HORIZON 2020

ACTION PLAN FOR PUC

ROBORDER

740593

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Abstract:

This action plan is developed within the efforts of T6.1 “End-user evaluation plans and methodology”. Its purpose is to identify the steps to test the ROBORDER platform against the Pilot Use Cases (PUCs) as required by the Grant Agreement. The platform shall be examined according to the evaluation methodology described in D6.1 to assess the

achievement of the project objectives, the fulfilment of requirements and the identification of shortfalls when testing the ROBORDER platform against the agreed PUCs.

Document History

Date	Version	Remarks
4.6.2018	0.1	Draft Version prior to D6.2 VTC
17.7.2018	0.2	Draft Version
27.7.2018	0.3	Draft Delivered to the Consortium
31.07.2018	1.0	Final Version

Document Authors

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Executive Summary

ROBORDER is an H2020 project with 25 partners, including government agencies and industry. The overall aim of the project is to develop a multi-domain platform which, with the use of autonomous vehicles, will support border security agents on securing borders and will be applied to a range of difference scenarios.

To demonstrate the platform adaptability, 9 Pilot Use Cases (PUCs) were chosen to test the platform performance against a range of conditions. Each PUC was chosen to represent the different scenarios the platform will be used.

The project is currently on Milestone 3 of 5 having passed Milestones 1 and 2. Milestone 1 includes the Concept of Operations (CONOPS) and the technological roadmap, the quality assurance and data management plans. Milestone 2 saw the completion of the ROBORDER platform architecture roadmap. During Milestone 3 the first prototype of the ROBORDER system will be completed.

The project is split into 3 development cycles, with testing and evaluation to be carried out at the end of each cycle. Testing will be carried out in 2 ways; Demonstrations and Operational Tests. Demonstrations will offer a more ‘hands-on’ experience and allow the end users to provide feedback on the system, whilst Operational Tests will highlight any technical issues to be resolved before the next round of testing.

An Action Plan has been created for the PUCs in the ROBORDER project. This has been created to identify and develop a suitable method to ensure the ROBORDER platform is rigorously tested against the PUCs identified in the Grant Agreement. The method to be used is detailed in D6.1 and will be used to assess if the ROBORDER platform fulfils the end-user and scenario requirements.

The Action Plan can be thought of as an enriched version of the project Gantt Chart with specific focus on those tasks that will lead to the evaluation and testing of the platform. It helps with the testing and evaluation of the system by clearly displaying the requirements and deliverables i.e. what needs to be achieved and the stage in the project which this will be completed. It is also kept up to date with information on whether the requirements are being fulfilled in a timely manner or if they are predicted to be late. Secondly, the Action Plan lists the modules of the platform architecture which are due to be integrated and which prototype they will be integrated for.

This document is organized as follows. Section 1 introduces the elements behind this deliverable. Section 2 is the action plan, its subsections contain detail about each development cycle; Section 3 sums up the conclusions for the action plan. Annex A contains the Excel file with the updated ROBORDER Project Gantt chart and the identification of the architecture components expected to be developed for each prototype.

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List of Acronyms

Table 1 List of acronyms

Acronym	Meaning
C2	Command and Control
CONOPS	Concept of Operations
CMRE	Centre for Maritime Research and Experimentation
LEA	Law Enforcement Agency
M&S	Modelling and Simulation
PUC	Pilot Use Case
SW	Software
UAV	Unmanned Aerial Vehicle
UGV	Unmanned Ground Vehicle
USV	Unmanned Surface Vehicle
UUV	Unmanned Underwater Vehicle
UxV	Unmanned Vehicle

1 Introduction

This Action Plan is developed within the efforts of T6.1 “End-user evaluation plans and methodology”. Its purpose is to identify the steps for the evaluation and testing of the ROBORDER platform against the Pilot Use Cases (PUCs) as required by the Grant Agreement. The platform shall be examined according to the evaluation methodology described in D6.1 [1] to assess if the ROBORDER platform achieves the project objectives, fulfilling the requirements in D1.1, D1.2 and D5.2.

The Action Plan contains an enriched version of the ROBORDER Project Gantt chart (see Annex A, Excel sheet named “*Prototype – Task – Deliverables*”), which has been updated to ensure consistency with the different stages of the platform testing phases and updated according to the latest project achievements. The timely completion of the deliverables in the Gantt chart shall lead to the testing of the PUCs to assess if the ROBORDER platform fulfils the requirements. Meaningful extracts of the Gantt chart are provided in the Output subsections of the Action Plan (Section 2). Additional actions are identified for each Evaluation subsections.

This Action Plan is a live document. The current version is based on the project status and the achievements obtained so far. Any update will be applied and reported to the consortium.

ROBORDER aims at developing and demonstrating a fully-functional autonomous border surveillance system with unmanned vehicles (UxVs) including Aerial, water Surface, Underwater and Ground vehicles (UAV, USV, UUV and UGV). These UxVs will be capable of functioning as both standalone system and as a swarm, and they will incorporate multimodal sensors as part of an interoperable network. The result of the test and evaluation is to assess if, by the end of the project, the ROBORDER platform is operationally ready and suitable for the end-user defined use cases.

The ROBORDER platform will be tested in two types of events, as detailed in section 1.3.3 of the Grant Agreement [2]:

- **Demonstrations** will be organized by GNR (Portugal), ORFK (Hungary) and HMOD (Greece). The Demonstrations will be co-located with workshops organised by the respective border authorities. Two demonstration workshops will be celebrated after the completion of the second prototype and the third will be held after the deployment of the final ROBORDER platform. The objectives of these events will be manifold:
    1. to present ROBORDER lessons learned and results and illustrate them through demonstrations;
    2. to offer the interested parties the possibility to experiment with ROBORDER’s workbench in “hands-on” sessions;
    3. to provide a user forum for networking with professionals working in related areas;
    4. to obtain feedback from the participants;
    5. to create a detailed document on lessons learned for further developments of the ROBORDER platform.

Demonstrations will cover three main PUCs:

- PUC1-1: Early identification and tracking of illegal activities, Greece (M35);
- PUC1-3: Detecting unauthorized land border crossing, Hungary (M27);
- PUC3-1: Detecting pollution accidents, Portugal (M27).

The External Advisory Board will be invited to the Final Demonstration Workshop.

- **Operational Tests** will be performed in different countries, in order to exhibit the wide applicability of ROBORDER over different scenarios, and to present any technical issue that should be improved for the next evolution. The following PUCs will be subject of operational tests :
  - PUC 1-2: Detecting unauthorised land border crossing and signals from trespassers (M18);
  - PUC 1-4: Tracking high-tech smugglers (M34-36);
  - PUC 1-5: Detecting the terrorist attack coming through cross border (M34-36);
  - PUC 1-6: Early and effective identification of passive boats moving offshore (M18);
  - PUC 1-7: Tracking Organised Crime Activity in remote border areas (M18);
  - PUC 2-1: Detecting jamming attacks (M26-28).

