The SmartShip project has received funding from the European Union's Horizon 2020 research and Innovation programme under the Marie Skłodowska-Curie grant agreement No 823916

Project Acronym:	**SmartShip**
Project Full Title:	**A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels**
Project Duration:	**48 months (01/04/2019 – 31/03/2023)**

Deliverable 1.2: Mid-term project meeting

Work Package	**WP1 – Project management and secondments coordination**
Task	**T1.1 – Administrative project management**
Document Status:	**Draft v0.5**
Due Date:	**M14**
Submission Date:	**23.10.2020**
Lead Beneficiary:	**DANAOS Shipping Co Ltd**

Dissemination Level

Public	X
Confidential, only for members of the consortium (including the Commission Services)	

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Executive Summary

This deliverable is in line with Article 19.1 of the Grant Agreement 823916 and provides the mid-term project meeting report of the SmartShip project funded by the Horizon 2020-MSCA-RISE-2018 Action.

The deliverable includes the structure of the Mid-Term project meeting (agenda), the consolidated presentations that were presented to the Project Officer of the European Commission (only representative of the EU) by the plenary of the partners of the SmartShip consortium, together with recorded and approved by all attendees Minutes of Meeting (MoM).

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List of Acronyms and Abbreviations

Term	Description
ADM	Administrative
AIS	Automatic Identification System
CE	Circular Economy
CI/CD	Continuous Integration/ Continuous Delivery
DHCP	Dynamic Host Configuration Protocol
ER	Experienced Researcher
ESR	Early Stage Researcher
EU	European Union
GA	Grand Agreement
H2020	Horizon 2020 Programme
ICT	Information and Communication Technology
IoT	Internet of Things
KPI	Key Performance Indicator
LCPA	Life Cycle Performance Analysis
MoM	Minutes of Meeting
PO	Project Officer
WP	Work Package

Partners Short Name	
DANAOS	DANAOS SHIPPING COMPANY LIMITED
ITML	INFORMATION TECHNOLOGY FOR MARKET LEADERSHIP
EPS	EPSILON MALTA LIMITED
ENPC	ECOLE NATIONALE DES PONTS ET CHAUSSEES
BLS	BLUESOFT SPOLKA Z OGRANICZONA ODPOWIEDZIALNOSCIA
TUBS	TECHNISCHE UNIVERSITAET BRAUNSCHWEIG
HUA	HAROKOPIO UNIVERSITY

1. Introduction

1.1. Scope and objectives of the deliverable

On 18th of September 2020, a virtual (online) meeting between SMARTSHIP consortium and project's PO was held. The meeting is contractual obligation under GA (as a project deliverable), is titled Mid-Term project meeting and has the following main objectives:

- to enable interaction between main project stakeholders (EU and beneficiaries),
- to present the work done up to M18 of the project timeline for each project work package,
- to report any issue, deviation or known-unknown risk recorded and
- to design work plan for the future.

In this context, scope of this deliverable is to portray the structure of the meeting, to deliver a consolidated report with the presentations that have been delivered by members of the consortium and to display the notes of meeting as recorded and approved by all attendees.

1.2. Structure of the deliverable

The deliverable is comprising of three main sections.

1. Structure, details, and layout of the meeting by displaying official meeting agenda.
2. Presentations of the meeting containing information on work packages progress, project issues and deviations from plan, secondment status, deliverables, and action plan for the next project period
3. Approved by all attendees' minutes of meeting

Deliverable concludes with some remarks and highlights as recorded in Mid-Term review meeting.

1.3. Relation to Other Tasks and Deliverables

Deliverable has strong reference with all activity recorded in WPs up to M18 of project's time plan. Active tasks for the period in reference are all project tasks (under GA) excluding T3.3, T4.3, T5.3 and all tasks of WP6. Finally, this report refers to all deliverables submitted to EU up to M18, specifically:

- D1.1: First-year progress report including initial exploitation, dissemination, and training plans
- D2.1: SmartShip requirements analysis, scenarios and KPIs definition
- D7.1: Data Management Plan

2. SmartShip Mid-term Meeting Agenda

SmartShip - Project ID: 823916

A data analytics, decision support, and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption, and emissions management of vessels

Review Meeting

Athens, 18 September 2020

Project ID:	823916
TOPIC:	MSCA-RISE-2018 Research and Innovation Staff Exchange
Starting date :	01/04/2019
Duration in months:	48
Consortium	DANAOS (Leader), ITML, EPS, ENPC, BLS, TUBS, HUA

Contact Details:
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Email: drc@danaos.gr
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The SmartShip project has received funding from the European Union's Horizon 2020 research and Innovation programme under the Marie Skłodowska-Curie grant agreement No 823916

AGENDA

Meeting Date	18-SEP-2020, 09:30-16:30 (CET)
Location	Review Meeting Remote
Minutes taker	WPLs will provide a summary of the discussion

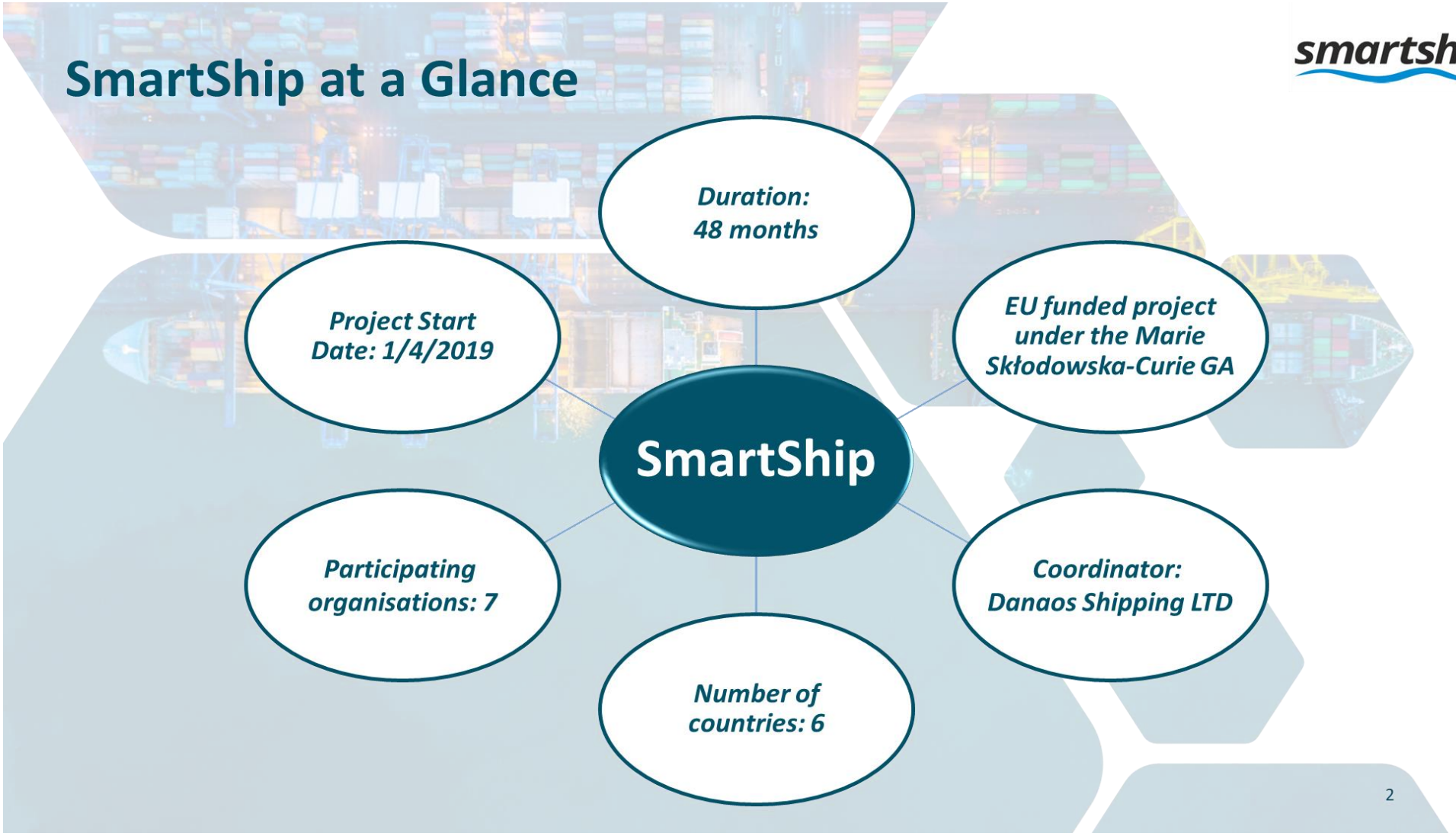
Friday, 18 September 2020		
Time (CET)	**Topic**	**Responsible partner**
09:30 – 09:40	Welcoming	DANAOS / ALL
09:40 – 10:00	Round the table introduction	ALL
10:00 – 10:30	Project overview	DANAOS
10:30 – 10:45	**WP1 Meeting**	
WP1 Project Management and Secondments Coordination • Project Management • Communication Tools • Quality management • Risk Management & Contingency planning • Secondment tracking		DANAOS
10:45 – 11:00	**WP2 Meeting**	
WP2: Requirements elicitation, use case scenarios, and roadmaps for integrated vessel management • Overview and plans • Deliverables and implementation • Next steps		HUA
11:00 – 11:15	**WP3 Meeting**	
WP3: SmartShip Circular-Economy based functional architecture design • Overview and plans • Deliverables and implementation • Next steps		ENCP
11:15 – 11:30	**Coffee Break**	
11:30 – 11:45	**WP4 Meeting**	
WP4: SmartShip Baseline framework: IoT and advanced data analytics • Overview and plans • Deliverables and implementation • Next steps		ITML
11:45 – 12:00	**WP5 Meeting**	
WP5: SmartShip Decision Support System and multi-layer optimization module • Overview and plans • Deliverables and implementation • Next steps		BLS
12:00 – 12:15	**WP6 Meeting**	
WP6: Integrated SmartShip Framework • Overview and plans • Deliverables and implementation • Next steps		EPS

12:15 – 12:30	**WP7 Meeting**	
<u>WP7: Dissemination, exploitation, and training management</u> • Overview and plans • Deliverables and implementation • Next steps		ENPC
12:30 – 13:30	**Lunch Break**	
13:30 – 14:00	**Secondments**	
• **Secondments implementation** • **Deviations from the initial work plan**		DANAOS
14:00 – 15:00	**Meeting with Project Officer**	
• **Meeting between seconded staff members and the Project Officer**		
15:00 – 15:15	**Coffee Break**	
15:15 – 16:15	**Open Discussion**	
16:15 – 16:30	**Conclusion & Next steps**	
16:30	**Closure of the meeting**	

3. Presentations

3.1. Smartship Project Overview

Smartship at a Glance



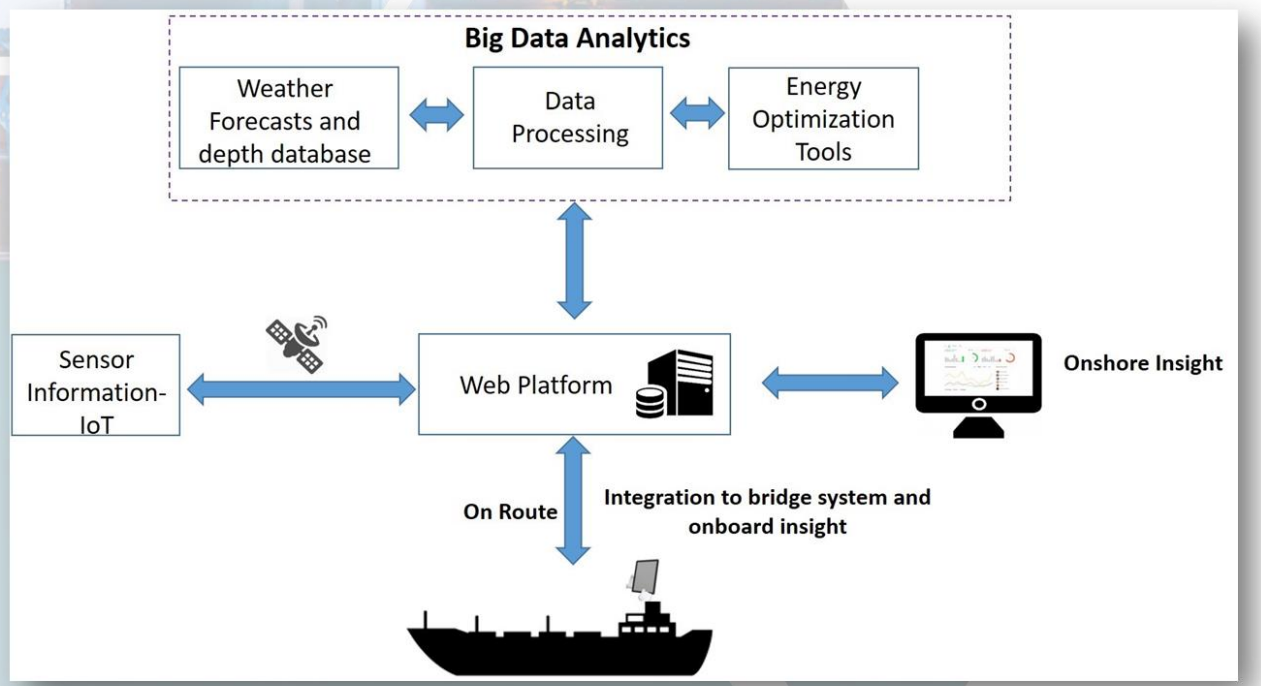
Smartship Consortium

Smartship Vision

SmartShip Vision

A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels

SmartShip aims to offer a multi-layer optimization in the fields of fuel consumption, energy efficiency and emissions control management, in full respect to the implementation of the requirements of maritime sector regulations and taking into account applications of circular economy concepts in the maritime as well



4

Smartship Objectives

SmartShip Objectives

- *Describe and identify marine market needs in energy efficiency and emissions control.*
- *Foster knowledge exchange between academic and non-academic experts in the fields of IoT, Data analytics, decision support and optimization.*
- *Design and develop a Data Analytics and a Decision Support Tool.*
- *Enhance the implementation of Circular Economy in the maritime field in terms of management of engines' components.*
- *Offer a holistic framework for energy efficiency and emissions control in maritime for optimizing the efficiency of daily operations.*
- *Demonstrate system effectiveness based on real-life use cases towards the reinforcement of the European Maritime Industry.*
- To develop new *long-lasting* research collaborations, achieve transfer of knowledge between participating organizations, and foster improved research and innovation potential.

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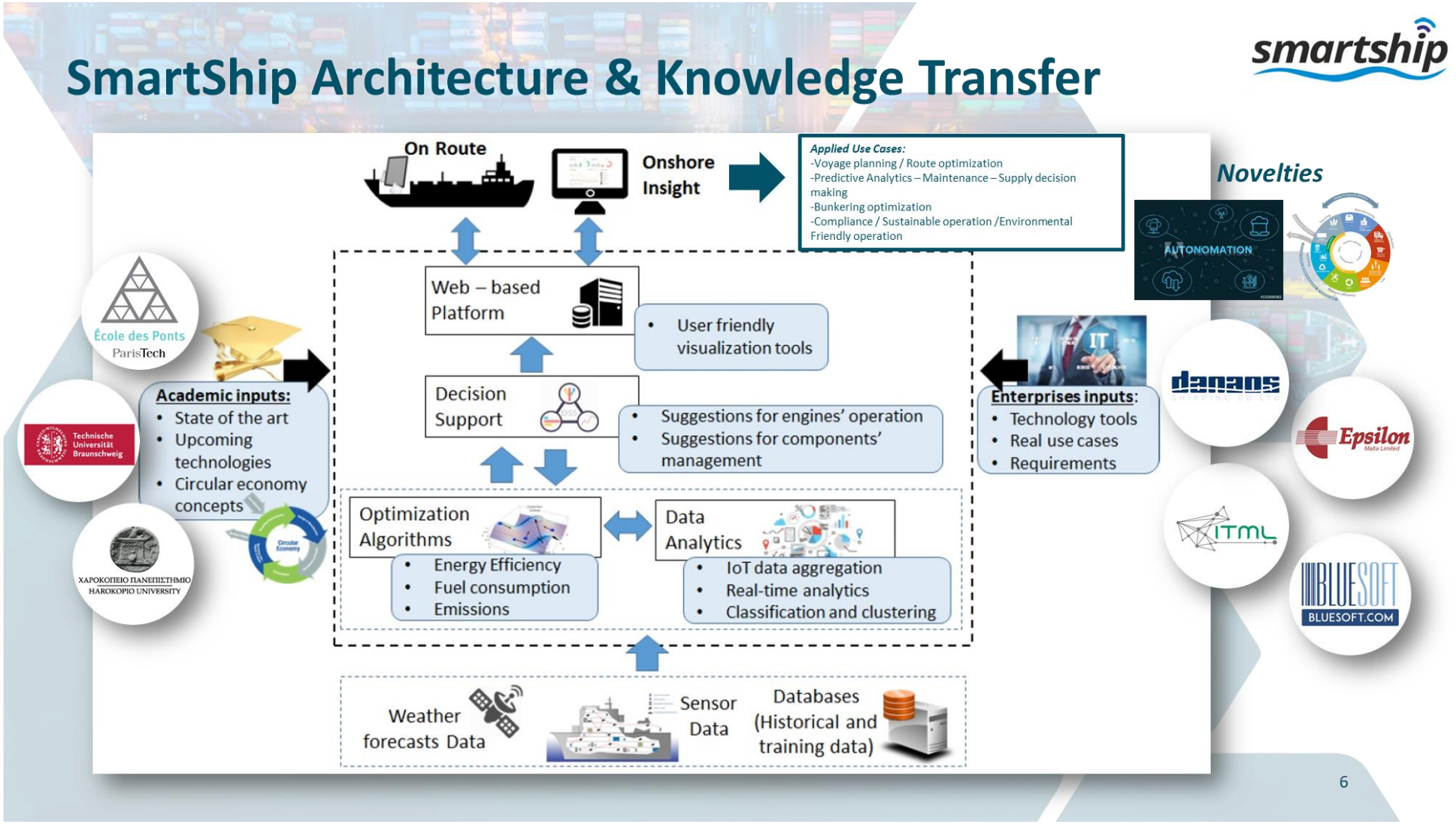
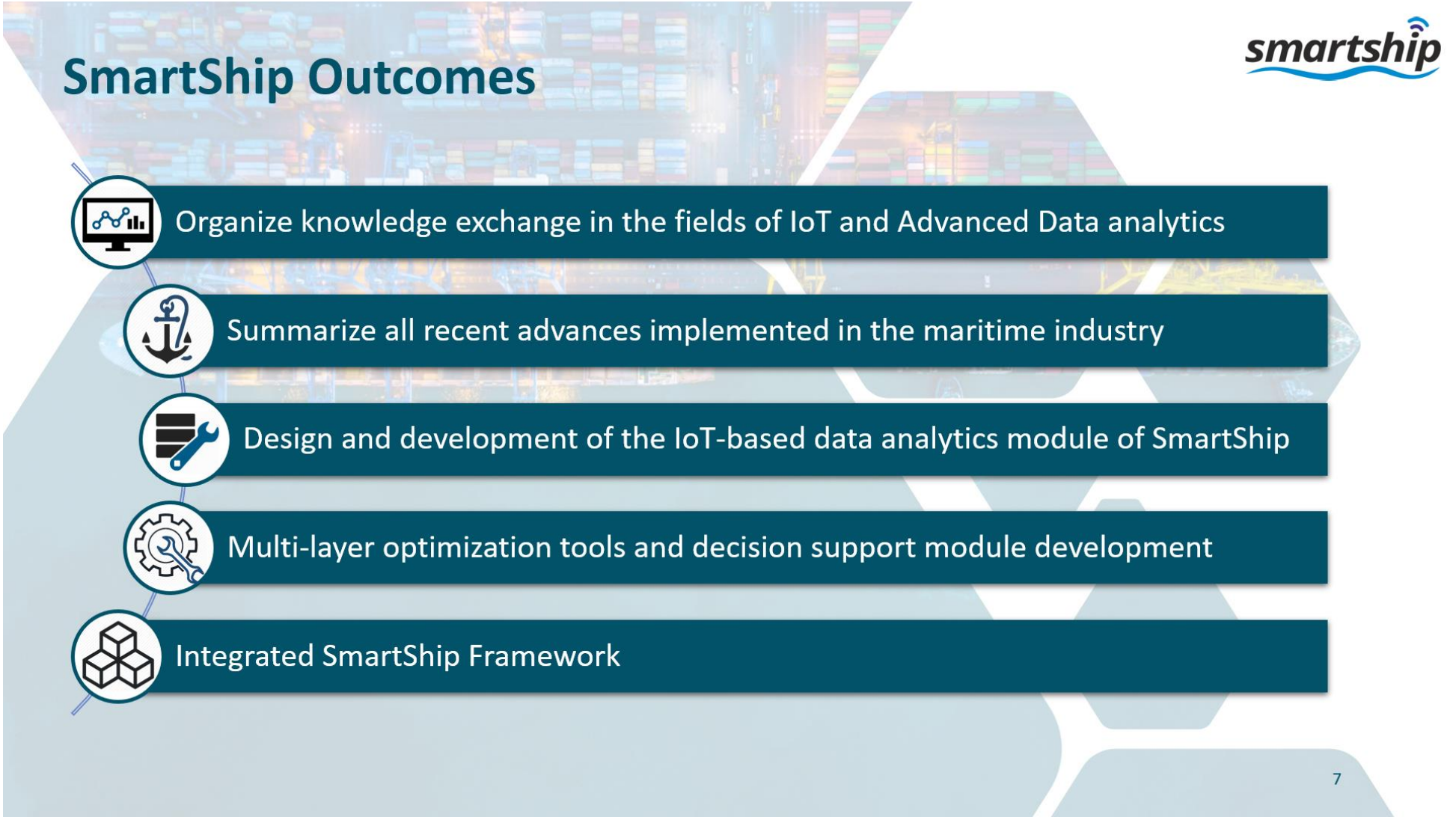
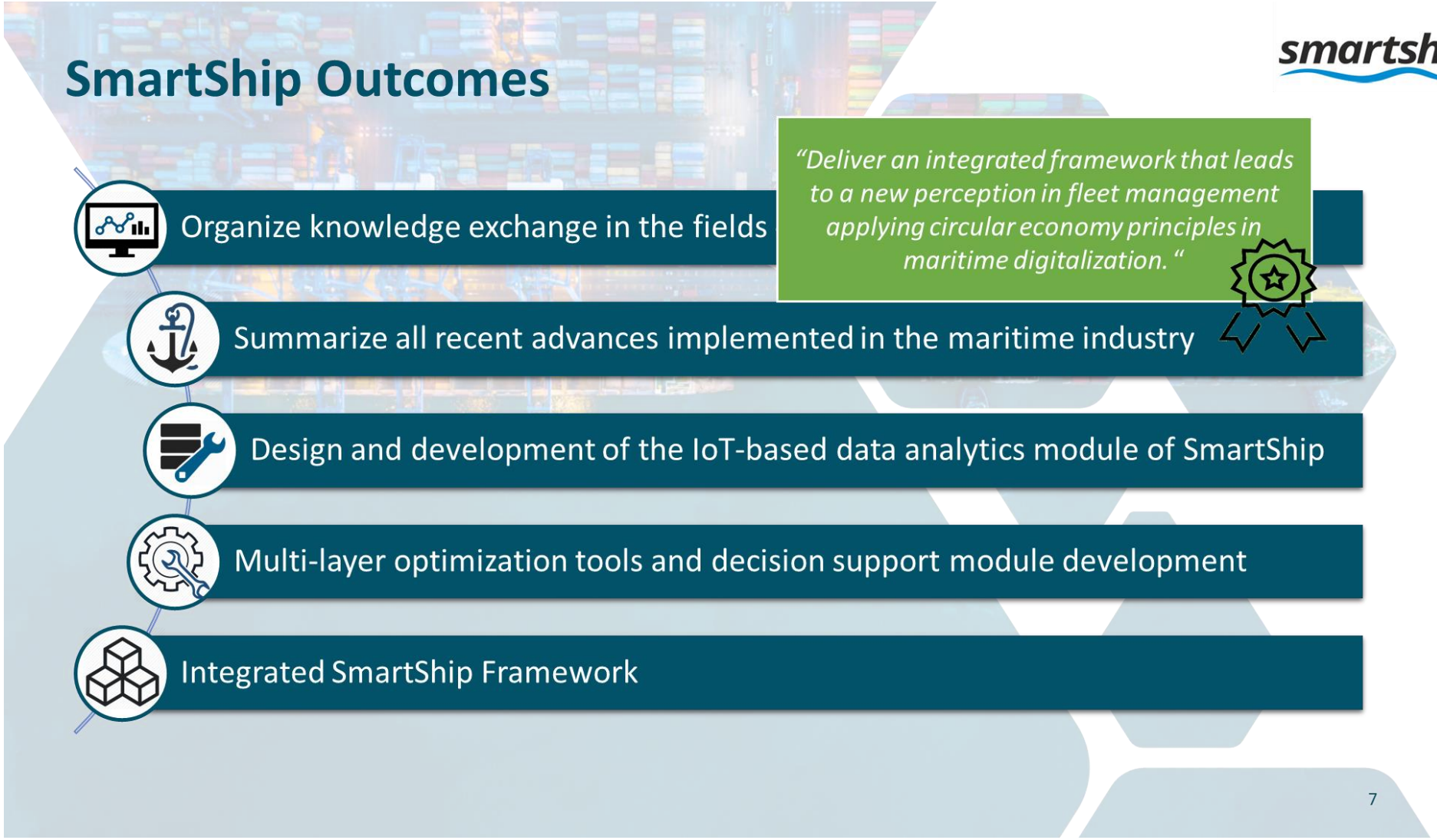
Smartship Architecture & Knowledge Transfer



