



ANNEX 1



Horizon Europe (HORIZON)

Description of the action (DoA)

Part A

Part B

DESCRIPTION OF THE ACTION (PART A)

COVER PAGE

Part A of the Description of the Action (DoA) must be completed directly on the Portal Grant Preparation screens.

PROJECT	
<i>Grant Preparation (General Information screen) — Enter the info.</i>	
Project number:	101060107
Project name:	Integrating Adaptive Learning in Maritime Simulator-Based Education and Training with Intelligent Learning System
Project acronym:	i-MASTER
Call:	HORIZON-CL2-2021-TRANSFORMATIONS-01
Topic:	HORIZON-CL2-2021-TRANSFORMATIONS-01-05
Type of action:	HORIZON-RIA
Service:	REA/C/01
Project starting date:	fixed date: 1 September 2022
Project duration:	48 months

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PROJECT SUMMARY

Project summary

Grant Preparation (General Information screen) — Provide an overall description of your project (including context and overall objectives, planned activities and main achievements, and expected results and impacts (on target groups, change procedures, capacities, innovation etc)). This summary should give readers a clear idea of what your project is about.

Use the project summary from your proposal.

While all educational sectors have been affected by the COVID-19 pandemic, the vocational-oriented academic training components in higher education sectors have been more severely affected than others. For undergraduate and graduate students currently studying for a career at sea, the pandemic has led to suspension to their simulator training sessions, vocational learning opportunities and future careers. The simulator-based education and training domain, which forms the platform of skilled manpower supply for the maritime industry, is facing this unprecedented challenge to ensure the continuity of the educational activities and to cope with the constraints imposed by the pandemic. High-quality vocational education is the cornerstone of effective youth transitions into the labour market for the European society. The suspension of simulator-based training and tutoring sessions has led to concerns regarding whether the higher and vocational educational institutes can produce a sufficient and competent workforce who could adequately carry out on-board navigation functions safely and efficiently in the near future. By accounting for the needs, knowledge gaps and challenges faced by today's maritime education and training sector, the i-MASTER project aims to integrate emerging technologies in vocational education and training to develop an innovative Intelligent Learning System (ILS) with maritime learning analytics and adaptive learning function to facilitate both remote and on-site maritime simulator-based education and training. The i-MASTER solution will significantly enhance the effectiveness and accessibility of simulator-based education in the European society and further improve safety, security and performance of maritime operations of the future.

LIST OF PARTICIPANTS

PARTICIPANTS

Grant Preparation (Beneficiaries screen) — Enter the info.

Number	Role	Short name	Legal name	Country	PIC
1	COO	UiT	UNIVERSITETET I TROMSOE - NORGES ARKTISKE UNIVERSITET	NO	999874643
2	BEN	UGOT	GOETEBORGS UNIVERSITET	SE	999981925
3	BEN	FhG	FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV	DE	999984059
4	BEN	AMA	AB YRKESHOGSKOLAN VID ABO AKADEMI	FI	947312962
5	BEN	VTI	STATENS VAG- OCH TRANSPORTFORSKNINGSINSTITUT	SE	999599551
6	BEN	TERP	TERP AS	NO	899570629
7	BEN	WU	WIRTSCHAFTSUNIVERSITAT WIEN	AT	999616138
8	BEN	USN	UNIVERSITETET I SOROST-NORGE	NO	921767430

LIST OF WORK PACKAGES

Work packages						
<i>Grant Preparation (Work Packages screen) — Enter the info.</i>						
Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverable No(s)
WP1	Project management, communication and coordination	1 - UiT	37.00	1	48	D1.9, D1.4, D1.8, D1.5, D1.3, D1.2, D1.1, D1.7, D1.6
WP2	Review of the state-of-the-art ILS technologies and KPI development	5 - VTI	43.00	1	8	D2.3, D2.2, D2.4, D2.5, D2.1
WP3	Development of simulation scenarios, learning resources and performance standards	8 - USN	45.00	7	12	D3.5, D3.7, D3.1, D3.2, D3.4, D3.6, D3.3
WP4	Maritime learning analytics dashboard development, experimental testing and expert validation	3 - FhG	55.00	11	17	D4.4, D4.1, D4.5, D4.3, D4.2
WP5	Testable prototypes of the Intelligent Learning System (ILS)	1 - UiT	63.00	15	24	D5.4, D5.1, D5.2, D5.3
WP6	Intelligent learning system advancement and integration	6 - TERP	57.00	23	32	D6.1, D6.2, D6.3, D6.5, D6.4
WP7	Implementation and evaluation	4 - AMA	59.00	30	40	D7.4, D7.5, D7.3, D7.1, D7.2
WP8	Dissemination, exploitation, and impact-maximization activities	7 - WU	33.00	5	48	D8.5, D8.1, D8.7, D8.2, D8.3, D8.8, D8.6, D8.4

Work package WP1 – Project management, communication and coordination

Work Package Number	WP1	Lead Beneficiary	1. UiT
Work Package Name	Project management, communication and coordination		
Start Month	1	End Month	48

Objectives

The objective of WP1 is to ensure effective implementation of the workplan and to facilitate smooth information flow among the consortium members and the European Commission project officer. WP1 will oversight for all research and development activities throughout the lifecycle of the project.

Description

T1.1– Project management and administration: managing the day-to-day operation of the project according to approved plans, monitoring of the progress, schedule and resources, managing the data according to the FAIR principles of EU. The coordinator (UIT) will be responsible for implementing the project strategy, monitoring the progress of each WP throughout the project duration. UIT and VTI define the data management principles in collaboration with the steering committee and ensure the research partners adhere to the agreed guidelines.

T1.2 – Innovation and societal impact management strategy development: maximizing the impact of the project throughout all stages and ensuring that the required outputs are prepared and delivered to the market in a timely manner. UIT will develop an innovation and societal impact management strategy to maximize the impact the project outputs at each milestone. The strategy will be reviewed and adopted by the steering committee. UIT will thereafter be responsible for the implementation and completion of the agreed strategy.

T1.3 – Communication and coordination: establishing and implementing a communication plan for the project, ensuring remote communication infrastructure are in place for the secure exchange of project information, results, deliverables, etc.

A communication and coordination plan will be established by UIT and WU to provide clarity regarding the communication channels, infrastructure and the meeting timelines for the i-MASTER consortium. The plan also includes the project kick-off meeting, steering committee meeting, the status and milestone update meeting. UIT, USN and WU will also create a i-MASTER website for both public users and the internal management of the project (access restricted to the consortium partners and designated EC officials). The consortium will distribute the project newsletter on a ‘sign-up’ basis on the project website.