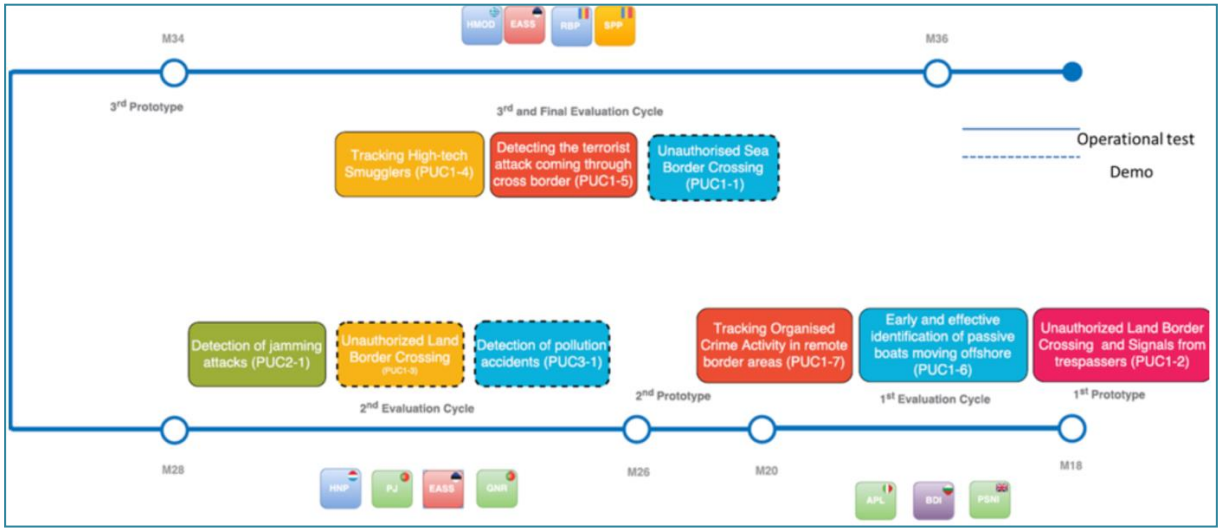

Figure 1 Evaluation cycles as in the Grant Agreement

This Action Plan proposes an update of the evaluation cycles in the Grant Agreement to meet the readiness level of the ROBORDER Platform and the time constraints. The changes from the current version (Figure 1) to the CMRE proposed version (Figure 2) are a **redistribution of the operational tests** of the First Evaluation Cycle to the second and third cycles and the notification of the willing to **move the demonstration of PUC 1-3** from M27 to M30 by ORFK.

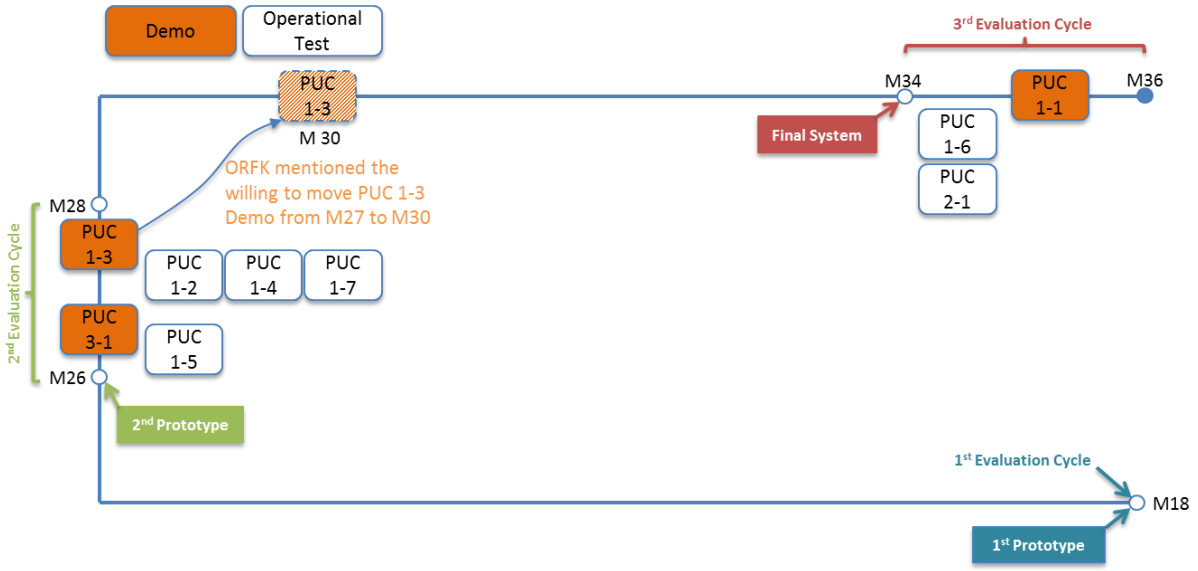

Figure 2 Evaluation cycles: Demonstrations and Operational Tests.

The platform will be tested in training ranges owned by border authorities of the consortium and their collaborators, located in Portugal, Estonia, Italy, Greece, Bulgaria, Romania and Hungary (e.g. see Figure 3). This approach to Operational Tests will require the implementation of ROBORDER platform prototypes across Europe multiple times within the 3 months of the evaluation cycles.

Figure 3 Operational Tests of the 2nd evaluation cycle in each end user training ground.

Project Milestones

The project is divided in five Milestones (at months 6, 12, 18, 28, and 36), currently Milestones 2 has been delivered, corresponding to the Operational Prototype, which should include:

- Communication architecture report D2.1, M12;
- Performance assessment of ROBORDER configurations D2.2, M12;
- Technical requirements and operational architecture D5.2, M12.

The deliverables included up to Milestone 2 are: D2.1, D2.2, D5.1, D5.2, D6.1, D7.1, D7.2, D8.1, D8.2, D9.1, D9.2, D9.3, D9.4, D9.5 and D9.6. Unfortunately, the deliverables of WP2 are late (namely D2.1 and D2.2). Those delays are due to consortium issues which are, to date, in a resolution phase. The consortium indeed undertook actions to mitigate the resulting risks. Despite the late, the Gantt chart contains valuable information about the logical relationships of the tasks and remains the main tool for this deliverable to define the actions to be undertaken to reach the goals of ROBORDER project.

The following section describes the Action plan, its subsections contain detail about each development cycle; Section 3 sums up the conclusions for the action plan. The Excel file with the updated ROBORDER Project Gantt chart and the identification of the architecture components expected to be developed for each prototype is introduced and attached in Annex A.

