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AMASS

Architecture-driven, Multi-concern and Seamless Assurance and Certification of Cyber-Physical Systems

External advisory board and industrial adoption program report
D7.2

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Executive Summary

This document presents the actions taken and their results to coordinate the AMASS External Advisory Board in task T7.1 and to improve industrial adoption of AMASS in task T7.2, as part of work package WP7: Industrial Impact and Community Building.

The main topics of this report are:

- Summary of AMASS consortium activities to collaborate with other research organizations and initiatives in order to present the outreach of the AMASS concepts and propose the adoption of the open platform.
- Summary of recommendations from the AMASS External Advisory Board (EAB), which consists of a group of influential and prominent people from relevant industrial companies, research institutions, and open source communities, and actions performed to follow their advice.
- Summary of actions taken for an early adoption of the AMASS approach by the industry, research and scientific communities, policy makers and the open source community, including promotion of AMASS results, their future development, and the creation of future initiatives for training and research in this field.

1. Introduction

The AMASS ambition is to **create and consolidate** a **European-wide assurance and certification open tool platform, ecosystem and self-sustainable community** spanning the CPS vertical markets. AMASS has performed a variety of activities at various stages of the project, as will be described in this report, in order to ensure impact of its results and gain interest from third parties.

These activities have been reinforced by the interaction with an **External Advisory Board (EAB)**, composed by relevant professionals in different domains, who have provided their advice to help AMASS achieve the project goals. Further **networking** activities have extended dissemination activities, especially by co-operating with other EU funded projects and other organisations, groups and professionals already working in the domain. In particular, the project intends to establish strong links to other projects and support the creation of appropriate ecosystems around technologies for CPS development.

As a way to coordinate these activities from the technical and strategic perspective (unlike other dissemination activities in work package WP8), two different tasks have been established and performed in WP7 Industrial Impact and Community Building:

- **Task 7.1 (Networking and Coordination of External Advisory Board)** has provided the necessary tools to plan, coordinate, and manage the networking and EAB activities.
- **Task 7.2 (Industrial Adoption Program)** has been dedicated to defining a roadmap for an early adoption of the AMASS approach by a user community.

The roadmaps for these two instruments (EAB and Industrial Program) was presented in deliverable D7.1 [1]. Now, in this new deliverable D7.2, we present the final report of these tasks.

Task 7.1 has provided a forum where the EAB, and other international experts, have exchanged ideas and advices. AMASS has used a mailing list/forum to discuss issues directly related to AMASS, such as technical approaches, platform architecture, technology, regulatory frames, etc. Task 7.1 has also established the means of networking of the AMASS initiative with other related projects and initiatives. Section 2 of this document presents the report for this task.

Task 7.2 has defined a roadmap for an early adoption of the AMASS approach by a user community. This roadmap has combined both operational and research-led activities for the design of a strategic roadmap for adoption of AMASS. The roadmap has used outputs from the different technical WPs (WP2-WP6) and has served to promote the early adoption of AMASS by different companies and initiatives. Section 3 of this document presents the report for this task.

2. Networking and External Advisory Board Management

2.1 Networking Activities

Networking activities have included technical and strategic promotion of the AMASS platform and collaboration with relevant communities, where AMASS has been considered as a strategic project. In particular, this task has also looked for co-operation with other EU funded projects as well as organisations, groups and professionals already working in the domain. The objectives were to join efforts, minimize duplications and maximise the potential. The emphasis was laid on the unique AMASS features and functionalities, which are expected to extend and enrich the existing knowledge in the domain.

Table 1 provides a list of research projects, standardization initiatives and organizations that have been the target of collaboration activities in AMASS. The lead contact partner in each row has coordinated the collaboration activities.

Table 1. Most relevant projects and organizations AMASS has collaborated with

Project	Lead contact (partner)	Description
SafeCOP	Detlef Scholle (ALT)	SafeCOP (Safe Cooperating Cyber-Physical Systems using Wireless Communication) aims to establish a safety assurance approach, an architecture platform, and tools for cost-efficient and practical certification of cooperating CPS. The SafeCOP project is relevant because it also works on producing safety assurance evidence, in this case needed to certify cooperative functions. Both projects, SafeCOP and AMASS, share the goal to lower certification costs. **Activities:** Common workshop organized in Stockholm during Addalot Safety conference 2017 in May. Participation in the Project Advisory Board of SafeCOP. **Results:** Presentation of Multiconcern Assurance and Co-engineering issues on standards evolution (11.04.2018 and 30.01.2019).
OMG System Assurance Task Force	Jose Luis de la Vara (UC3)	This OMG task force works on: (1) the adaptation and extension of OMG technologies that apply across domains to enhance System Assurance (e.g. Reliability, Safety, Security, and Compliance); (2) the definition of a common framework for analysis and exchange of information related to system assurance and trustworthiness, and; (3) the promotion of System, Software and Information Assurance in OMG product interoperability mechanisms. Its specific activities include the development of the SACM specification for assurance case modelling. **Activities:** AMASS Partners (UC3, Tecnalia) participate to the Task Force. **Results:** Contribution to the development of the SACM 2.0 standard for assurance cases; mainly to the argumentation metamodel and the evidence metamodel. Involvement in the discussions for SACM 2.1.
CP-SETIS	Erwin Schoitsch (AIT)	CP-SETIS (Towards Cyber-Physical Systems Engineering Tools Interoperability Standardization) is a support-action type IA of Horizon 2020 driven by key partners of several ARTEMIS/ECSEL projects of the High-Rel Cluster of projects, aiming at harmonizing and creating a sustainable infrastructure for maintaining the IOS (Interoperability Specification) set of standards and guidelines, which all ARTEMIS/ECSEL projects could follow in establishing interoperable tools, tool chains and environments. **Activities:** Connection through the participation of some partners to both projects (AIT). Using results of AMASS Multi-concern Assurance aspects in standardization considerations on CPS, and discussing tool interoperability issues for AMASS, providing input for AMASS Deliverables D8.10 [28] and D8.11 [29].