Smartship Outcomes #1

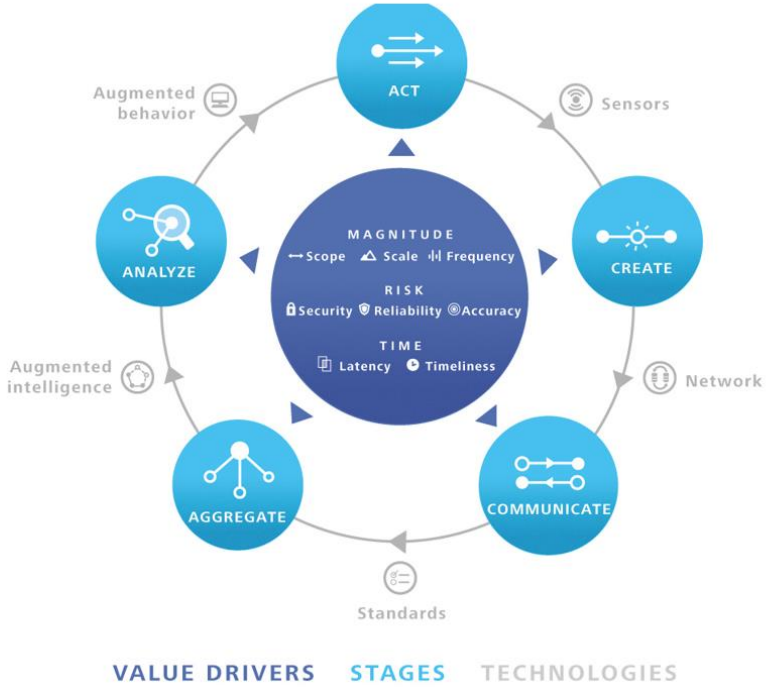


Smartship Outcomes #2



Approach | Workpackages

- **WP1**: Project Management & Secondments coordination
- **WP2**: Requirements elicitation, use case scenarios and roadmaps for integrated vessel management
- **WP3**: Smartship Circular-Economy based functional architecture design
- **WP4**: Smartship Baseline framework: IoT and advanced data analytics
- **WP5**: Smartship Decision Support and multi-layer optimization module
- **WP6**: Integrated Smartship framework, validation and piloting
- **WP7**: Dissemination, exploitation and training management



Approach | Workpackages

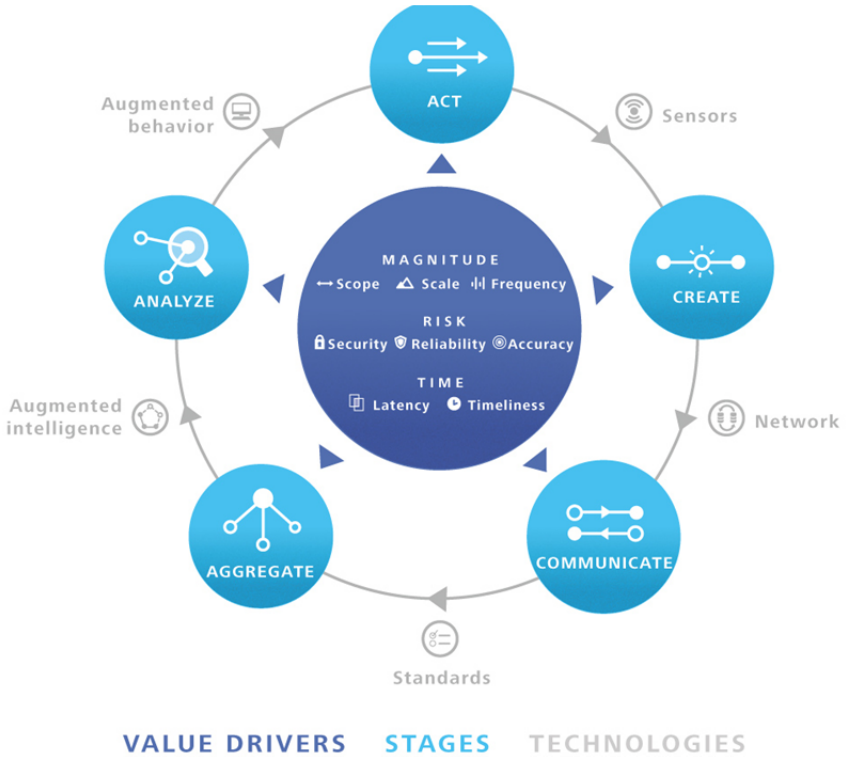
- **WP1**: Project Management & Secondments coordination
- **WP2**: Requirements elicitation, use case scenarios and roadmaps for integrated vessel management

Knowledge Exchange and definition phase

- **WP3**: Smartship Circular-Economy based functional architecture design
- **WP4**: Smartship Baseline framework: IoT and advanced data analytics

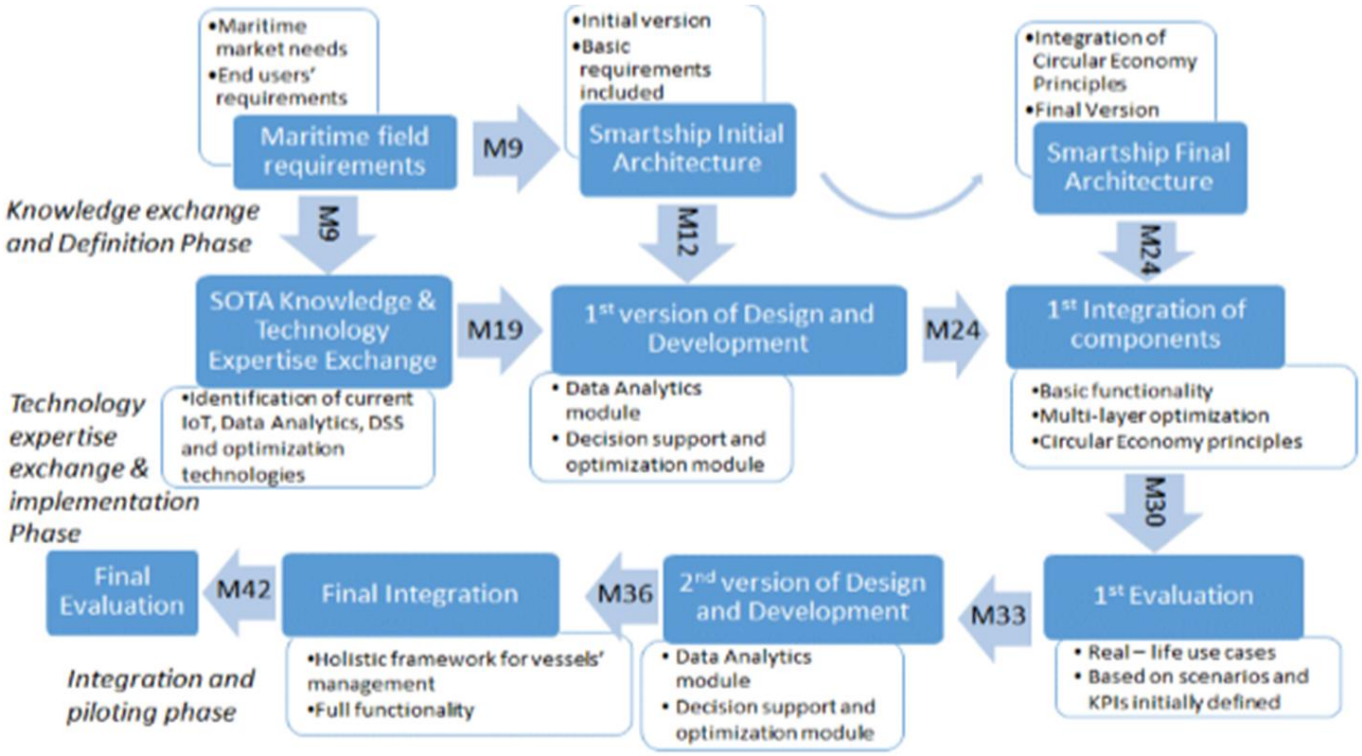
Technology Expertize Exchange & Implementation phase

- **WP5**: Smartship Decision Support and multi-layer optimization module
- **WP6**: Integrated Smartship framework, validation and piloting
- **WP7**: Dissemination, exploitation and training management



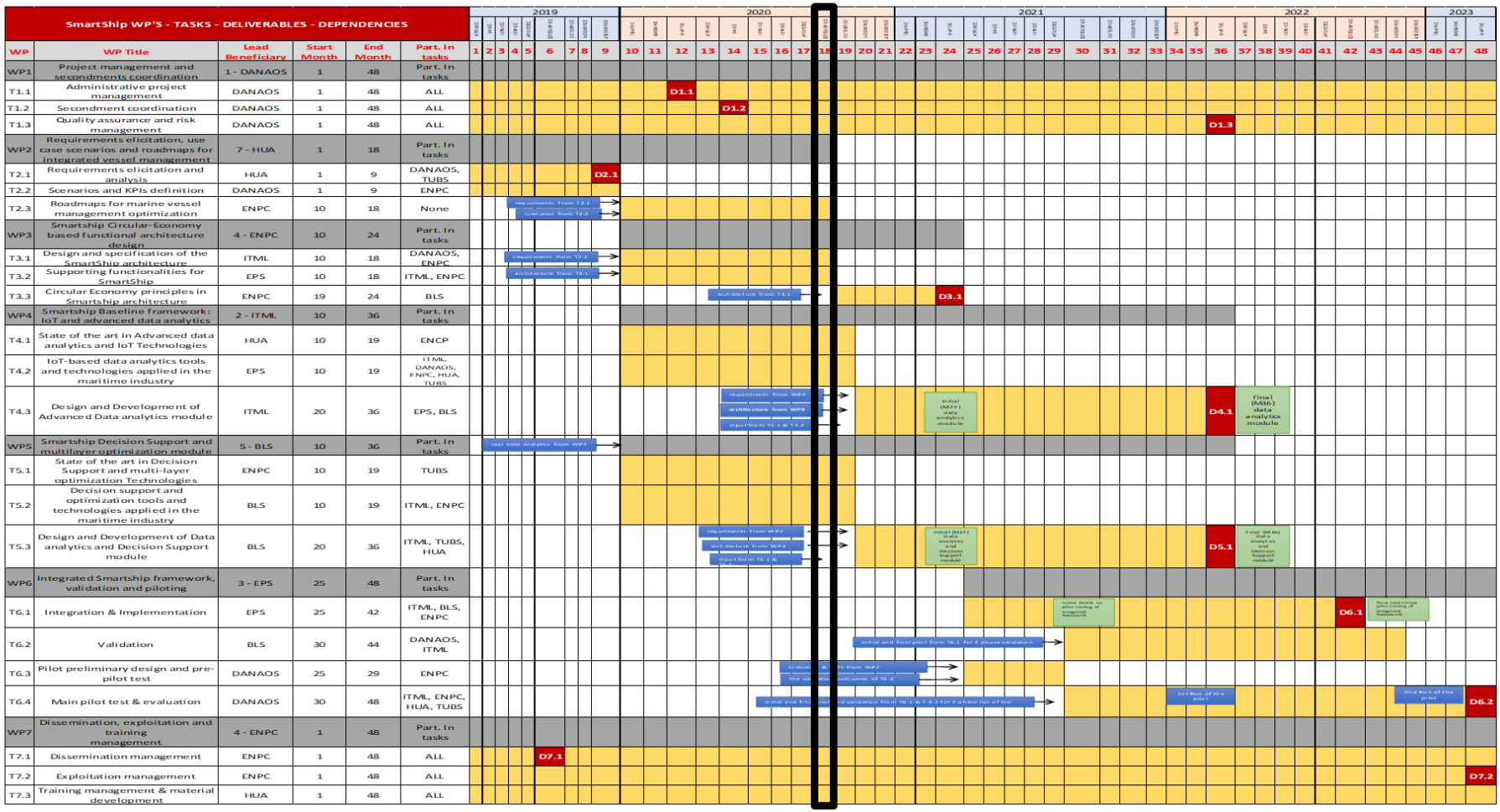
Methodology Rollout

Methodology Rollout



Gantt Chart

Gantt Chart



Deliverables

Deliverables

No.	Title	Leader	Type	Dissemination Level	Due Date (in months)	Date Of Submission (in months)	Status
D1.1	First year progress report including initial exploitation, dissemination and training plans	DANAOS	Report	Public	12	13	SUBMITTED
D1.2	Mid-term project meeting	DANAOS	Other	Public	14		PENDING
D1.3	Third year progress report	DANAOS	Report	Public	36		ACTIVE
D2.1	SmartShip requirements analysis, scenarios and KPIs definition	HUA	Report	Public	9	9	SUBMITTED
D3.1	SmartShip circular economy-based functional architecture	ENPC	Report	Public	24		ACTIVE
D4.1	IoT applied tools and technologies and data analytics module	ITML	Demonstrator	Confidential, only for members of the consortium (including the Commission Services)	36		ACTIVE
D5.1	Decision support module and multi-layer optimization tools and technologies	BLS	Demonstrator	Public	36		ACTIVE
D6.1	Integrated SmartShip framework	EPS	Demonstrator	Public	42		ACTIVE
D6.2	Report on final pilot design and implementation	DANAOS	Demonstrator	Public	48		ACTIVE
D7.1	Data Management Plan	ENPC	ORDP: Open Research Data Pilot	Confidential, only for members of the consortium (including the Commission Services)	6	6	SUBMITTED
D7.2	Overall Smartship framework demonstration/ exhibition activity	ENPC	Demonstrator	Public	48		ACTIVE

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smartship
Thank you!
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3.2. SmartShip Review Meeting WP1 progress

smartship

A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels

Review Meeting
Athens, 18.09.2020

WP1: Project management and secondments coordination

Beneficiary: DANAOS Shipping

Presenter: Fotis Oikonomou

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WP1 Overview #1

WP1 Overview

Work package number	WP1	Lead beneficiary	DANAOS
Work package title	Project management and secondments coordination		
Start month	1	End month	48
Involved Partners	ALL		

Tasks No	Description	Leader - Partners	M(st.) – M(en.)
T1.1	Administrative project management	DANAOS - ALL	M1-M48
T1.2	Secondment coordination	DANAOS - ALL	M1-M48
T1.3	Quality assurance and risk management	DANAOS - ALL	M1-M48

SmartShip - WP1

2

WP1 Overview #2

WP1 Overview

Objectives

- *Project* is *coordinated* and managed in an *efficient and effective* way
- The required quality of the work and *results are guarantee*
- Provides a good controlling mechanism and fast response time to *management requests and conflict resolution*
- Ensure that *proper quality standards* are met within the project and included in the management reports to the commission. (internal & external reviews, self-assessment, etc.)

WP1 Deliverables

WP1 Deliverables

No.	Title	Leader	Type	Dissemination Level	Due Date	Data of Submission	Status
D1.1	First year progress report including initial exploitation, dissemination and training plans	DANAOS	Report	Public	12	13	SUBMITTED
D1.2	Mid-term project meeting	DANAOS	Other	Public	14	N/A	PENDING
D1.3	Third year progress report	DANAOS	Report	Public	36	N/A	ACTIVE

Task 1.1: Administrative project management

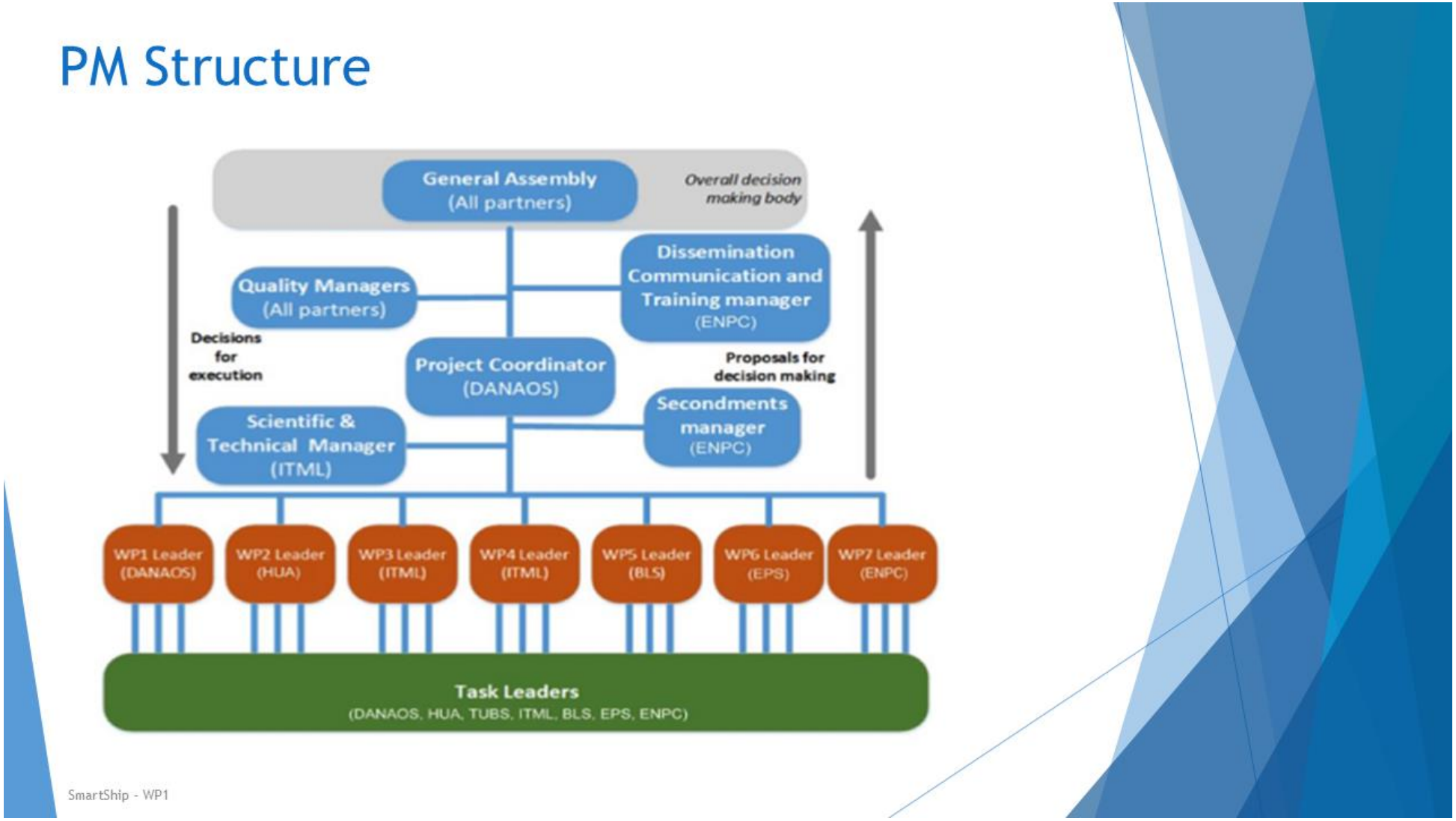
Task 1.1: Administrative project management

- **Duration: M1-M48**
- **LEADER:** DANAOS **CONTRIBUTORS:** ALL PARTNERS

Focus

- Project management and coordination with all the functions, committees and responsibilities (As per G.A)
  - **Administration/communication/monitoring/reporting**: The organization of the *Management and Evaluation Team of the project, the reporting within the project and towards the Commission* (Quarterly and Periodic Reports), *the financial auditing and distribution of the funds*

PM Structure



Task 1.1: Work Implementation

Task 1.1: Work Implementation

- **Consortium Agreement** prepared and signed copies shared with each partner **on time**
- **Pre-Financing payment** distribution to partners without delay
- Preparation and structuring of a **common online document repository and management tool**. **Google drive** was selected and organized with special folders each associated with project demands in terms of administrative, reporting, project progress, and secondment tracking.
- **Templates** for WP progress report, deliverable layout, meeting notes, dissemination action recording, quality control checklist, secondment report, secondment plan tracking, and presentation layout (ppt) were prepared.
- **Zoom** as a meeting tool was initially selected for bilateral and consolidated consortium **online communication**. **Changed to MS teams** recently
- **Reporting and Progress monitoring: Organization of monthly telcos** with the participation of all partners for work progress updates, Secondment status, discussion for any issue or deviation recorded, and scheduling of action plan. **A bi-monthly WP progress report document** is prepared by WP leaders in liaison with task leaders for monitoring project rollout.
- Set-up, preparation, and management of **physical meetings** for technical coordination and project progress evaluation was conducted (**Kick-off, one progress , two technical meetings**)

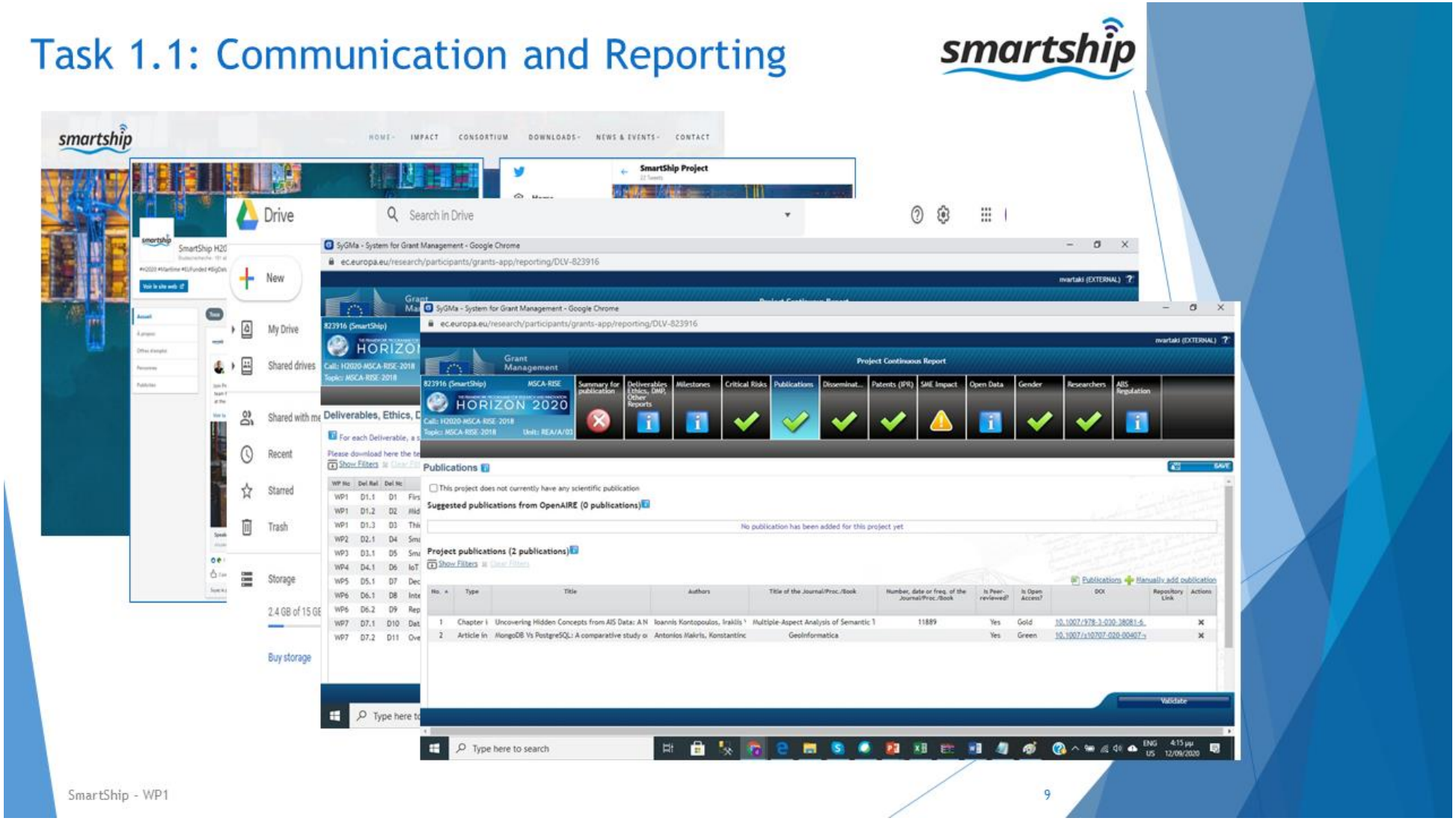
SmartShip - WP1 7

Task 1.1: Communication Management

Task 1.1: Communication Management

- **Website:** https://smartship2020.eu/
- **Online communication standard tool:** *Microsoft Team*
- **Social network:** Twitter *(#Smartship2020)*, Linkedin *(SmartShip H2020)*
- **Mailing list:** smartship@lists.itml.gr
- **Document repository:** https://drive.google.com/drive/u/0/folders/1G1la28EfvwdgEh0396cHNq-XHGX74dyz

Task 1.1: Communication and Reporting



Task 1.2: Secondment Coordination

Task 1.2: Secondment Coordination

- **Duration: M1-M48**
- **LEADER:** DANAOS **CONTRIBUTORS:** ALL PARTNERS

Focus

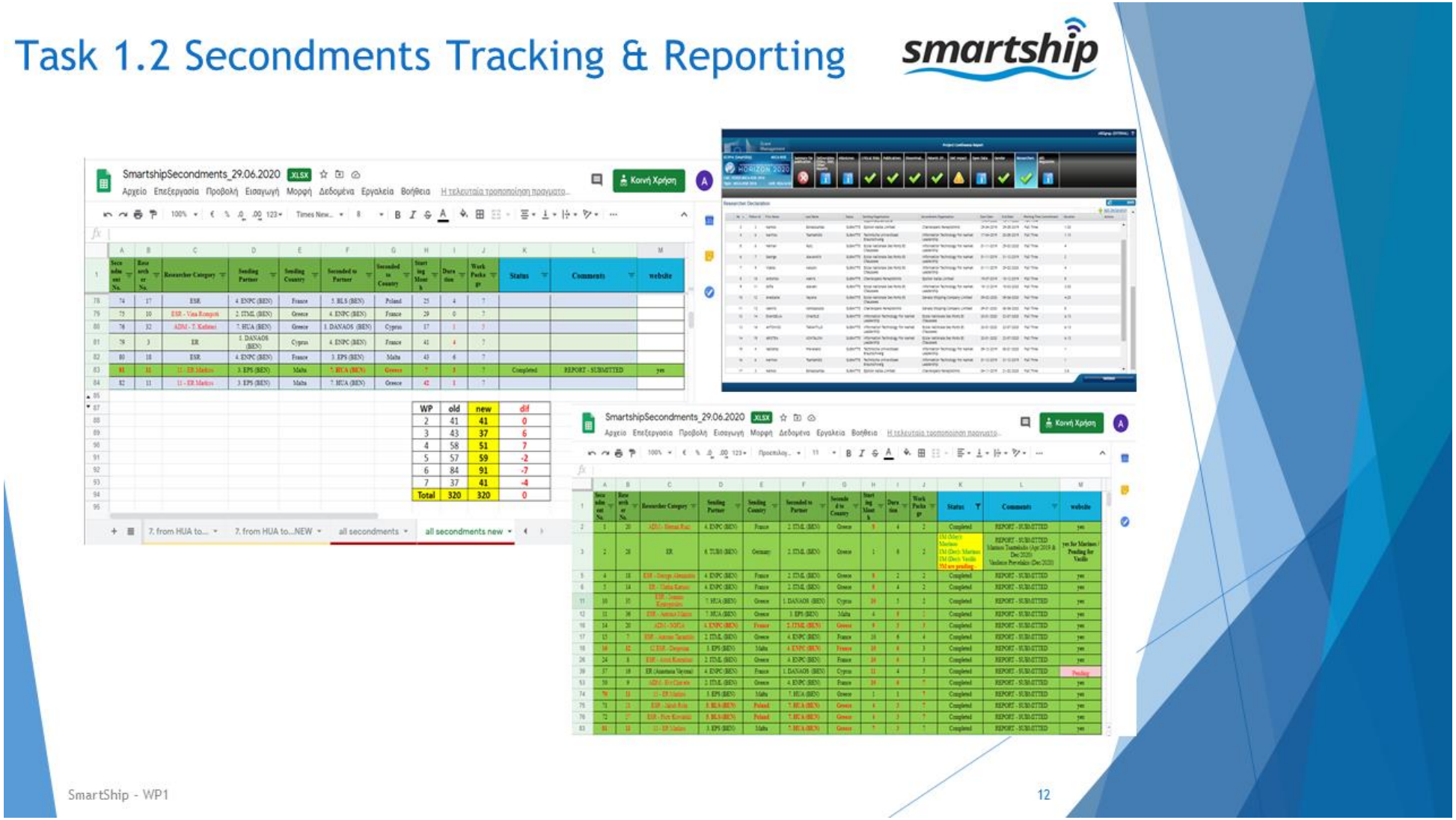
- The focus of this Task is to have an overview of the secondments between partners and the quality and quantity of knowledge exchanged within these secondments