T1.4 – Data Management Plan (DMP), quality assurance and risk management: Implementing procedures for quality management, monitoring, tracking, and controlling deviations and risks throughout the project duration to ensure effective implementation.

UIT and VTI will collaborate to provide a project roadmap including schedule, cost estimates, deliverables, and milestones together with a data management, quality assurance and risk management plan to ensure the appropriate procedures are in place for quality management. UIT coordinator team will also maintain the financial status and control deviations due to scheduling and financial changes.

T1.5 - Ethics compliance

Work package WP2 – Review of the state-of-the-art ILS technologies and KPI development

Work Package Number	WP2	Lead Beneficiary	5. VTI
Work Package Name	Review of the state-of-the-art ILS technologies and KPI development		
Start Month	1	End Month	8

Objectives

The objective of WP2 is to review state-of-the-art intelligent and adaptive learning approaches, technologies and tools used in various industrial domains to explore the potentials, benefits, and constraints of their applications within maritime simulator-based education and training. WP2 will further conduct competence mappings and training needs analyses with focus on the overall needed Knowledge, Understanding & Proficiency (KUP) for ship navigation from basic to advanced level. A set of performance metrics and KPIs will be developed as input to further work packages. The aim

is to ensure that project results are in line with the expected innovation level and avoid the technical risks as identified in Table 3.1e.

Description
<p>T2.1– State-of-the-art review: Analyse the state-of-the-art intelligent learning technologies and provide recommendations regarding the types of AI-enabled learning interventions for i-MASTER VTI will conduct a thorough analysis of the state-of-the-art intelligent learning tools and technologies used in various industrial domains (with a particular focus on the vocational and practice-oriented education and training field) to understand the potentials, benefits, and constraints of its application in the maritime simulator-based education and training sector. VTI provides recommendations regarding the types of AI-enabled learning interventions for i-MASTER and conducts SWOT analyses over the envisioned solutions.</p> <p>T2.2 – Vessel navigation competency mapping: Map the overall needed knowledge, skills, and competences for ship navigation from basics to advanced level Based on the extensive experience in maritime education and training, Fraunhofer collaborates with UiT, VTI and UGOT to outline and map out the core technical and non-technical skills and competences needed for ship navigation. The competency mapping builds upon but goes beyond the basic requirements specified in the Knowledge, Understanding and proficiency (KUP) sections in the latest International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW, 1978 as amended), the STCW Table A-II/2 (for masters and chief mates) and Table A-II/1 (for officers in charge of a navigational watch).</p> <p>T2.3 – Performance metrics and KPI: Define the measurable Key Performance Indicators (KPIs) for each Knowledge, Understanding & Proficiency (KUP) items for ship navigation VTI will specify a list of measurable, attainable, and reliable KPIs to measure and assess each Knowledge, understanding & proficiency (KUP) item identified through T2.2. The KPIs should be attainable by using the existing simulation technologies such as desktop simulators, full-mission simulators and eye-tracking devices.</p> <p>T2.4 – Measurement methodology specification: Determine the KPI measurement methodology, frequency and data needs VTI, in collaboration with USN and UIT, will further define the measurement methodology, frequency, metrics, and data that is needed for measuring each KPI item.</p>

Work package WP3 – Development of simulation scenarios, learning resources and performance standards

Work Package Number	WP3	Lead Beneficiary	8. USN
Work Package Name	Development of simulation scenarios, learning resources and performance standards		
Start Month	7	End Month	12

Objectives
<p>The objective of WP3 is to harness the learning resources, design the simulation scenarios for remote (desktop) and on-site training exercises, solicit user requirements and define the performance standard and best practices. WP3 delineates an initial design of the system architecture for the i-MASTER learning analytics by identifying the components, data requirement and parameters, their functionalities, and interconnections, providing strategies and specifications for the system development.</p>

Description
<p>T3.1 – Training scenarios design and ship simulation trials: Define the scope of training scenarios to be designed into the intelligent learning system for remote and on-site simulation and create the educational objectives and the corresponding performance metrics for each simulation exercise USN defines the training scope and design several simulation scenarios for both remote and on-site simulation exercises taking into consideration of its importance and representativeness for navigation competence development. USN also defines the performance evaluation criteria, parameters needed, as well as explanations for each of the established scenarios based on the competence specification and KPI outputs from WP2.</p> <p>T3.2 – Performance patterns and instructional strategy: Conduct research on the students’ performance patterns with</p>

the developed training scenarios, determine the appropriate tutoring or instructional strategy and identifying user requirement and needs to develop learning analytics and adaptive learning functions

WP3 solicits user needs and requirements from the perspective of each of the stakeholders (i.e., students and simulator instructors) and employs user-centred design methods during the analysis and design process of the learning analytics system, the visualization dashboard and the adaptive learning functions.

T3.3 – Architecture design of the i-MASTER learning analytics and ILS: Design the architecture for the i-MASTER learning analytics dashboard and ILS by identifying the components, data requirement, their functionalities and interconnections

TERP will provide an initial design of the i-MASTER learning analytics and Intelligent Learning System (ILS) based on the outputs of T3 to delineate a basic roadmap for system development and integration in WP4. The learning analytics dashboard will be firstly designed by Fraunhofer to enable automatic performance assessment for maritime simulator education. Data collection for ML algorithms starts from T3.3 after data requirements has been determined by TERP.

T3.4 – Consolidate KPI and performance metrics for the learning analytics algorithm and the visualization dashboard

WP3 lists out the data required and parameters to be collected from the remote/desktop and the full mission simulators for constructing the learning analytics under the defined training scenarios.

Work package WP4 – Maritime learning analytics dashboard development, experimental testing and expert validation

Work Package Number	WP4	Lead Beneficiary	3. FhG
Work Package Name	Maritime learning analytics dashboard development, experimental testing and expert validation		
Start Month	11	End Month	17

Objectives

The objective of WP4 is to develop the maritime learning analytics and visualization dashboard to enable simulation-instructor and students to monitor and reflect on learning patterns and competence development progress. The developed maritime learning analytics and visualization dashboard will then be refined through two rounds of experimental testing and expert validation sessions.