Project	Lead contact (partner)	Description
		Results: Given the short overlap between the durations of the two projects and the very different development stages they had reached in this time span, CP-Setis and AMASS did not aim at a direct close collaboration. Nevertheless, the interoperability specification and roadmap provided by CP-SETIS formed the basis for the tool collaboration concepts developed in WP5 "Seamless Interoperability" as well as the OSLC interfacing provided by the prototypic method implementations that were eventually demonstrated in the case studies. Moreover, former CP-SETIS participants are forming a follow-up project targeting the uniform integration of methods developed in ARTEMIS/ECSEL projects. This offers opportunities also for AMASS partners to provide conformant interoperable solutions on a European platform.
ImmerSAFE	Barbara Gallina (MDH)	ImmerSAFE (Immersive Visual Technologies for Safety-critical Applications), 2018-2021, aims at training a new generation of multi-disciplinary experts, who understand the core imaging technologies, the requirements set to them by the safety-critical applications and who can account for the human user in the design of such systems. **Activities:** The dependability profile for socio-technical systems and the co-analysis methods constitute the starting point for at least one ESR. In addition, compliance management solutions have been briefly presented to other ESRs, who are expected to closely cooperate during the second half of the second year of the project.
ESPRESSO and Gen&ReuseSafetyCases	Barbara Gallina (MDH)	The ESPRESSO project [1] and the Gen&ReuseSafetyCases project[2] were Swedish projects aimed at increasing readiness to comply with ISO-26262. These projects ended during the first year of AMASS. Despite a short overlapping time, these projects and AMASS benefited from each other (cross-fertilized themselves) and the cross-fertilization continued over time. **Activities:** Collaboration of MDH with Scania. Reuse of safety cases. During the overlapping time, joint results were achieved regarding OSLC-based safety case generation, documented in WP5 (D5.2 and D5.3 [20]) deliverables. The collaboration continued throughout the AMASS project, beyond the end of these projects. In particular, cross-fertilization was possible in a small scale via the co-advisory of a PhD student. This cross-fertilization was witnessed by co-authored papers, where AMASS results were clearly cited and discussed in the related work. **Results:** Paper: D. Nesic, M. Nyberg, B. Gallina. Constructing Product-Line Safety Cases from Contract-Based Specifications. 34th ACM/SIGAPP Symposium on Applied Computing. Limassol, Cyprus April 8-12, (to appear in 2019).[3]
PROMPT	Barbara Gallina (MDH)	PROMPT project (Professional Master's Education in Software Development). PROMPT is a cooperation project between academia and industry with the aim of strengthening competitiveness in Swedish companies. The aim of PROMPT is to establish a national educational alternative with the aim of guaranteeing the supply of software-related advanced skills and innovative power for Swedish private enterprise. **Activities:** For the development of a new course on certification, PROMPT has benefited from some AMASS results, specifically regarding compliance management and process-focused reuse.

[1] https://www.vinnova.se/p/espresso/

[2] http://stratresearch.se/en/research/ongoing-research/strategic-mobility-2014/project/6788/

[3] http://www.es.mdh.se/publications/5299-Constructing_Product_Line_Safety_Cases_from_Contract_Based_Specifications

Project	Lead contact (partner)	Description
		Results: DVA467-course was delivered and students, at the time of writing, are taking it. https://www.mdh.se/utbildning/kurser?kod=DVA467&l=en_UK
AQUAS	Thomas Gruber (AIT)	AQUAS (Aggregated Quality Assurance for Systems) is an ECSEL project that includes the proposal of some AMASS platform features to be exploited during the implementation of the co-engineering processes identified by AQUAS. **Activities:** A talk about AMASS results has been given to the AQUAS people at City University of London. **Results:** The Co-engineering methodology developed in AMASS was taken into consideration in the AQUAS concepts development. As several AQUAS partners are also involved in AMASS, this knowledge transfer was easily possible without organizing dedicated collaboration workshops. Both AMASS and AQUAS EABs appreciated the broader scope of possible multi-concern engineering approaches considered in conceptual work. Another important aspect is also that AQUAS is open to integrate the AMASS ARTA platform while instantiating the Product Lifecycle with the so-called Interaction Points (IPs) as proposed in the AQUAS methodology. In order to capture also the final AMASS results, the AQUAS project members have been invited to attend the AMASS Open Industrial Workshop on March 28th, 2019 in Florence and discuss about the methodologies and results with the AMASS partners. AMASS results regarding compliance management and reuse (WP6) were presented at City University London in January 2018.
PDP4E	Alejandra Ruiz (TEC)	PDP4E (Methods and Tools for GDPR Compliance through Privacy and Data Protection Engineering) is a H2020 Innovation Action that is interested in the work done in AMASS in relation with assurance accountability. **Activities**: A talk on the OpenCert capabilities and a training about Assurance Cases has been given to the PDP4E project members. **Results**: The assurance cases and how they are used in AMASS for dependability argumentation has been considered interesting, specifically with a focus on privacy. The use of OpenCert for accountability purposes has been agreed. It will be adapted in order to include the GDPR standard modelling. The PDP4E project members have been invited to attend the AMASS Open Industrial Workshop on March 28th, 2019 in Florence and discuss about the methodologies and results with the AMASS partners.
RobMoSys	Huáscar Espinoza (CEA)	RobMoSys aims to coordinate the whole community's best and consorted efforts to realise a step-change towards a European ecosystem for open and sustainable industry-grade software development for robotics. **Activities:** Presentation of AMASS to RobMoSys consortium. RobMoSys is a cascade funding project. Two of the funded sub-projects, eITUS and CARVE, are considering the use of a contract-based approach for modular design of robotics systems. **Results:** Considering the use of the AMASS open platform for certification of robots, in particular for the contract-based design of composable systems.
eITUS	Garazi Juez (TEC)	The eITUS project aims at creating a basic experimental infrastructure (models, software and tools) that enables robotic development stakeholders to assure system safety both at design time, using analysis and simulation-based techniques, and at run time, using safety monitoring algorithms. **Activities:** AMASS capabilities on fault injection simulations for the safety assessment of robotics systems have been explained during different meetings/workshops.