Task 1.2: Secondment Coordination & Tracking

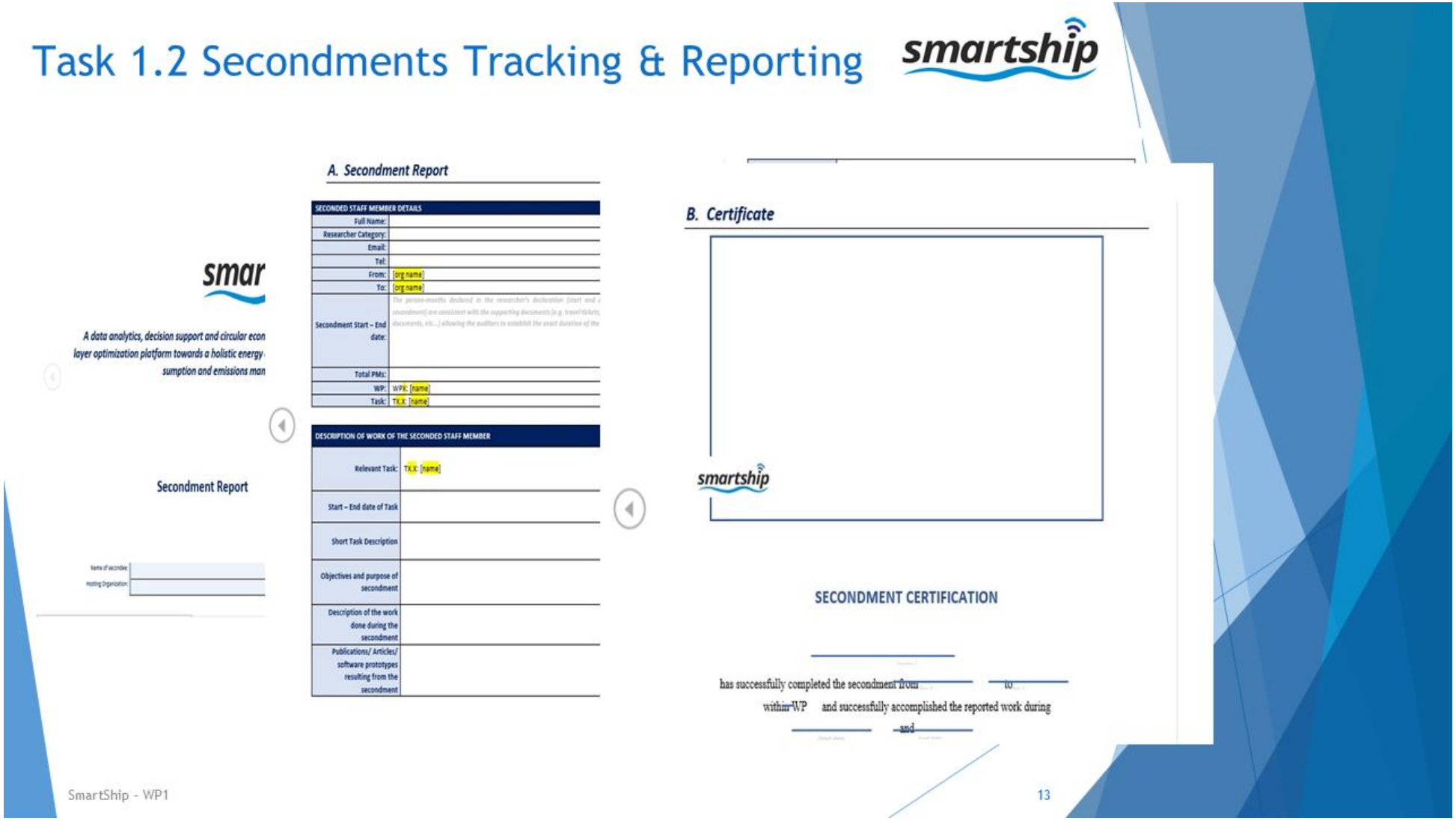
Task 1.2: Secondment Coordination & Tracking

- **Continuous support** during all **secondment life-cycle** by Secondement management team (technical + coordinator+ secondment manager)
- **Declaration Monitoring** in EU Portal
- **Secondment control** through centralized **tracking** (*GD drive*)
- Partner's **Secondement plan status updates** as dedicated section in our monthly progress calls.
- **Reporting** completed secondments in given template

Task 1.2 Secondments Tracking & Reporting



Task 1.2 Secondments Tracking & Reporting



Task 1.3: Quality Assurance and Risk Management

Task 1.3: Quality Assurance and Risk Management

- **Duration: M1-M48**
- **LEADER**: DANAOS **CONTRIBUTORS**: ALL PARTNERS

Focus

- This Task is dedicated to quality management/control of the project and its results. It also ensures that the required self-assessments and quality reports are being provided

Task 1.3: Quality Management

Task 1.3: Quality Management

- **Adaptive and Agile assessment**. Agile based model for planning, scoping and re-assessing SmartShip research has been adopted
- **Quarterly Reports** (Plan-Do-Check-Act (PDCA) principal) / Monitoring progress *(Bi-Monthly reporting secures progress monitoring)*
- ***KPIs** have been set* based on the S.M.A.R.T. criteria (Specific, Measurable, Achievable, Relevant and Time phased). **Quality metrics** are directed to:
  - An added value proposition to existing technology infrastructure for decision making support
  - Foster knowledge exchange between academic and non-academic experts both in technology and maritime terms
  - Introducing the concept of Circular Economy in traditional fleet management
- ***Internal Reviews** of Deliverables* (WP outsiders). External reviewers from major deliverables / results are considered
- Dissemination activities. **Training** (M20) and **Exploitation** Sessions (M22, M32, M44)

Task 1.3: Risk analysis

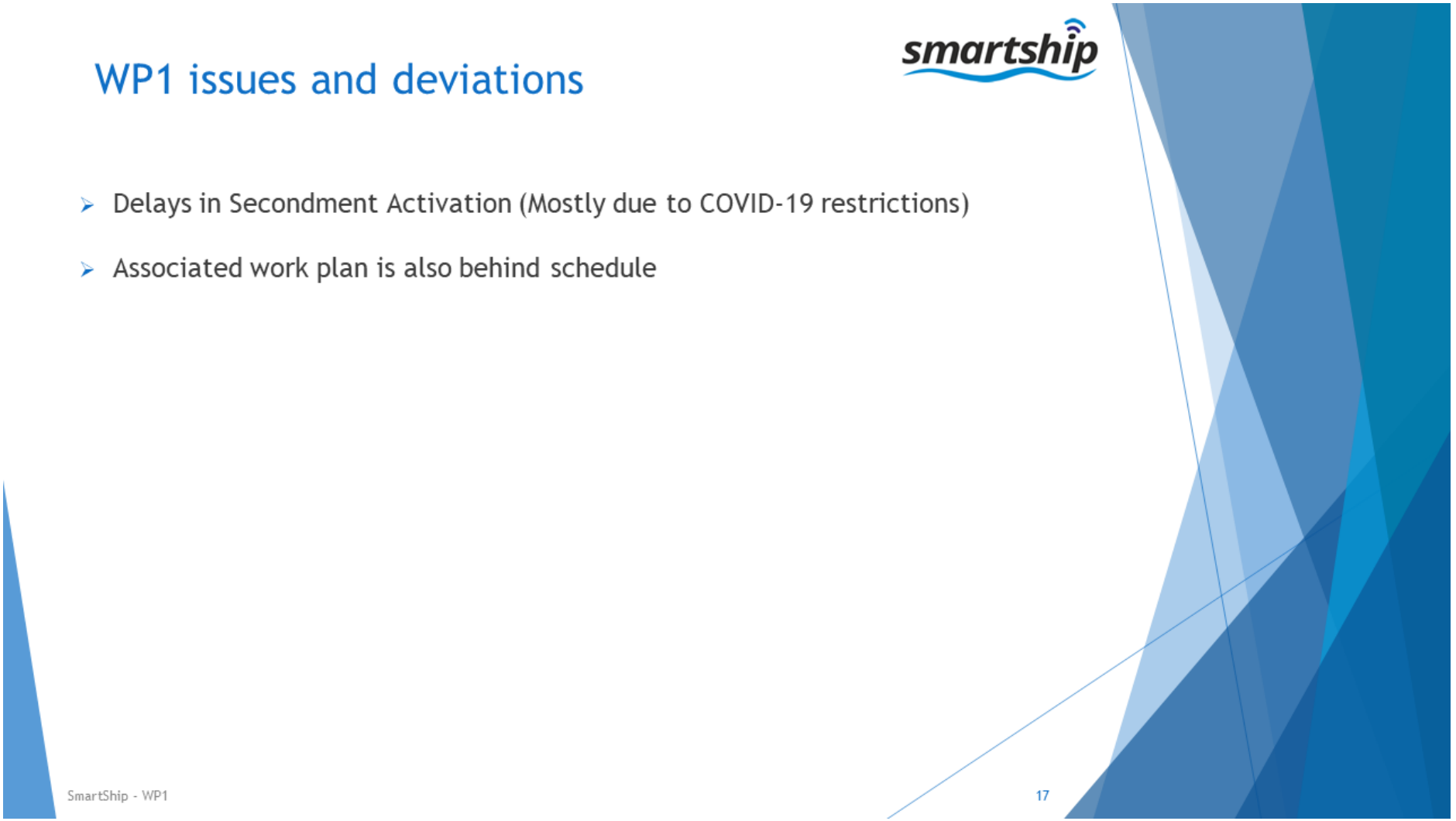
Task 1.3: Risk analysis

Risk Number	Description of Risk	Mitigation Measures as DOA	Revised Mitigation Measured	Risk Materialized
#16 (DOA)	Delay in the implementation of secondments	The consortium has allocated a partner organisation as secondments manager (SM) (ENPC), which will closely monitor secondments' implementation in terms of the accuracy and efficiency of the planned and implemented actions……..	Not Revised	Materialized: There have been noticed rearrangement of initial secondment plan for all partners. SM and Project coordinator assured and keep securing that all these amendments are in line with the safe execution of work-plan.
#17. (NEW)	Due to unforeseen emergency associated with COVID-19 outbreak in Europe there will be significant delays or changes in secondment plan rollout due to applied restrictions in travelling imposed by authorities. This will also cause significant delays in smooth delivery of anticipated project results.	Corrective Measures of Risk No16 are applied. On top of that and given the extent of this force majeure issue and the degree of severity of implications to project progress, an extension to project time-plan will be considered by the consortium.		Not Materialized

SmartShip - WP1

16

WP1 issues and deviations



WP1 Next steps

Slide No. 19

Thanks for your attention

Questions

3.3. SmartShip Review Meeting WP2 progress

smartship

A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels

Review Meeting
Athens, 18.09.2020

WP2: Requirements elicitation, use case scenarios and roadmaps for integrated vessel management

Beneficiary: Harokopio University of Athens (HUA)

Presenter: Ioannis Kontopoulos

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WP2 Overview

WP2 Overview:

- Objectives

1. The definition of scenarios, use cases and KPIs
2. The requirement analysis and elicitation for the ICT-based of marine vessels
   a. Requirements from the maritime point of view
   b. Requirements for the vessel management framework from the sustainable, CE-aware ICT point of view.

- Structure & Time Plan

Work Package No	WP2	Lead Beneficiary	HUA
Work Package Title	Requirements elicitation, use case scenarios and roadmaps for integrated vessel management		
Start month	1	End month	18
Involved partners	DANAOS, TUBS, ENPC		
Task No	Description	Leader - Partners	M(st.) – M(en.)
T2.1	Requirements elicitation and analysis	HUA - DANAOS, TUBS	M1 - M9
T2.2	Scenarios and KPIs definition	DANAOS - ENPC	M1 - M9
T2.3	Roadmaps for marine vessel management optimization	ENPC	M10 - M18

- Dependencies (Secondments, WPs, Tasks)
  1. Linked with WPs 3 (T3.1), 4 (T4.2,T4.3), 5 (T5.2,T5.3) and 6 (T6.3)
  2. 5 secondments

SmartShip - WP2 2

WP2 Deliverables & Secondments

WP2 Deliverables & secondments

No.	Title	Leader	Type	Dissemination Level	Due Date	Status
D2.1	SmartShip requirements analysis, scenarios and KPIs definition	HUA	Report	Public	31/12/2019	Completed

Secondee	Researcher Category	Sending Partner	Sending Country	Sending Sector Academic	Seconded to Partner	Seconded to Country	Seconded Sector Academic	Starting Month	Duration
Marinos Tsantekidis	ER	6. TUBS	Germany	Yes	2. ITML	Greece	No	1	1
Antonios Makris	ESR	7. HUA	Greece	Yes	3. EPS	Malta	No	4	5
Marinos Tsantekidis	ER	6. TUBS	Germany	Yes	2. ITML	Greece	No	9	1
Vassilis Prevelakis	ER	6. TUBS	Germany	Yes	2. ITML	Greece	No	9	1
Ioannis Kontopoulos	ESR	7. HUA	Greece	Yes	1. DANAOS	Cyprus	No	10	5

Task 2.1: Requirements elicitation and analysis

Task 2.1: Requirements elicitation and analysis

- **Duration: M1-M9**
- **LEADER:** HUA **CONTRIBUTORS:** DANAOS, TUBS

- **Objectives**

Provide requirements from both the maritime field and the technology fields

- **Status & progress (Completed)**

15 user requirements have been identified regarding real-time route monitoring, weather routing optimization and fleet performance monitoring

Task 2.2: Scenarios and KPIs definition

Task 2.2: Scenarios and KPIs definition

- **Duration: M1-M9**
- **LEADER:** DANAOS **CONTRIBUTORS:** ENPC

- **Objectives**

The definition of the scenarios and KPIs that will be used for SmartShip framework validation and evaluation

- **Status & progress (Completed)**

4 use cases have been identified

1. Weather Routing Optimization
2. Vessel route monitoring
3. Condition-based (Predictive) Maintenance
4. Visualization

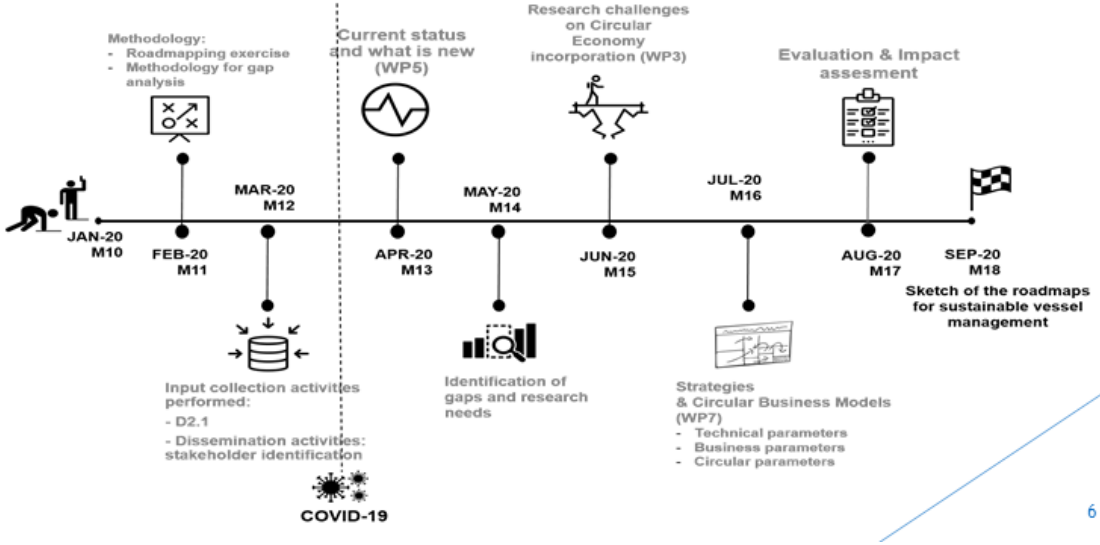
SmartShip - WP2

5

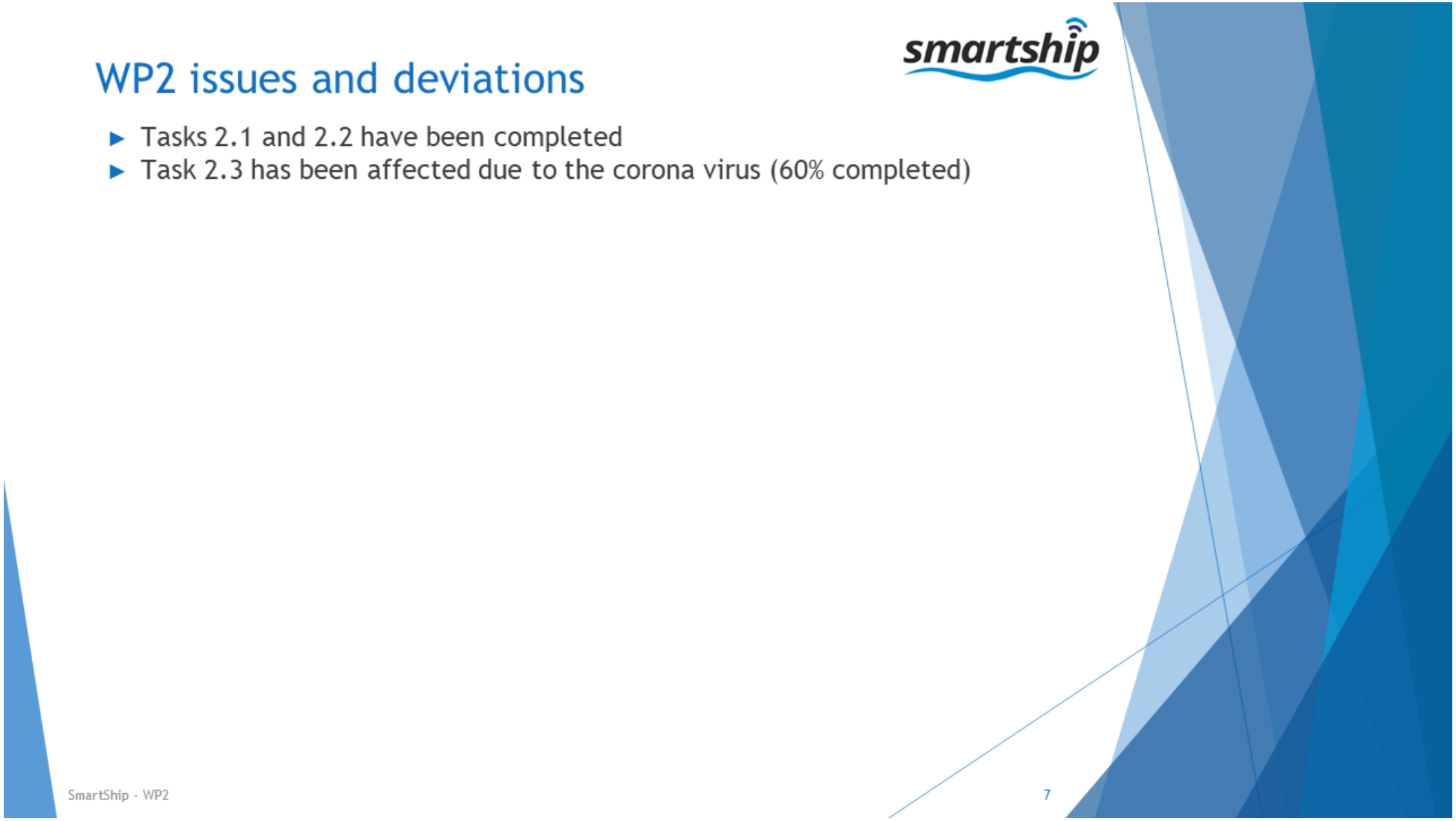
Task 2.3: Roadmaps for marine vessel management optimization

Task 2.3: Roadmaps for marine vessel management optimization

- **Duration: M10-M18**
- **LEADER: ENPC CONTRIBUTORS: -**
- **Objectives**
  - To sketch the roadmaps for sustainable marine vessel management optimization in terms of energy efficiency, fuel consumption and emissions control.
- **Status & progress**
  - An initial sketch of the roadmap was presented at the beginning of the task, however due to impact of the COVID-19 outbreak, T2.3 is under design phase.



WP2 issues and deviations



WP2 Next steps

Secondment activity

Secondment activity

Sending partner: HUA

Destination partner: DANAOS

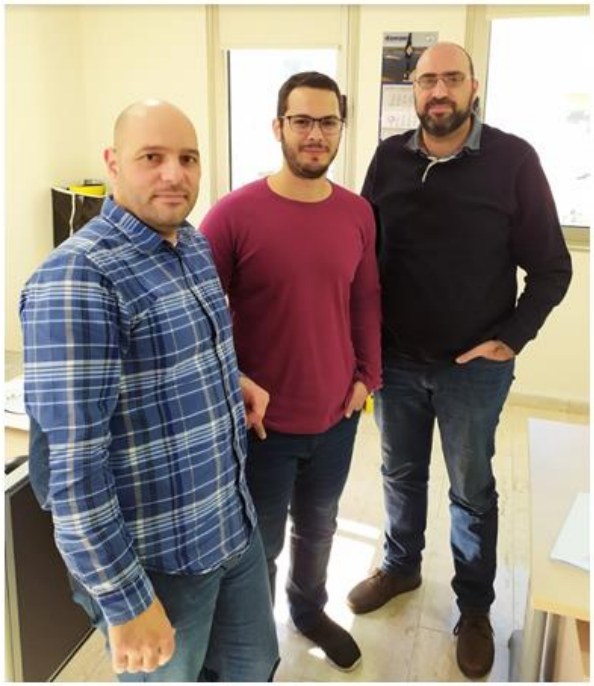
Duration: 5 months

Related Work Package: WP2 & WP4

Knowledge Transfer:
1. How data can be converted to meaningful information
2. How historical AIS data can be used to better plan a vessel's route

Knowledge Gained:
1. How an industrial environment works
2. Better understanding of the maritime domain
3. The huge amount of information and data need to actually plan a vessel's route

Secondee names: Ioannis Kontopoulos



SmartShip - WP2

9

Secondment activity - Secondees

Secondment activity - Secondees

Secondment activity - Secondees

- Impact on the overall project

1. Task 2.3 is nearly completed despite the COVID-19 outbreak.
2. The report for Task 4.1 has been completed and state-of-the-art methodologies have been identified.
3. A better understanding of the literature which will help SmartShip advance the existing state-of-the-art.

- Impact on future career

1. Work experience in an industrial environment.
2. Better equipped to overcome obstacles when living in a foreign country.
3. Helped grow as a person both in personal and professional life.