Description

T4.1 – Development of the maritime learning analytics algorithms and visualization dashboard
 Fraunhofer collaborates with TERP, UIT, UGOT, WU in developing the learning analytics algorithms and visualization dashboard, while incorporating the user needs and requirements into the system to ensuring their coherency with the requirements and needs.

T4.2 – Creation of database systems, data integration, configuration, test environment setup
 The data from the remote, physical simulators and eye tracking devices will be integrated with the learning analytics and visualization dashboard.

T4.3 – Experimental testing for remote/desktop simulation exercises to ensure that data will be processed correctly, and reliable output will be produced in the desired format
 USN experimentally tests the learning analytics during remote/desktop simulation exercises and set the performance standards for each of the established scenarios with experience ship navigators and simulator-instructors.

T4.4 – Experimental testing for on-site simulation exercises with full-mission simulators and eye tracking tools (e.g., devices or webcam)
 The system needs to be integrated with the outputs from the full-mission simulators and eye tracking devices to experimentally tests the learning analytics during on-site simulation exercises to ensure that data will be processed correctly, and reliable output will be produced in the desired format. Performance standards for each of the established scenarios will be established with experience ship navigators and simulator-instructors.

T4.5 – Expert validation of the developed learning analytics algorithms and visualization dashboard
 Expert validation will be further conducted by UIT to verify that the dashboard complied with the visual guidelines and provided learners and simulator-instructors with the information they need.

Work package WP5 – Testable prototypes of the Intelligent Learning System (ILS)

Work Package Number	WP5	Lead Beneficiary	1. UiT
Work Package Name	Testable prototypes of the Intelligent Learning System (ILS)		
Start Month	15	End Month	24

Objectives
The objective of WP 5 is to design and develop the key components and algorithms of the adaptive learning function (i.e., the learner model, instruction model and expert model) and to develop testable prototypes of the maritime Intelligent Learning System (ILS) with the current remote/desktop and full-mission ship simulators to enable remote maritime simulation activities and AI-assisted simulator training.

Description
<p>T5.1 – Software design and coding of the maritime Intelligent Learning System (ILS) TERP in collaboration with UIT, VTI, UGOT, USN will design the adaptive learning function in the maritime Intelligent Learning System (ILS) based on the input from Phase 1. This task includes the description of the intelligent learning system software components, the data and services required.</p> <p>T5.2 – Data analysis and construction of the adaptive learning functions This process involves developing the expert model, learner model, and instruction model and integrated with the user interface. The instruction model is the algorithms that determine what feedback to give to the students and when. The expert model (ideal knowledge state) and the student model (the student current state) will inform the instruction model. As the student model and the instruction model changes, the learning analytics interface will be updated accordingly. The instruction model determines the actual adaptation of the intelligent learning system, and the student model and the expert model will be used as input parameters for identifying the needs of the student. Strategies for data generation and improvement of the learner model, instruction model and expert model are also established and implemented.</p> <p>T5.3 – Data generation and improvement of the ML algorithms WP5 researchers will employ both qualitative and quantitative methods to evaluate and validate the developed models to assess and improve their quality and accuracy in giving instructions and assessing the students’ needs. The evaluation process would include the expert appraisals and user evaluations to establish its content validity and reliability.</p> <p>T5.4 – Maritime ILS testable prototype establishment and system integration This task starts the actual software development process. Taking into account the results in the previous tasks, modules and functionalities are being developed to incorporate intelligent capabilities to the system.</p>

Work package WP6 – Intelligent learning system advancement and integration

Work Package Number	WP6	Lead Beneficiary	6. TERP
Work Package Name	Intelligent learning system advancement and integration		
Start Month	23	End Month	32

Objectives
The objective of WP 6 is to extend the maritime ILS capabilities by integrating the ILS with the information outputs from the full-mission ship simulator and eye tracking data to enable real-time understanding of student’s operational performance and visual attention. WP6 further evaluates the functionality, design and User Experience (UX) of the developed prototypes with the aims to improve the design to accommodate the needs of the end user.

Description
<p>T6.1 – Prototype assessment of the maritime ILS for remote simulations This task by Fraunhofer focuses on evaluating the functionality, design and UX of the system for remote/desktop</p>

simulations. The aim is to improve the system design to accommodate the needs of the end user. The prototype testing for the remote simulation may also incorporate eye tracking technology to know the visual attention of the users. This would be useful for generate user insights such as understanding the ways in which the learners engage with the system, what information is processed and for how long.

T6.2 – Advancement of the maritime ILS for on-site full-mission simulator training

Building upon the basic ILS development in previous tasks, TERP extends the system capabilities by integrating it with the outputs from physical simulators and eye tracking data to enable real-time understanding of student’s operational actions and visual attention. TERP will conduct the system design sessions and describe the development procedures and plans regarding the integration.

T6.3 – Iterative usability testing and system improvement

This task focuses on evaluating the functionality, design and UX of the developed prototype for training using on-site full mission ship simulators. The aim is to evaluate the system performance and improve the system integration and analysis algorithms.

T6.4 – System functional verification and performance evaluation

WP6 and the participating organizations will jointly conduct expert evaluation and validation regarding the ILS system and to verify if the system and the user interface (dashboard) complied with the visual guidelines and provided learners with the information they needed.

Work package WP7 – Implementation and evaluation

Work Package Number	WP7	Lead Beneficiary	4. AMA
Work Package Name	Implementation and evaluation		
Start Month	30	End Month	40

Objectives

The objective of WP 7 is to launch a demonstration programme and experimentally evaluate the performance and effectiveness of the maritime ILS for student’s learning and skill acquisition during both remote and physical simulator training activities. WP7 will deploy and evaluate the learning analytics and ILS prototypes that have been developed in the WP4, WP5 and WP6 and to measure the effectiveness and usability as well as its feasibility for expansion to larger maritime education and training industry in global contexts.

Description

T7.1 – Large-scale demonstration programme

Deployment and demonstration will take place in (at least) three EU countries and associated countries (e.g., Norway, Sweden and Finland) with use of the European Maritime Simulator Network. A demonstration programme that incorporates a systematic research and evaluation strategy and agenda will be established jointly by Fraunhofer and UGOT to collect information regarding the demonstration results.

T7.2 – Experimental evaluation and improvement of the maritime ILS performance

A systemic evaluation will be performed in WP7 with student groups to assess the maritime ILS performance and effectiveness of the adaptive learning functions for student learning and skill acquisition during both remote and physical simulator training activities, the specific learning effects and the degree to which the dependence on the instructor can be decreased for certain aspects of the training scenarios.