Project	Lead contact (partner)	Description
		Results: Safety modelling concerns and safety validation through fault injection simulations are quite new for, at least, a part of the robotics community. Looking at the work carried out in AMASS for other domains such as automotive regarding fault injection simulations, can be fruitful for assessing the safety of the robotics systems. Furthermore, the robotics community could benefit for several approaches and solutions performed in the AMASS.
EARTO security group	Garazi Juez (TEC)	European Association of Research and Technology Organisations (EARTO). EARTO's Security Research Working Group. **Activities:** AMASS project objectives and results have been explained to the EARTO´s people in Graz (Austria). Especially, AMASS capabilities and addressed challenges in terms of safety-security co-analysis/co-assessment and standardisation have been explained. **Results:** Some AMASS ideas regarding safety-security co-assessment and standardisation could be interesting to complement the challenges currently defined in the ongoing FP9 programme definition. Especially the ones contributing to "resilience and security".

2.2 External Advisory Board Scope

The AMASS External Advisory Board (EAB) consists of relevant and influential professionals from industry and academia. The main task of the EAB was to provide strategic guidance and support to the consortium to ensure that the AMASS results meet the project's objectives and industry needs. The EAB members advised the AMASS Technical Committee in its strategic technical decision-making process and in the standardization & community building activities in order to leverage the results toward the community (see Section 3). Another important task of the EAB was to support AMASS networking with standardization committees and industry communities, and to provide opportunities for research collaborations.

A dedicated communication channel has been created through the EAB Mailing list.

To achieve the above tasks, the EAB members have **undertaken the following activities**:

- Attending two **EAB workshops,** aligned with the main milestones of the project, to give feedback on the results achieved in the first and second AMASS prototypes.
- **Providing feedback** about and linking AMASS to international research, reports, conferences, etc. on the initiative of the EAB members.
- **Providing ad-hoc feedback** when requested by the EAB Coordinator (Huascar Espinoza, CEA), or the AMASS Technical Manager (Barbara Gallina, MDH) on various issues.

Each EAB member **experienced the following benefits** from being part of AMASS:

- Access to **innovative solutions and results** developed during AMASS.
- Being part of a **worldwide community** for CPS dependability (e.g., safety, security …).
- Being a member of the AMASS community, which enables **information and know-how exchange.**

Table 2 summarises the list of EAB members. This board balanced the different industrial sectors, academia, and kind of stakeholders in the area of assurance and certification of cyber-physical systems.

Table 2. List of EAB Members

Partner	Country	Contact	Role
Renault	FR	Javier Ibañez-Guzman	Car manufacturer
Mondragon Goi Eskola Polit. J.M.A. S.COOP	ES	Miren Illarramendi	University (Miren is expert on safety-critical embedded systems)
University of York	UK	Tim Kelly	University (Tim is expert on Assurance Cases)
Embraer	BR	Johnny Marques	Airborne manufacturer
Spinet	FI	Timo Varkoi	Nuclear domain expertise/assessor
ARM	UK	Antonio Priore	Multi-industry consultancy for engineering, technology, project innovation and strategy
LFV	SE	Anders Sandin	Air control traffic services
Cross Control ABC_CONTROL	SE	Markus Wallmyr	CPS engineering services and products
SoftComply	EE	Marion Lepmets	Medical domain

Partner	Country	Contact	Role
Critical System Labs (CSL)	CA	Laurent Fabre	Engineering consultancy/management of safety risk and security vulnerabilities associated with complex software-intensive systems
CAF Signalling	ES	Pascual Breton and Raquel Arriba	Railway signalling, certification
MAGNA STEYR Engineering AG & Co KG	AT	Kurt Tschabuschnig	Automotive Tier 1 - Engineering Services, Complete Vehicle Engineering and Production
NASA	US	Ganesh Pai	Robust Software Engineering (RSE) technical area, of the Intelligent Systems Division (Code TI).
SINTEF	NO	Thor Myklebust	Expert in the automotive domain and certification activities

A special role in the AMASS Consortium was given to the **EAB Coordinator** (EABC). The EABC is in charge of EAB communication management and the EAB information control. The EABC role was given to Huáscar Espinoza (CEA) and performed conjointly by Gaël Blondelle (ECL).

2.3 External Advisory Board Activities

2.3.1 Organization of EAB Workshops

During the AMASS project, we have organised two meetings dedicated to the EAB communication. These EAB workshops were accomplished to present the progress of the AMASS project and to start an information exchange and discussion between the AMASS consortium and the AMASS EAB members.

Table 3. EAB Workshops

EAB Workshop	Date	Related Milestone
Workshop n°1	September 11, 2017	M2 First Prototype: Core AMASS Platform Validated in Laboratory
Workshop n°2	September 17, 2018	M3 Second Prototype: Full AMASS Platform Validated in Laboratory

We initially planned to organize 3 workshops, being the last one at the end of the project. However, it was not possible to meet a common available date for the workshop. Hence, we decided to invite EAB members to the AMASS Open Industrial Workshop[4], which will be held on March 28th, 2019, in Florence, Italy.

In addition, we have organized two important webinars and conference calls:

Table 4. EAB Webinars and Conference Calls

EAB Webinar/Conf Call	Date	Objective
Webinar and Conf Call n°1	May 05, 2017	Preparation of the First EAB Workshop
Webinar and Conf Call n°2	May 31, 2018	Preparation of the Second EAB Workshop

[4] https://amass-ecsel.eu/content/amass-open-industrial-workshop

Deliverables and relevant information have been sent to the EAB members before each EAB workshop. The distribution of specific confidential information has required the signature of a Non-Disclosure-Agreement (NDA) with the related organisations.

