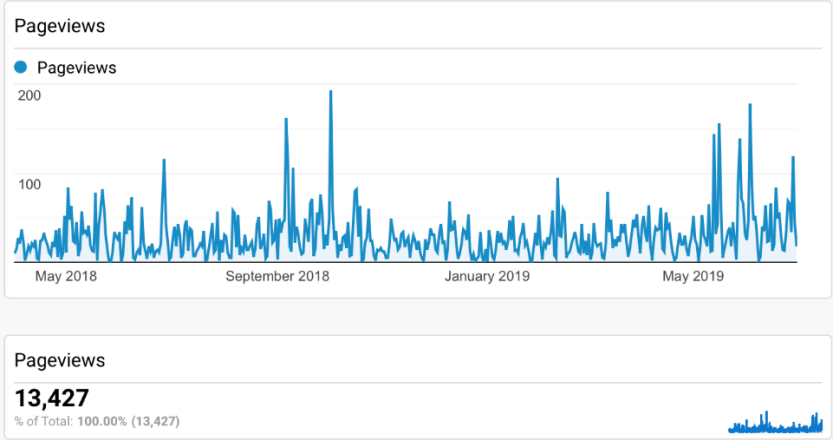

Figure 21: Page views distribution over time and total number of page views

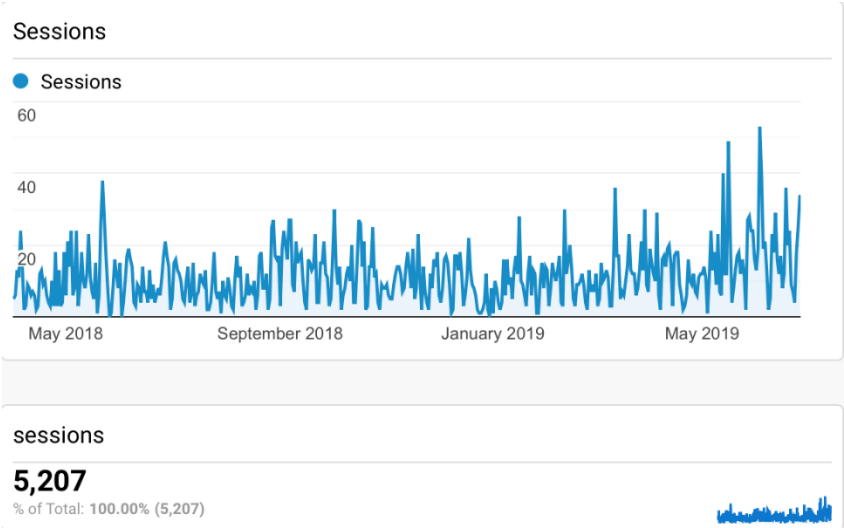

Figure 22: Sessions' distribution over time, total # of sessions and average duration

3.2 Social media presence

From its beginning, BigDataOcean has established a set of social media accounts to boost the visibility of the project and to maximise the communication means with the user communities that are relevant to the project's scope and its achievements.

Figure 23 shows the total reach, engaged users and new likes per week. The results show that users occasionally interact with BigDataOcean. In addition, a rapid increase has been observed in November 2018, when BigDataOcean participated in EBDVF'18. This demonstrates the interest of the BigData community in the technologies being developed. Similar trends are also observed in statistics extracted from the BigDataOcean Twitter account. Figure 24 highlights the tweets, likes and impressions capturing the reachability of BigDataOcean Twitter account to its followers per week since the beginning of the project.