T7.3 – Multi-dimensional impact analysis of the ILS on the domain of maritime simulator-based education and training
WP7 will integrate interdisciplinary (e.g., cognitive, pedagogical, human factor) perspectives to identify usability problems of the ILS, collect qualitative and quantitative data to determine participant satisfaction as well as the educational, societal, and economic impact of the deployment.

T7.4 – Training and assessment package with pedagogical guideline regarding the system capabilities of the developed AI-assisted ILS and how it should be utilized by the simulator-instructors

In order to disseminate the learning outcomes, methods and best practices from the i-MASTER project, a training and assessment package will be made available and share with relevant stakeholders. WP7 also provides the pedagogical guidelines for AI-assisted ILS-based simulator training: from the behaviour of the ILS to how it should be utilized by educators.

Work package WP8 – Dissemination, exploitation, and impact-maximization activities

Work Package Number	WP8	Lead Beneficiary	7. WU
Work Package Name	Dissemination, exploitation, and impact-maximization activities		
Start Month	5	End Month	48

Objectives

The objective of WP 8 is to maximize the potential impact of the innovation for learners, teachers, and education institutions through a series of dissemination, exploitation impact-maximization activities at national, European and international arenas to bring the value generated to both commercial market (from the business perspective) and the EU society (from the societal perspective). A range of dissemination and exploitation actions will be outlined in this WP and the consortium partners will work collaboratively to maximize the results and achievements through various channels, obtain support and encourage participation of all stakeholders involved, as well as the general public in exploiting the results.

Description

T8.1 – Clustering, communication, dissemination, and exploitation strategies for the i-MASTER project
The WU will in collaboration with UIT to establish dissemination and exploitation strategies for the i-MASTER project and ensure a quality control over the activities carried out and guarantee their correspondence with the project plan. Dissemination strategy aims to promote intersectoral and societal communication to facilitate knowledge sharing, the exploitation strategy focuses on the commercialization and potential market uptake of project results.

T8.2 – i-MASTER showcase and instructor training activities
The i-MASTER project will facilitate and arrange various training and trial activities using the maritime intelligent learning system during and after the project.

T8.3 – EC and EU Dissemination Routes
Dissemination material will be prepared by the consortium partners for inclusion on the CORDIS and EUROPA websites.

T8.4 – Communication and dissemination activities
The i-MASTER project will design distinct communication strategies for each specific audience. All WP leaders will be responsible for executing the dissemination and exploitation strategy of i-MASTER, including developing the dissemination materials (both online social media platforms and printed materials such as posters, leaflets, brochures), participating at scientific and industrial events, exhibitions, conferences and tradeshows to actively promote the i-MASTER outputs and to set the ground for a commercial and scientific exploitation of the project results.

T8.5 – Exploitation and impact-maximization activities
All WP leaders will be involved in executing the exploitation strategy of i-MASTER developed in T8.1 and will further maximize the project impact by channelling the project's results to a wide international audience, in particular the developing countries where the proposed solutions will lead to immediate society impacts (e.g., the developing counties or in EU cities with lower socioeconomic status that could not facilitate any maritime training under the current pandemic situation).

STAFF EFFORT

Staff effort per participant									
<i>Grant Preparation (Work packages - Effort screen) — Enter the info.</i>									
Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	Total Person-Months
1 - UiT	15.00	4.00	4.00	21.00	25.00	22.00	12.00	11.00	114.00
2 - UGOT	1.00	6.00	7.00	1.00	2.00	1.00	4.00	2.00	24.00
3 - FhG	4.00	6.00	4.00	12.00	3.00	3.00	6.00	2.00	40.00
4 - AMA	1.00	2.00	9.00	3.00	5.00	2.00	16.00	3.00	41.00
5 - VTI	1.00	16.00	2.00	2.00	2.00	2.00	2.00	2.00	29.00
6 - TERP	1.00	2.00	8.00	9.00	16.00	18.00	3.00	4.00	61.00
7 - WU	4.00	2.00	2.00	2.00	3.00	3.00	8.00	3.00	27.00
8 - USN	10.00	5.00	9.00	5.00	7.00	6.00	8.00	6.00	56.00
Total Person-Months	37.00	43.00	45.00	55.00	63.00	57.00	59.00	33.00	392.00

LIST OF DELIVERABLES

Deliverables						
<i>Grant Preparation (Deliverables screen) — Enter the info.</i>						
<i>The labels used mean:</i>						
<i>Public — fully open (⚠ automatically posted online)</i>						
<i>Sensitive — limited under the conditions of the Grant Agreement</i>						
<i>EU classified —RESTREINT-UE/EU-RESTRICTED, CONFIDENTIEL-UE/EU-CONFIDENTIAL, SECRET-UE/EU-SECRET under Decision 2015/444</i>						
Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Project management plan	WP1	1 - UiT	R — Document, report	PU - Public	2
D1.2	i-MASTER gender equality plan	WP1	2 - UGOT	R — Document, report	PU - Public	2
D1.3	Communication and coordination plan	WP1	7 - WU	R — Document, report	PU - Public	2
D1.4	Data Management Plan (DMP)	WP1	5 - VTI	R — Document, report	PU - Public	6
D1.5	Research practice, quality assurance and risk management plan	WP1	8 - USN	R — Document, report	PU - Public	6
D1.6	i-MASTER project website and social media platforms	WP1	1 - UiT	DEC —Websites, patent filings, videos, etc	PU - Public	2
D1.7	Organization of the kick-off, workshops, research and industrial events	WP1	1 - UiT	DEC —Websites, patent filings, videos, etc	PU - Public	12
D1.8	IPR strategy development and implementation	WP1	1 - UiT	R — Document, report	PU - Public	12
D1.9	Interim & end of project documents	WP1	1 - UiT	R — Document, report	PU - Public	24
D2.1	State-of-the-art analysis report	WP2	5 - VTI	R — Document, report	PU - Public	5
D2.2	Navigation competency mapping report	WP2	3 - FhG	R — Document, report	PU - Public	6