During the second Webinar and Conf Call, a survey was presented to the EAB members. This survey included questions related to innovation coverage, value, industrial adoption, community building, dissemination and outreach and opportunities of tooling (see full details of the questionnaire in the Annex 3 of this deliverable). The feedback from this questionnaire was used to prepare the Brainstorming session of the second EAB Workshop.

A web page "External Advisory Board" has been created in the AMASS web site (https://amass-ecsel.eu/content/external-advisory-board). This section shows information about the EAB composition and provides all details about the EAB workshops (attendees, agenda, presentations and report of conclusions).

2.3.2 EAB Workshop n°1: The AMASS vision

The first workshop with the members of the AMASS EAB was held in Trento, Italy, on September 11th, 2017, at FBK premises, together with the SafeComp 2017 Conference. Twenty-four people attended the workshop, including 8 EAB members: Miren Illarramendi, Timo Varkoi, Johnny Marques, Marion Lepmets, Anders Sandin, Kurt Tschabuschnig, Laurent Fabre, and Tim Kelly. Two other EAB members attended remotely: Antonio Priore and Javier Ibañez.

Figure 1. First AMASS EAB Workshop at Trento (Italy)

During the first day of the workshop, the technical approach and achievements of the AMASS project were presented, a brainstorming session was also carried out. During the second day, some of the EAB members participated in a joint industrial panel on assurance of safety and security that was organized together with the **SASSUR 2017 workshop**.

Further details at: https://www.amass-ecsel.eu/external-advisory-board/first-eab-workshop

Figure 2. AMASS EAB members participating in the First EAB Workshop

The Workshop Agenda was as follows:

Table 5. Agenda - First EAB Workshop

Start	End	Description	Speaker
9:00	9:30	Project Outline	Huáscar Espinoza
9:30	10:00	Technical Overview	Barbara Gallina
10:00	10:30	Selected Case Studies	Benito Caracuel, Helmut Martin and Thierry Lecomte
10:30	11:00	Coffee break	
11:00	11:50	Project Outreach and Community Building	Ran Bi and Gaël Blondelle
11:50	12:20	Intra and Cross-Domain Reuse	Barbara Gallina
12:30	13:30	Lunch	
13:30	14:00	Architecture-Driven Assurance	Stefano Puri
14:00	14:30	Multi-concern Assurance	Thomas Gruber
14:30	15:00	Seamless Interoperability	José de la Vara
15.00	16:30	EAB Feedback Brainstorming	Moderated by Huáscar Espinoza
16.30	17:00	Coffee break	
17:00	17.30	Wrap-up	Moderated by Huáscar Espinoza

The detailed technical and non-technical discussions of this first EAB workshop have been published in the AMASS web site[5] and are also available in the Annex 1 of this deliverable.

For a summary of the EAB feedback and actions taken, please see Section 2.4 in this deliverable.

2.3.3 EAB Workshop n°2: Story boards applied to the Case Studies

The second workshop with the members of the AMASS EAB (External Advisory Board) was held in Västerås, Sweden, on September 17th, 2018, together with the SafeComp 2018 Conference. The workshop was hosted by MDH at the Aros Congress Center facilities. Eighteen people attended the workshop, including 8 EAB

[5] Report of the First EAB workshop

members: Miren Illarramendi, Timo Varkoi, Anders Sandin, Laurent Fabre, Thor Myklebust, Markus Wallmyr, Marion Lepmets and Kurt Tschabuschnig.

Figure 3. Second AMASS EAB Workshop at Västerås (Sweden)

During the first day of the workshop, the topics presented included a selection of usage scenarios from the project's industrial case studies that introduced the AMASS Tool Platform and its current features: architecture specification and refinement, process & product configuration and compliance management, tool chain for system specification and quality assessment, and safety & security co-assessment. A brainstorming session was also carried out. During the second day, some of the EAB members participated in a joint industrial panel on trends and needs for future assurance of safety-critical systems organized together with the **SASSUR 2018 workshop**.

Further details at: https://www.amass-ecsel.eu/content/second-eab-workshop

Figure 4. AMASS EAB members participating in the Second EAB Workshop

The Workshop Agenda was as follows:

Table 6. Agenda - Second EAB Workshop

Start	End	Description	Speaker
9:00	9:30	Welcome and Project Outline	Garazi Juez (Tecnalia)
9:30	10:00	Technical Overview	Barbara Gallina (MDH)
10:00	10:30	2nd AMASS Platform Prototype: An Overview	Huascar Espinoza (CEA)
10:30	11:00	Coffee break	
11:00	11:45	AMASS Usage Scenario 1: Architecture Refinement by using Safety Assessment	Stefano Puri (Intecs)
11:45	12:30	AMASS Usage Scenario 2: Process & Product Configuration and Compliance Management	Barbara Gallina (MDH)
12:30	13:30	Lunch	
13:30	14:15	AMASS Usage Scenario 3: Toolchain for system specification and quality assessment	José Luis de la Vara (UC3)
14:15	15:00	AMASS Usage Scenario 4: Safety and security co-assessment	Thomas Gruber (AIT)
15:00	15:30	Project Outreach and Community Building	Ran Bi (RPT) and Gaël Blondelle (ECL)
15.30	16:00	Coffee break	
16.00	17:00	EAB Feedback Brainstorming	Moderated by Huáscar Espinoza (CEA) and Gaël Blondelle (ECL).
17:00	17.30	Wrap-up	Moderated by Huáscar Espinoza (CEA) and Gaël Blondelle (ECL)

The detailed technical and non-technical discussions of this second EAB workshop been published in the AMASS web site[6] and are also available in the Annex 2 of this deliverable.

For a summary of the EAB feedback and actions taken, please see Section 2.4 in this deliverable.