2 Action Plan

The project foresees three development cycles. In the first cycle, the user requirements are defined, the technical architecture is designed and the **first prototype** is developed and evaluated by the border authorities and LEAs. The outcome of this evaluation is fed as input to the second cycle to update the user requirements and proceed with the **second prototype** and evaluation. The **final system** is integrated during the third cycle. Each development cycle coincides with different maturity level of the components and systems developed.

In the following subsections, each cycle is analysed in detail. The description of the output of each development cycle is extracted from section 3.1.5 Milestone List of the Grant Agreement [2] and from Section 4.2 of the D5.2 Technical Requirements and Operational Architecture version 1.0 [3].

2.1 Development Cycle 1 (M1-M18)

2.1.1 Output of the Cycle 1: First Prototype Milestone 3

Milestone 3 stands for the completion of the first development cycle of the project. It includes the first version of the ROBORDER platform:

- UxVs tele-operation framework and interface D4.1, M24;
- Visual analytics and decision support tools based on risk models and reasoning methods D4.2, M24.

The authors identified the Logical architecture components, in Table 2, that will be tested during the first evaluation cycle. The first and most important set of action for this cycle is the delivery of the components identified in timely manner. WP4 components are foreseen to be delivered at M24, but as per discussion with WP leader, intermediate results of WP4 (red in Table 2) will be ready for being evaluated at M18 during the First Evaluation Cycle.

Table 2 First Prototype Logical Architecture Components

Architecture Component	Architecture Layer	Task	Responsible	Delivery
Mixed Reality Robot Control UI	Interaction (SW)	T4.1	VTT	M24
Mission Editor (MDL)	Interaction (SW)	T4.2	UoA	M24
Autonomous Resource Task Coordination	Integration (Prediction)	T4.3	CERTH	M24
RDF Data Service	Integration (Prediction / Analytics)	T4.4	CERTH	M24
Risk models	Integration	T4.5	UoA	M24

	(Analitics)			
Decision Support	Integration (Analitics)	T4.6	CERTH	M24
Visual Analytics	Integration (Analitics)	T4.6	CERTH	M24
National C2 Simulation 1	Application	T5.1	TEK	M12
National C2 Simulation 2	Application	T5.2	TEK	M18
Data model (EU-CISE, UCS etc.)	Interoperability	T5.2	TEK	M18
Devices (STANAG 4586, JAUS, JANUS etc.)	Interoperability	T5.2	TEK	M18
National C2 Simulation 3	Application	T5.3	TEK	M18
Mission Control	Integration (Mission Planner)	T5.4	Everis	M18
Mission Execution	Integration (Mission Planner)	T5.4	TEK	M18
Device Management	Integration (Mission Planner)	T5.4	TEK	M18
C&C Connection and Configuration	Interaction (SW)	T5.4	TEK	M18
Mission Dashboard	Interaction (SW)	T5.4	TEK	M18
Operational Data	Persistence	T5.4	Everis	M18
Processed Data	Persistence	T5.4	Everis	M18

This table is an extract for the First Prototype components of the Excel sheet "*Architecture – Task"* of the file attached in the Annex A.

The output of Development Cycle 1 also includes:

- Action plan for PUC D6.2 (this deliverable), M15;
- First Modelling and Simulation (M&S) based Test Bed Demonstration D6.3, M18;
- First evaluation report D6.6, M18;
- Concept of Operation, Use Cases and Requirements D1.1, M18;
- Market Analysis D7.3, M14;
- Dissemination Reports D7.4, M18;
- Mid-term review and progress report.

An independent Ethics Review will be realised in parallel with MS3.

The updated Gantt chart in Figure 4 shows the deliverables contributing to MS3 and their scheduling along the project.

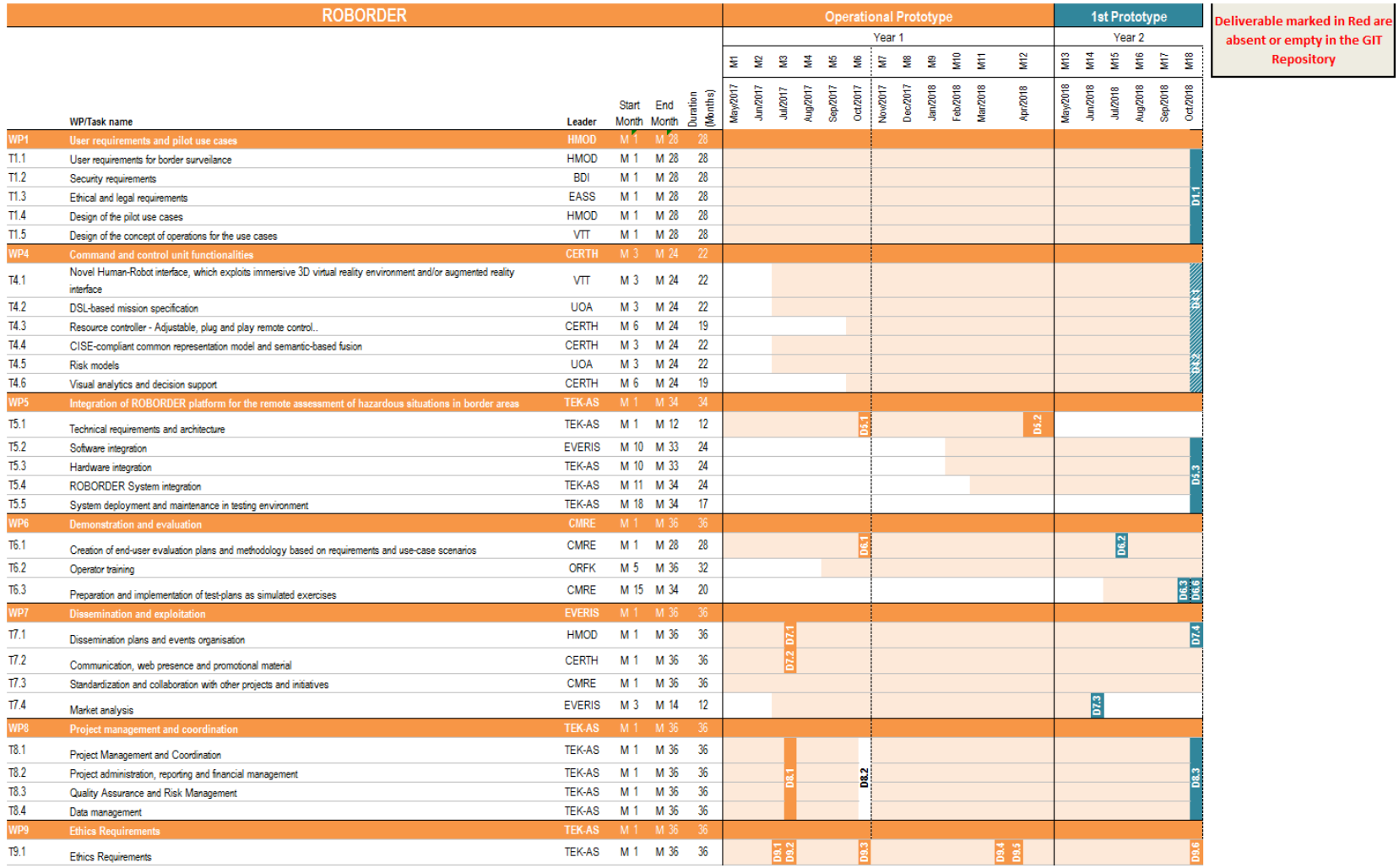

Figure 4 Updated Gantt Chart for the 1st ROBORDER platform prototype

2.1.2 Evaluation (M18)

In order to meet the readiness level of the ROBORDER Platform and the time constraints, the consortium agreed [4] to redistribute the operational tests of the PUCs foreseen in the Grant agreement in the First Evaluation Cycle among the Second and Third one. The First Evaluation Cycle will be devoted to perform Integration tests. PUCs will be used as a guideline for the integration tests of M18.