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D2.3	KPI analysis for the evaluation of navigation competence	WP2	5 - VTI	R — Document, report	PU - Public	7
D2.4	KPI measurement methodology, frequency and data needs report	WP2	8 - USN	R — Document, report	SEN - Sensitive	8
D2.5	Research publications on systemized performance assessment for maritime navigation	WP2	1 - UiT	DEC — Websites, patent filings, videos, etc	PU - Public	8
D3.1	Consolidation of learning resources for the developed training scenarios	WP3	8 - USN	R — Document, report	SEN - Sensitive	9
D3.2	Tutoring or instructional strategies for the developed training scenarios	WP3	4 - AMA	R — Document, report	SEN - Sensitive	10
D3.3	User requirement and needs analysis for learning analytics and visualization dashboard	WP3	7 - WU	R — Document, report	PU - Public	10
D3.4	Architecture of the i-MASTER learning analytics and ILS	WP3	6 - TERP	OTHER	SEN - Sensitive	11
D3.5	Validation of the concept and components of the technology report	WP3	6 - TERP	R — Document, report	SEN - Sensitive	12
D3.6	Research publications on maritime learning analytics and adaptive instructional design strategies	WP3	8 - USN	DEC — Websites, patent filings, videos, etc	PU - Public	12

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D3.7	Policy Brief	WP3	1 - UiT	R — Document, report	PU - Public	12
D4.1	Maritime learning analytics algorithms and visualization dashboard	WP4	3 - FhG	DEM — Demonstrator, pilot, prototype	SEN - Sensitive	14
D4.2	Usability testing and evaluation of the learning analytics for remote maritime simulation	WP4	8 - USN	R — Document, report	PU - Public	16
D4.3	Usability testing and evaluation of the learning analytics for on-site maritime simulation	WP4	8 - USN	R — Document, report	PU - Public	16
D4.4	Expert validation report	WP4	4 - AMA	R — Document, report	PU - Public	17
D4.5	Research publications on implementation process of a learning analytics system in maritime education and training	WP4	1 - UiT	DEC — Websites, patent filings, videos, etc	PU - Public	17
D5.1	Maritime Intelligent Learning System (ILS) software development	WP5	6 - TERP	OTHER	SEN - Sensitive	18
D5.2	Adaptive learning function specification	WP5	6 - TERP	R — Document, report	PU - Public	21
D5.3	Testable prototype of the maritime ILS	WP5	6 - TERP	DEM — Demonstrator, pilot, prototype	SEN - Sensitive	24
D5.4	Research publications regarding the evaluation and validation process of the	WP5	8 - USN	DEC — Websites, patent filings, videos, etc	PU - Public	24

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EU classified — RESTREINT-UE/EU-RESTRICTED, CONFIDENTIEL-UE/EU-CONFIDENTIAL, SECRET-UE/EU-SECRET under Decision [2015/444](#)

Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
	algorithms for adaptive learning process for maritime simulator training					
D6.1	Prototype assessment and usability testing of the maritime ILS for on-site maritime simulation	WP6	3 - FhG	R — Document, report	PU - Public	27
D6.2	ILS technical specification	WP6	3 - FhG	R — Document, report	PU - Public	31
D6.3	User experience report	WP6	2 - UGOT	R — Document, report	PU - Public	32
D6.4	System functional verification and performance evaluation report	WP6	6 - TERP	R — Document, report	SEN - Sensitive	32
D6.5	Scientific publications on the development and implementation of performance metrics for automated evaluation of seafarer's performance under simulator-based training	WP6	5 - VTI	DEC — Websites, patent filings, videos, etc	PU - Public	32
D7.1	Large-scale demonstration programme	WP7	4 - AMA	DEM — Demonstrator, pilot, prototype	PU - Public	36
D7.2	Component-wise evaluation of the maritime intelligent learning system	WP7	4 - AMA	R — Document, report	PU - Public	38
D7.3	Research publications on pedagogical guideline	WP7	2 - UGOT	DEC — Websites, patent filings, videos, etc	PU - Public	40
D7.4	Multi-dimensional impact analysis	WP7	7 - WU	R — Document, report	PU - Public	39

Deliverables

Grant Preparation (Deliverables screen) — Enter the info.

The labels used mean:

Public — fully open (⚠ automatically posted online)

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D7.5	Advanced maritime training and assessment package using i-MASTER	WP7	2 - UGOT	R — Document, report	PU - Public	40
D8.1	i-MASTER Clustering, Dissemination, Exploitation, and Communication (DEC) plan	WP8	7 - WU	R — Document, report	PU - Public	6
D8.2	Gender equality campaign: Empowering women and girls in the maritime education sector	WP8	2 - UGOT	DEC — Websites, patent filings, videos, etc	PU - Public	39
D8.3	Presentations at international conferences and meetings of professional associations	WP8	5 - VTI	DEC — Websites, patent filings, videos, etc	PU - Public	42
D8.4	i-MASTER system development workshop and clustering activity	WP8	8 - USN	DEC — Websites, patent filings, videos, etc	PU - Public	17
D8.5	Dissemination materials (online tools and printed materials)	WP8	4 - AMA	DEC — Websites, patent filings, videos, etc	PU - Public	39
D8.6	i-MASTER showcase and instructor training event	WP8	8 - USN	DEC — Websites, patent filings, videos, etc	PU - Public	40
D8.7	i-MASTER knowledge sharing seminar	WP8	1 - UiT	DEC — Websites, patent filings, videos, etc	PU - Public	46
D8.8	i-MASTER clustering, dissemination, exploitation, and communication final report	WP8	7 - WU	R — Document, report	PU - Public	48

Deliverable – Project management plan

Deliverable Number	D1.1	Lead Beneficiary	1. UiT
Deliverable Name	Project management plan		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	2	Work Package No	WP1

Description
This document provides a detailed management plan for the i-MASTER project.

Deliverable – i-MASTER gender equality plan

Deliverable Number	D1.2	Lead Beneficiary	2. UGOT
Deliverable Name	i-MASTER gender equality plan		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	2	Work Package No	WP1

Description
This document specifies the i-MASTER gender equality plan.

Deliverable – Communication and coordination plan

Deliverable Number	D1.3	Lead Beneficiary	7. WU
Deliverable Name	Communication and coordination plan		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	2	Work Package No	WP1

Description
This document details the communication and coordination plan for the i-MASTER project.

Deliverable – Data Management Plan (DMP)

Deliverable Number	D1.4	Lead Beneficiary	5. VTI
Deliverable Name	Data Management Plan (DMP)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	6	Work Package No	WP1

Description
This documents details the Data Management Plan (DMP) for the i-MASTER project.

Deliverable – Research practice, quality assurance and risk management plan

Deliverable Number	D1.5	Lead Beneficiary	8. USN
Deliverable Name	Research practice, quality assurance and risk management plan		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	6	Work Package No	WP1

Description
This document specifies the ethics compliance and the standards for research practice, quality assurance and risk management.