2.4 EAB Recommendations and Actions Taken

During the **First EAB workshop**, the AMASS Consortium received very helpful feedback, which was compiled in an AMASS-internal spreadsheet. The EAB acknowledged the ambition and difficulty of the areas addressed in AMASS. Among the main discussion and feedback points on technical challenges, the members suggested that AMASS needs to pay special attention to: (1) the use of contracts for architecture-driven assurance and how the contracts relate to argumentation; (2) how to unify processes for safety & security co-assurance and be open to different kinds of processes; (3) the provision of clear information about the objectives and limitations of the specific solutions for tool integration, and; (4) the extent to which certain application domains pose additional constraints for assurance reuse (e.g. through product lines).

For industrial impact, the EAB emphasised the need for providing guidelines on how different companies would get benefit from AMASS (e.g. through user stories) and on what they need to learn to understand AMASS usage.

Table 7 shows the main EAB recommendations and actions taken by the AMASS Consortium. The details of the recommendations are presented in the Annex 1 of this deliverable.

6 Report of the Second EAB workshop

Table 7. Recommendations and Actions taken from the First EAB Workshop

Recommendation	Actions
Take care on defining the objectives for **tool integration**. Be honest on to what extent AMASS will provide tool wrappers and guidance of tool integration. How much would be the effort for such integrations?	• We started by defining ad-hoc integration cases to understand the complexity and implications (Prototype "Core"). • We systematized some tool integration cases (Prototype "P1"). • During the second EAB workshop, some concrete integration usage scenarios were described.
Why to go for a unified process for **co-assurance** and be open to different kind of processes?... Combining safety and security analyses could be challenging for users, who traditionally maintain the assurance cases or analyses in a separate way.	• AMASS fosters the use of a combined co-assurance approach (FMVEA-based) • Time needed for separate safety & security engineering process is reduced when applying the combined co-engineering process → we still need to provide evidence and understand if this is a reasonable goal. • The AQUAS project will focus on an approach based on separate analysis techniques and communication paths.
Take care of explaining the extent to which **case studies** are connected with AMASS solutions.	• Case studies are being better connected to Solutions in WP1 documentation. • During the second EAB workshop, some Usage Scenarios (Case Studies in the context of specific AMASS Solutions) were presented.
Provide **guidelines** on how different companies would get benefit from AMASS and what they need to learn to understand AMASS usage… Provide user stories to understand by different stakeholders…. To provide a common vocabulary which can be used by different areas or domains.	• The 2nd EAB workshop was built on the concept of usage scenarios, which connect goals and benchmarking for Case Studies+Solutions. • Benchmarking will be completed in the upcoming months. • A global methodological document has been developed, connecting to specific technical guidance [3]. • Guidance Dashboards will be integrated in the AMASS platform.

During the **Second EAB Workshop**, organized in Västeräs, Sweden on September 17th, 2018, the topics presented included a project overview, the technical vision, the project's strategy and means to ensure impact, and a selection of usage scenarios to introduce the AMASS Tool Platform and its current features: architecture specification and refinement, process & product configuration and compliance management, tool chain for system specification and quality assessment, and safety & security co-assessment. The scenarios were presented from a selection of the project's industrial case studies.

A brainstorming session was also carried out generating very useful feedback, tracked by each WP. Among the aspects discussed, the EAB expressed their vision regarding to how usage scenarios could be improved to get impact in the AMASS ecosystem users, how to improve the AMASS guidance for users, the conceptual and implementation approach underlying the AMASS Tool Platform, some industry usage opportunities of specific AMASS features, and the soundness of the AMASS community building, exploitation, and dissemination strategies.

The specific feedback included the need: (1) for information about why, how, when, and by whom the AMASS Tool Platform should be used, (2) for the development of a dashboard to guide users, (3) for providing tool qualification information about the AMASS Tool Platform, (4) for searching for early adopters and identifying the main issues that AMASS can solve for them, and (5) for a sustainability plan, including in North America and result standardisation.

Table 8 shows the main EAB recommendations and actions taken by the AMASS Consortium. The details of the recommendations are presented in the Annex 2 of this deliverable.

Table 8. Recommendations and Actions taken from the Second EAB Workshop

Recommendation	Actions
Reduction of Certification Costs • Clear argument on how the project will help reducing certification costs. • It is a key point to reach the industry: not only to convince the engineers or designers but the management. • Show how each of the proposed usage scenarios presented during the workshop will lead to reductions on assurance and certification.	• The AMASS project has defined a framework to benchmark the business and technical goals of the project in Deliverable D1.3 [2]. • The results will be published end of March/2019 in the AMASS website as part of Deliverable D1.7 AMASS solution benchmarking. • D1.7 will provide numbers in terms of cost reduction for each of the usage scenarios. • The benchmarking is described in market terms, so as the different business units from the companies involved either in the project or in the community (AMASS external advisory and open source community related companies) can understand the improvements done by AMASS in a clear and comprehensive way.
Dashboard and AMASS Lite • Help dealing with the complexity of the Project ("Tool Complexity"). • Much more Dynamic guidelines need to be embedded in the Dashboard. • Different configuration of the AMASS Platform must be provided (AMASS Lite).	• The last phase of the AMASS platform development focuses in developing a Dashboard that is already integrated in the AMASS toolkit. • The general guidance proposed by this Dashboard allows AMASS users to be guided at a high level, but also in the technical details of tooling and certification assets. • The AMASS Lite idea was not implemented as proposed because of the complexity of the solution and time constraints. However, the tools are modular and can be installed in different modules by using the *Eclipse Update Site* mechanism. Further facilities for the AMASS Lite could be added in the framework of the Eclipse project (OpenCert Platform).
Roles and Multi-concern issues • The current specifications and definitions for roles need to be reviewed to ensure consistency with respect to the vocabulary used in industry. • The current definition for roles doesn't consider Tier levels. • Clarify the responsible role within a company who would be carrying out combined safety-security analysis (e.g. FMVEA). "Who is the responsible person: the safety engineer? The security engineer?	• The Dashboard contains description of the roles to handle different AMASS activities. • Deliverable D2.5 [3], AMASS user guidance and methodological framework, provides a detailed description of the roles for AMASS usage. • The decomposition of roles in tier level has not been implemented since it is more company or context-specific. However, the mechanism of the Dashboard creation could be extended in the future to handle other kinds of roles. • Roles decomposition for safety-security analysis must be managed case by case (sometimes in the context of a company). Since this is a very new topic, it will be considered in the AQUAS project[7] (by those partners participating at AMASS).
Open Source Versus Security Issues, and Tool Qualification • The use of open-source software in safety-critical environments was questioned. • AMASS needs to improve Tool Qualification issues.	• The AMASS consortium has taken this issue very seriously. A summary of the outcomes are available in the AMASS Blog entry "Considerations about open source and security". • AMASS project partners and early adopters agree that security is crucial in all tools, systems and platforms, and of course AMASS results are no exception: – On the one hand, the Eclipse Development Process already covers the traceability of the code published for the AMASS tool platform. – On the other hand, the AMASS open platform is supposed to be embedded in a larger environment, - either a proprietary product,