The following actions enabling the tests are currently undertaken by the author of this document:

- Agree with the consortium on the location in which to perform the tests;
- Agree with the consortium on the precise time frame for the tests;
- Define a Test Plan.

Once agreed on the location of the tests, the following action will result:

- The owner of the premise in which the tests will take place shall lead the security and bureaucratic procedures connected to the organization of the testing with the support of the participating partners.

2.2 Development Cycle 2 (M18-M28)

2.2.1 Output of the Cycle 2: Second Prototype Milestone 4

Milestone 4 stands for the completion of the second development cycle of the project. It includes the second version of the ROBORDER platform:

- Final Sensors Implementations D2.3, M24
- Adaptability solutions for robotic platforms D2.4, M24
- Event and Activity Detection and Recognition D3.1, M24;
- Intrusion and illegal communications detection D3.2, M24;
- UxVs teleoperation framework and interface D4.1, M24;
- Visual analytics and decision support tools based on risk models and reasoning methods D4.2, M24.

The authors identified the Logical architecture components, in Table 3, that will be tested during the second evaluation cycle. The first and most important set of action for this cycle is the delivery of the components identified at M24.

Table 3 Second Prototype Logical Architecture Components

Architecture Component	Architecture Layer	Task	Responsible	Delivery
Passive Radar	Interaction (HW)	T2.2	FHR	M24
RF signal Sensors on-board UxVs	Interaction (HW)	T2.3	ELTM	M24

Re-configuration of agents and carrier solution	Interaction (HW)	T2.5	ELTM	M24
MoniCA + Radar Network + IP Cameras	Interaction (HW)	T2.6	CNIT/APL	M24
Photonic-based Radar Network	Interaction (HW)	T2.6	CNIT	M24
Detection of Pollution Incidents	Integration (Ingestion)	T3.1	CNIT	M24
Identification and tracking of illegal activities	Integration (Ingestion)	T3.2	CNIT	M24
Low level fusion of sensor data	Integration (Ingestion)	T3.3	CERTH	M24
Intrusion Detection and Classification	Integration (Ingestion)	T3.4	CPT	M24
Sensors adaptability	Interaction (HW)	T3.4	ELTM	M24
Identification of unauthorized communication	Integration (Ingestion)	T3.5	TEK	M24

This table is an extract for the Second Prototype components of the Excel sheet "*Architecture – Task"* of the file attached in the Annex A.

The products expected at the delivery of this second prototype will also include:

- Final Concept of Operation, Use Cases and Requirements D1.2, M28;
- Second M&S based Test Bed Demonstration D6.4, M26;
- Second evaluation report D6.7, M28
- Business Model D7.6, M24;
- Self-assessment and data management plan V2 D8.4, M24.

Deliverables contributing to MS4 are depicted in the updated Gantt chart in Figure 5.