Deliverable – i-MASTER project website and social media platforms

Deliverable Number	D1.6	Lead Beneficiary	1. UiT
Deliverable Name	i-MASTER project website and social media platforms		
Type	DEC —Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	2	Work Package No	WP1

Description
This deliverable will report the establishment of the i-MASTER project website and social media platforms, these materials will be updated continuously until M48.

Deliverable – Organization of the kick-off, workshops, research and industrial events

Deliverable Number	D1.7	Lead Beneficiary	1. UiT
Deliverable Name	Organization of the kick-off, workshops, research and industrial events		
Type	DEC —Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	12	Work Package No	WP1

Description
This deliverable will provide information regarding the plans for kick-off, workshops, research and industrial events.

Deliverable – IPR strategy development and implementation

Deliverable Number	D1.8	Lead Beneficiary	1. UiT
Deliverable Name	IPR strategy development and implementation		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	12	Work Package No	WP1

Description
This document provides details regarding the IPR strategy development and implementation.

Deliverable – Interim & end of project documents

Deliverable Number	D1.9	Lead Beneficiary	1. UiT
Deliverable Name	Interim & end of project documents		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	24	Work Package No	WP1

Description
Interim & end of project documents will be delivered in M24 and M48.

Deliverable – State-of-the-art analysis report

Deliverable Number	D2.1	Lead Beneficiary	5. VTI
Deliverable Name	State-of-the-art analysis report		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	5	Work Package No	WP2

Description
This report will provide a state-of-the-art analysis regarding the field of research.

Deliverable – Navigation competency mapping report

Deliverable Number	D2.2	Lead Beneficiary	3. FhG
Deliverable Name	Navigation competency mapping report		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	6	Work Package No	WP2

Description
This report maps the navigation competency by detailing the knowledge, skills, and proficiency requirements for ship navigation from basics to advanced level.

Deliverable – KPI analysis for the evaluation of navigation competence

Deliverable Number	D2.3	Lead Beneficiary	5. VTI
Deliverable Name	KPI analysis for the evaluation of navigation competence		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	7	Work Package No	WP2

Description
This report provides a KPI analysis for the evaluation of navigation competence.

Deliverable – KPI measurement methodology, frequency and data needs report

Deliverable Number	D2.4	Lead Beneficiary	8. USN
Deliverable Name	KPI measurement methodology, frequency and data needs report		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP2

Description
This report provides information related to KPI measurement methodology, frequency and data needs.

Deliverable – Research publications on systemized performance assessment for maritime navigation

Deliverable Number	D2.5	Lead Beneficiary	1. UiT
Deliverable Name	Research publications on systemized performance assessment for maritime navigation		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	8	Work Package No	WP2

Description
Research publications on systemized performance assessment for maritime navigation.

Deliverable – Consolidation of learning resources for the developed training scenarios

Deliverable Number	D3.1	Lead Beneficiary	8. USN
Deliverable Name	Consolidation of learning resources for the developed training scenarios		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	9	Work Package No	WP3

Description
This document consolidates the learning resources for the developed training scenarios.

Deliverable – Tutoring or instructional strategies for the developed training scenarios

Deliverable Number	D3.2	Lead Beneficiary	4. AMA
Deliverable Name	Tutoring or instructional strategies for the developed training scenarios		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	10	Work Package No	WP3

Description
This report provides the tutoring or instructional strategies for the developed training scenarios.

Deliverable – User requirement and needs analysis for learning analytics and visualization dashboard

Deliverable Number	D3.3	Lead Beneficiary	7. WU
Deliverable Name	User requirement and needs analysis for learning analytics and visualization dashboard		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	10	Work Package No	WP3

Description
This deliverable specifies the user requirement and needs analysis for learning analytics and visualization dashboard.

Deliverable – Architecture of the i-MASTER learning analytics and ILS

Deliverable Number	D3.4	Lead Beneficiary	6. TERP
Deliverable Name	Architecture of the i-MASTER learning analytics and ILS		
Type	OTHER	Dissemination Level	SEN - Sensitive
Due Date (month)	11	Work Package No	WP3

Description
This deliverable outlines the architecture of the i-MASTER learning analytics and ILS.

Deliverable – Validation of the concept and components of the technology report

Deliverable Number	D3.5	Lead Beneficiary	6. TERP
Deliverable Name	Validation of the concept and components of the technology report		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	12	Work Package No	WP3

Description
This report provides information related to the validation of the concept and components of the technology.

Deliverable – Research publications on maritime learning analytics and adaptive instructional design strategies

Deliverable Number	D3.6	Lead Beneficiary	8. USN
Deliverable Name	Research publications on maritime learning analytics and adaptive instructional design strategies		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	12	Work Package No	WP3

Description

Research publications on maritime learning analytics and adaptive instructional design strategies.

Deliverable – Policy Brief

Deliverable Number	D3.7	Lead Beneficiary	1. UiT
Deliverable Name	Policy Brief		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	12	Work Package No	WP3

Description

Policy recommendations generated from i-MASTER project. It will be initially delivered at M12 and updated continuously until the end of the project.

Deliverable – Maritime learning analytics algorithms and visualization dashboard

Deliverable Number	D4.1	Lead Beneficiary	3. FhG
Deliverable Name	Maritime learning analytics algorithms and visualization dashboard		
Type	DEM — Demonstrator, pilot, prototype	Dissemination Level	SEN - Sensitive
Due Date (month)	14	Work Package No	WP4

Description

This deliverable establishes the maritime learning analytics algorithms and visualization dashboard.

Deliverable – Usability testing and evaluation of the learning analytics for remote maritime simulation

Deliverable Number	D4.2	Lead Beneficiary	8. USN
Deliverable Name	Usability testing and evaluation of the learning analytics for remote maritime simulation		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	16	Work Package No	WP4

Description

This document provides information related to the usability and evaluation of the learning analytics for remote maritime simulation.

Deliverable – Usability testing and evaluation of the learning analytics for on-site maritime simulation

Deliverable Number	D4.3	Lead Beneficiary	8. USN
Deliverable Name	Usability testing and evaluation of the learning analytics for on-site maritime simulation		
Type	R — Document, report	Dissemination Level	PU - Public

Due Date (month)	16	Work Package No	WP4
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Description
This document provides information related to the usability and evaluation of the learning analytics for on-site maritime simulation.