Slide No. 12

Thanks for your attention

Questions

SmartShip Review Meeting WP3 progress

smartship

A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels

Review Meeting
Athens, 18.09.2020

WP3: SmartShip Circular-Economy based functional architecture design

Beneficiary: ENPC

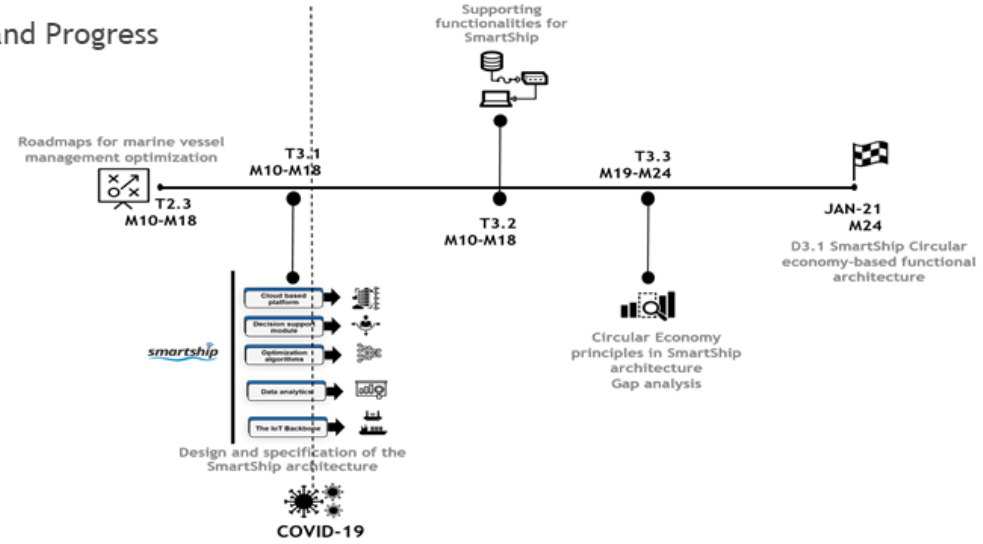
Presenter: Vlatka Katusic

The SmartShip project has received funding from the European Union's Horizon 2020 research and Innovation programme under the Marie Skłodowska-Curie grant agreement No 823916

WP3 Overview

WP3 Overview:

- Objectives
  - To specify the Smartship functional architecture, in terms of:
    - Translation of the requirements into functions,
    - Grouping of functions into functional blocks and
    - Specification of interfaces between blocks
    - Incorporation of Circular Economy principles
- Status and Progress



- Dependencies (Secondments, WPs, Tasks)
  - Linked to WPs: WP2 (T2.3), WP4 (T4.3), WP5 (T5.3)
  - 3 secondments

SmartShip - WP3

2

WP3 Deliverables

WP3 Deliverables

No.	Title	Leader	Type	Dissemination	Due Date	Status
D3.1	SmartShip circular economy-based functional architecture	ENPC	Report	Public	24	

Secondee	Researcher category	Partner	Sending country	Sending sector Academic	Seconded to partner	Seconded to country	Seconded sector academic	Starting month	Duration
Ms. Sofia Alexaqui	ESR	ENPC	France	Yes	ITML	Greece	No	9	3
Ms. Despina Kallidromitou	ESR	EPS	Malta	No	ENPC	France	Yes	10	6
Ms. Aristi Kontaloni	ESR	ITML	Greece	No	ENPC	France	Yes	10	6

Task 3.1: Design and specification of the SmartShip architecture

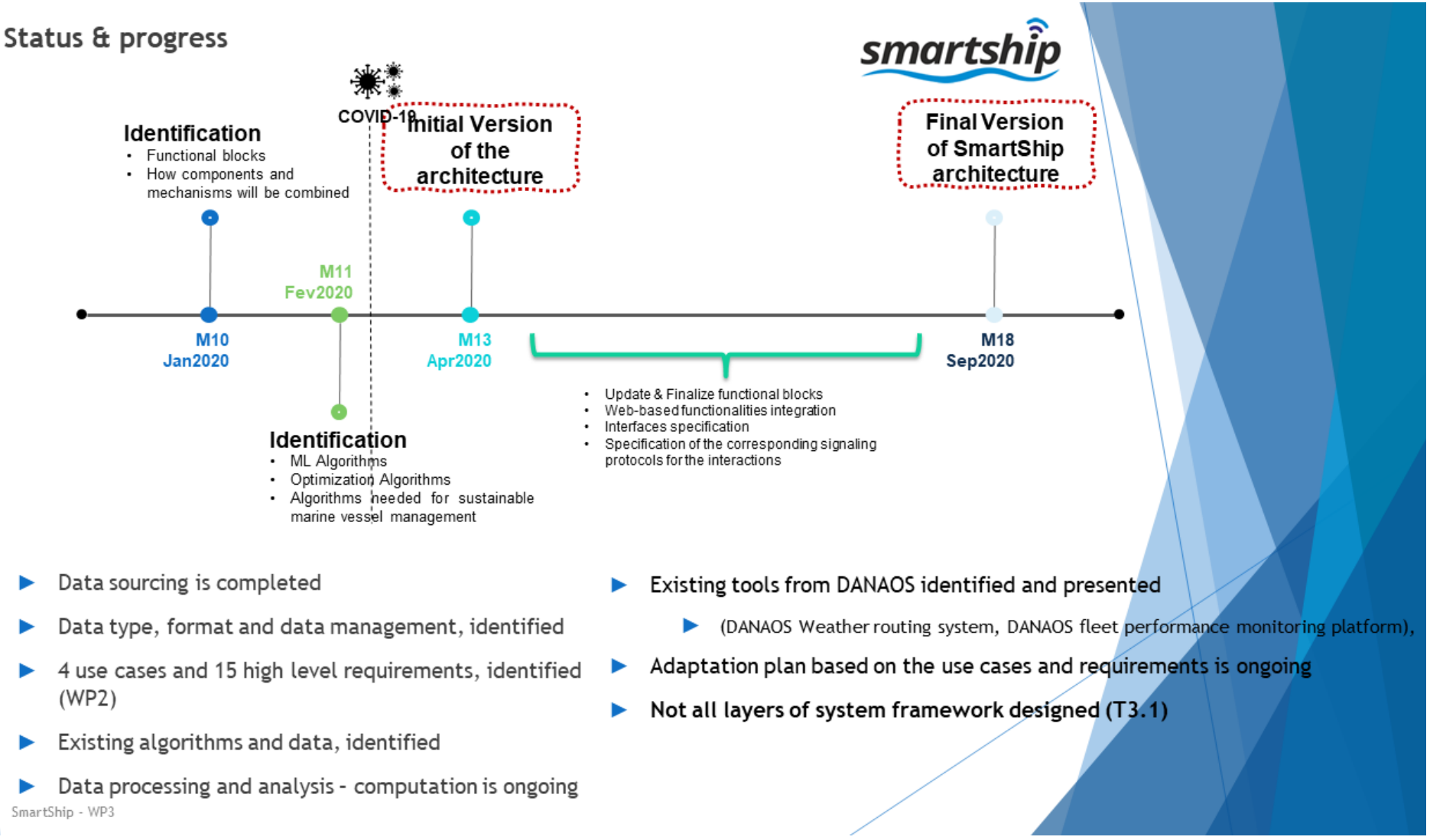
Task 3.1: Design and specification of the SmartShip architecture

- **Duration: M10-M18 LEADER:** ITML **CONTRIBUTORS:** DANAOS, ENPC
- **Objectives**
  - To provide the general architecture, combining the different components and mechanisms
  - To provide guidelines for the development work
  - Based on the requirements described in WP2, T3.1:
    - Identify and specify the functional blocks and
    - the algorithms needed for sustainable marine vessel management

SmartShip - WP3

4

Status & progress



Task 3.2: Supporting functionalities for SmartShip

Task 3.2: Supporting functionalities for SmartShip

- **Duration: M10-M18**
- **LEADER: EPS CONTRIBUTORS: ITML, ENPC**
- **Objectives**
  - **Focus:**
    - Mechanisms to reduce the average IP acquisition latency and the network overhead
    - Naming, addressing and object localization in networks of internet-connected marine vessels
    - Mechanisms to extend the coverage time of nodes in internet-connected marine vessels from a DHCP perspective and
    - Investigation of routing protocols including tunnelling through non-IP links

SmartShip - WP3

6

Status & progress

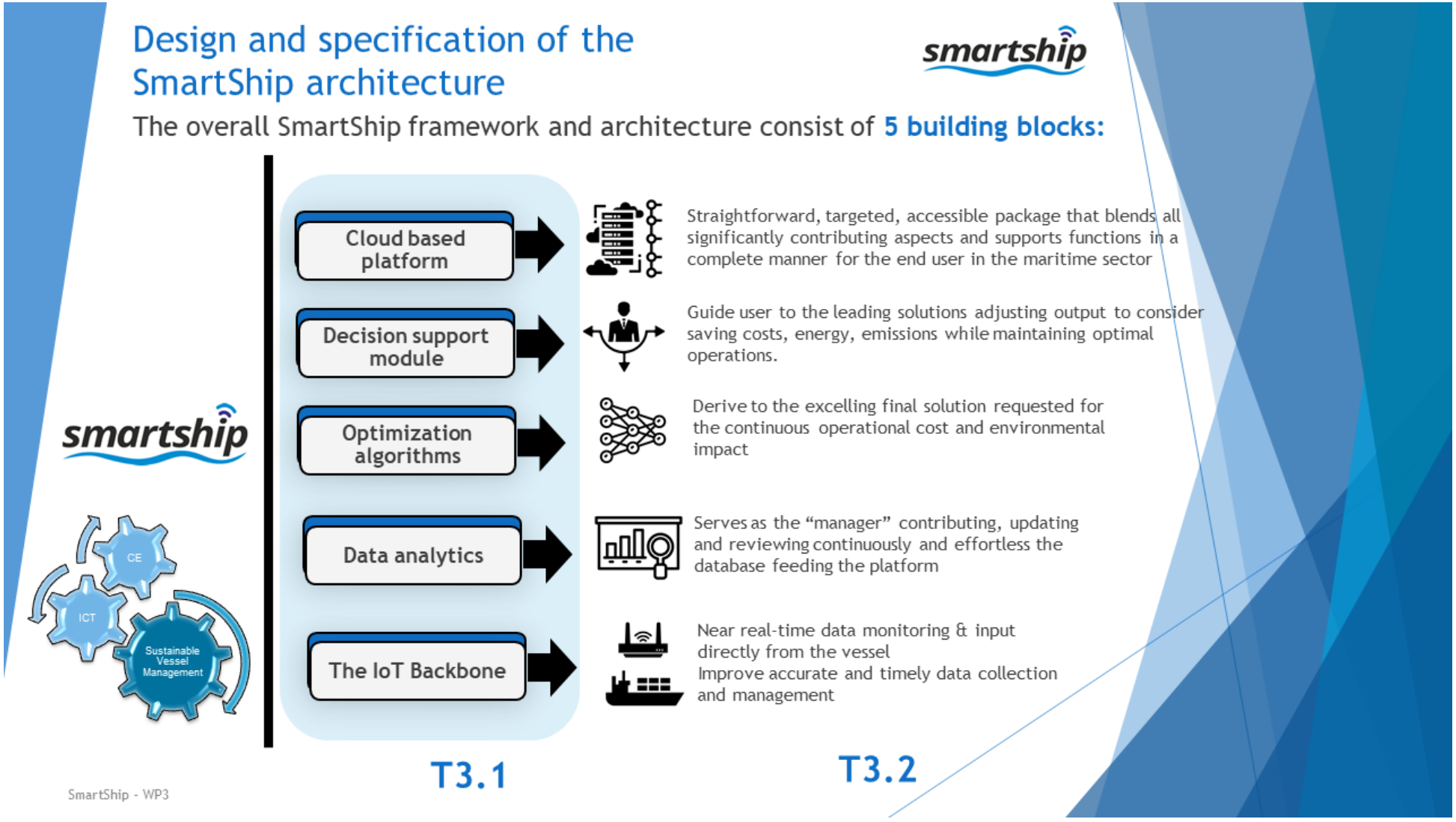
- **Status & progress**
  - Through SmartShip contribute to an optimum utilization of Smart Technologies and use SmartShip architecture as a future benchmark, milestone and reference point in the maritime Industry

Functions		
IoT technologies	Big Data Analytics	Cloud-based system
Decision support integrated modules	Life Cycle Optimization mathematics formulae	

  - Further develop the Artificial Neural Networks (ANNs) for accurate on-point data analysis & decision support
  - Invest in sensor technology:
    - Monitoring devices targeting heavy-duty niche applications and fields e.g. oil & gas industry
  - Safeguard stability of radio signal via the inclusion of proper contingencies
  - Decision Support System (DSS) for the optimization of the utilization of IoT & Data Analytics
  - **Supporting functionalities (T3.2) for SmartShip are Subject to T3.1 delays**

SmartShip - WP3

Design and specification of the SmartShip architecture



Task 3.3: Circular Economy principles in SmartShip Architecture

Task 3.3: Circular Economy principles in SmartShip Architecture

- **Duration: M19-M24 LEADER: ENPC CONTRIBUTORS: BLS**
- **Objectives**
  - To adjust and customize the architecture based on functional requirements and existing standards (T3.1)
  - To incorporate the main principles of Circular Economy in the maritime field
- **Status & progress**
  - It will focus on exploiting energy efficiency, fuel consumption, & emission control optimization procedures to apply CE principles regarding engines' components operation and re-usage (WP7, T7.2)

value of products materials & resources for as long as possible → Design out of waste and pollution

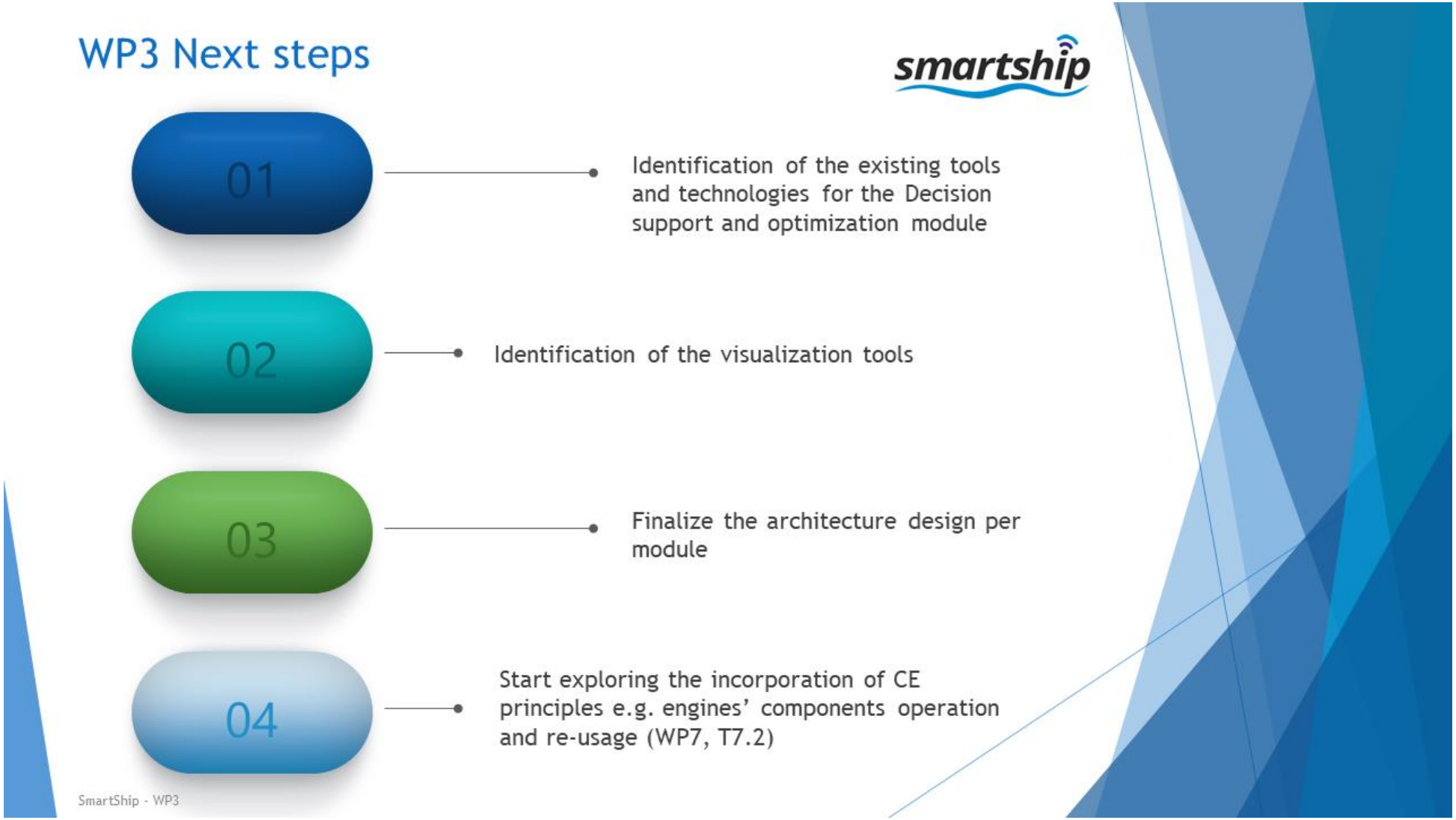
value of products materials & resources into the product cycle at the end of their use → Keep products & materials in use

generation of waste & resource intensty of manufacturing → Regenerate natural systems

SmartShip - WP3

9

WP3 Next steps



Secondment activity

Secondment activity

Sending partner: EPS

Destination partner: ENPC

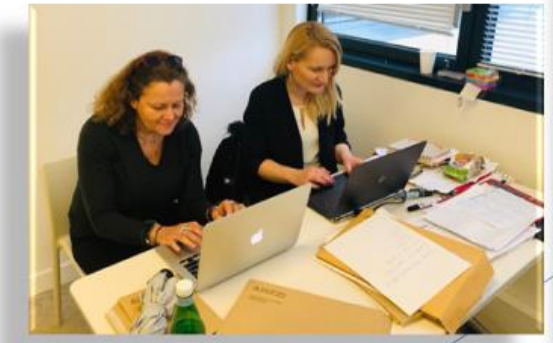
Duration: 6 months 30/01-30/07/2020

Related Work Package: WP3 Smartship Circular-Economy based functional architecture design

Knowledge Transfer:
Previously acquired know-how and in-depth knowledge of Decision Support.

Knowledge Gained:
Circular Economy principals were demonstrated effectively & clearly.

Secondee names: Ms Despina Kallidromitou



SmartShip - WP3

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Secondment activity - Secondees

Secondment activity - Secondees

- Background
  - Professional Experience
    - Diploma of Civil Engineer (hydraulics, water resources and environment), Bochum University (DE); National Technical University of Athens (Greece, NTUA)
    - MSc in Business Administration (MBA) from NTUA
  - Academic research
    - Co-author of books
    - 100+ scientific publications with numerous citations
    - Attendee of courses
      - Mathematical techniques & environmental systems modelling, University of Wisconsin-Milwaukee, USA
      - Optimization & Decision Support Systems, Herriot Watt University, Edinburgh, UK
  - Participation in projects
    - Coordinator of national & international projects
      - Hydraulics, water resources
      - Environmental management & economics
      - Mathematical environmental modelling
      - Decision support systems
      - Modelling & forecasting, cost-benefit & multi-criteria analysis
      - Law & policy
      - Remote sensing & GIS
      - Risk analysis & civil protection management
  - Other Activities
    - Certified Auditor of TUV HELLAS for ISO 9001:2008 and 14001:2008
    - EU National Representative in Teleworking, EU Expert in Puno (Peru)
    - Member:
      - Hellenic Society of Civil Engineers (HELASCO)
      - BoD (as Vice General Secretary, 1995-1997, and General Secretary, 2011-2015)
      - American Society of Civil Engineers (ASCE)
      - American Society for Photogrammetry & Remote Sensing
      - Hellenic Technical Chamber of Engineers (TEE)

SmartShip - WP3

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Secondment activity - Secondees

Secondment activity - Secondees

- Impact on the overall project
  - Knowledge exchange related to Decision Support towards the application of Circular Economy in maritime
  - Striving & contributing towards the maritime industry's holistic framework (of energy efficiency & emissions control) imbued by and adhering to Circular-by-Design Economy principles and aspects
- Impact on future career
  - Seeds were sown concerning future innovation & value creation
  - Multi-disciplinary exposure and networking
  - Effective collaboration between Techno-Economic/Engineering background and Sustainability/Life Cycle & Circular Economy fields
  - Circular economy principals were shown in maritime application and their demonstration struck a chord on the following:
    - Value drivers (maximization of asset utilization)
    - The combination of ICT-enhanced infrastructure, smart assets and Sustainability Design (via Circular Economy economic models) yields more value from the large amounts of acquisited maritime data

SmartShip - WP3

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Slide No.14

Thanks for your attention

Questions

3.4. SmartShip Review Meeting WP4 progress

smartship

A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels

Review Meeting
Athens, 18.09.2020

WP4: Smartship Baseline framework: IoT and advanced data analytics

Beneficiary: ITML

Presenter: Ms. Aristi Kontaloni

The SmartShip project has received funding from the European Union's Horizon 2020 research and Innovation programme under the Marie Skłodowska-Curie grant agreement No 823916

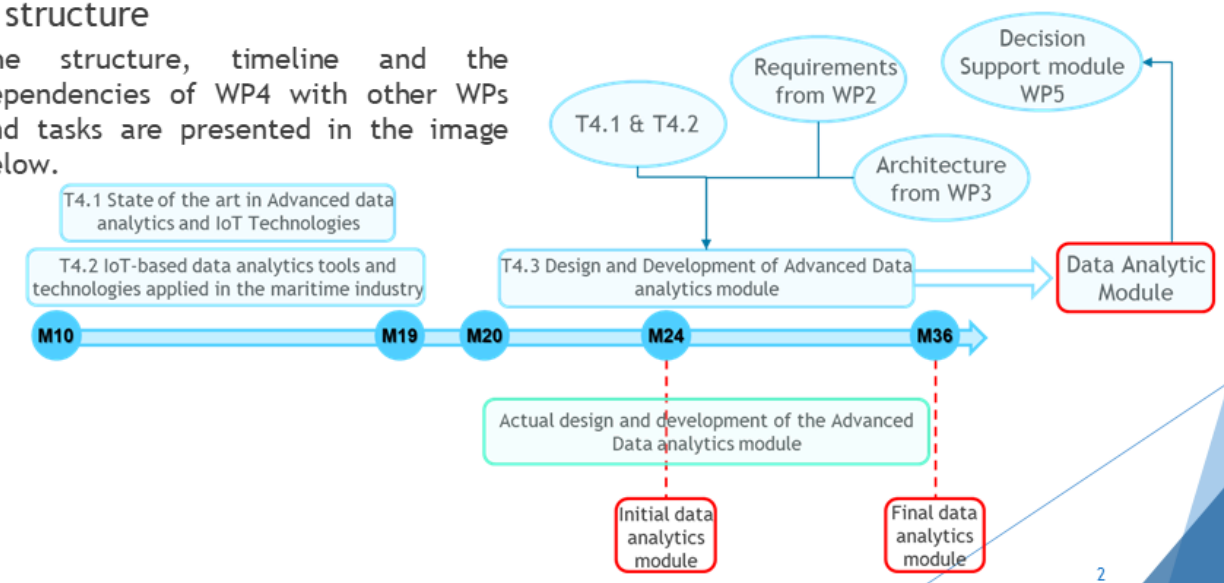
WP4 Overview

WP4 Overview:

- Objectives
  - ✓ Foster knowledge exchange between academic and non-academic experts in the fields of IoT and Advanced Data analytics to be applied in the maritime field.
  - ✓ Design and develop the SmartShip Advanced data analytics module, that will:
    - aggregate different types of data through sensing devices structuring the IoT framework and
    - provide real-time analytics, which will be exploited in WP5 for the Decision Support and optimization module

- The structure

The structure, timeline and the dependencies of WP4 with other WPs and tasks are presented in the image below.



SmartShip - WP4

2

Deliverables & Secondments

WP4 Overview:

Deliverables

No.	Title	Leader	Type / Diss. Level	Due Date	Status
D4.1	IoT applied tools and technologies and data analytics module	ITML	Demonstrator / CO	M24/M36	Pending

Secondments

Researcher Name & Category	Sending Partner	Sending Country	Seconded to Partner	Seconded to Country	Start (M)	End (M)	Duration	Work Package	Status
ESR - Antonis Tarantilis	ITML (BEN)	Greece	ENPC (BEN)	France	10	16	6	4	Completed
ESR - Alexandros Papadopoulos	EPS (BEN)	Malta	HUA (BEN)	Greece	13	16	4	4	Completed
ADM - Thekla Kafatari	HUA (BEN)	Greece	DANAOS (BEN)	Cyprus	17	18	1	4	Completed
ER - Avraam Mavridis	EPS (BEN)	Malta	HUA (BEN)	Greece	17	19	2	4	Ongoing

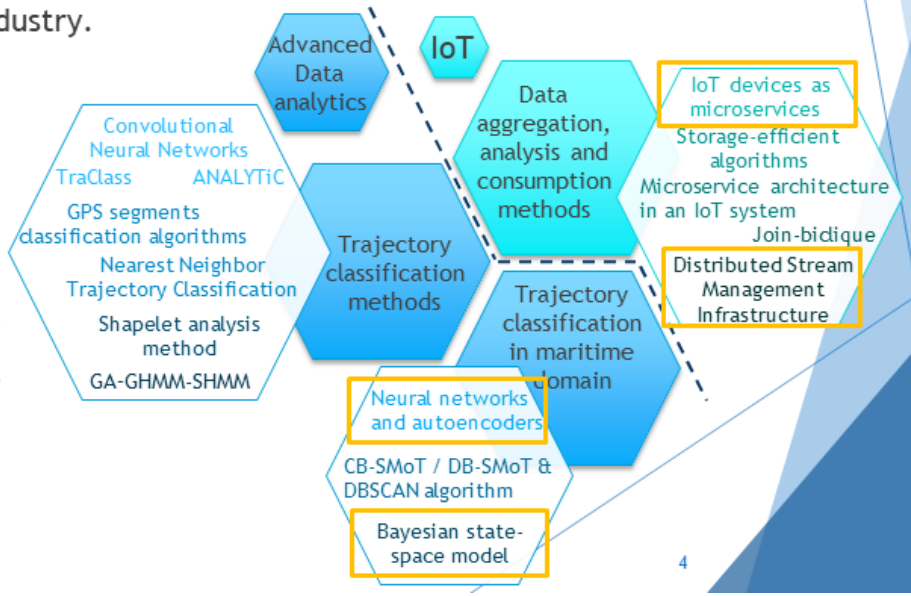
SmartShip - WP4

3

Task 4.1: State of the art in Advanced data analytics and IoT Technologies

Task 4.1: State of the art in Advanced data analytics and IoT Technologies

- **Duration: M10-M19**
- **LEADER:** HUA **CONTRIBUTORS:** ENPC
- **Objectives**
  - Knowledge transfer between academic and non-academic specialists in the fields of IoT and Advanced Data analytics.
  - Summary of recent advances in the fields of IoT & Advanced Data analytics implemented in the maritime industry.
- **Status:** Ongoing
- **Progress:**
  - The advanced methods and technologies used for data aggregation, analysis, consumption and classification in the fields of IoT & Advanced Data analytics have been defined and presented in a first draft report.



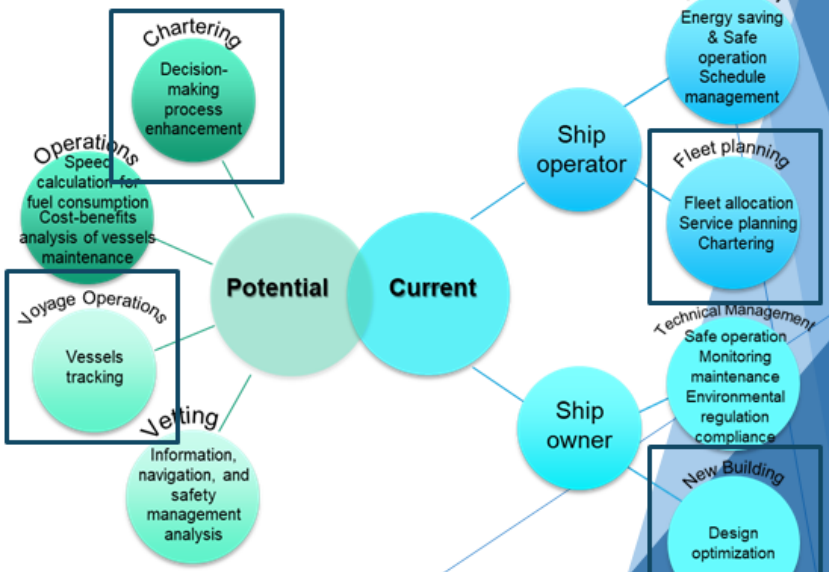
SmartShip - WP4

4

Task 4.2: IoT-based data analytics tools and technologies applied in the maritime industry

Task 4.2: IoT-based data analytics tools and technologies applied in the maritime industry

- Duration: M10-M19
- LEADER: EPS CONTRIBUTORS: ITML,DANAOS, ENPC, HUA, TUBS
- **Objectives:** The main objectives of T4.2 are to identify and report any market-ready tool and technology already applied in the maritime industry, related to IoT-based advanced data analytics, as well as, to potentially customize the identified tools and technologies, to meet the requirements of SmartShip as defined in WP2.
- **Status:** Ongoing
- **Progress:**
  - The application areas in which big data is applied in the maritime industry have been initially identified.
  - The use of IoT Applications in the maritime industry have been identified in a first draft report.
    Specifically, IoT in maritime can be found in:
    - ✓ Cyber Physical Systems (CPS)
    - ✓ Fleet Data IoT platform
    - ✓ Interconnected sensors onboard and offshore
    - ✓ Future advances: use of 5G applications
  - Initial estimation of the proposed tools in terms of efficiency, accuracy and response-time based on Smartship's requirements.