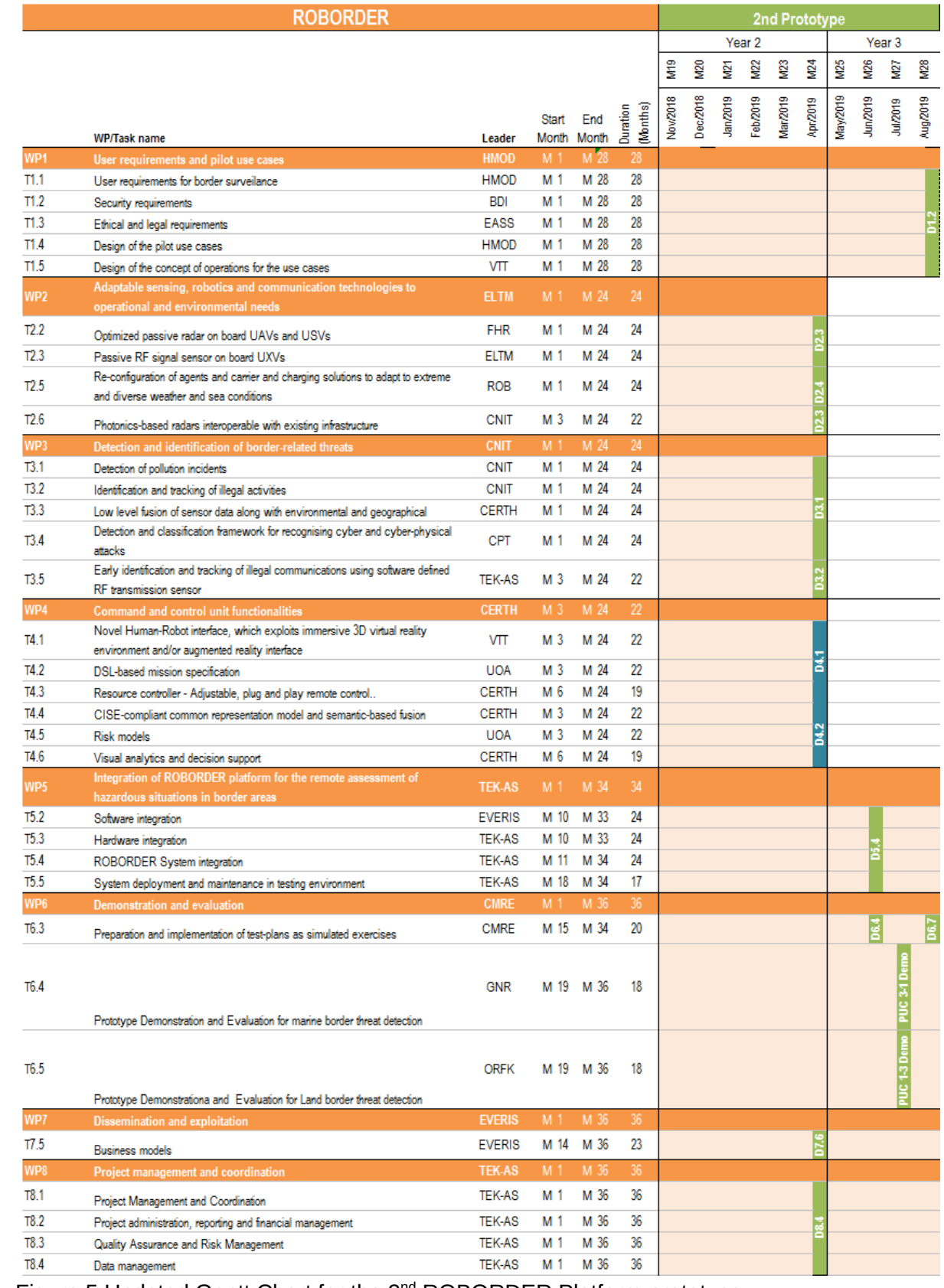

Figure 5 Updated Gantt Chart for the 2nd ROBORDER Platform prototype

2.2.2 Evaluation (M26-M28)

The following arrangement of the tests is proposed (Figure 6), resulting from the shift of the operational tests of the First Evaluation Cycle.

The operational tests are distributed in order to be coherent with the Demo PUC border type (green – blue). ***PUC 1-3, Detecting unauthorised land border crossing*** and ***PUC 3-1, Detecting pollution accidents*** are expected to be the demonstrated during the Second Evaluation Cycle, while the following PUCs are foreseen to be operationally tested:

- PUC 1-2, Detecting unauthorised land border crossing and signals from trespassers;
- PUC 1-4, Tracking high-tech smugglers;
- PUC 1-5, Detecting the terrorist attack coming through cross border;
- PUC1-7, Tracking Organised Crime Activity in remote border areas.

Currently ORFK has proposed to move the Demo of PUC 1-3 from M27 to M30, outside the evaluation cycle. The author of this deliverable requested ORFK to provide a formal written motivation in order to properly evaluate this change and discuss it at consortium level.

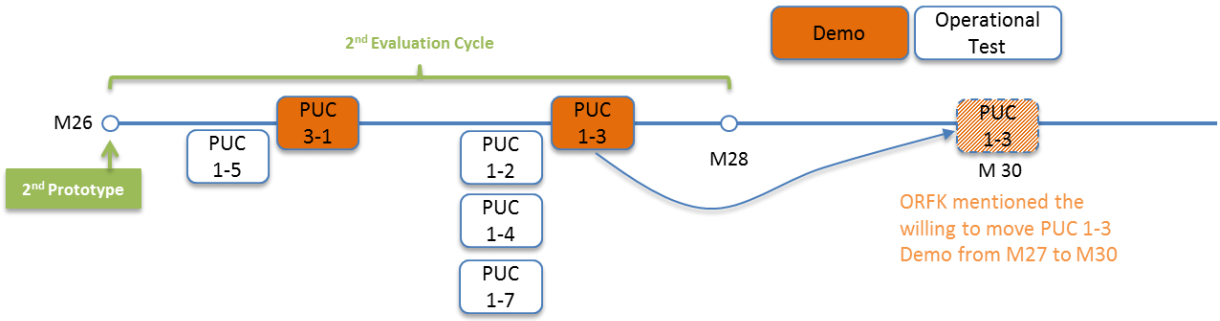

Figure 6 Second Evaluation Cycle, proposed Demonstrations and Operational Tests.

The partners hosting the events will be responsible of the security and bureaucratic issues with the support of all the partners. The owners of the premises agreed that the time for dealing with those is enough. The current actions undertaken for the second evaluation cycle are:

- Agree on how to perform operational tests;
- Agree on who is responsible for their organization.

2.3 Development Cycle 3 (M28-M36)

2.3.1 Output of the Cycle 3: Final System Milestone 5

Milestone 5 marks the successful completion of the third Software (SW) development cycle. It includes:

- Final M&S based Test Bed Demonstration D6.5, M34;
- Final Evaluation report D6.8, M36
- Operator Training Manual D6.9, M36;

- Final Dissemination Reports D7.5, M36;
- Report on Standards and Collaborations D7.7, M36;
- Exploitation plan and sustainability model D7.8, M36
- Public final activity report.

Deliverables contributing to MS5 are contained in the updated Gantt chart in Figure 7.