[7] https://aquas-project.eu/

Recommendation	Actions
	or a specific deployment by a large organisation-, where additional measures can be integrated to ensure the security of the platform. • Deliverable D2.9 [5], AMASS platform validation provides an evaluation of the tool qualification and the TRL achieved by (some components of) the platform. Some recommendations concerning the AMASS Platform further usage and evolution, as well as some tracks for future exploitations are also provided.
Usage Scenarios and Dissemination • Some improvements to usage scenarios must be considered. • Consider creating a "one page" per usage scenario in the AMASS leaflet.	• A leaflet summarizing the usage scenarios has been created and is publicly available in the AMASS project web site[8]. • The first time it was used for dissemination was in the EFECS 2018 Conference. • Deliverable D2.5 [3], AMASS user guidance and methodological framework, Section 4, provides concrete examples on the AMASS methodology by using the proposed usage scenarios.
Community Building • Consider participating in some relevant events	• The AMASS project has kept on an intensive agenda of dissemination activities, as it will be reported in the final dissemination deliverable D8.8 Dissemination and Training Progress (c). • CTIC Conference organizers were approached by AMASS partners. However, they plan to organize this conference in the second semester of 2019 (when AMASS is over). AMASS partners plan to participate at this event (Tecnalia, CEA, ECL, MDH).

[8] https://www.amass-ecsel.eu/sites/amass.drupal.pulsartecnalia.com/files/documents/AMASS-Triptych_1.0.pdf

3. Industrial Adoption

3.1 Objective

An industrial adoption program was defined in the deliverable D7.1 [1] in order to promote the early adoption of the AMASS tools. This industrial adoption program has the objective of promoting the results of AMASS to the user community and using the available means. The industrial program includes:

- the identification of the community of AMASS stakeholders,
- the identification of AMASS results and research areas that may impact such community,
- the identification of means that could be used for the promotion, and
- the definition of the workflows.

The program must provide recommendations for the promotion of AMASS results, their future development, and the creation of future initiatives for training and research in this field.

The following subsections describe for each group of stakeholders, the actions taken to improve the adoption of AMASS and the recommendations for its promotion.

3.2 Industry

Industry is one of the main target groups for AMASS. Stakeholders in this group are composed of manufacturers, providers, integrators, consultants and certification organizations that have different expectations respect to safety integration, dependability/safety assurance and certification process, dependability/safety assessment and compliance management, security, multi-concern assurance, etc.

The following table and figure show the adoption program that has been defined for the Industry user group.

Table 9. Adoption program for the Industry user group

Intended Audience	Content to promote	Means
• Original Equipment Manufacturers (OEMs) • Component Suppliers (Manufacturers) • Integrators of Safety-Critical Platforms • Consulting and Service Providers • Certification Organizations • Tool Vendors • Standardization groups • Industrial forums	• AMASS Reference Tool Architecture (ARTA) • AMASS Open Tool Platform • Open AMASS Community • AMASS Tool Ecosystem (i.e. the AMASS Open Tool Platform + the external tools with which the Platform interacts)	• AMASS website • Promotion through industry events • Organisation of international AMASS workshops • Industry partner community • Training • Demonstrations • Web Portal for industrial adoption • Tools support kit • Product data sheets • Web based tool demonstrator provision (tools in the cloud) • Leaflet with usage scenarios