Deliverable – Expert validation report

Deliverable Number	D4.4	Lead Beneficiary	4. AMA
Deliverable Name	Expert validation report		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	17	Work Package No	WP4

Description
This report details the expert validation regarding the validity and reliability of the developed maritime learning analytics system for remote and on-site simulator-based education.

Deliverable – Research publications on implementation process of a learning analytics system in maritime education and training

Deliverable Number	D4.5	Lead Beneficiary	1. UiT
Deliverable Name	Research publications on implementation process of a learning analytics system in maritime education and training		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	17	Work Package No	WP4

Description
Research publications on implementation process of a learning analytics system in maritime education and training.

Deliverable – Maritime Intelligent Learning System (ILS) software development

Deliverable Number	D5.1	Lead Beneficiary	6. TERP
Deliverable Name	Maritime Intelligent Learning System (ILS) software development		
Type	OTHER	Dissemination Level	SEN - Sensitive
Due Date (month)	18	Work Package No	WP5

Description
This deliverable initiates maritime Intelligent Learning System (ILS) software development.

Deliverable – Adaptive learning function specification

Deliverable Number	D5.2	Lead Beneficiary	6. TERP
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Deliverable Name	Adaptive learning function specification		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	21	Work Package No	WP5

Description
This report provides information related to the adaptive learning functions.

Deliverable – Testable prototype of the maritime ILS

Deliverable Number	D5.3	Lead Beneficiary	6. TERP
Deliverable Name	Testable prototype of the maritime ILS		
Type	DEM — Demonstrator, pilot, prototype	Dissemination Level	SEN - Sensitive
Due Date (month)	24	Work Package No	WP5

Description
This deliverable establishes the testable prototype of the maritime ILS for remote (desktop) maritime simulations.

Deliverable – Research publications regarding the evaluation and validation process of the algorithms for adaptive learning process for maritime simulator training

Deliverable Number	D5.4	Lead Beneficiary	8. USN
Deliverable Name	Research publications regarding the evaluation and validation process of the algorithms for adaptive learning process for maritime simulator training		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	24	Work Package No	WP5

Description
Research publications regarding the evaluation and validation process of the algorithms for adaptive learning process for maritime simulator training.

Deliverable – Prototype assessment and usability testing of the maritime ILS for on-site maritime simulation

Deliverable Number	D6.1	Lead Beneficiary	3. FhG
Deliverable Name	Prototype assessment and usability testing of the maritime ILS for on-site maritime simulation		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	27	Work Package No	WP6

Description

This document provides information related to the prototype assessment and usability of the maritime ILS for on-site maritime simulation.

Deliverable – ILS technical specification

Deliverable Number	D6.2	Lead Beneficiary	3. FhG
Deliverable Name	ILS technical specification		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	31	Work Package No	WP6

Description

This document provides information related to the ILS technical specification for on-site training with full mission ship simulators (technical documentation, including glossary, model and architecture).

Deliverable – User experience report

Deliverable Number	D6.3	Lead Beneficiary	2. UGOT
Deliverable Name	User experience report		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP6

Description

This report provides information related to the user experience.

Deliverable – System functional verification and performance evaluation report

Deliverable Number	D6.4	Lead Beneficiary	6. TERP
Deliverable Name	System functional verification and performance evaluation report		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	32	Work Package No	WP6

Description

This report provides information related to the system functional verification and performance.

Deliverable – Scientific publications on the development and implementation of performance metrics for automated evaluation of seafarer's performance under simulator-based training

Deliverable Number	D6.5	Lead Beneficiary	5. VTI
Deliverable Name	Scientific publications on the development and implementation of performance metrics for automated evaluation of seafarer's performance under simulator-based training		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public

Due Date (month)	32	Work Package No	WP6
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Description
Scientific publications on the development and implementation of performance metrics for automated evaluation of seafarer's performance under simulator-based training.

Deliverable – Large-scale demonstration programme

Deliverable Number	D7.1	Lead Beneficiary	4. AMA
Deliverable Name	Large-scale demonstration programme		
Type	DEM — Demonstrator, pilot, prototype	Dissemination Level	PU - Public
Due Date (month)	36	Work Package No	WP7

Description
This report details the large-scale demonstration programme.

Deliverable – Component-wise evaluation of the maritime intelligent learning system

Deliverable Number	D7.2	Lead Beneficiary	4. AMA
Deliverable Name	Component-wise evaluation of the maritime intelligent learning system		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	38	Work Package No	WP7

Description
This document provides information related to the component-wise evaluation of the maritime intelligent learning system.

Deliverable – Research publications on pedagogical guideline

Deliverable Number	D7.3	Lead Beneficiary	2. UGOT
Deliverable Name	Research publications on pedagogical guideline		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	40	Work Package No	WP7

Description
Research publications on pedagogical guideline regarding the implementation of AI-assisted intelligent learning system in maritime simulator-based education and training.

Deliverable – Multi-dimensional impact analysis

Deliverable Number	D7.4	Lead Beneficiary	7. WU
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Deliverable Name	Multi-dimensional impact analysis		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	39	Work Package No	WP7

Description
This report provides a multi-dimensional impact analysis regarding the implementation of maritime learning analytics and intelligent learning system in higher education and Vocational Education And Training (VET).

Deliverable – Advanced maritime training and assessment package using i-MASTER

Deliverable Number	D7.5	Lead Beneficiary	2. UGOT
Deliverable Name	Advanced maritime training and assessment package using i-MASTER		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	40	Work Package No	WP7

Description
This report provides a detailed description regarding the use of i-MASTER for maritime training and assessment.

Deliverable – i-MASTER Clustering, Dissemination, Exploitation, and Communication (DEC) plan

Deliverable Number	D8.1	Lead Beneficiary	7. WU
Deliverable Name	i-MASTER Clustering, Dissemination, Exploitation, and Communication (DEC) plan		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	6	Work Package No	WP8

Description
This document provides the plan for i-MASTER Dissemination, Exploitation, and Communication (DEC) activities. Clustering activities also included.

Deliverable – Gender equality campaign: Empowering women and girls in the maritime education sector

Deliverable Number	D8.2	Lead Beneficiary	2. UGOT
Deliverable Name	Gender equality campaign: Empowering women and girls in the maritime education sector		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	39	Work Package No	WP8

Description
This document provides the information related to the gender equality campaign: Empowering women and girls in the maritime education sector.