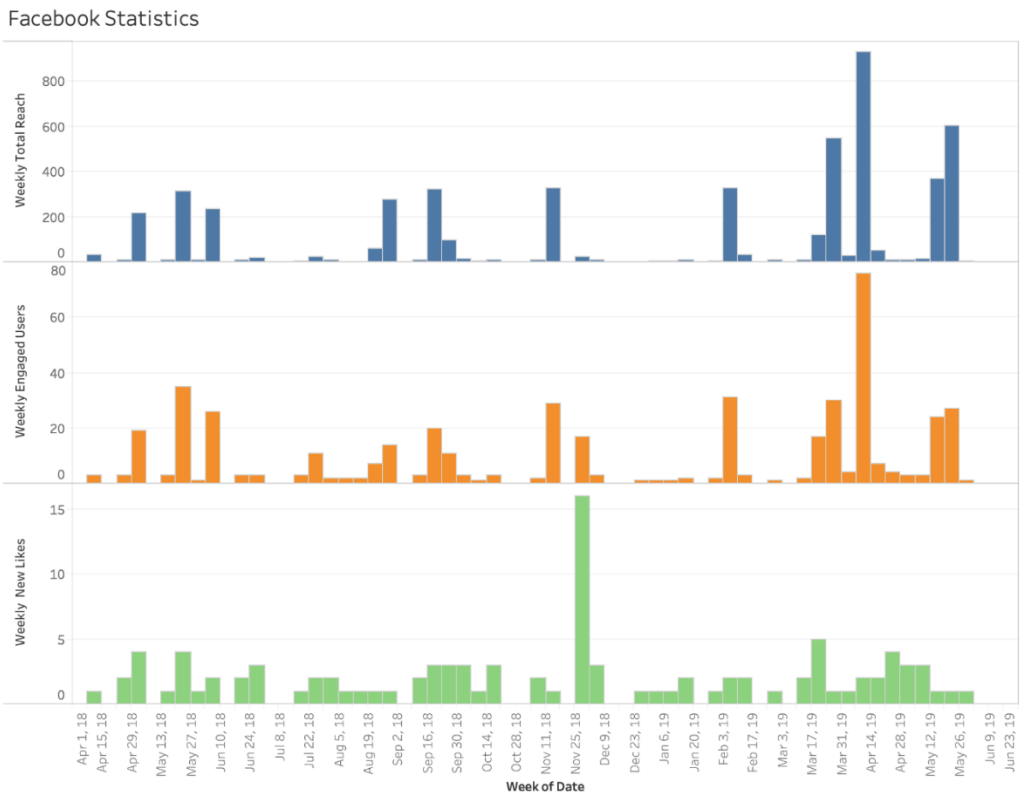

Figure 23: BigDataOcean Facebook page statistics

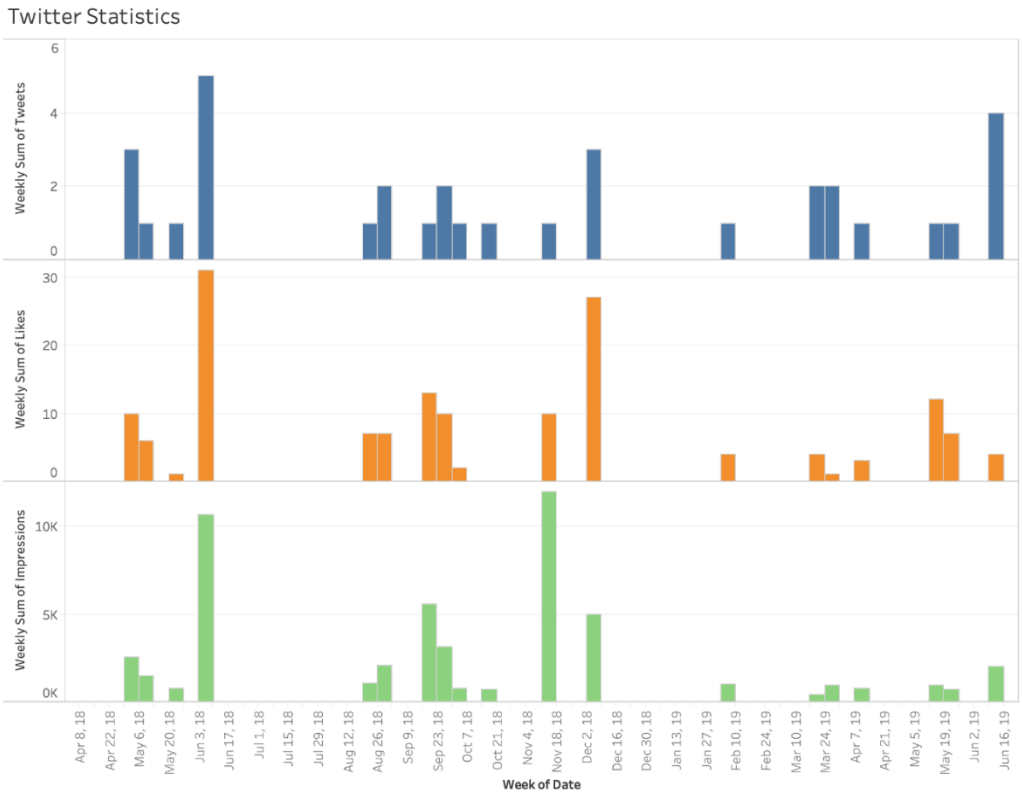

Figure 24: BigDataOcean Twitter account statistics

3.3 Project's blog

BigDataOcean website also includes two sections where news and events of the project are posted. Table 3-2 lists all the blog posts produced during the second period of the project.