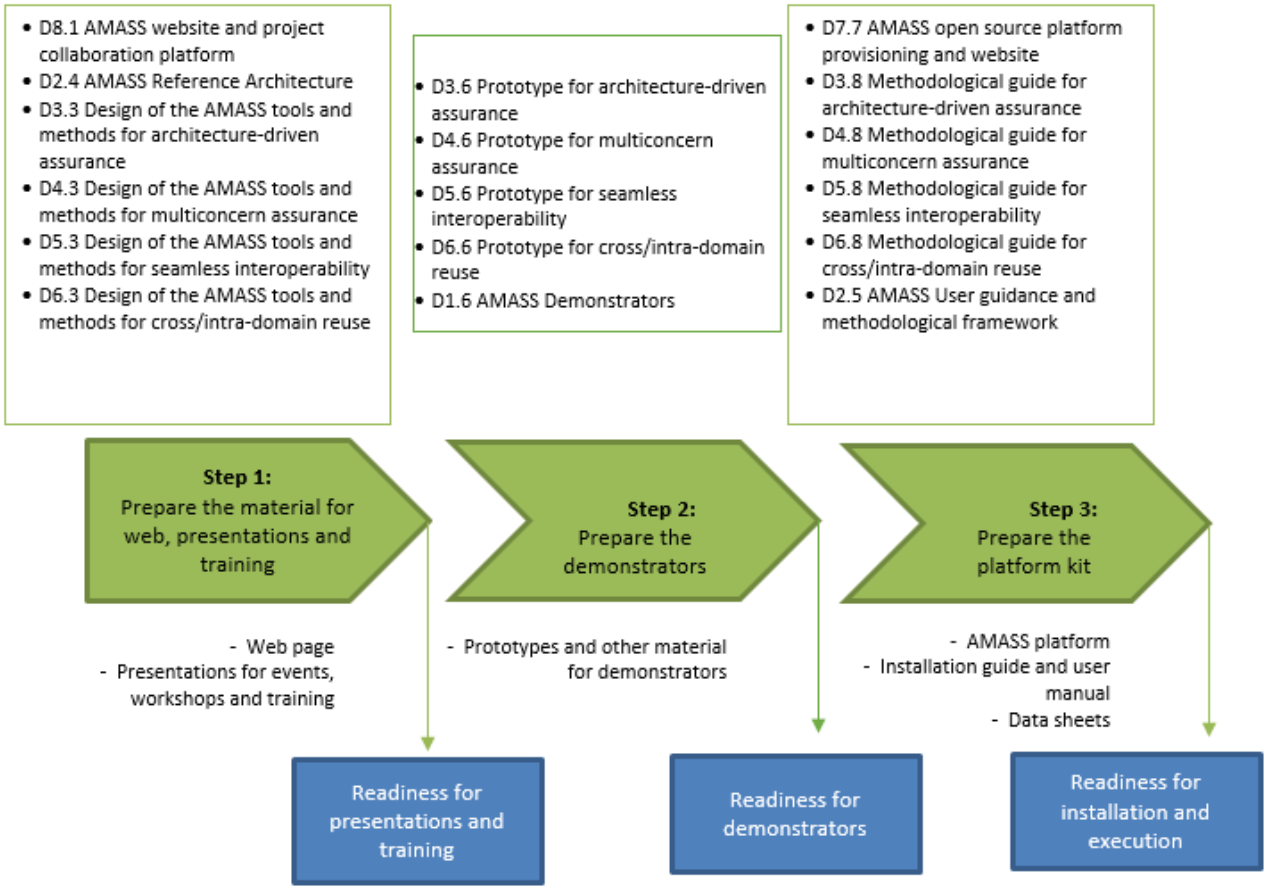

Figure 5. Workflow for the Industry user group

Based on this program, a set of concrete results per WP has been identified by the AMASS partners. The target is to promote these possible AMASS results during and after the project execution. It has been identified not only the results but also the means, the actions to carry out and the possible barriers to entry as it is shown in the tables of Annex 4.

Table 10 shows some actions taken to promote AMASS in the Industry user group, as documented in D8.6 [6], D8.7 [7] and D8.8 [8]. These actions have been focused on: the exhibition of posters, presentations, flyers; participation in conferences, workshops and other events; trainings; publications in social media; and videos.

Table 10. Actions taken for the promotion related to Industry user group

Actions	Description
Exhibition of AMASS posters, presentations, flyers.	• ARTEMIS Technology Conference 2016 • EclipseCon France 2016 • MESS 2016 (Microelectronics Systems Symposium) • Safety and Security of Railway Systems: Modelling, Analysis, Verification and Certification (RSSR-2016) • SafeComp 2016 • ECSEL Brokerage Event 2017 • INCOSE Symposium 2017 • International Requirements Engineering Conference 2017 (RE 2017) • ECSEL JU Symposium 2017 • EclipseCon France 2017 • DIF 2017 • SafeComp 2017

Actions	Description
	• ERTS 2018 – Toulouse • ECSEL Brokerage Event 2018 • EclipseCon Europe 2018 • SafeComp 2018 • Euromicro 2018 • ECSEL JU Symposium 2018 • DIF 2018 • EFECS 2018 • IDIMT 2019 • ECS Brokerage Event 2019 • Embedded world 2019 • AMASS Open Industrial Workshop
Participation in conferences	• TRC World 2016 • Euromicro 2016, SEAA & DSD • European Robotics Forum • 10th Zürcher Conference • 9th International Conference on the. Quality of Information and Communications Technology (QUATIC 2016) • Safety and Security of Railway Systems: Modelling, Analysis, Verification and Certification (RSSR-2016) • 16th International SPICE Conference (SPICE 2016) • 17th International Conference on Product-Focused Software Process Improvement (PROFES-2016) • 35th Digital Avionics Systems Conference (DASC-2016) • 36th Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2016) • ECSEL Symposium 2017 • 24th EuroAsiaSPI 2017 • IMBSA 2017 • 5th Scandinavian Conference on SYSTEM & SOFTWARE SAFETY 2017 • SAFECOMP 2017 • ICSE 2017 • 36th International Conference on Conceptual Modeling (ER 2017) • 2nd International Conference on Reliability Engineering (ICRE 2017) • 2017 IEEE INTERNATIONAL CONFERENCE ON VEHICULAR ELECTRONICS AND SAFETY (ICVES 2017) • 6th Scandinavian Conference on SYSTEM & SOFTWARE SAFETY 2018 • Model-Driven Engineering and Software Development, MODELSWARD 2018 (MODELSWARD 2018) • GT Safety Spanish platform (PESI) • Modellierung2018 • EUROSPACE-DASIA 2018 • 17th International Conference on Software Reuse (ICSR 2018) • Euromicro Conference on Software Engineering and Advanced Applications (SEAA 2018) • 11th International Conference on the Quality of Information and Communications Technology (QUATIC 2018) • SAFECOMP 2018 • EclipseCon 2018 • 17th International Conference on Software Reuse (ICSR 2018) • 22nd International Systems and Software Product Line Conference (SPLC 2018)