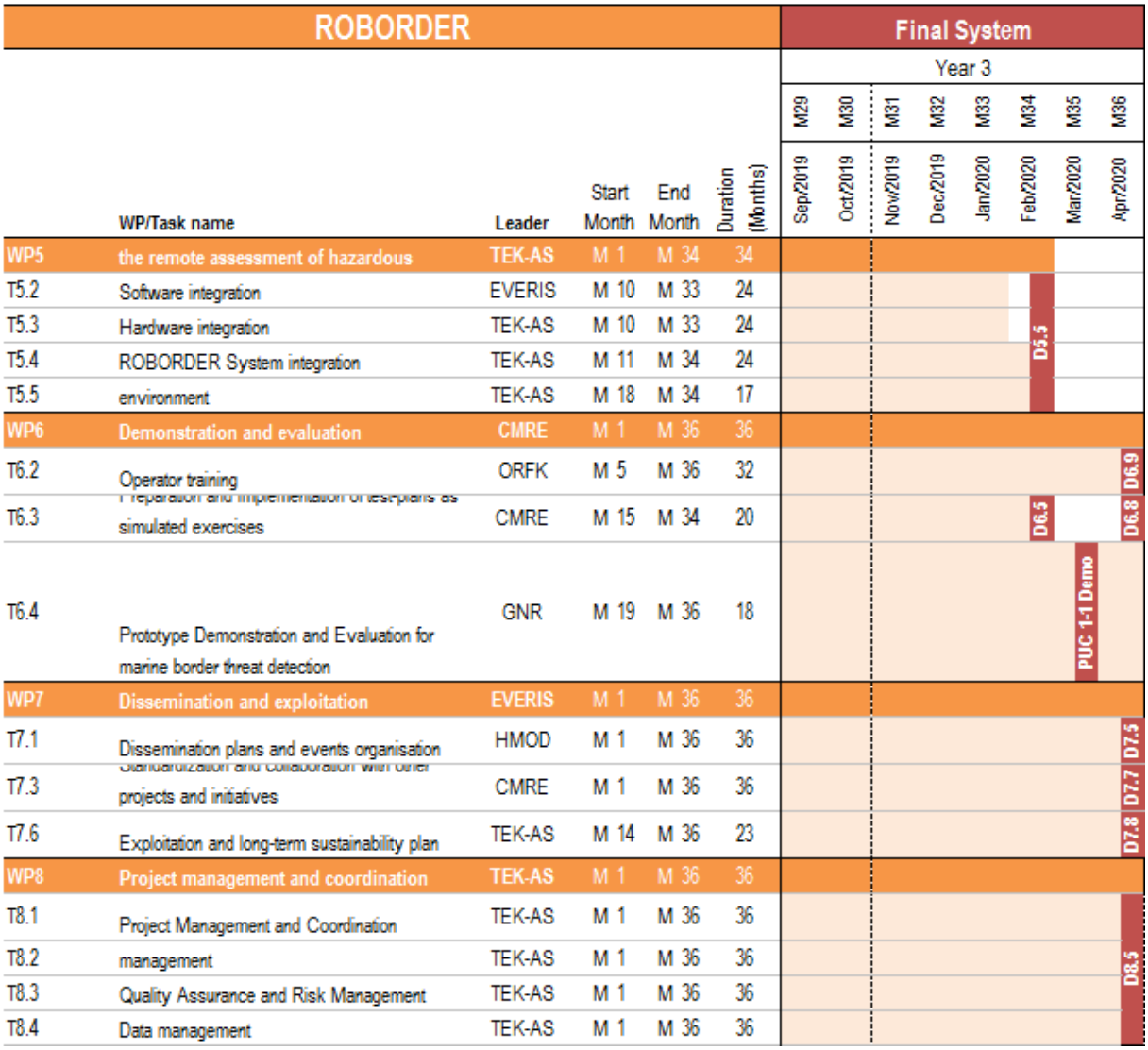

Figure 7 Updated Gantt for the Final System

2.3.2 Evaluation (M34-M36)

As for the Second Evaluation Cycle, the following arrangement of the tests is proposed (Figure 8), resulting from the shift of the operational tests of the First Evaluation Cycle.

The operational tests are distributed in order to be coherent with the Demo PUC border type (blue). ***PUC 1-1, Detecting unauthorised see border crossing*** is expected to be the topic of the Demonstration of the final evaluation Cycle, while the following PUCs are foreseen to be operationally tested:

- PUC 1-6, Early and effective identification of passive boats moving offshore;
- PUC 2-1, Detecting jamming attacks.

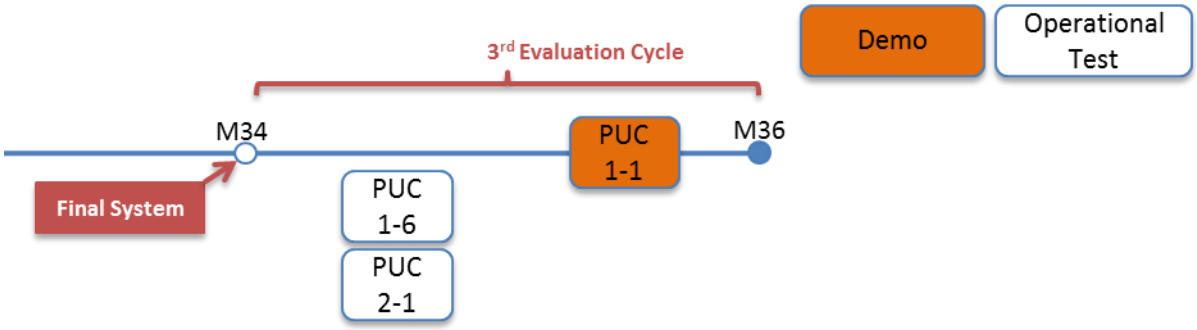

Figure 8 Third Evaluation Cycle, proposed Demos and Operational Tests

The partners hosting the events will be responsible of the security and bureaucratic issues with the support of all the partners. The owners of the premises agreed that the time for dealing with those is enough

The current actions undertaken for the Third Evaluation Cycle are:

- Agree on how to perform operational tests;
- Agree on who is responsible for their organization.

3 Conclusions

The Action Plan for PUC can be thought of as an enriched version of the project Gantt Chart, which has been updated to ensure consistency with:

- The different cycles of the platform development;
- The architecture in D5.2;
- The current status of the project.

The accomplishment of the tasks in the chart should ensure the successful development of the ROBORDER platform for each development cycle.

A series of additional pending actions have been identified in Section 2 for each Evaluation subsection that should lead to the testing. Those actions in particular are related to the organization of the First Evaluation cycle and the definition of the responsible entity for the Operational Tests. Those actions are listed below.

- Actions currently ongoing for the First Evaluation Cycle:
  - Agree with the consortium on the location in which to perform the tests;
  - Agree with the consortium on the precise time frame for the tests;
  - Define a Test Plan.
- Once agreed on the location of the tests, the following actions will result:
  - The owner of the premise in which the tests will take place shall lead the security and bureaucratic procedures connected to the organization of the testing with the support of the participating partners.

Actions for the Second and Third Evaluation cycles:

- Agree on how to perform operational tests;
- Agree on who is responsible for their organization.

Integration Tests will be performed to meet the current readiness level of the ROBORDER platform at the First Evaluation Cycle time (M18). To this end, Operational Tests of the PUCs that were foreseen to take place in M18 when writing the Grant Agreement, have been redistributed within the Second and third Evaluation Cycle.

Reference

[1] CMRE, “ROBORDER Evaluation Methodology using Benchmarking; Deliverable D6.1,” 2017.

[2] R. Consortium, “Grant Agreement number 740593 ROBORDER,” European Commission, 2017.

[3] TEKEVER-AS, “ROBORDER Technical Requirements and Operational Architecture; Deliverable D5.2 version 1.0,” 2018.

[4] G. L. Maglione and A. Carrera Viñas, *ROBORDER: Minutes of WP6 VTC 6.6.2018.*

Annex A

The document attached is an enriched version of the ROBORDER Project Gantt chart (Excel sheet named "*Prototype – Task – Deliverables*"), which has been updated to ensure consistency with the different stages of the platform testing phases and updated according to the latest project achievements.

The Logical architecture components pertaining to each prototype are identified in the "*Architecture – Task"* sheet of the file attached.