Table 3-2: Blog posts of the second reporting period

#	Blog post title	Type
1	Final release of the Mare protection pilot application	News
2	BigDataOcean Ecosystem and Use Cases	News
3	BigDataOcean Wave Energy Pilot - Dissemination and Validation from External Users	News
4	Load Matching Analysis using BigDataOcean Wave Energy Services	News
5	Mare Protection Service Webinar and Training Session	News
6	Achieving 1103 Evaluations of the BigDataOcean Platform	News
7	More than 170 TB of data are available at the BigDataOcean platform	News
8	Using the BigDataOcean platform as a teaching tool	News
9	Three lessons learnt from BigDataOcean exploitation	News
10	BigDataOcean goes live!	News
11	BigDataOcean presented Anomaly Detection service at OCEANS 2019	News
12	BigDataOcean participation at NITEC 19	News
13	BigDataOcean Platform Final Release	News
14	BigDataOcean platform in now part of the BDV PPP Innovation Marketplace!	News
15	Getting started with BigDataOcean Platform!	News
16	Primary Resource Assessment in a Portuguese Offshore Renewables Pilot Zone	News
17	BigDataOcean platform use case: Assessing the impact of the variability of the resource in the electrical energy conversion	News
18	BigDataOcean platform use case: Assessment of wave resource in the coast of Portugal – Part 2	News
19	BigDataOcean platform use case: Assessment of wave resource in the coast of Portugal	News
20	Fuel Consumption Reduction Investigation	News
21	BigDataOcean is presented at the 18th Conference on Computer Applications and Information Technology in the Maritime Industries (COMPIT '19)	Events
22	AtlantOS and BigDataOcean join forces and produce a comparative study of AIS tracks and VISIR ship routing model	News
23	Making the Leap from Lab to Market: the BigDataOcean Approach	News

#	Blog post title	Type
24	A Methodology for Assessing the Impact of the Interannual Variability of Wave Energy Resource on Electrical Energy Conversion	News
25	The third release of the integrated BigDataOcean platform	News
26	Big Data Ocean platform was presented to MONGOOS workshop	News
27	BigDataOcean at the annual meeting of marine technology (H.I.M.T.)	News
28	BigDataOcean at ICT 2018	News
29	BigDataOcean at European Big Data Value Forum	News
30	Fault Prediction and Predictive Maintenance Initial results	News
31	Transforming Decision and Policy Making Through Big Data: a EGOV-CeDEM-ePart 2018 Conference Workshop	Events
32	An approach towards fuel consumption reduction	News
33	Big Data Ocean Mid-term review	News
34	First Project Review Meeting and Next Actions in ANEK's social media	-
35	BigDataOcean at ESWC 2018	Events
36	DEBS 2018	News
37	BigDataOcean at Posidonia 2018	Events
38	BigDataOcean was presented at the Maritime Big Data Workshop on the 9-10th of May in La Spezia, Italy	News
39	Platform Architecture Revisions and APIs	News
40	BigDataOcean platform first major release	News
41	BigDataOcean platform and design	News
42	BigDataOcean presence at BMDA 18	News

3.4 Traditional media and Communication Material

During the second period of the project, BigDataOcean partners have put significant effort to produce high quality printed material and therefore support the engagement and acquisition of Maritime and Energy industries related users, future costumers and other stakeholders. EXMILE designed a roll-up during M22 (i.e., October 2018) which included information relevant to the project's objective, its pilot services, the consortium, etc., as depicted in Figure 25. The rollup was printed in multiple copies so that BigDataOcean partners could attend more than one events running in parallel.

Figure 25: BigDataOcean rollup

Furthermore, the four pilot flyers produced in the first reporting period have been redesigned aiming to adjust communication to target audience (Maritime and Energy industries) and directly communicate benefits to the BigDataOcean users. The front page of each flyer is common for all pilots including general information about the project. The back page of each flyer is dedicated to the corresponding pilot service, including the pilot's main goal and description, together with the contact points. The content of the flyers is depicted in Figure 26. Furthermore, EXMILE prepared one poster during the last year of the project, see Figure 27, which was presented during the IEEE OCEANS 2019 event. The poster is related to Pilot 3 – Maritime Security and Anomaly Detection services. Finally, BigDataOcean partners have prepared a banner shown in Figure 28 below, which has been used in exhibition booths. The banner introduces the four pilots of the BDO platform.

Finally, the project has produced four videos, used to promote the BigDataOcean platform and its services to related stakeholders. The videos are available at the project's Youtube channel[30] and also shared in other platforms (e.g. BigDataOcean LinkedIn group and the Facebook page).