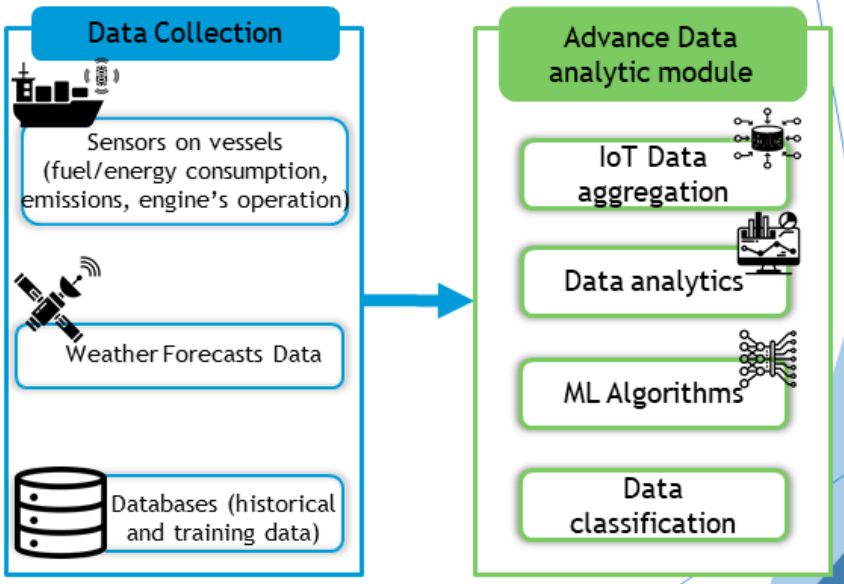


Task 4.3: Design and Development of Advanced Data analytics module

Task 4.3: Design and Development of Advanced Data analytics module

- **Duration: M20-M36**
- **LEADER:** ITML **CONTRIBUTORS:** EPS, BLS
- **Objectives & Methodology**

Task 4.3 aims to design and develop the advance data analytics module which will the base for the decision support module and optimization algorithms in terms of energy efficiency, fuel consumption and emission control in the maritime field.
The methodology that will be followed is to collect data from the sensors on the vessels, weather data and historical data. Accordingly, the data analytic module will aggregate and analyze the data, while will also deploy ML algorithms and classification methods for the data collected. The output of this task will be used as base for the development of the decision support module.



- **Status & progress**

Task 4.3 starts in Month 20

SmartShip - WP4

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WP4 issues and deviations and Next Steps

WP4 issues and deviations

- Due to covid-19 circumstances and considering the traveling restrictions, the knowledge exchange between the academic and non-academic partners for tasks T4.1 and T4.2 has not been fulfilled.
- The research is on an initial stage. We can further extend the research on tools and technologies implemented in the maritime.

WP4 Next steps

- Completion of customizing the proposed tools based on Smartship's requirements.
- Identification and integration of all necessary components for the development of the first draft version of the advance data analytic module.

Secondment activity:

Secondment activity:

Three Secondments have been completed relevant to WP4. Below is the presentation of one of the completed secondments.

Sending partner: ITML

Destination partner: ENPC

Duration: 6M

Related Work Package: WP4

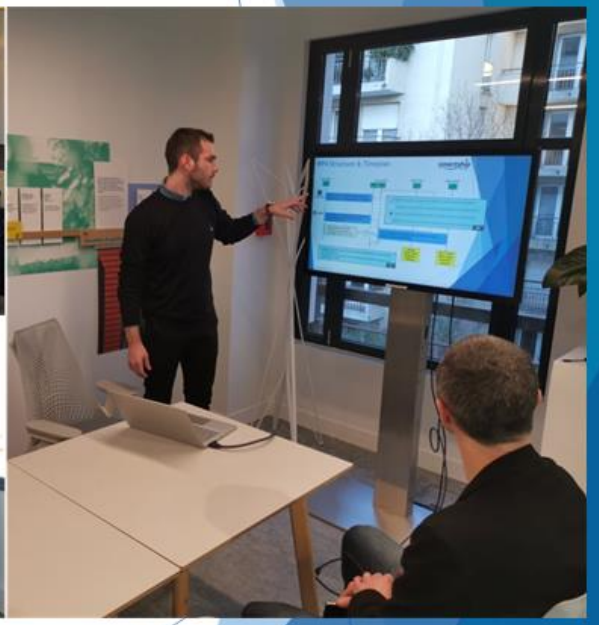
Knowledge Transfer:

- ✓ Data analytics implementation (focusing on AIS data)
- ✓ Decision support technologies
- ✓ Data clustering algorithms in decision support systems

Knowledge Gained:

- ✓ Research methodologies relevant to IoT and Advance Data analytics field

Secondee name: Mr. Antonios Tarantilis



SmartShip - WP4

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Secondment activity - Secondees

Secondment activity - Secondees

Secondment activity - Secondees

- Impact on the overall project
  - Enhancement of the knowledge transfer relevant to the use of Data analytics in the maritime
  - Ensuring successful and efficient project results
  - Implementation of new practices and potential for innovation

- Impact on future career
  - Work experience in the academic domain
  - Broaden career horizons
  - Future business collaborations
  - Experience gained on researching in the field of Advance data analytics
  - Adaptation to new environments

Slide No. 11

Thanks for your attention

Questions

3.5. SmartShip Review Meeting WP5 progress

smartship

A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels

Review Meeting
Athens, 18.09.2020

WP5: Smartship Decision Support and multi-layer optimization module

Beneficiary: BlueSoft

Presenter: Dimitrios Panos

The SmartShip project has received funding from the European Union's Horizon 2020 research and Innovation programme under the Marie Skłodowska-Curie grant agreement No 823916

WP5 Overview

WP5 Overview:

- Objectives
  - The main objective of WP5 is to foster knowledge exchange between academic and non-academic experts in the fields of Decision support and optimization in terms of energy efficiency and emissions control in the maritime field. Moreover, within WP5 beneficiaries will design and develop a Decision Support module that will:
    - (i) exploit the analyzed data from the data analytics module;
    - (ii) manage the operation of the whole IoT environment and
    - (iii) run optimization algorithms to provide suggestions related to the operations of the vessel's engines.
- Structure & Time Plan
  - M10-M19 tasks T5.1 and T5.2
  - M20-M36 task T5.3
- Deliverables
  - D5.1 : Decision support module and multi-layer optimization tools and technologies

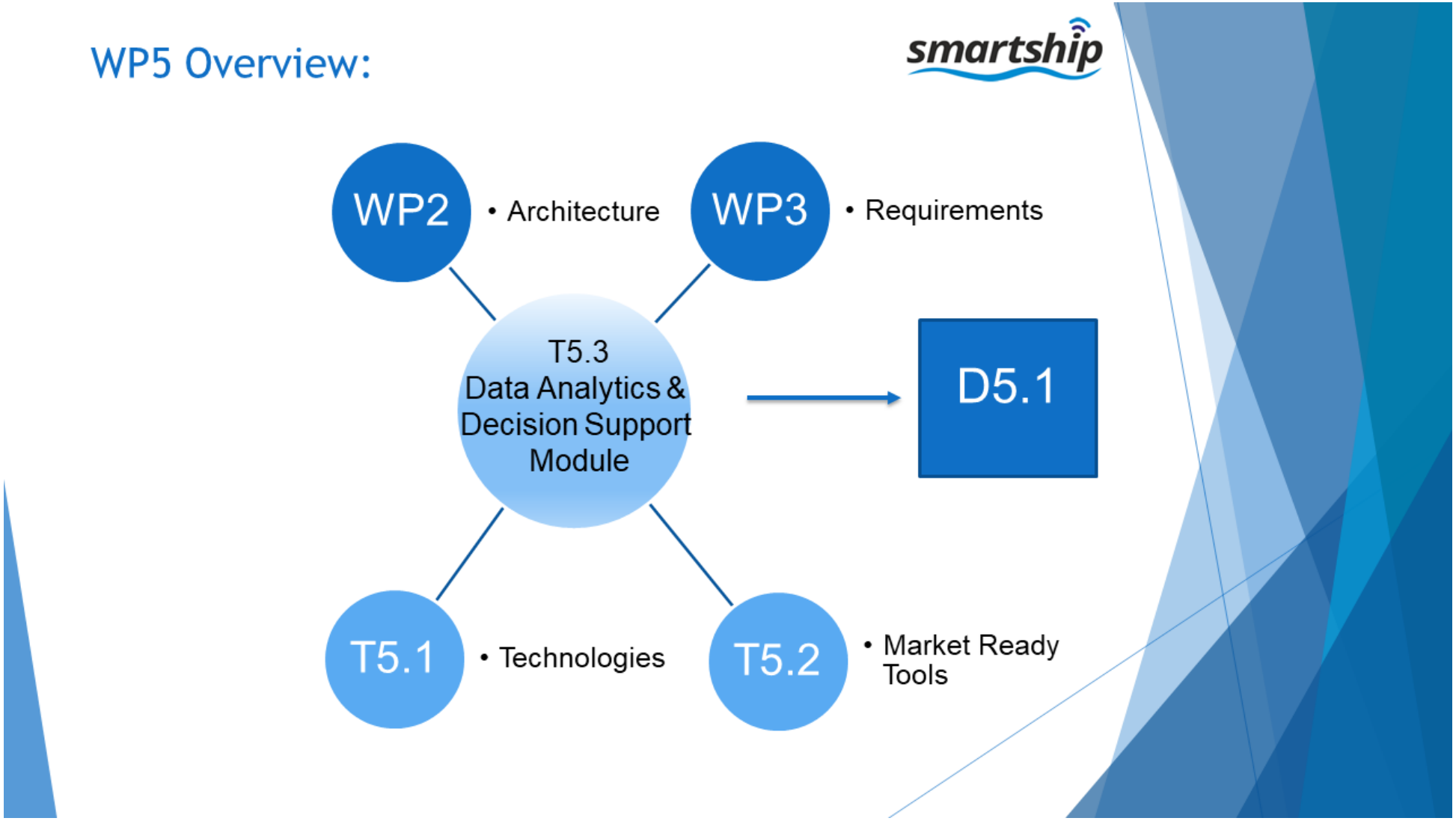
Secondments overview and plan

WP5 Overview:

- Dependencies
  - WP2 (Architecture)
  - WP3 (Requirements)
- Secondments overview and plan

Sending Partner	Hosting Partner	Duration	Start	End	Status
ENPC	DANAOS	4M	M12	M15	Completed
BLS	HUA	4M	M18	M21	Active
BLS	HUA	3M	M19	M21	Planned
BLS	ENPC	4M	M20	M24	Planned

WP5 Structure



Project plan overview

WP5 Overview:

Project plan overview

Task	M10	…	M19	M20	…	M36
WP2	Architecture					
WP3	Requirements					
WP5 – T5.1	Technologies					
WP5 – T5.2	Market ready tools					
WP5 – T5.3				Data Analytics & Decision Support Module		

WP5 Deliverables

WP5 Deliverables

No.	Title	Leader	Type	Dissemination	Due Date	Status
D5.1	Decision support module and multi-layer optimization tools and technologies [36] Decision support module and multi-layer optimization tools and technologies	BLS	Demonstrator	Public	M36	Ongoing

Task 5.1: State of the art in Decision Support and multi-layer optimization Technologies

Task 5.1: State of the art in Decision Support and multi-layer optimization Technologies

- **Duration: M10-M19**
- **LEADER: ENPC CONTRIBUTORS: TUBS**
- **Objectives**
  - Knowledge exchange academic and non-academic experts
    - Decision support and optimization in the maritime field:
      - Energy efficiency and
      - Emissions control
  - State of the art reports to summarize recent advances
- **Status & progress**
  - Knowledge gathered in recent advancements
    - Decision support
    - Multi-layer optimization technologies
    - Use cases Technical details
  - ToC for tracking knowledge

SmartShip - WP5

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   - 1.1 Purpose of the report
   - 1.2 Structure of the report
   - 1.3 Relation to Other Tasks and Deliverables
2. **Overview**
3. **Decision Support & Multi-layered Optimization Technologies**
   - 3.1 Decision Support Systems
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     - 3.1.2 Functionality
     - 3.1.3 Interfaces
     - 3.1.4 Implementation
     - 3.1.5 Evaluation and Impact
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   - 3.3 Operations Research in Ship Management (ORISMA)
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   - 4.2 Emissions Control
5. **Use case technical details**
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   - 5.2 Route monitoring (Use case #2)
   - 5.3 Condition-based (Predictive) Maintenance (Use case #3)
   - 5.4 Visualization (Use case #4)
6. **Conclusions**
7. **References**

Task 5.2: Decision support and optimization tools and technologies applied in the maritime industry

Task 5.2: Decision support and optimization tools and technologies applied in the maritime industry

- **Duration: M10-M19**
- **LEADER: BLS CONTRIBUTORS:** ENPC, ITML
- **Objectives**
  - The Research, identification and reporting of any market-ready tool and technology already applied in the maritime industry, related to decision support systems and optimization tools regarding energy efficiency, fuel consumption and emissions.
- **Status & progress**
  - Between M12 and M17, initial research has been conducted in specific market-ready tools.
  - All contributors, have started their initial research. This research will include information about the researched tools SEAROUTES and WAVES from BLS, METIS from ENPC and DEEPSEA from ITML.
  - The first draft of the internal report with the consolidated input of all contributors will be shared with partners for their review and comments.

SmartShip - WP5

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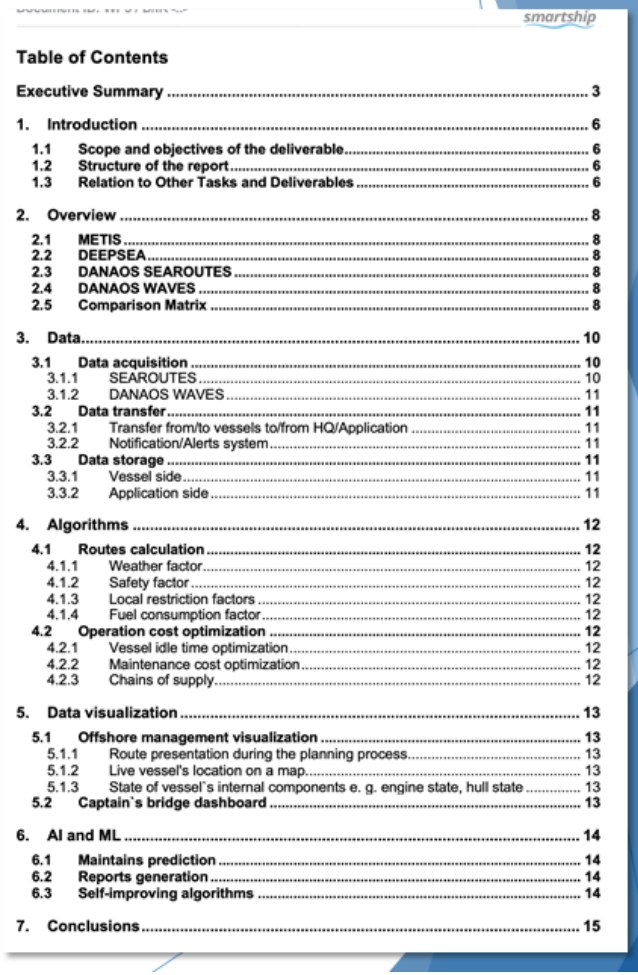
Task 5.2: Decision support and optimization tools and technologies applied in the maritime industry

Task 5.2: Decision support and optimization tools and technologies applied in the maritime industry

- Table of Contents of internal document is finalised
- Market Ready tools have been identified
  - METIS
  - DEEPSEA
  - SEAROUTES
  - WAVES
- Inputted data of Initial Research



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Task 5.3: Design and Development of Data Analytics and Decision Support module

Task 5.3: Design and Development of Data analytics and Decision Support module

- **Duration: M20-M36**
- **LEADER: BLS CONTRIBUTORS:** ITML, TUBS, HUA

- **Objectives**
  - Based on the inputs from T5.1 and T5.2, as well as the architecture from WP3 and the requirements from WP2, this task will be responsible for the actual design and development of the decision support module of SmartShip, that will be the core of the multi-level optimization of the vessels' operation and management in terms of fuel consumption, energy efficiency, emissions and circular economy principles. It will lead to 2 versions, an initial (M24) and a final (M36).

- **Status & progress**
  - Due to start on M20

SmartShip - WP5

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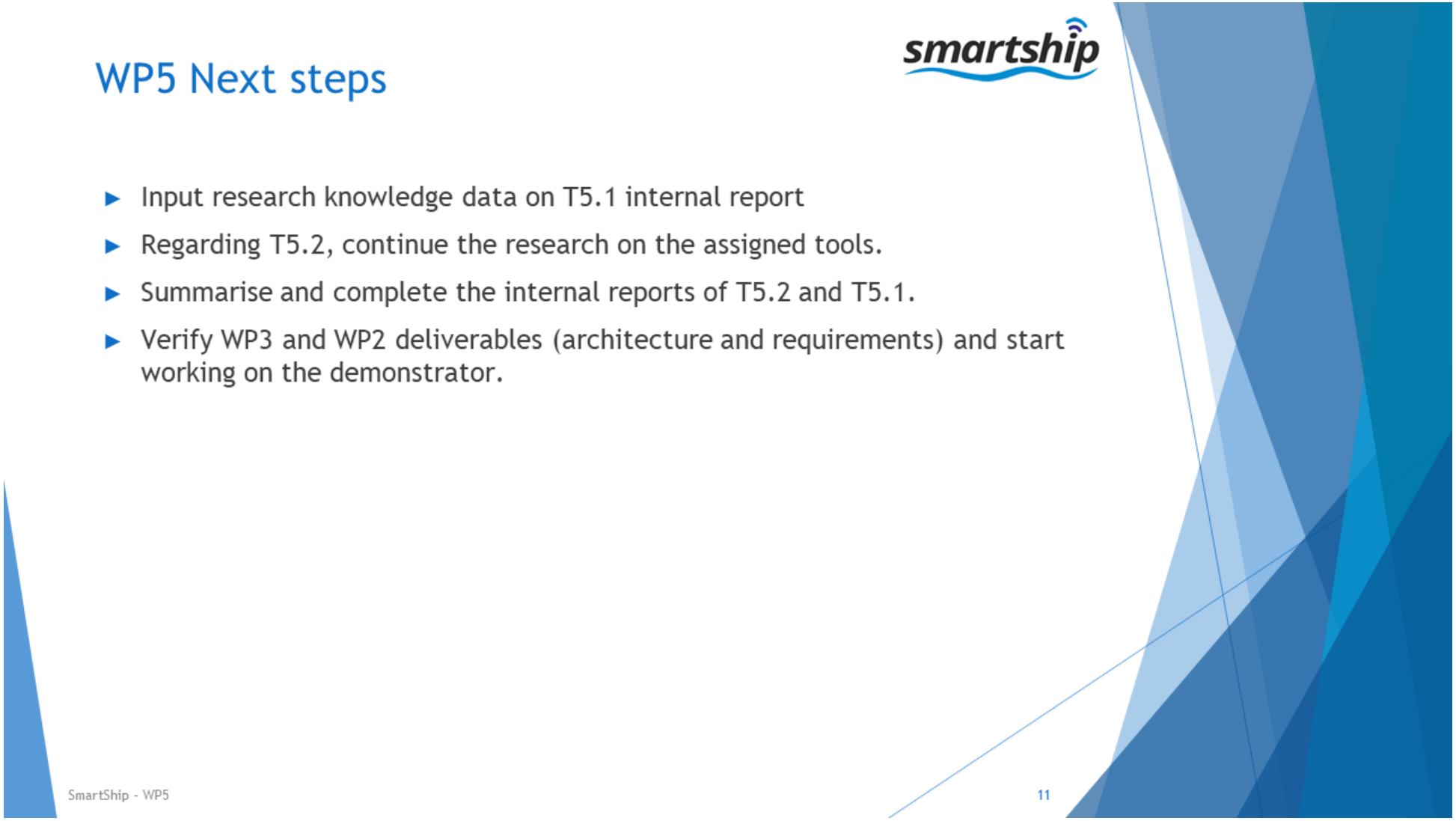
WP5 Next steps



WP5 issues and deviations

WP5 issues and deviations

- Due to the covid-19 pandemic and the traveling restrictions, knowledge exchange between academic and non-academic partners was not possible, thus limiting the progress of T5.1 and T5.2.
- Between M12 and M18 only two secondments were activated and only one was completed
- Additionally, two more secondments are planned:
  - 1. From M19 a secondment from BLS to HUA for 3M and
  - 2. From M19, a secondment from BLS to ENPC for 4M
- For the above reason, T5.1 and T5.2 are considered for extension.
- Consequently, T5.3, depending on T5.2 and T5.1, should also be considered for extension.

Secondment activity

Secondment activity

Sending partner: ENPC

Destination partner: DANAOS

Duration: 4 months

Related Work Package: WP5
T5.1 State of the art in Decision Support and multi-layer optimization Technologies

Knowledge Transfer:
- Research methodologies

Knowledge Gained:
- Decision Support Systems foundations, functionality, interfaces, implementation, evaluation and impact, novel, and insightful perspectives for DSS.
- Multi-layer optimization Technologies

Secondee name: Mrs. Anastasia Vayona

[Mrs. Anastasia Vayona]

SmartShip - WP5

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Secondment activity - Secondees

Secondment activity - Secondees

Background

Professional Experience

- Doctoral candidate (ENPC - BS, France)
- MA in Landscape Design Studies(Newcastle upon Tyne University, UK)
- Diploma in Education (ASPAITE, Greece)
- BSc in Agriculture (ATEITH, Greece)
- 10 years professional experience as Landscape Architect
- 6 years professional experience as Lecturer in International Hellenic University (ex Technologiko Ekpaideutiko Idrima, Kavalas) in the Department of Landscape Architecture

Academic research

Research interests include Circular Economy, Circular Urban Development, Urban Regeneration, Sentient Cities, Sustainability, Attribution Theory, Citizen Participation, Circular Economy Business Models.

Participation in projects

- Ideal-Cities- Horizon 2020 (RISE) under the Marie Skłodowska-Curie grant agreement
- SPEED-The Smart Ports Ecosystem of the European 2 Seas region, Interreg
- Workshop on the regional architectural development for the region of Drama focusing on sustainability- NSRF 2007-2013

Other Activities

- Journal article: Investigating the Preferences of Individuals in Redeveloping Waterfronts: The Case of the Port of Thessaloniki - Greece, https://doi.org/10.1016/j.cities.2011.05.007
- Conference paper: Towards an Operating Model For Attribution In Circular Economy DOI: 10.1109/DCOSS49796.2020.00082

SmartShip - WP5

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Secondment activity - Secondees

Secondment activity - Secondees

- Impact on the overall project

Identification and prioritization of the research in efficient fuel consumption and emissions control; data-driven approach for fine grained tuning of energy consumption, to increase energy efficiency.

Contribution to task T5.1: State of the art in Decision Support and multi-layer optimization Technologies, which is nearly completed despite the COVID-19 outbreak.

- Impact on future career
  - Work experience in an industrial environment
  - Enlarge my professional network
  - Collaboration with the non- academic experts
  - Understanding circular economy in a wider context

SmartShip - WP5

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Slide No. 16

Thanks for your attention

Questions

3.6. SmartShip Review Meeting WP6 progress

smartship

A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels

Review Meeting
Athens, 18.09.2020

WP6: ***Integrated Smartship framework, validation and pilot***

Beneficiary: EPSILON

Presenter: Nikolaos Katsiotis

The SmartShip project has received funding from the European Union's Horizon 2020 research and Innovation programme under the Marie Skłodowska-Curie grant agreement No 823916

WP6 Overview

WP6 Overview

Objectives

- …the **integration** and **implementation** of the *SmartShip framework*
  - *binding* the maritime world with the information/communication technology one;
    - towards a **multi-layer optimization tool**.
- the implementation's **combination** of the envisioned framework aimed at:
  - *(i) addressing **environmental** issues and requirements;*
  - (ii) meeting **complementary requirements** inserted by the **maritime** *stakeholders;*
  - (iii) facing **challenges** from novel technological advances such as
    - *advanced data analytics;*
    - *decision support systems;*
    - *optimization algorithms.*
- The **demonstration** of SmartShip framework *efficiency* through a **pilot**, based on the cooperation of
  - *(i)* **DANAOS**, who will contribute with its fleet and expertise in the vessel management systems evaluation and
  - *(ii)* the main technology providers (**EPS, ITML, BLS**) that have expertise in providing tools and services in the maritime sector.