D6.2 Updated Gantt Chart.xlsx

Deliverable marked in Red are absent or empty in the GIT Repository

Deliverable marked in yellow are drafts in the GIT Repository

ROBORDER						Operational Prototype												1st Prototype						2nd Prototype						Final System											
						Year 1												Year 2												Year 3											
						M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36
	WP/Task name	Leader	Start Month	End Month	Duration (Months)	May/2017	Jun/2017	Jul/2017	Aug/2017	Sep/2017	Oct/2017	Nov/2017	Dec/2017	Jan/2018	Feb/2018	Mar/2018	Apr/2018	May/2018	Jun/2018	Jul/2018	Aug/2018	Sep/2018	Oct/2018	Nov/2018	Dec/2018	Jan/2019	Feb/2019	Mar/2019	Apr/2019	May/2019	Jun/2019	Jul/2019	Aug/2019	Sep/2019	Oct/2019	Nov/2019	Dec/2019	Jan/2020	Feb/2020	Mar/2020	Apr/2020
WP1	User requirements and pilot use cases	HMOD	M 1	M 28	28																																		
T1.1	User requirements for border surveilance	HMOD	M 1	M 28	28																		D1.1																
T1.2	Security requirements	BDI	M 1	M 28	28																											D1.2							
T1.3	Ethical and legal requirements	EASS	M 1	M 28	28																																		
T1.4	Design of the pilot use cases	HMOD	M 1	M 28	28																																		
T1.5	Design of the concept of operations for the use cases	VTT	M 1	M 28	28																																		
WP2	Adaptable sensing, robotics and communication technologies to operational and environmental needs	ELTM	M 1	M 24	24																																		
T2.1	Hierarchical cloudlet based communication network architecture to support context-aware reliable and secure communications	TEK-AS	M 1	M 12	12												D2.1																							
T2.2	Optimized passive radar on board UAVs and USVs	FHR	M 1	M 24	24																							D2.3											
T2.3	Passive RF signal sensor on board UXVs	ELTM	M 1	M 24	24												D2.2																							
T2.4	Optimization of sensors for a variety of situations and conditions	ELTM	M 1	M 24	24																																		
T2.5	Re-configuration of agents and carrier and charging solutions to adapt to extreme and diverse weather and sea conditions	ROB	M 1	M 24	24																							D2.3 D2.4											
T2.6	Photonics-based radars interoperable with existing infrastructure	CNIT	M 3	M 24	22																																		
WP3	Detection and identification of border-related threats	CNIT	M 1	M 24	24																																		
T3.1	Detection of pollution incidents	CNIT	M 1	M 24	24																																		
T3.2	Identification and tracking of illegal activities	CNIT	M 1	M 24	24																							D3.1											
T3.3	Low level fusion of sensor data along with environmental and geographical	CERTH	M 1	M 24	24																																		
T3.4	Detection and classification framework for recognising cyber and cyber-physical attacks	CPT	M 1	M 24	24																							D3.2											
T3.5	Early identification and tracking of illegal communications using software defined RF transmission sensor	TEK-AS	M 3	M 24	22																																		
WP4	Command and control unit functionalities	CERTH	M 3	M 24	22																																		
T4.1	Novel Human-Robot interface, which exploits immersive 3D virtual reality environment and/or augmented reality interface	VTT	M 3	M 24	22																		D4.1					D4.1											
T4.2	DSL-based mission specification	UOA	M 3	M 24	22																		D4.2					D4.2											
T4.3	Resource controller - Adjustable, plug and play remote control..	CERTH	M 6	M 24	19																																		
T4.4	CISE-compliant common representation model and semantic-based fusion	CERTH	M 3	M 24	22																																		
T4.5	Risk models	UOA	M 3	M 24	22																																		
T4.6	Visual analytics and decision support	CERTH	M 6	M 24	19																																		
WP5	Integration of ROBORDER platform for the remote assessment of hazardous situations in border areas	TEK-AS	M 1	M 34	34																																		
T5.1	Technical requirements and architecture	TEK-AS	M 1	M 12	12							D5.1					D5.2																							
T5.2	Software integration	EVERIS	M 10	M 33	24																																		
T5.3	Hardware integration	TEK-AS	M 10	M 33	24																		D5.3																
T5.4	ROBORDER System integration	TEK-AS	M 11	M 34	24																									D5.4										
T5.5	System deployment and maintenance in testing environment	TEK-AS	M 18	M 34	17																																	D5.5		
WP6	Demonstration and evaluation	CMRE	M 1	M 36	36																																		
T6.1	Creation of end-user evaluation plans and methodology based on requirements and use-case scenarios	CMRE	M 1	M 28	28							D6.1								D6.2																				
T6.2	Operator training	ORFK	M 5	M 36	32																																		D6.8 D6.9
T6.3	Preparation and implementation of test-plans as simulated exercises	CMRE	M 15	M 34	20																		D6.3 D6.6							D6.4		D6.7					D6.5		D6.8 D6.9
T6.4	Prototype Demonstration and Evaluation for marine border threat detection	GNR	M 19	M 36	18																										PUC 3-1 Demo								PUC 1-1 Demo	
T6.5	Prototype Demonstrationa and Evaluation for Land border threat detection	ORFK	M 19	M 36	18																										PUC 1-3 Demo									

As per discussion with the WP leader, intermediate results will be ready for being tested during the 1st evaluation cycle.

Figure 9 D6.2 Updated Gant Chart, Prototype -Task – Deliverable Sheet 1/2

Deliverable marked in Red are absent or empty in the GIT Repository

Deliverable marked in yellow are drafts in the GIT Repository

ROBORDER						Operational Prototype												1st Prototype						2nd Prototype						Final System					
						Year 1												Year 2												Year 3					
						M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36
	WP/Task name	Leader	Start Month	End Month	Duration (Months)	May/2017	Jun/2017	Jul/2017	Aug/2017	Sep/2017	Oct/2017	Nov/2017	Dec/2017	Jan/2018	Feb/2018	Mar/2018	Apr/2018	May/2018	Jun/2018	Jul/2018	Aug/2018	Sep/2018	Oct/2018	Nov/2018	Dec/2018	Jan/2019	Feb/2019	Mar/2019	Apr/2019	May/2019	Jun/2019	Jul/2019	Aug/2019	Sep/2019	Oct/2019	Nov/2019	Dec/2019	Jan/2020	Feb/2020	Mar/2020	Apr/2020
WP7	Dissemination and exploitation	EVERIS	M 1	M 36	36																																		
T7.1	Dissemination plans and events organisation	HMOD	M 1	M 36	36			D7.1														D7.4																	D7.5
T7.2	Communication, web presence and promotional material	CERTH	M 1	M 36	36			D7.2																															
T7.3	Standardization and collaboration with other projects and initiatives	CMRE	M 1	M 36	36																																		D7.7
T7.4	Market analysis	EVERIS	M 3	M 14	12														D7.3																				
T7.5	Business models	EVERIS	M 14	M 36	23																							D7.6											
T7.6	Exploitation and long-term sustainability plan	TEK-AS	M 14	M 36	23																																		D7.8
WP8	Project management and coordination	TEK-AS	M 1	M 36	36																																		
T8.1	Project Management and Coordination	TEK-AS	M 1	M 36	36				D8.1														D8.3						D8.4											D8.5
T8.2	Project administration, reporting and financial management	TEK-AS	M 1	M 36	36							D8.2																												
T8.3	Quality Assurance and Risk Management	TEK-AS	M 1	M 36	36																																		
T8.4	Data management	TEK-AS	M 1	M 36	36																																		
WP9	Ethics Requirements	TEK-AS	M 1	M 36	36																																		
T9.1	Ethics Requirements	TEK-AS	M 1	M 36	36			D9.1	D9.2			D9.3					D9.4 D9.5						D9.6																	
	Milestones											MS1						MS2						MS3									MS4							MS5