[30] https://www.youtube.com/channel/UCSdjZHwPHA3m3bQCccvOdTg

Figure 26: BigDataOcean Pilot flyers

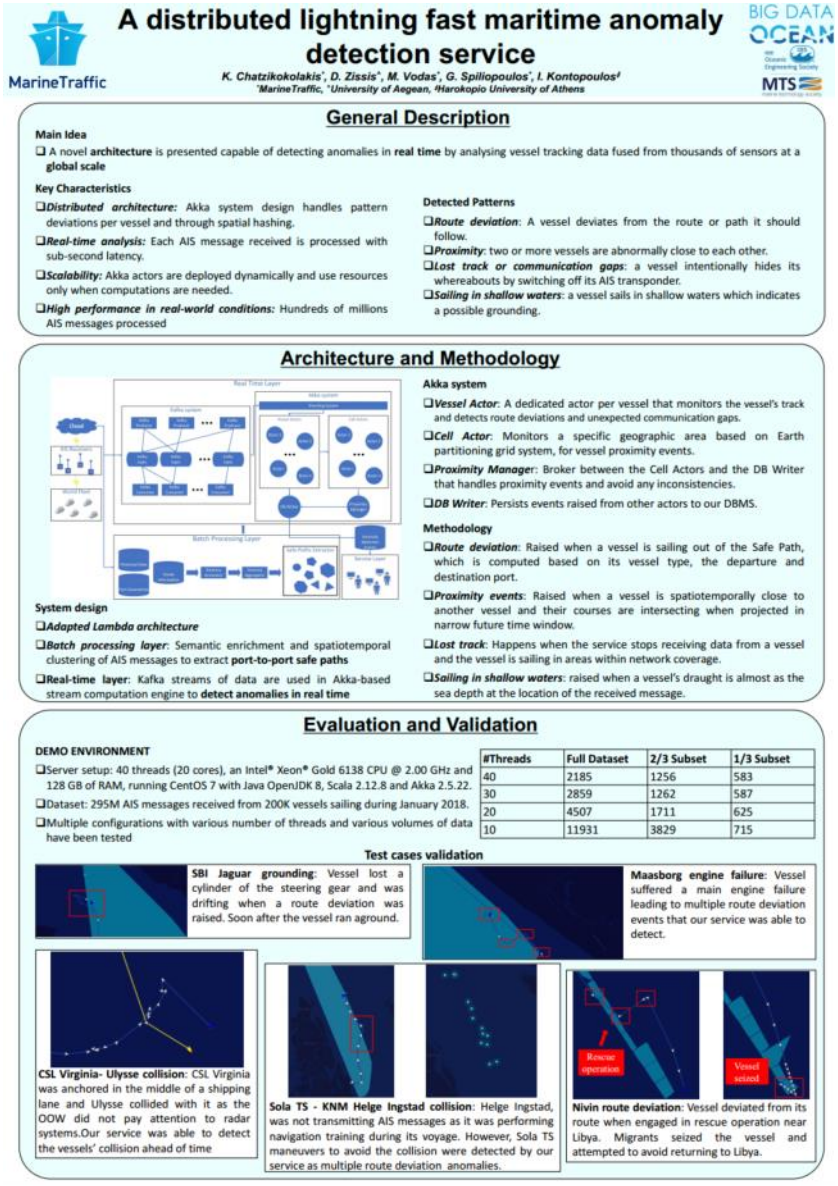

Figure 27: BigDataOcean poster for Pilot 3 (presented in Poster Session of OCEANS'19)

Figure 28: BigDataOcean banner

4 Data Collected and Generated During the Project

During the whole duration of BigDataOcean project more than 200 datasets have been added to the BigDataOcean platform. More specifically, the BDO platform hosts more than 170 TB of data retrieved from 17 data sources including 209 distinct datasets from 223 data providers. The full list of the datasets and their description is presented in Annex I of deliverable D5.6 "BigDataOcean Platform Final Release". **The vast majority of those datasets (i.e., 204 out of the 209 dataset) are open and can be used freely from the BDO platform users**.

The following table lists only the private data that are hosted in BDO platform. This data can be shared with other BigDataOcean platform users only with the prior consent of the dataset owner.