WP6 Structure

WP6 Overview

Work Package no:	*WP6*	Lead beneficiary:	*EPSILON*
Work Package title:	*"Integrated Smartship framework, validation and piloting"*		
Start month:	**M25** *(April '21)*	End month:	**M48** *(March '23)*
Involved Partners:	**ALL Partners**		
Tasks No:	Description:	Leader – Partners:	M(st.) – M(en.)
T6.1	*"Integration & Implementation"*	*EPSILON – ITML, BLS, ENPC*	M25 - M42 *(April '21 – Sept '22)*
T6.2	*"Validation"*	*BLS – DANAOS, ITML*	M30 - M44 *(Sept '21 – Nov '22)*
T6.3	*"Pilot preliminary design and pre-pilot test"*	*DANAOS – ENPC*	M25 – M29 *(April '21 – Aug '21)*
T6.4	*"Main pilot test & evaluation"*	*DANAOS – ITML, ENPC, TUBS*	M30 – M48 *(Sep '21 – Mar '23)*

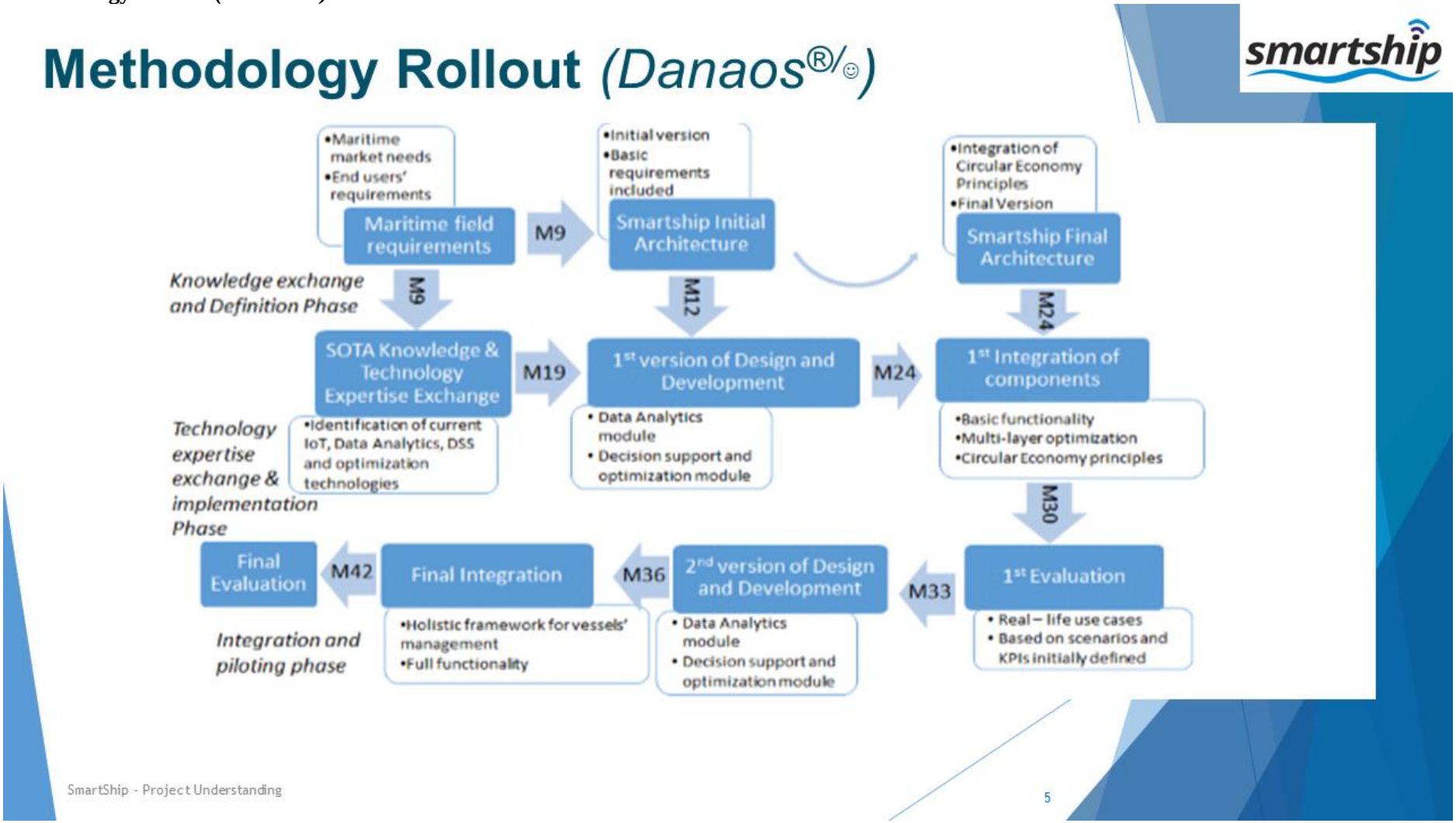
SmartShip - WP6 Integrated Smartship framework, validation and piloting 3

WP6 Deliverables

WP6 Deliverables

No.	Title	Leader	Type	Dissemination Level	Due Date
D6.1	"Integrated Smartship framework"	*EPSILON*	*Demo*	*Public*	**M42** *(Sept '22)*
D6.2	"Report on final pilot design and implementation"	*DANAOS*	*Demo*	*PU*	**M48** *(Mar '23)*

Methodology Rollout *(Danaos®/☺)*



Task 6.1: Integration & Implementation

Task 6.1: Integration & Implementation

- **Duration: M25** *(April '21)* **- M42** *(Sept '22)*
- **LEADER:** EPSILON **CONTRIBUTORS:** ITML, BLS, ENPC

Focus:

- To integrate all work performed in the project from both academic beneficiaries and the non - academic ones, in order to provide the overall **Smartship framework**.
- Two versions of the integrated framework will be delivered:
  - an initial one for the 1st validation and pilot testing (*M30 - Sept '21*) and
  - a final one for the final pilot testing (*M42 - Sept '22*)
- Secondments from **EPS, ITML, BLS** to the academic beneficiaries as well as from **ENPC** are foreseen.

Task 6.2: Validation

Task 6.2: Validation

- **Duration: M25** *(April '21)* **- M42** *(Sept '22)*
- **LEADER:** BLS **CONTRIBUTORS:** DANAOS, ITML

Focus:

- To ensure that knowledge has been transferred in a **bidirectional manner** appropriately enough, so as to cater for the provision of a functional SmartShip framework.
- Validation will be performed in a **2**-stage fashion:
  - both versions of the integrated framework from **T6.1** will be validated **before** applied in the pilots in **T6.4**.
- Bidirectional secondments are foreseen, focusing mainly on secondments from **BLS, ITML** and **DANAOS** to the academic beneficiaries in order to validate the results in their own premises.

Task 6.3: Pilot preliminary design and pre-pilot test

Task 6.3: Pilot preliminary design and pre-pilot tes

- **Duration: M25** *(April '21)* **- M29** *(Aug '21)*
- **LEADER:** DANAOS **CONTRIBUTORS:** ENPC

Focus:

- This task comprises the **preliminary design** of the *pilot* and the *pre-pilot testing*.
- **DANAOS** will organize the procedures, based on the scenarios and the KPIs defined in **WP2** and the *validation* outcomes of **T6.2**.
- Secondments will be required from **DANAOS** as well as from other technology partners to universities in order to coordinate the work and verify that all parameters are taken into consideration.
- A pre-pilot test will also be carried out, requiring secondments from **DANAOS**, **ENPC** and **EPS** who is responsible for the integration in **T6.1**.

Task 6.4: Main pilot test & evaluation

Task 6.4: Main pilot test & evaluation

- **Duration: M30** *(Sept '21)* **- M48** *(Mar '23)*
- **LEADER:** DANAOS **CONTRIBUTORS:** ITML, ENPC, TUBS

Focus:

- This task will focus on the **demonstration** of the SmartShip framework through a pilot carried out based on DANAOS' premises exploiting DANAOS' fleet.
- The SmartShip framework will be thoroughly **evaluated** and the level at which all requirements are met will be estimated.
- **Pilots** will run with both versions of the integrated platform.
- Staff from **DANAOS** will be **seconded** to academic beneficiaries.

Slide No. 10

Vă mulțumesc foarte mult pentru atenție

Questions please?

3.7. SmartShip Review Meeting WP7 progress

smartship

A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels

Review Meeting
Athens, 18.09.2020

WP7: Dissemination, Exploitation and Training management

Beneficiary: ENPC

Presenter: Hernan Ruiz-Ocampo

The SmartShip project has received funding from the European Union's Horizon 2020 research and Innovation programme under the Marie Skłodowska-Curie grant agreement No 823916

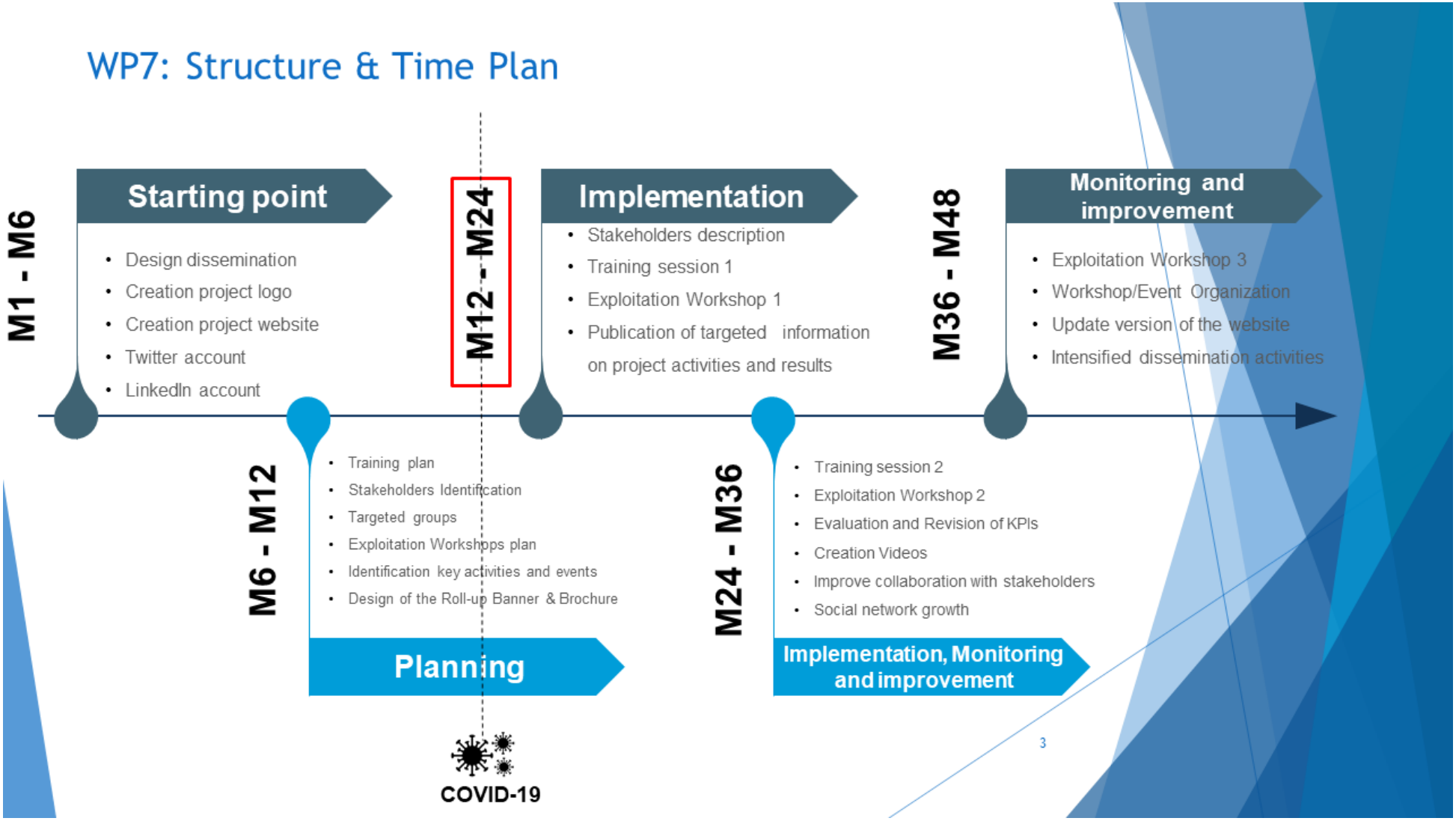
WP7 Overview

WP7 Overview:

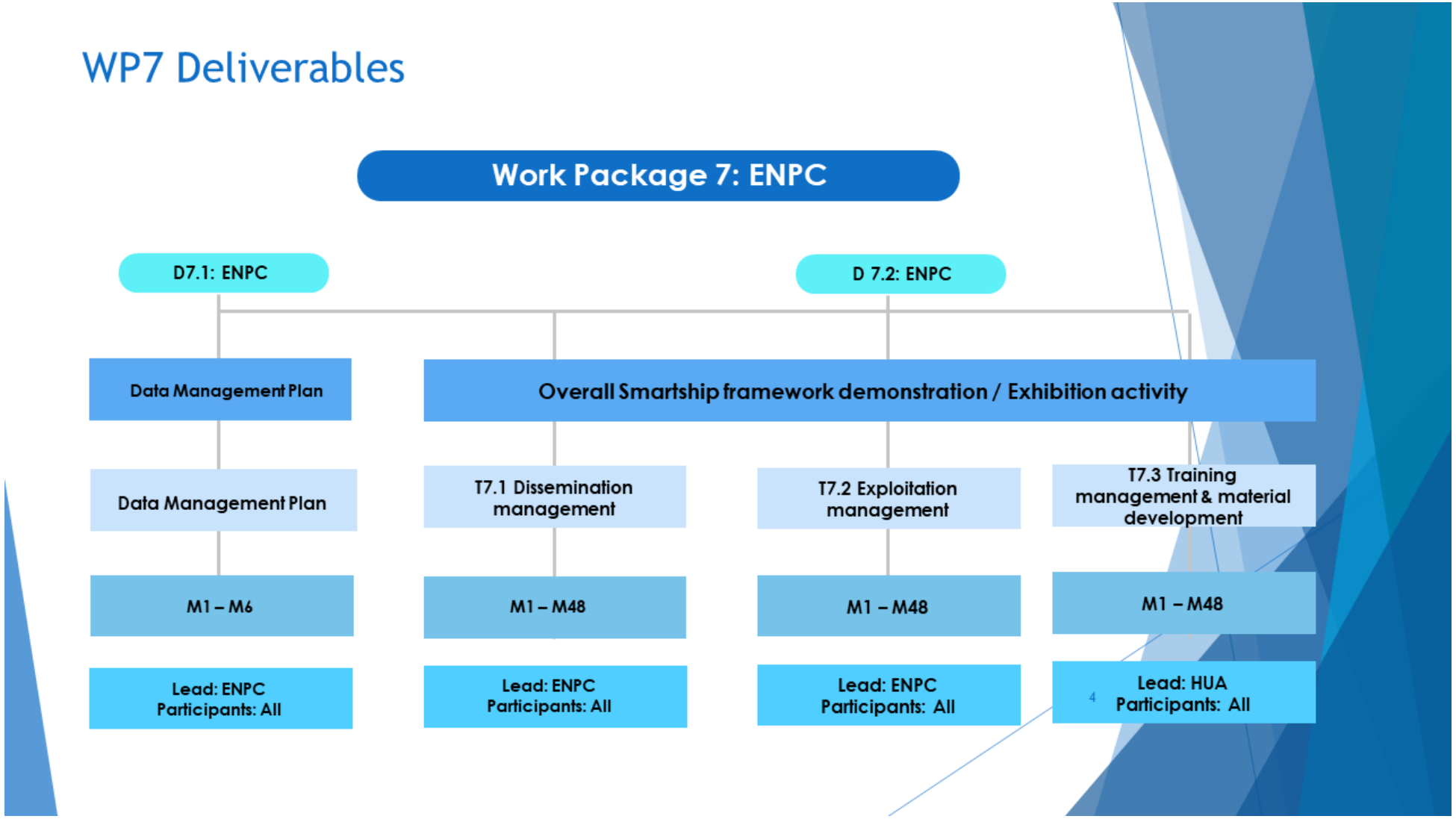
- **Objectives**
  - Coordination, management and execution of the dissemination, exploitation and training activities for efficient binding of maritime industry with ICT-oriented industrial and research beneficiaries
  - Management of basic networking and knowledge-sharing activities
- **Dependencies (Secondments, WPs, Tasks)**
  - Bidirectional secondments between partners (T7.1, T7.2, T7.3)
  - Secondments: 5

Secondee	Researcher category	Partner	Sending country	Sending sector Academic	Seconded to partner	Seconded to country	Seconded sector academic	Starting month	Duration
Ms. Evi Chavele	ADM	ITML	Greece	No	ENPC	France	Yes	10	4
Mr. Markos Bonazountas	ER	EPS	Malta	No	HUA	Greece	Yes	1	1
Mr. Jakub Rola	ESR	BLS	Poland	No	HUA	Greece	Yes	4	3
Mr. Piotr Kowalski	ESR	BLS	Poland	No	HUA	Greece	Yes	4	3
Mr. Markos Bonazountas	ER	EPS	Malta	No	HUA	Greece	Yes	7	3

WP7: Structure & Time Plan

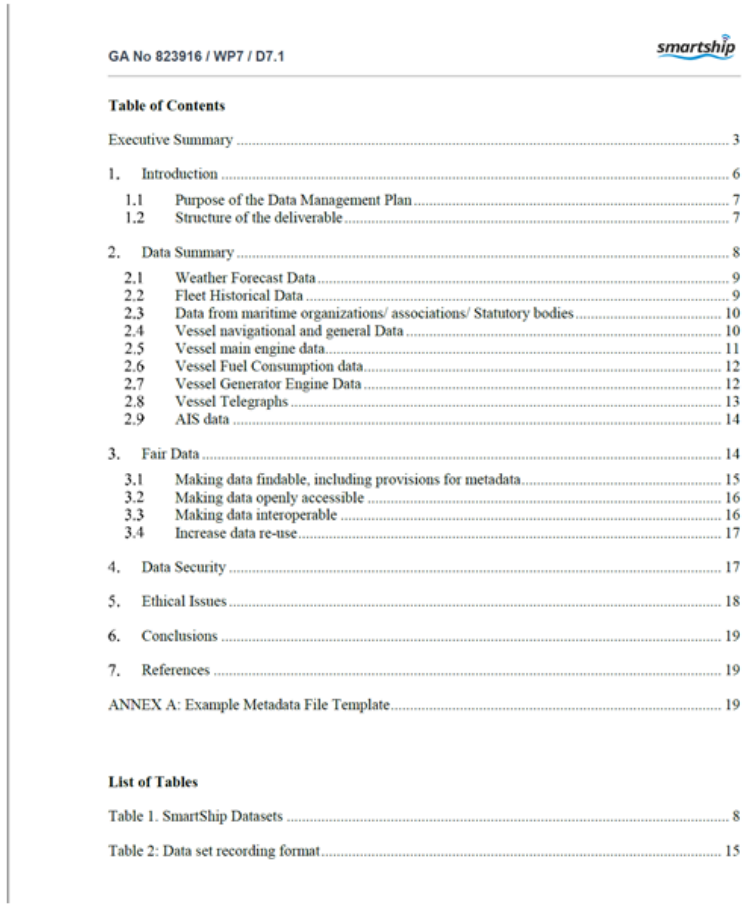


WP7 Deliverables



D7.1 Data management Plan

D7.1 Data management Plan



GA No 823916 / WP7 / D7.1

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Delivered on time: M06

Task 7.1: Dissemination Management

Task 7.1: Dissemination Management

- **Duration: M1-M48 LEADER: ENPC CONTRIBUTORS: ALL**
- **Objectives**
  - Planning and implementation of the project's dissemination activities
  - Definition and analysis of target audiences
  - Selection and usage of appropriate online and offline communication channels
  - Evaluation of the effectiveness of the project's dissemination measures
- **Status & progress**
  - Relevant stakeholders
  - Dissemination and public engagement strategy
  - Dissemination and public engagement activities

SmartShip - WP7

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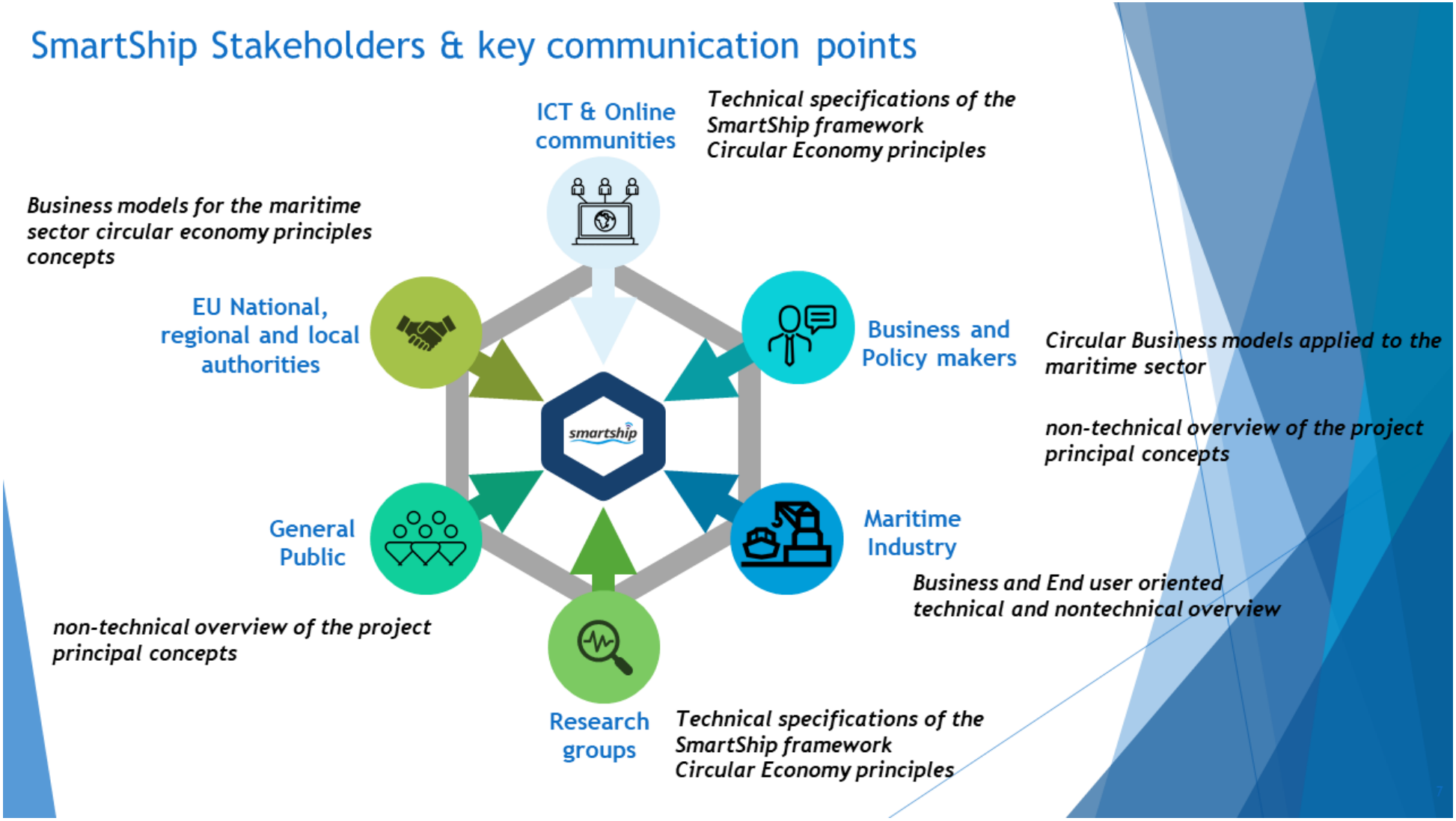
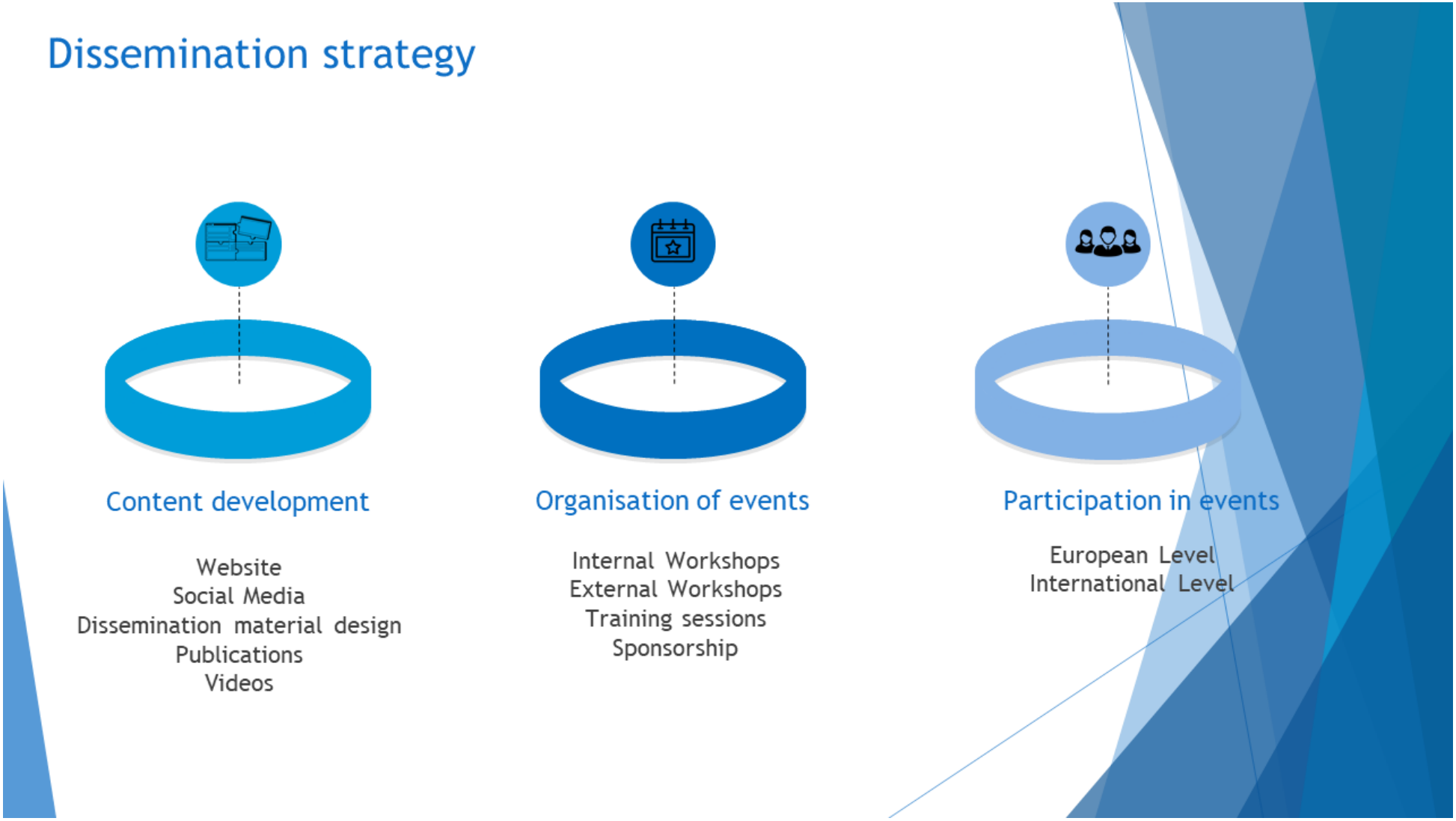
SmartShip Stakeholders & key communication points