Figure 10 D6.2 Updated Gant Chart, Prototype -Task – Deliverable Sheet 2/2

Operational Prototype				
1st Prototype	First Check of blue cells at 1st Prototype M18			
2nd Prototype	First Check of green cells at 2nd prototype M26			
Final System				

Architecture Component	Architecture Layer	Task	Responsible	Delivery
Decision Support	Integration (Analitics)	T4.6	CERTH	M24
Visual Analytics	Integration (Analitics)	T4.6	CERTH	M24
Low level fusion of sensor data	Integration (Ingestion)	T3.3	CERTH	M24
Autonomous Resource Task Coordination	Integration (Prediction)	T4.3	CERTH	M24
RDF Data Service	Integration (Prediction / Analytics)	T4.4	CERTH	M24
Detection of Pollution Incidents	Integration (Ingestion)	T3.1	CNIT	M24
Identification and traking of illegal activities	Integration (Ingestion)	T3.2	CNIT	M24
Photonic-based Radar Network	Interaction (HW)	T2.6	CNIT	M24
MoniCA + Radar Network + IP Cameras	Interaction (HW)	T2.6	CNIT/APL	M24
Intrusion Detection and Classification	Integration (Ingestion)	T3.4	CPT	M24
RF signal Sensors on-board UxVs	Interaction (HW)	T2.3	ELTM	M24
Re-configuration of agents and carrier solution	Interaction (HW)	T2.5	ELTM	M24
Sensors adaptability	Interaction (HW)	T3.4	ELTM	M24
Mission Control	Integration (Mission Planner)	T5.4	Everis	M18
Operational Data	Persistence	T5.4	Everis	M18
Processed Data	Persistence	T5.4	Everis	M18
Passive Radar	Interaction (HW)	T2.2	FHR	M24
National C2 Simulation 1	Application	T5.1	TEK	M12
National C2 Simulation 2	Application	T5.2	TEK	M18
National C2 Simulation 3	Application	T5.3	TEK	M18
Identification of unauthorized communication	Integration (Ingestion)	T3.5	TEK	M24
Mission Execution	Integration (Mission Planner)	T5.4	TEK	M18
Device Management	Integration (Mission Planner)	T5.4	TEK	M18
C&C Connection and Configuration	Interaction (SW)	T5.4	TEK	M18
Mission Dashbord	Interaction (SW)	T5.4	TEK	M18
Data model (EU-CISE, UCS etc.)	Interoperability	T5.2?	TEK?	M18
Devices (Stanag 4586, JAUS, JANUS etc.)	Interoperability	T5.2?	TEK?	M18
Risk models	Integration (Analitics)	T4.5	UoA	M24
Mission Editor (MDL)	Interaction (SW)	T4.2	UoA	M24
Mixed Reality Robot Control UI	Interaction (SW)	T4.1	VTT	M24

Figure 11 D6.2 Updated Gant Chart, Architecture-Task Sheet

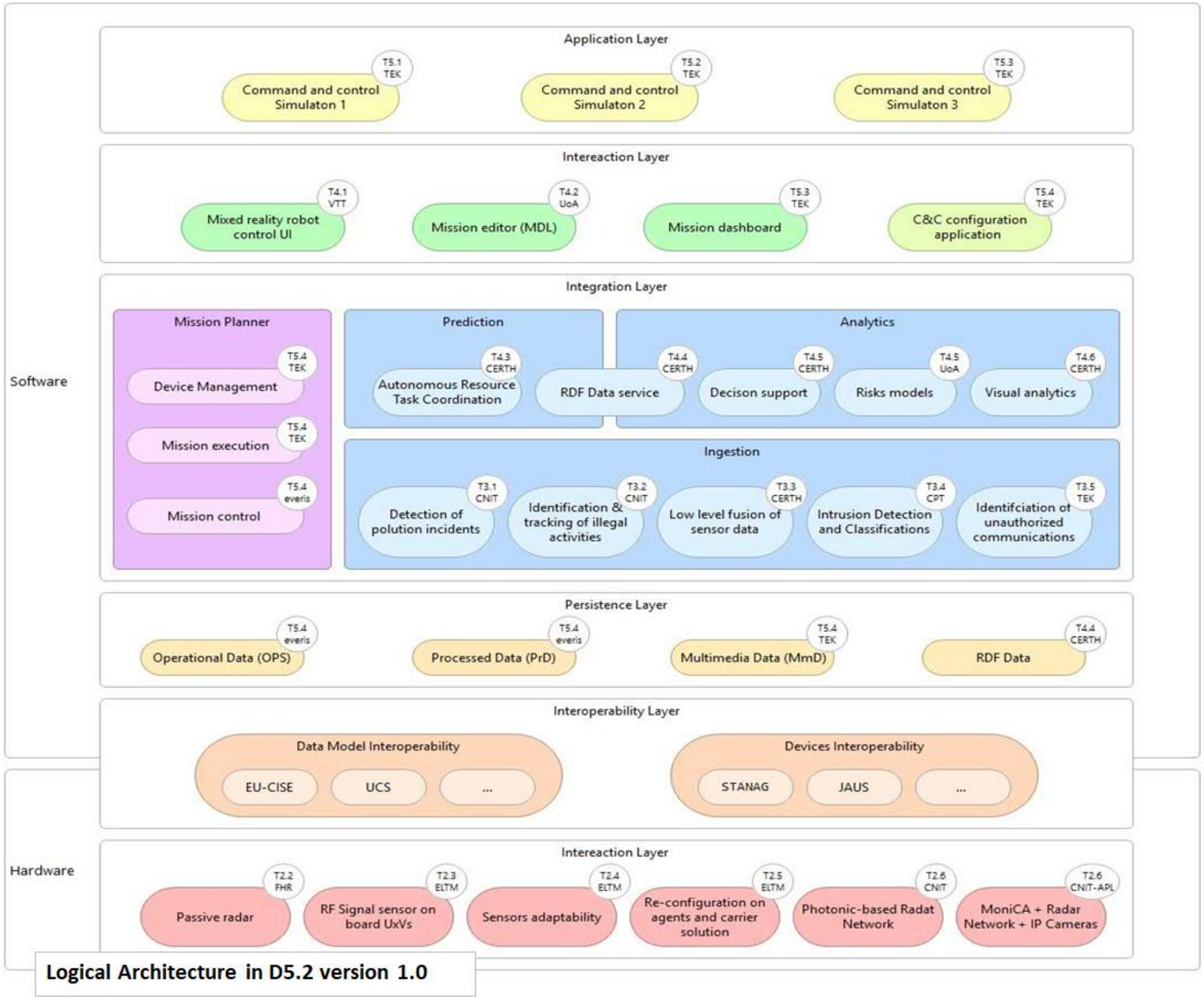

Figure 12 D5.2 Logical Architecture

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