Table 4-1: Proprietary Data hosted in BDO platform

BigDataOcean Platform's Datasets					
No	**Dataset Name**	**Dataset Description**	**Number of Rows**	**Total Size (GBs)**	**Owner**
1	ANEK EPOS History Data	Travel information from ANEK's EPOS system	8,267,209	5.2791	ANEK
2	ANEK Epos History Data	Journey information from ANEK's EPOS system	6,453	0.0131	ANEK
3	FOINIKAS Tanker Trips	Trip information regarding FOINIKAS' tankers	1,422	0.0034	FOINIKAS
4	EXMILE AIS	The dataset includes the positional data of vessels that have been received by the MarineTraffic(Exmile) private AIS receivers network during 2010. This data collection contains dynamic information such as time-series observations of latitude, longitude, course over ground, speed over ground as well as a set of static information such as vessel's identification information (e.g., IMO, MMSI, etc.) that are periodically transmitted from vessels	533,836,530	107.34	EXMILE
5	EXMILE Real Time AIS	Live AIS data coming directly from vessels' AIS receivers via the XMILE API	42,532	0.5924	EXMILE

Finally, each pilot user is the owner of any datasets that are produced through data analysis performed upon any of the datasets hosted in the BDO platform. The pilot user then can share the produced dataset with any other BDO platform user.

5 Conclusion

As the last deliverable of WP8 "Dissemination and Communication Activities", this document aims to: i) report the dissemination and communication activities carried out during the second reporting period of the BigDataOcean project (M16-M30); and ii) address the data collected and generated during the entire project and the respective future access.

Following the dissemination and communication plans defined in D8.4 "Communication and Stakeholder Engagement Report and Plan for Second Reporting Period" several dissemination and communication mechanisms were used to engage with the Maritime and Energy industries related users, hence reverting the tendency to address the Big Data Community that the project had targeted in the first period. As an example, from the 29 (external) dissemination events attended during the second reporting period, about 70 % had the Maritime Industry as target audience where several industry contact points were stablished. If to this, one adds the internal events at partners' premises (e.g. Demo Events), this ratio will even be better as most of those events where directed to maritime related stakeholders.

In total, 95% of the KPIs were successfully achieved or surpassed (100% if dissemination alone is considered). Additionally, the dissemination and communication activities supported the achievement of other objectives, like gathering 755 evaluations for the BigDataOcean platform during the second reporting period (more than 1100 in total) with about 70% of the evaluators coming from the Maritime or Energy industries (the Maritime industry alone contributed with 443 evaluations (approximately 60%) in the second reporting period). Table 5-1 summarises the results collected for all dissemination and communication KPIs.

Table 5-1: Dissemination and communication mechanisms and associated KPIs

Mechanism	Related KPIs	Target M16-M30	Achieved M16-M30	Achieved M1-M30
D1 "Organisation of project events"	Number of workshops organised	4	5	14
	Number of hackathons organised	2	2	2
	Number of demo events	4	6	6
D2 "Participation to conferences and workshops"	Number of attended events	19	29	50
	Number of events with project's presentation	14	19	30
	Number of project's demo booths	3	6	6
D3 "Publications"	Number of conference papers	7	13	21
	Number of journal papers	4	4	4
	Number of articles in trade press	16	16	16[31]
D4 "Community building/ engagement with stakeholders"	Number of industry contact points	241	250	309
	Number of industry communities informed about the project	22	30	38
	Number of webinars	4	5	5
D5 "Collaboration	Number of projects with synergies	4	8	19

[31] This metric was not available in the first reporting period, thus the value of M16-M30 is equal to the M1-M30

and synergies with projects"	Number of joint activities	3	5	12
D6 "Internal dissemination in partner's networks"	Number of internal partners' events	9	14	15
	Number of links to the project's website	14	15	51
	Number of training sessions	4	4	4
D7 "Standardisation contributions"	Number of working groups	2	7	8
	Number of project's presentations in standardisation meeting (online of offline)	5	5	6
C1 "Project's Website"	Number of unique visitors	3 293	3 344	6051
	Average duration of visits (min)	2	2:42	2:28
	Number of page views	11 785	13 427	25 212
C2 "Social media presence"	Number of accumulative followers in social media channels	824	255	431
	Number of accumulative posts	942	101	159
	Number of interactions in social media	208	1 099	1 391
C3 "Website Content"	Number of sections dedicated to pilots	4	4	4
	Number of blog-posts in website	40	42	62
	Number of interactions	109	143	234
C4 "Traditional media"	Number of press releases	8	9	9
C5 "Communication material"	Number of project's factsheets/ brochures and banners	5	8	13
	Number of pilot specific posters and flyers	4	4	8
	Number of e-Newsletter	7	8	8
	Number of videos	1	4	5
	Number of blog posts in EC mechanisms	3	3	9
	Number of e-Newsletter registered users	200	298	350
	Number of times videos watched	100	329	329[32]
	Number of views per blog post	100	142	142[33]

[32] This metric was not available in the first reporting period, thus the value of M16-M30 is equal to the M1-M30

[33] This metric was not available in the first reporting period, thus the value of M16-M30 is equal to the M1-M30