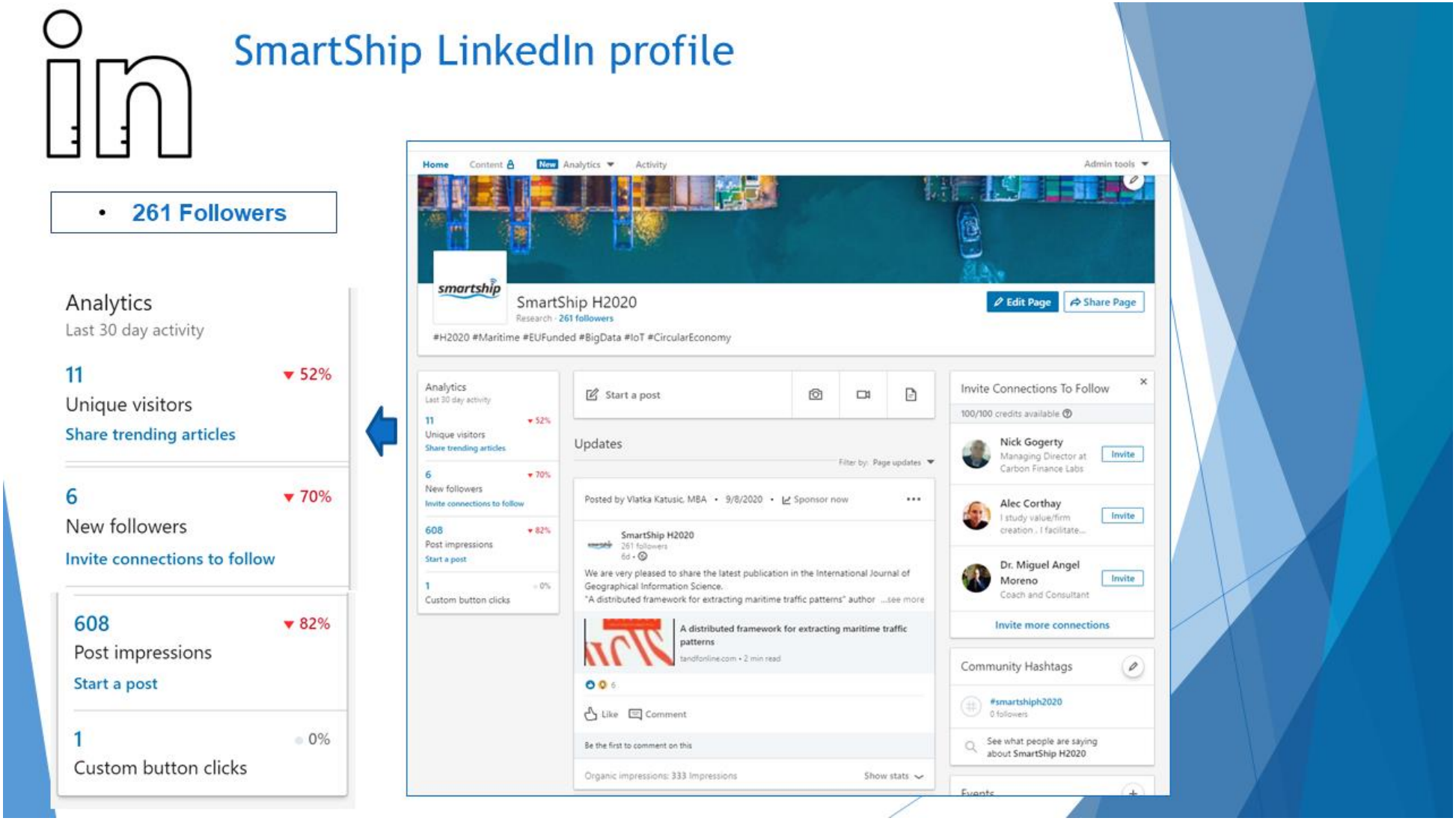


Dissemination strategy

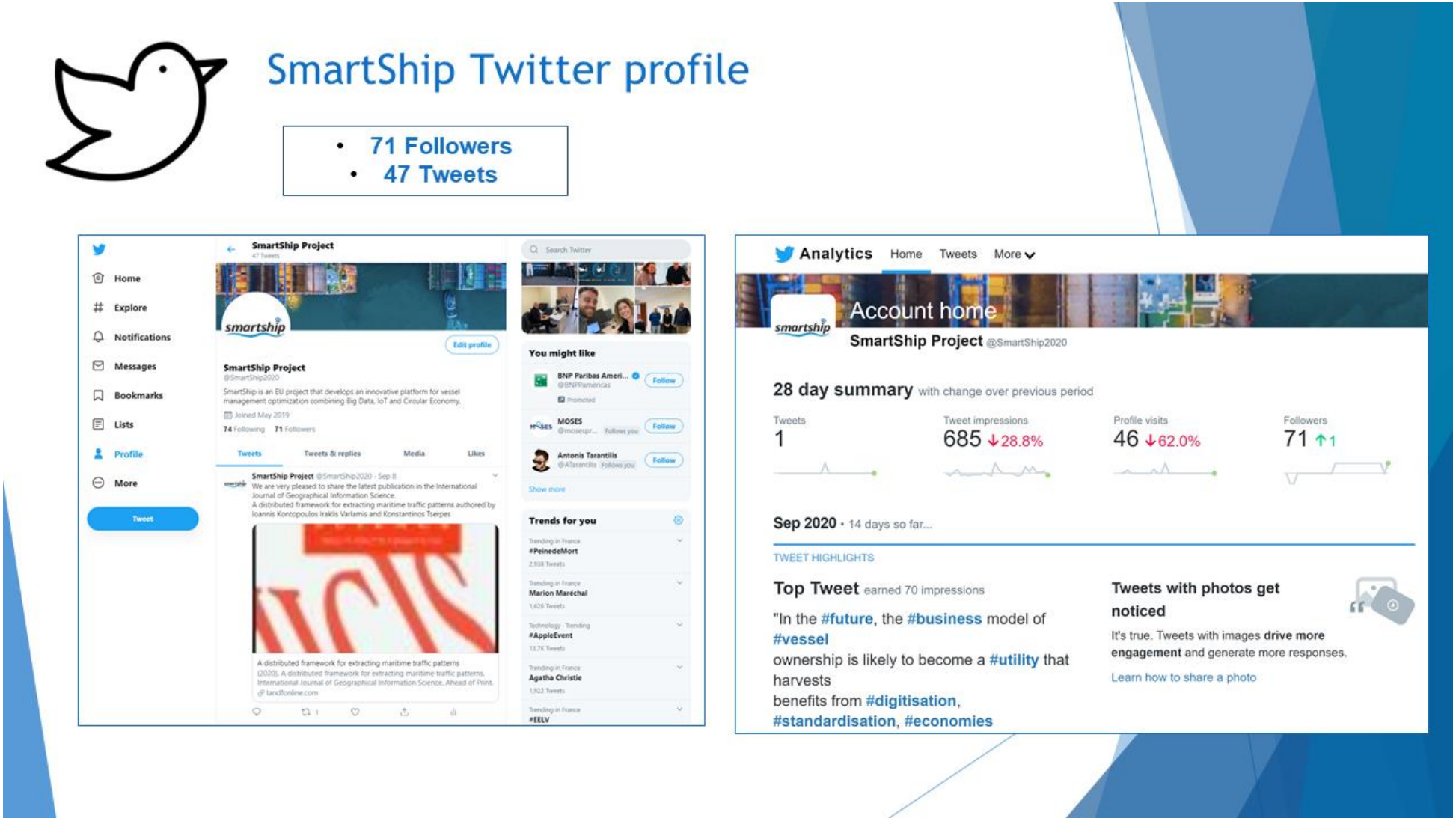


SmartShip website

SmartShip LinkedIn profile



SmartShip Twitter profile

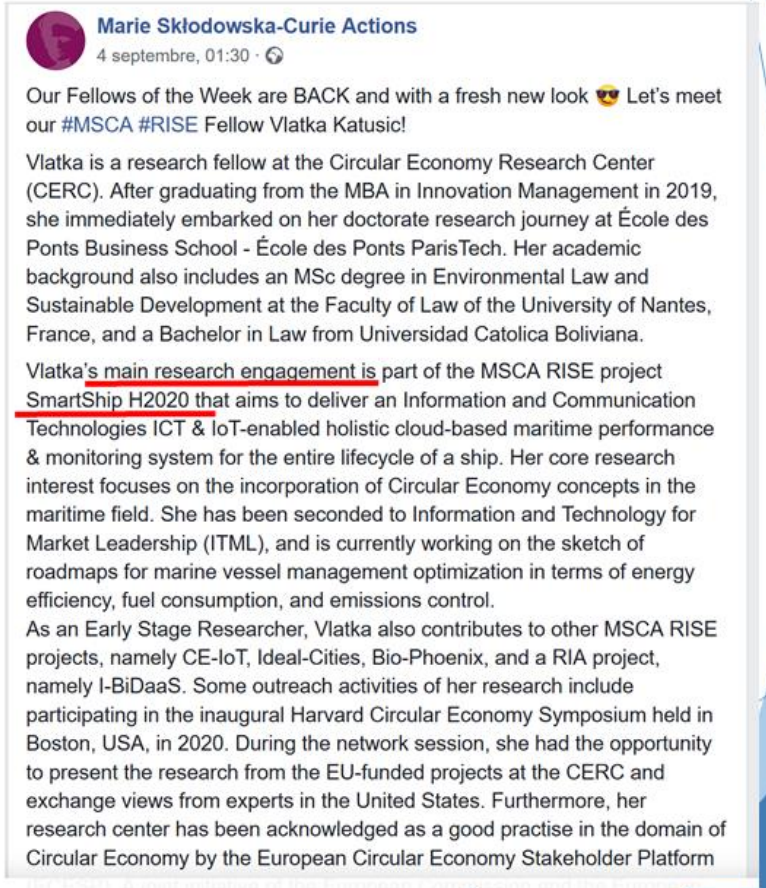


Marie Sklodowska-Curie Actions social media

Marie Sklodowska-Curie Actions social media

Facebook:
- 44 reactions
- 7 shares

Twitter:
- 19 reactions
- 9 retweets



Marie Skłodowska-Curie Actions
4 septembre, 01:30 ·

Our Fellows of the Week are BACK and with a fresh new look 😎 Let's meet our #MSCA #RISE Fellow Vlatka Katusic!

Vlatka is a research fellow at the Circular Economy Research Center (CERC). After graduating from the MBA in Innovation Management in 2019, she immediately embarked on her doctorate research journey at École des Ponts Business School - École des Ponts ParisTech. Her academic background also includes an MSc degree in Environmental Law and Sustainable Development at the Faculty of Law of the University of Nantes, France, and a Bachelor in Law from Universidad Catolica Boliviana.

Vlatka's main research engagement is part of the MSCA RISE project SmartShip H2020 that aims to deliver an Information and Communication Technologies ICT & IoT-enabled holistic cloud-based maritime performance & monitoring system for the entire lifecycle of a ship. Her core research interest focuses on the incorporation of Circular Economy concepts in the maritime field. She has been seconded to Information and Technology for Market Leadership (ITML), and is currently working on the sketch of roadmaps for marine vessel management optimization in terms of energy efficiency, fuel consumption, and emissions control.
As an Early Stage Researcher, Vlatka also contributes to other MSCA RISE projects, namely CE-IoT, Ideal-Cities, Bio-Phoenix, and a RIA project, namely I-BiDaaS. Some outreach activities of her research include participating in the inaugural Harvard Circular Economy Symposium held in Boston, USA, in 2020. During the network session, she had the opportunity to present the research from the EU-funded projects at the CERC and exchange views from experts in the United States. Furthermore, her research center has been acknowledged as a good practise in the domain of Circular Economy by the European Circular Economy Stakeholder Platform

SmartShip Banner & Flyer

Dissemination activities overview

Dissemination activities overview

Participation in Events:

- InfoDay: MSCA NPCs and Industry Workshop
- Researcher's night
- 2nd Workshop of EU Research & Innovation Maritime Projects, The Hellenic contribution
- HCES Symposium
- Online training programme: From Linear to Circular
- 'Loops' First Episode on the Digital Circular Economy

Sponsorships:

- Circular City Week
- CYpBER2020

Publications:

- International Journal of Geographical Information Science
- Geoinformatica
- International Workshop on Multiple-Aspect Analysis of Semantic Trajectories

Events highlights

Events highlights

Malta, July 2020

Malta Council for Science and Technology MSCA NPCs and Industry Workshop

Presentation on the SmartShip project emphasizing on the Marie-Curie fund benefits for both the private and the government sector

Germany, September 2019

ECML PKDD - European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases

- Research publication

Piraeus, November 2019

2nd Workshop of EU Research & Innovation Maritime Projects, The Hellenic contribution

- Promote and Present project to an event dedicated to Greek EU research initiative applied to Maritime industry

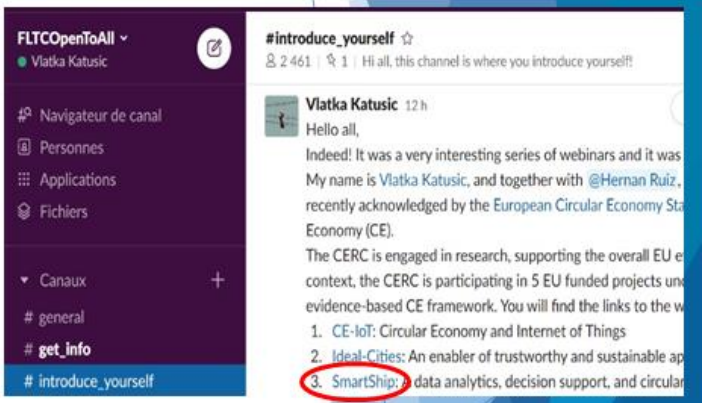
Boston, March 2020

1st Symposium on CE at Harvard

- Networking session presenting SmartShip project

10-week Online training session

- Transition to circular economy



Innovation in Circular Economy

- **Director CERC (ENPC) presented interplay between CE and IoT: Key elements towards circular economy**

Sponsorships

Scientific Journals

Future Activities

FUTURE ACTIVITIES: TOOLS

Module B. design and execute portfolio dissemination plan

- **SERVICE 1 (D7.2)**
- Creation portfolio R&I products
- Mapping Stakeholders
- Common dissemination plan according w/ portfolio results
- Valorization key exploitation results
- **SERVICE 2 (D7.2)**
- Market Analysis & strategy
- Business modelling
- Competitor Identification and analysis
- Clear action plan
- Estimation time to market
- **SERVICE 3 (D7.2)**
- Pitching
- Intellectual Property rights
- Dessing Commercial development plan
- Feasability study and asses potelntial business plan
- Creation Spin-off/Start-up

EXPLOITATION, STANDARDISATION & DISSEMINATION

Task 7.2: Exploitation management

Task 7.2: Exploitation management

- Duration: M1-M48
- LEADER: ENPC CONTRIBUTORS: ALL
- Objectives
  - Promote individual exploitation potential
  - Identify possible exploitation cooperation between the partners
  - Identify exploitable results
  - Analyse the most relevant domains
  - Prepare and present realistic exploitation plans (initial Exploitation Plan, as part of D7.2)
  - Exploitation of the project results depend on the technological components
- Status & progress
  - Identification individual exploitation objectives
  - Workshop exploitation plan definition
  - Identification business model worksheet

SmartShip - WP7

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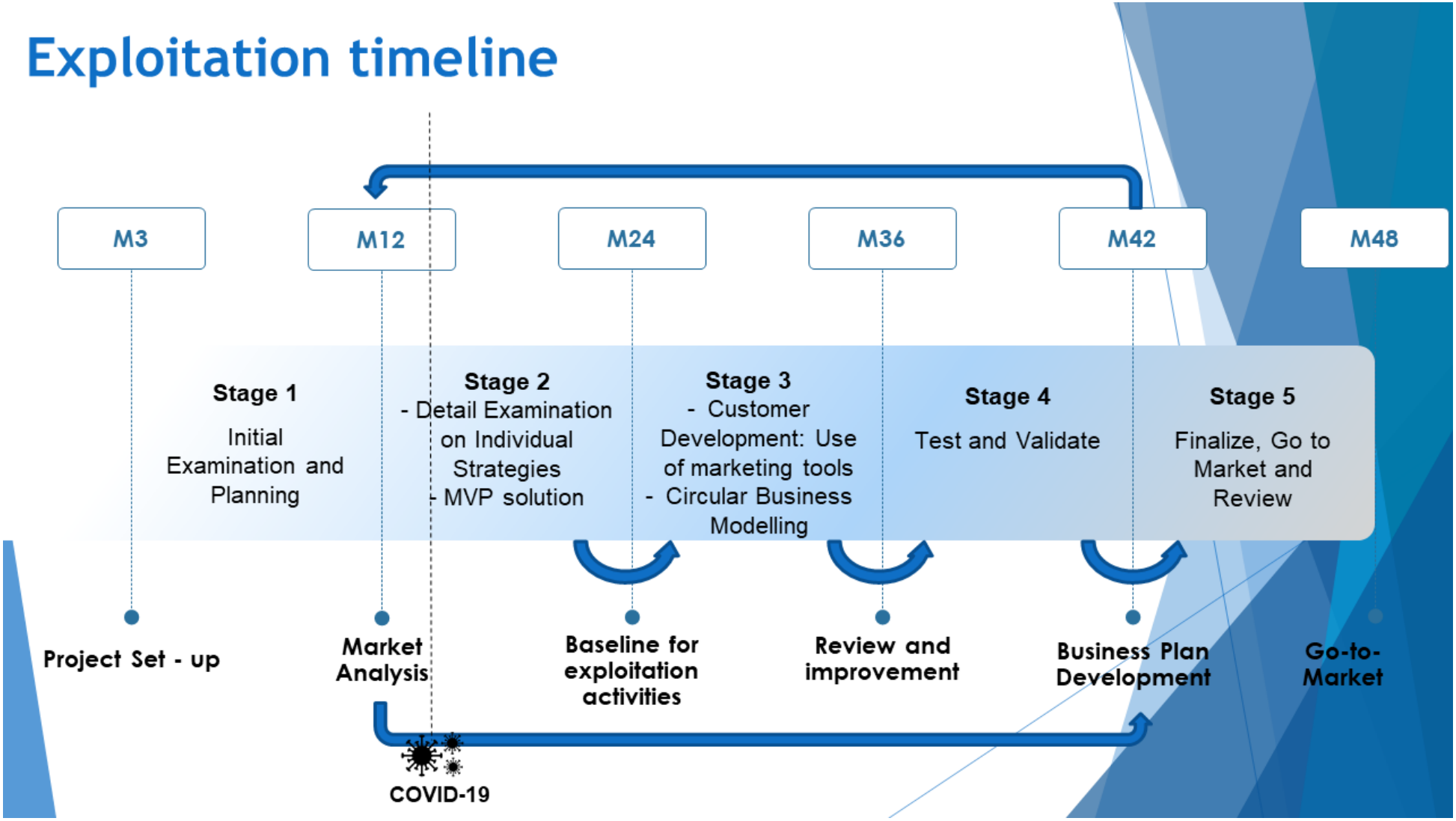
Exploitation timeline



Individual exploitation objectives

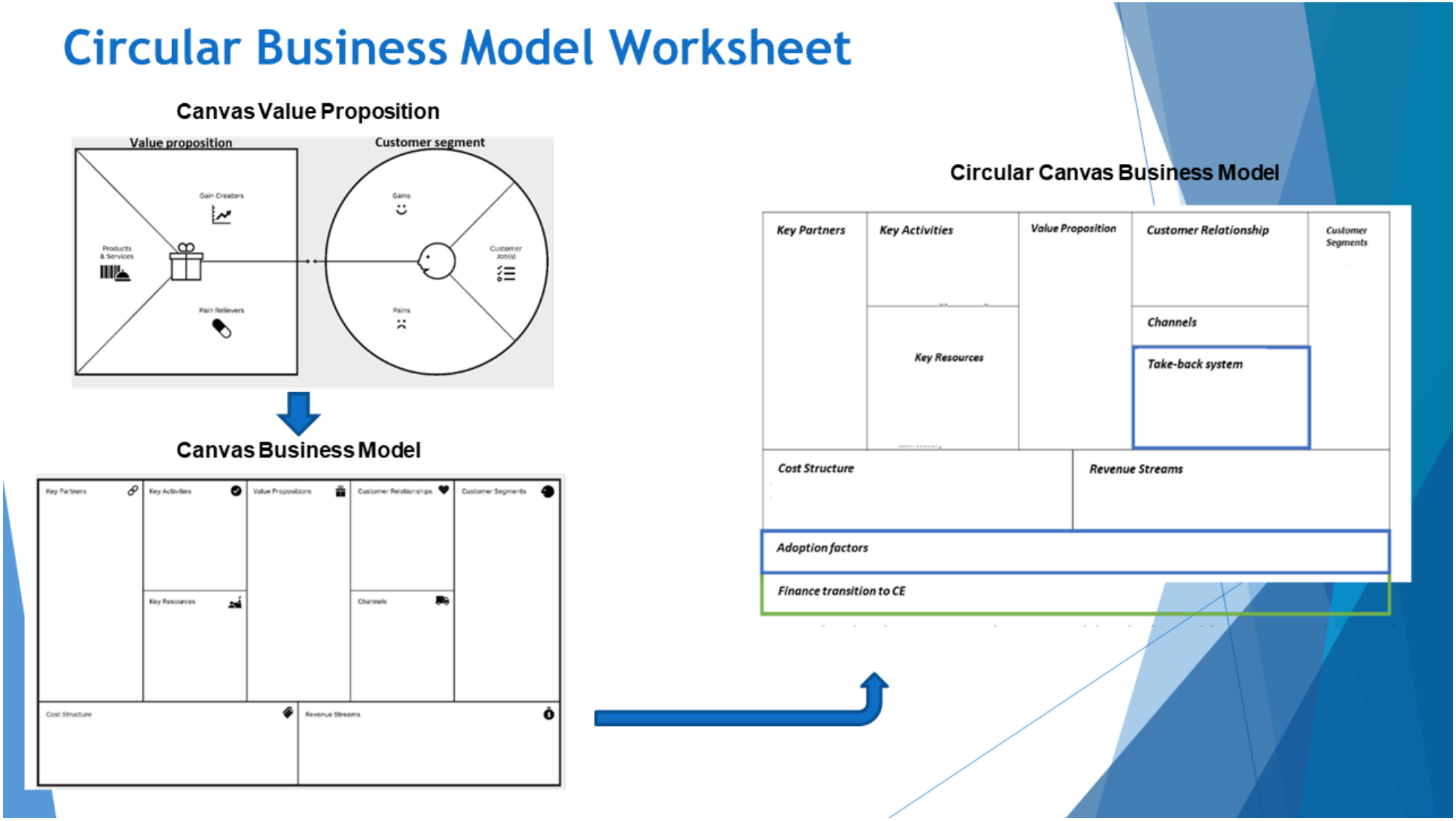
Individual exploitation objectives

- *identified different exploitation objectives*
  - *Industrial partners*
    - *Improve technologies*
    - *Enrich portfolio*
  - *Academics*
    - *Training*
      - *Master programs (e.g. MBA)*
      - *Research programs (e.g. PhD)*
      - *Professional training*

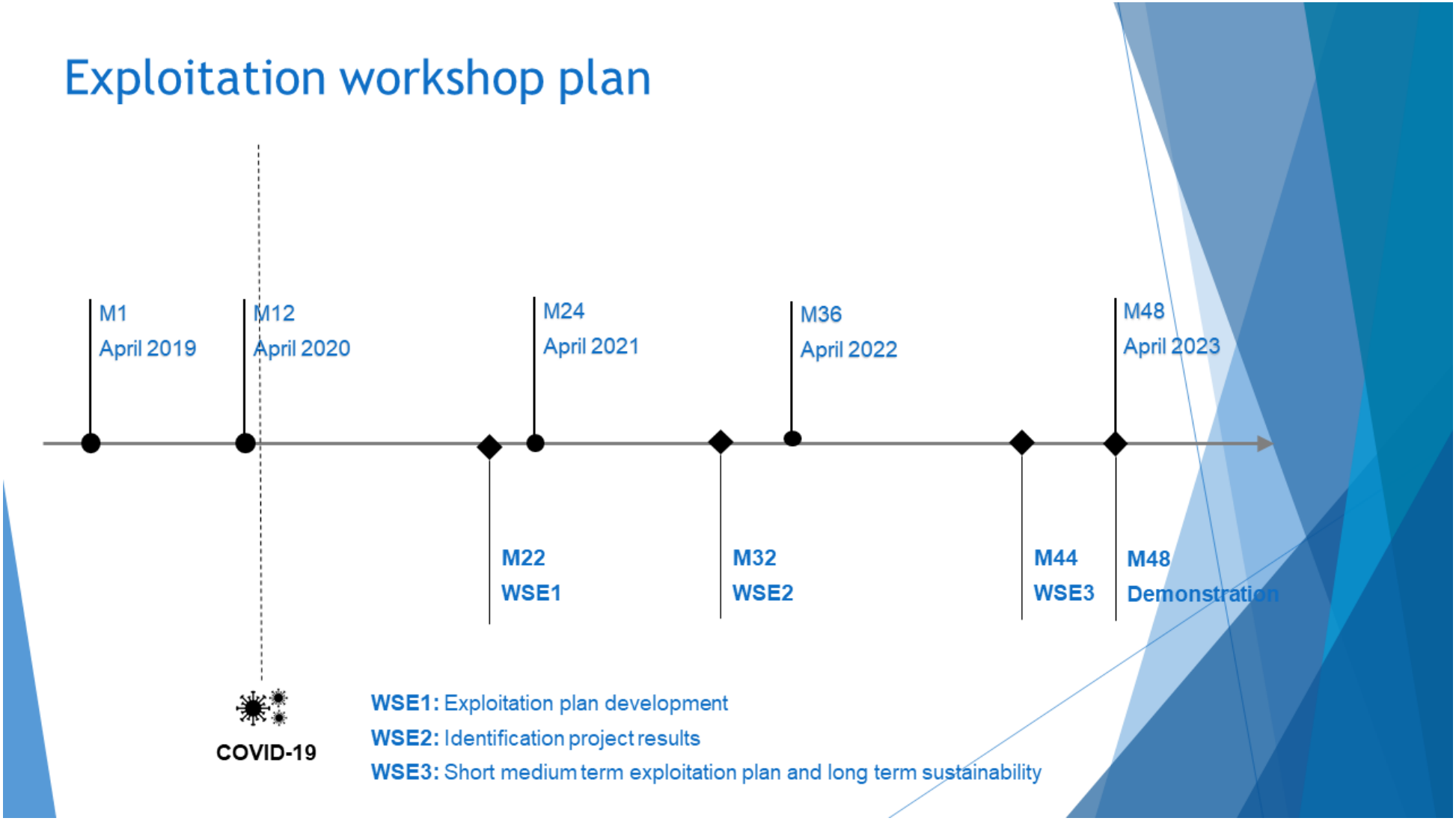
Joint objectives

- Transfer of knowledge
- Life Cycle Analysis Approach
- Application of Circular Business Models (e.g. product life-extension)
- Showcase the project to the **EC as a success story**

Circular Business Model Worksheet



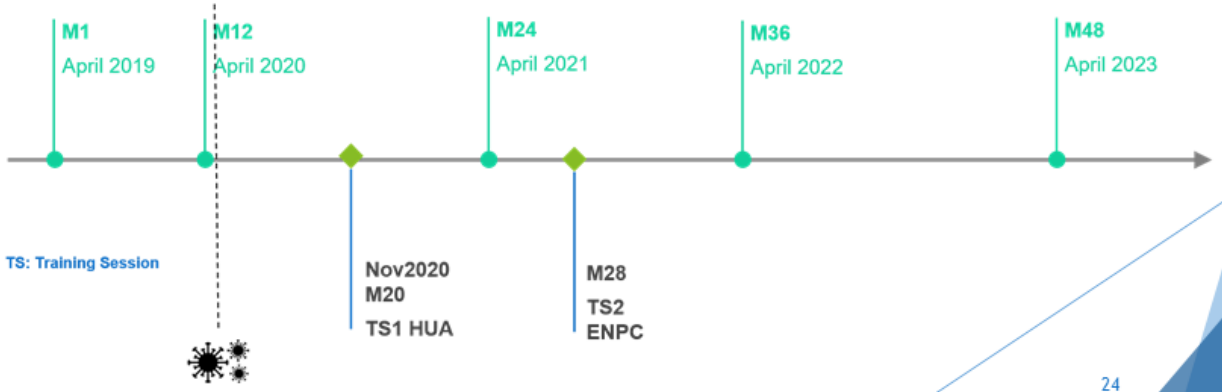
Exploitation workshop plan



Task 7.3: Training management & material development

Task 7.3: Training management & material development

- **Duration: M1-M48**
- **LEADER: HUA CONTRIBUTORS: ALL**
- **Objectives**
  - Set out a training plan (continuously updated)
  - Organization of training sessions about public impact and societal challenges of SmartShip
- **Status & progress**
  - An initial training plan has been designed and a first training session was planned to be organised in the upcoming months. However, due to COVID-19 outbreak, a physical training session might be cancelled and discussions for an online session are being held.