Deliverable – Presentations at international conferences and meetings of professional associations

Deliverable Number	D8.3	Lead Beneficiary	5. VTI
Deliverable Name	Presentations at international conferences and meetings of professional associations		
Type	DEC —Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	42	Work Package No	WP8

Description
This document provides the feedback regarding the presentations at international conferences and meetings of professional associations.

Deliverable – i-MASTER system development workshop and clustering activity

Deliverable Number	D8.4	Lead Beneficiary	8. USN
Deliverable Name	i-MASTER system development workshop and clustering activity		
Type	DEC —Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	17	Work Package No	WP8

Description
This deliverable provides information regarding the arrangement and outcomes of the i-MASTER system development workshops.

Deliverable – Dissemination materials (online tools and printed materials)

Deliverable Number	D8.5	Lead Beneficiary	4. AMA
Deliverable Name	Dissemination materials (online tools and printed materials)		
Type	DEC —Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	39	Work Package No	WP8

Description
This deliverable provides the dissemination materials (online tools and printed materials).

Deliverable – i-MASTER showcase and instructor training event

Deliverable Number	D8.6	Lead Beneficiary	8. USN
Deliverable Name	i-MASTER showcase and instructor training event		
Type	DEC —Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	40	Work Package No	WP8

Description	
This deliverable provides information regarding the i-MASTER showcase and instructor training event.	

Deliverable – i-MASTER knowledge sharing seminar

Deliverable Number	D8.7	Lead Beneficiary	1. UiT
Deliverable Name	i-MASTER knowledge sharing seminar		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	46	Work Package No	WP8

Description	
This deliverable establishes the i-MASTER knowledge sharing seminar.	

Deliverable – i-MASTER clustering, dissemination, exploitation, and communication final report

Deliverable Number	D8.8	Lead Beneficiary	7. WU
Deliverable Name	i-MASTER clustering, dissemination, exploitation, and communication final report		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	48	Work Package No	WP8

Description	
This report provides a final evaluation regarding the i-MASTER dissemination, exploitation, and communication activities from 2022 to 2026. Clustering activities also included.	

LIST OF MILESTONES

Milestones					
<i>Grant Preparation (Milestones screen) — Enter the info.</i>					
Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
1	Project start	WP1	1-UiT	Project management plan, i-MASTER gender equality plan, communication and coordination plan are presented and approved by the Steering Committee. I-MASTER project website and social media platforms are established.	2
2	Functional requirements are specified, ILS technologies and KPIs are established	WP2	5-VTI	Functional requirements specification report is approved by the Steering Committee.	8
3	Simulation scenarios, learning resources and performance standards are established	WP3	8-USN	Simulation scenarios, learning resources and performance standards are approved by the Steering Committee.	12
4	Maritime learning analytics dashboard are established, experimental testing and expert validation are completed	WP4	3-FhG	Performance of maritime learning analytics dashboard has been validated, and approval by experts is secured.	17
5	Testable prototypes of the intelligent learning system (ILS) are established	WP5	1-UiT	Testable prototypes of the ILS have been validated in a real-world environment using project KPIs.	24
6	ILS advancement and integration are established	WP6	6-TERP	Advanced testable prototypes of the ILS prototypes have been validated in real-world environment using project KPIs.	32
7	Large-scale demonstration programme completed	WP7	4-AMA	Demonstration and impact analysis report is approved by the Steering Committee and disseminated via project and partner COMMS channels.	41
8	Project ends	WP8	1-UiT	The project objectives have been met to a	48

Milestones					
<i>Grant Preparation (Milestones screen) — Enter the info.</i>					
Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
				satisfactory level and the EC project officer confirmed the completion.	

LIST OF CRITICAL RISKS

Critical risks & risk management strategy			
<i>Grant Preparation (Critical Risks screen) — Enter the info.</i>			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
1	Project management may be unable to accommodate project complexities which may result in delayed and missing project tasks/activities.	WP1	Appropriate project governance methods will be adopted from previous EU projects that have been delivered by the project consortium partners.
2	Functional requirements for specified ILS technologies and KPIs are not fully captured, resulting in a disconnect between functionality and user needs/expectations.	WP2	Adequate information on the Functional Requirements for specified ILS technologies and KPIs will be captured during the relevant workshops, then reviewed and approved by the end-users.
3	Simulation scenarios, learning resources and performance standards are not established due to technical difficulties in the bridge systems.	WP3	Multiple project partners with navigation bridge systems, operational knowledge and experiences are invited to be a part of the project consortium and that can mitigate this risk. Further, Fraunhofer CML has long-term experience and existing interfaces to a variety of ship handling simulators and equipment realized in their smart shipping laboratories over the years. Minimum dataset according to EMSN interface can be guaranteed.
4	Maritime learning analytics dashboard and/or ILS cannot be established due to leave of software developer(s), experimental testing and expert validation can be delayed.	WP4	The project has industrial level software development partners (Fraunhofer, VTI, TERP Global) who have encountered such development. Hence, a suitable replacement can be placed into the software development process to mitigate this risk by the industrial partners. On the dashboard side, Fraunhofer CML has a documentation and knowledge database

Critical risks & risk management strategy			
<i>Grant Preparation (Critical Risks screen) — Enter the info.</i>			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
			system in place ensuring a seamless transfer of project knowledge, thus minimizing delays in case of personnel changes.
5	The quality of the data sets from the bridge simulator environment can be diverse and that can delay the maritime learning analytics dashboard and ILS development process.	WP5, WP6, WP4	Multiple project partners with ship navigation bridge systems, operational knowledge and experiences are invited to be a part of the project. Hence, many data sets will be collected, and the high-quality data sets will be utilized toward the systems development process. UIT and Fraunhofer CML already have training data sets for AI-applications in the navigational context in place.
6	Students are unsure how to utilize the maritime learning analytics dashboard and/or ILS, the teaching and learning potentials are underexploited during the large scale demonstration programme.	WP7	There are six partners in this project with significant maritime infrastructure, extensive knowledge and experience with teaching and learning which will be utilized to support and train students to use the project outcomes.

PROJECT REVIEWS

Project Reviews			
<i>Grant Preparation (Reviews screen) — Enter the info.</i>			
Review No	Timing (month)	Location	Comments
RV1	14	To be discussed with PO	Location best in a country where Europe / European programmes (widening country) should be promoted
RV2	26	To be discussed with PO	Location best in a country where Europe / European programmes (widening country) should be promoted
RV3	48	Bxl	