SmartShip - WP7

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Secondment activity

Secondment activity

Sending partner: BLS

Destination partner: HUA

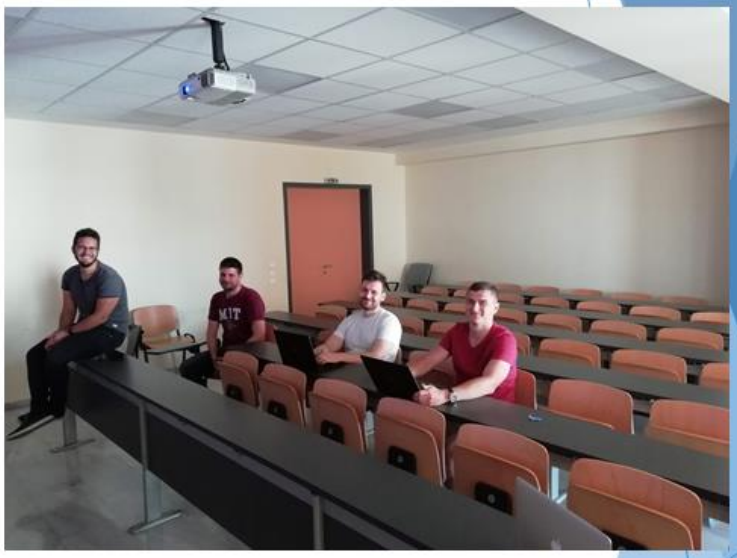
Duration: 5.07.2019 - 5.10.2019

Related Work Package: WP7

Knowledge Transfer:
- Best practices in CI/CD process
- Integration process in microservices solutions

Knowledge Gained:
- General information about maritime sector
- Machine learning techniques used in maritime sector
- Ship trajectory analysis techniques

Secondee names:
Mr. Jakub Rola



[Mr. **Jakub Rola**]

SmartShip - WP7

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Secondment activity - Secondees

Secondment activity - Secondees

- Background
  - Professional Experience

    2019: software developper in BlueSoft

  - Participation in projects
    - Ce-IoT
    - Ideal-Cities
- Impact on the overall project

The secondment provided to the secondee an insight into the maritime sector which was unknown before. It also provided the secondee with basic information on the current solutions available in the maritime sector and what can be done in future.

- Impact on future career

The learned technologies and techniques can be used in future projects

Slide No. 27

Thanks for your attention

Questions

3.8. Secondments Status and Progress

Secondments Initial Plan

Secondments Initial Plan (M1-M18)

	Initial allocation							
	DANAOS	HUA	ENPC	ITML	BLS	EPS	TUBS	Total
WP2	10	6	19				6	**41**
WP3	4		7	12		6		**29**
WP4	2	11	14	5		3		**35**
WP5		5	14	4	10			**33**
WP7					6	3		**9**
	16	**22**	**54**	**21**	**16**	**12**	**6**	**147**

SmartShip

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Secondments Actual Implementation & Deviations

Secondments Actual Implementation & Deviations (M1-M18)

	Secondment Implementation									
	DANAOS	HUA	ENPC	ITML	BLS	EPS	TUBS	**Total**	Completion/WP	Deviation / WP
WP2		10	10				3,13	**23,13**	56%	44%
WP3			3,03	6,13		6,03		**15,19**	52%	48%
WP4		1		6,13		4		**11,13**	32%	68%
WP5			4,03					**4,03**	12%	88%
WP7				6,13	6,04	4,63		**16,8**	187%	-87%
Total	**0**	**11**	**17,06**	**18,39**	**6,04**	**14,66**	**3,13**	**70,28**	**48%**	**52%**
Completion/Partner	0%	50%	32%	88%	38%	122%	52%			
Deviation/ Partner	100%	50%	68%	12%	62%	-22%	48%			

SmartShip

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Secondments Remaining

Secondments Remaining

	Remaining Secondments							
	DANAOS	HUA	ENPC	ITML	BLS	EPS	TUBS	**Total**
WP2	10	-4	9				2,87	**17,87**
WP3	4		11,97	5,87	6	-0,03		**27,81**
WP4	2	10	14	9,87	6	5		**46,87**
WP5		12	9,97	7	24			**52,97**
WP6	22	7	11	19	10	15		**84**
WP7	6	6	10	-3,13	-0,04	1,37		**20,20**
Total	**44**	**31**	**65,94**	**38,61**	**45,96**	**21,34**	**2,87**	**249,72**

SmartShip

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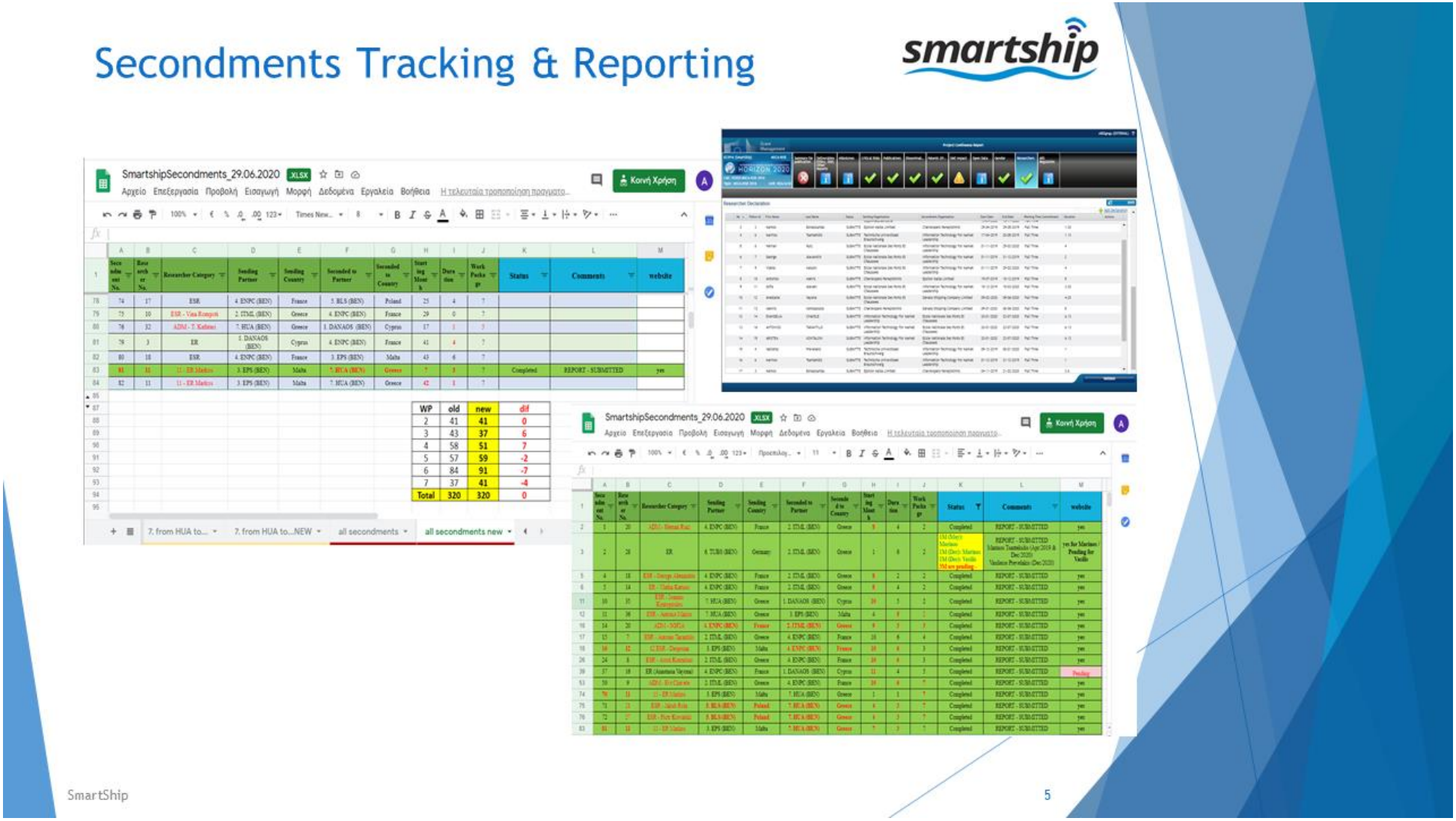
Secondments Tracking & Reporting



Transfer Knowledge

Transfer Knowledge

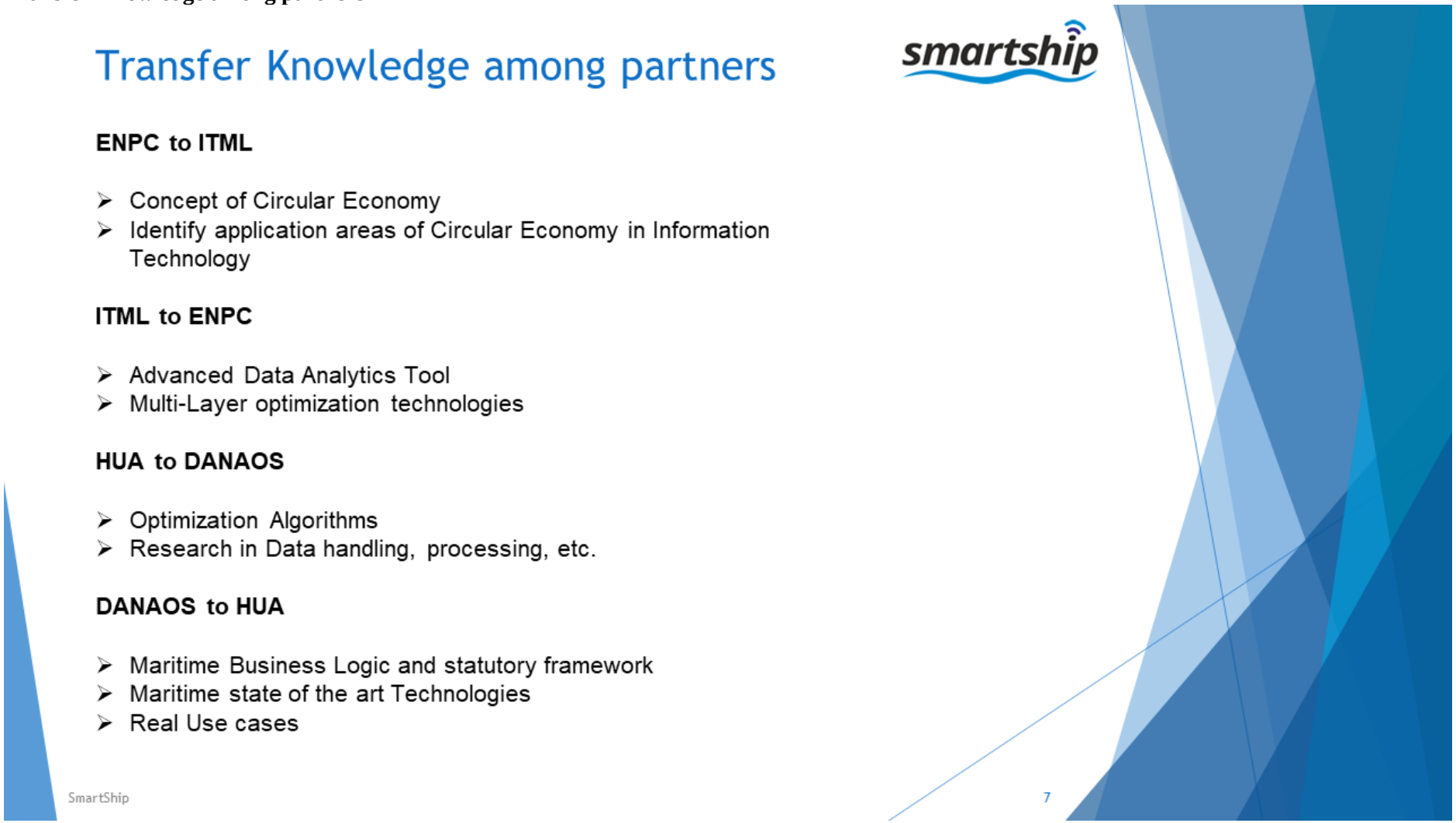
Main Areas

- Industry to Academic and vise versa
- Technology providers to Maritime and vise versa

Concepts

- Challenges in maritime in search of optimization applications
- Academic in search of maritime business logic and real cases to apply innovation / research
- Embed Circular Economy concept to ship management
- Research collaboration between industry and Academic institutions as leverage for added value in shipping operation

Transfer Knowledge among partners



Transfer Knowledge among partners

Transfer Knowledge among partners

Work Plan Deviations

Work Plan Deviations

Active Tasks	M(start)	M(end)	Duration	Completion % M18 (estimated)	Completion % M18 (Actual)	Deviation
1.1	1	48	48	38%	38%	0%
1.2	1	48	48	38%	38%	0%
1.3	1	48	48	38%	38%	0%
2.1	1	9	9	100%	100%	0%
2.2	1	9	9	100%	100%	0%
2.3	10	18	9	100%	50%	50%
3.1	10	18	9	100%	50%	50%
3.2	10	18	9	100%	50%	50%
4.1	10	19	10	90%	40%	50%
4.2	10	19	10	90%	40%	50%
5.1	10	19	10	90%	30%	60%
5.2	10	19	10	90%	30%	60%
7.1	1	48	48	38%	38%	0%
7.2	1	48	48	38%	38%	0%
7.3	1	48	48	38%	38%	0%

Work Plan Related Deviations

Work Plan Related Deviations

- Sketching the roadmap for sustainable marine vessel management optimization in terms of energy efficiency. Use cases identified already (T2.1,T2.2). **Currently under design phase (T2.3)**
- Design and Specifications of the SmartShip architecture**. Not all layers of system framework designed (T3.1)**
- Supporting functionalities (T3.2) for SmartShip **are Subject to T3.1 delays.**
- State of the art Advanced data analytics tool and IoT Technologies in maritime industry are identified (T4.1,T4.2). **Further research needed**
- State of the art in Decision support and multi-layer optimization technologies applied in maritime industry (T5.1,T5.2)**. Only initial research**

Contingency plan #1

Contingency plan (Project Extension Reasoning)

- Recording Deviation 50% in secondments and Work plan attributed to COVID-19 and associated with tasks scheduled between M12-M18/19
- Should highlight effective project Management in project remote coordination. Ongoing secondments keeping work running. Dissemination actions driven from partner's initiatives are supporting project promotion
- Project Extension allow partners to effectively allocate / distribute secodnemnts so to boost work forward
- Further facilitate dissemination given cancellations of events due to COVID-19
- Not possible to properly quantify the duration of the extension, Not possible to predict when things will go better.

Contingency plan #2

Contingency plan (Project Extension Debate)

- **OUR Intention** Keep work alive, Keep project on track as much as possible
- Close collaboration with EU is needed. (Guidelines)
  - When is the proper timing for a formal request? Checkpoint (Dec2020/Jan2021)_**Next Milestone** : Submission of D3.1 (March 2021).
  - Different COVID-19 restrictions as applied locally given severity in each host country. Effect on balanced distribution of secondments among partners under a consolidated framework. (Should take into consideration that someone maybe feels no comfortable travelling even with no local measures). How should we handle secondment management under these circumstances ?
  - Do we assume the possibility to perform some of the work remotely?
  - Project baseline amendments ? (prolonging duration of task behind schedule?) OR maybe change scope (?) especially if due to unpredicted COVID-19 crisis/implications, time expansion could probably be an ongoing/continuous request?
  - ……

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Secondments

Slide No. 15

Thanks for your attention

Questions

4. Minute notes (MoM)

A data analytics, decision support and circular economy – based multi-layer optimization platform towards a holistic energy efficiency, fuel consumption and emissions management of vessels

Review Meeting
Minutes

Athens, 8 July 2019

Project ID:	823916
TOPIC:	MSCA-RISE-2018 Research and Innovation Staff Exchange
Starting date :	01/04/2019
Duration in months:	48
Consortium:	DANAOS (Leader), ITML, EPS, ENPC, BLS, TUBS, HUA

Location

Meeting day & time	18-SEP-2020, 09:30-16:30 (CET)
Location	Review Meeting Remote
Minutes taker	Aristi Kontaloni, akontaloni@itml.gr, ITML

List of Attendees

Table 1: List of Attendees

Organization	Name	E-mail
RESEARCH EXECUTIVE AGENCY	Radu Diaconescu - Project Officer (PO)	Radu.DIACONESCU@ec.europa.eu
DANAOS	Fotis Oikonomou (FO)	drc@danaos.gr
ITML	George Bravos (GB)	gebravos@itml.gr
	Aristi Kontaloni (AK)	akontaloni@itml.gr
EPSILON	Marc Bonazountas (MB)	bonazountas@epsilonmalta.com
	Nikolaos S. Katsiotis (NK)	maritime@epsilon.gr
ENPC	Giorgos Demetriou (GD)	g.demetriou@pontsbschool.com
	Hernan Ruiz Ocampo (HO)	h.ruizocampo@pontsbschool.com
	Vlatka Katusic Cuentas (VC)	v.katusiccuentas@pontsbschool.com
BLS	Bartłomiej Lipa (BL)	bartlomiej.lipa@bluesoft.com
	Jakub Rola (JR)	jakub.rola@bluesoft.com
	Dimitrios Panos (DP)	dimitrios.panos@bluesoft.com
TUBS	Marinos Tsantekidis (MT)	tsantekidis@ida.ing.tu-bs.de
HUA	Konstantinos Tserpes (KT)	tserpes@hua.gr
	Ioannis Kontopoulos (IK)	kontopoulos@hua.gr

Minutes

Table 2: Minutes of Meeting (MoM)

Project Overview	**Presented by DANAOS (FO)** • Very structured and well-developed work (*PO commented*)
WP1	**Presented by DANAOS (FO)** No comments
WP2	**Presented by HUA (IK)** No comments
WP3	**Presented by ENPC (VC)** No comments
WP4	**Presented by ITML (AK)** No comments
WP5	**Presented by BLS (DP)** • Upload the publication relevant to WP5 in the SYGMA platform (*PO commented*)
WP6	**Presented by EPS (NK)** No comments
WP7	**Presented by ENPC (HO)**

	• Very structured and well-developed work (*PO commented*) • Give feedback regarding the future dissemination activities especially in regards to Horizon booster services. How exactly will this be implemented and assist SMARTSHIP dissemination/exploitation strategy /scope? Feedback on booster tool performance will help the EU to assess the contractor for his services (*PO commented*)
Secondments	**Presented by DANAOS (FO)** • Reminder on the obligation of each beneficiary to keep records proving the eligibility of the secondments (for ex: proof of accommodation, plane/train tickets, lab journals, timesheets, email exchanges with the receiving organization, proof of use of Cat A costs, etc.). (*PO commented*) • When is the proper timing for a formal request? *(FO commented*) *It is not an emergency to request an extension. The EU is aware that deliverables and secondments will be delayed due to Covid-19. It is preferred to inform the REA through the platform for the request when it looks more feasible and we have a clear view of the COVID-19 crisis*. (*PO commented*) • Perform work remotely? (*FO commented*) *The researchers must attend the hosting parties for the execution of the secondments. Right now, the EU insist on the secondments to be continued as physical. It does not allow the performance of the secondment remotely*. (*PO commented*) • Prolonging the duration of tasks currently behind schedule? Or maybe change scope? (*FO commented*) *Due to the situation generated by the pandemics, deviations from the scope of the project might be accepted if duly justified (for ex for the validation of results) and the extension of the duration of the project up to 12 months.* (*PO commented*) • Asymmetry in the overall implementation of the secondments (ex. ENPC might want to send secondees but other partners might not want) (*GD commented*) • Remote work at the place of secondment? (*GD commented*) • Do we proceed with the secondments for those who can do secondments, even though we might have asymmetries? Or do we postpone secondments until further notice? (*GD commented*) *The option of suspending the project exists, however, it should be noted that no costs or activities can be claimed during the suspension period. (PO commented)* *If we continue as we do, will we have an understanding from the EU? (GD commented).* *There is some flexibility from the EU side on the secondment's implementation due to the Covid-19. Additionally, due to Covid we do not have visibility about what will happen.* (*PO commented*) • Non-Covid related delays must be identified and justified, tackled (*PO commented*) • Can a secondee practice more than 12 months of secondments? (*MB commented*)

	No, the maximum duration of a secondment per secondee is 12 months. (PO commented) • It is going to be challenging to align the newly planned secondments without changing the workplan. (*KT commented*). *I do not have an answer to that, as we do not know how the situation will evolve. There are two options, either to postpone the project or to switch to remote work but* ***not for the secondments****! You can organize online conferences workshops etc., but the secondments cannot be executed remotely*. (*PO commented*) • It is essential to detail all delays in the periodic report and if the consortium believes that a formal request regarding the secondments is going to be helpful then proceed with that. (*PO commented*) • If someone wants to activate a secondment and go to the premises of the hosting party and the premises are closed, then it is best not to activate the secondment at all. It is preferable to postpone the secondment. (*PO commented*) • If the secondment plan changes by more than 30%, then it is required to complete an official statement. (*PO commented*)
Open discussion	• **Reminder:** be careful to keep records for the eligibility conditions regarding the 2.100 euros that the researcher received for the secondment. (PO *commented)* • Moreover, add the publications to the SYGMA platform. (PO *commented)*
Other comments	• Regarding the submitted progress report (D1.1), the 65 pages are quite extended. More room in the doc. should have been focused on the research activities, rather than the reporting of the secondments. (*PO commented*) • We need to ensure compliance with the IPR sorted, agreed and included in the CA. (*PO commented*) • We need to keep track on the delays of the deliverables. (*PO commented*) • We need to report all the publications on the SYGMA platform. Golden OA is good but due to the high cost we can opt for Green OA (*PO commented*) *Green OA is not feasible because the publishers set an embargo period longer than the one accepted by the EC, i.e. six months*[1]*. This means that we cannot provide the published/camera-ready version in public repositories like Zenodo within six months of the publication. Golden OA is the only solution which obviously costs a lot of money.* (*KT commented*) *Try other repositories to upload the publications. The EU has a long list of approved repositories for publications. Moreover, in the periodic*

[1] Indicative list of embargo periods per publisher
https://ieeeauthorcenter.ieee.org/wp-content/uploads/article_sharing_infographic.pdf -> IEEE -> 24 months
https://www.springer.com/gp/open-access/publication-policies/self-archiving-policy -> Springer -> 12 months
https://authorservices.taylorandfrancis.com/publishing-open-access/open-access-cost-finder/ -> Taylor and Francis -> 12 months

	report we can mention the issue we have with the publications and the high cost, considering the embargo period for publishing open access. (*PO commented*) • For the first periodic report we will need justification for each delay associated with each beneficiary. (*PO commented*) • It is essential; all partners comply with project requirements securing project continuity. (*PO commented*)

5. Conclusion

Mid-Term Meeting review took place on 18th September 2020 with virtual means using MS teams[2] as online communication bridge. The meeting was attended by representatives of all parties thus bringing together project leaders and secondees from project beneficiaries with project PO as sole representative of the European Research Agency (see Table 2).

The Mid-Term meeting comprised of five parts:

1. An overview of project objectives and achievements up to M18 presented by project coordinator
2. Work done, issues and deviation recorded and action plan for each active work package of SMARTSHIP as presented by WP leaders
3. Project and secondment progress as well as project strategy to mitigate issues specially recorded due to COVID-19 implications attributed mainly to traveling restrictions not allowing on-schedule activation of planned secondments
4. Open interaction of PO with selected seconded staff from all project beneficiaries and
5. A round table open discussion between beneficiaries and PO to address any type of issues, questions, problems as well as to discuss over action plan for the next project period.

MoM, displayed in this document, are quoting all main statements, remarks, comments as have been recorded from all attendees in each thematic section of meeting's agenda.

Concluding should note that meeting, even though virtual due to COVID-19 restriction in physical interference, was held with the best possible quality, was run smoothly from the beginning to the end, and was productive for all parties involved.

[2] https://www.microsoft.com/en-us/microsoft-365/microsoft-teams/group-chat-software