Actions	Description
	• 23rd International Conference on Reliable Software Technologies – Ada-Europe 2018 • European Conference on Software Architecture (ECSA 2018) • DECPS 2018 • 16th International Conference on Software Engineering and Formal Methods (SEFM 2018) • 13th International Conference on Software Technologies (ICSOFT 2018) • 16th International Symposium on Automated Technology for Verification and Analysis (ATVA 2018) • 7th International Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems (SASSUR 2018) • 40th International Conference on Software Engineering (ICSE 2018) • 26th IEEE International Requirements Engineering Conference (RE 2018) • INCOSE Symposium 2018 • Nordic Systems Engineering Tour (NOSE 2018) • 18th International SPICE Conference (SPICE 2018) • 10ª Conferencia del Programa Marco de Investigación e Innovación de la Unión Europea en España Hacia un Nuevo Horizonte • 25th EuroAsiaSPI 2018 • DIF 2018 • South European Systems Engineering Tour (SESE 2018) • 4th International annual medini analyze User Conference 2018 • EFECS 2018 • 14th European Dependable Computing Conference (EDCC 2018)
Participation in Workshops	• Con.nect Informunity (FutureNet), Workshop Security Trends 2016 • Attendance to SASSUR 2016 • Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems at SASSUR 2016 • Functional Safety Community (FUSACOM) at Virtual Vehicle: “Safety and Security Analysis in the Automotive Domain" • DECSoS Workshop at SAFECOMP 2016 • Workshop “Highly Autonomous Systems and Vehicles: Society, Economy, Technology” at IDIMT 2016 • Safety meets Security in 2016 • Workshop (Summit) at CPS Week 2016 • 5th Scandinavian Conference on SYSTEM & SOFTWARE SAFETY, co-definition of the call for workshop-presentations in the context of AMASS/SafeCOP • Project presentation at De-CPS Workshop 2016 • ADCSS (Avionics, Data, Control and Software Systems) at ESTEC 2016 • International workshop on Interplay of Security, Safety and System/Software Architecture (ISSA) 2016 • CARS 2016 • 4th International Workshop on Assurance Cases for Software-intensive Systems (ASSURE2016) • OSS4MDE workshop 2016 • SASSUR 2017 • Functional Safety Community (FUSACOM) @ Virtual Vehicle: “Safety and Security Standards in the Automotive Domain” • ISSA 2018 • FMEA Workshop 2017 • Italian Workshop on Embedded Systems (IWES 2017)

Actions	Description
	• GARTEUR workshop 2017 (The group for Aeronautical Research and Technology in Europe (GARTEUR) is an important organization for research collaboration in Europe in the field of aeronautics) • 7th IEEE International Workshop on Software Certification (WoSoCER 2017) • 1st Workshop on Technologies for Regulatory Compliance (TeReCom 2017) • International Symposium on Software Testing and Analysis (ISSTA 2017) • 3rd Italian Workshop on Embedded Systems (IWES 2018) • Lorentz Center Workshop "Safety of Future Systems: Science meets Industry 2018 • Eclipse Community Day 2018 • 4th international workshop on agile development of safety-critical software (ASCS 2018) • SASSUR 2018 • DECSoS Workshop at SAFECOMP 2018 • 2nd Workshop on Technologies for Regulatory Compliance (TeReCom 2018)
Participation in other events	• Developments regarding security in Edition 2 of part 2 of ISO 26262 • AMASS-goals were presented at the Safety Panel organized by FiSMA • Presentation about AMASS at NASA Ames research center: Presentation of AMASS results and tooling during a research visit • Honeywell Engineers Week • TRC User Group Summit Madrid 2019
Social Media	• Kick-off press release • UC3-tailored Kick-off press release • MDH-tailored Kick-off press release • Several posts in the AMASS Blog (https://amass-ecsel.eu/blog) • Several entries in the AMASS LinkedIn group (https://www.linkedin.com/groups/3807241) • Several tweets at Twitter (@AMASSproject) • Several publications in Schneider Electric social media • Several publications in blogs from Tecnalia
Trainings	• Presentation of the AMASS open source platform in the SafeCop training meeting • Training videos on AMASS website (https://www.amass-ecsel.eu/content/training) • Training videos on AMASS YouTube channel (https://www.amass-ecsel.eu/content/amass-youtube-channel)
Videos	• UC3 video introducing the project (https://www.youtube.com/watch?v=RC8LtJyzU3Q) • Presentation at EclipseCon France 2016 (https://www.youtube.com/watch?v=wJrIut4y0o4) • Creation of OpenCert video channel in YouTube (http://goo.gl/CCjF4o) and uploading training videos. • AMASS Prototype Core demo (https://youtu.be/bZudolhtCu4) • AMASS Marketing video showing the main features of the OpenCert tool platform (https://youtu.be/36d-LF-ns44) • AMASS Prototype videos and demos (https://www.amass-ecsel.eu/content/demos) • Interview in EclipseCon France 2018 (https://www.youtube.com/watch?v=_bONHtkRPEA)

Recommendations for the future promotion of AMASS

The following recommendations are suitable when products are built on top of the AMASS platform, i.e. marketing methods to increase sales engagements:

- Website articles, such as: how the AMASS platform can benefit a user, how it can be used in a case study, blogs, etc.
- Social media, such as LinkedIn, where regular updates or articles can be published.
- Email marketing, i.e. creating a pool of potential interested audiences so that we can send updates and relevant articles to.
- Press release, such as PRweb.com, which is a paid service to widen audience.
- Search engine optimization.
- Presentation of AMASS results in industry-targeted events.
- Presentation of AMASS results in events about open source software solutions.
- Provide some sample material to be used with some of the exploitation results to be used for training and demonstration purposes.

3.3 Research and Scientific Communities

Another key user group is the one representing research and scientific communities. Since AMASS worked on implementing a common metamodel called Common Assurance and Certification Metamodel (CACM), this knowledge database was introduced within these communities. By doing so, these theoretical concepts are formalized through a metamodel and transmitted to the community in order to work on those concepts and suggest possible extensions to the AMASS platform.

The following table and figure show the adoption program defined for the Research and Scientific Communities user group:

Table 11. Adoption program for the Research and Scientific Communities user group

Intended Audience	Content to promote	Means
• Universities • Research institutes	• CACM Metamodel • AMASS Reference Tool Architecture • AMASS Tool Platform	• Theoretical presentation and training • Scientific publications • Scientific presentations

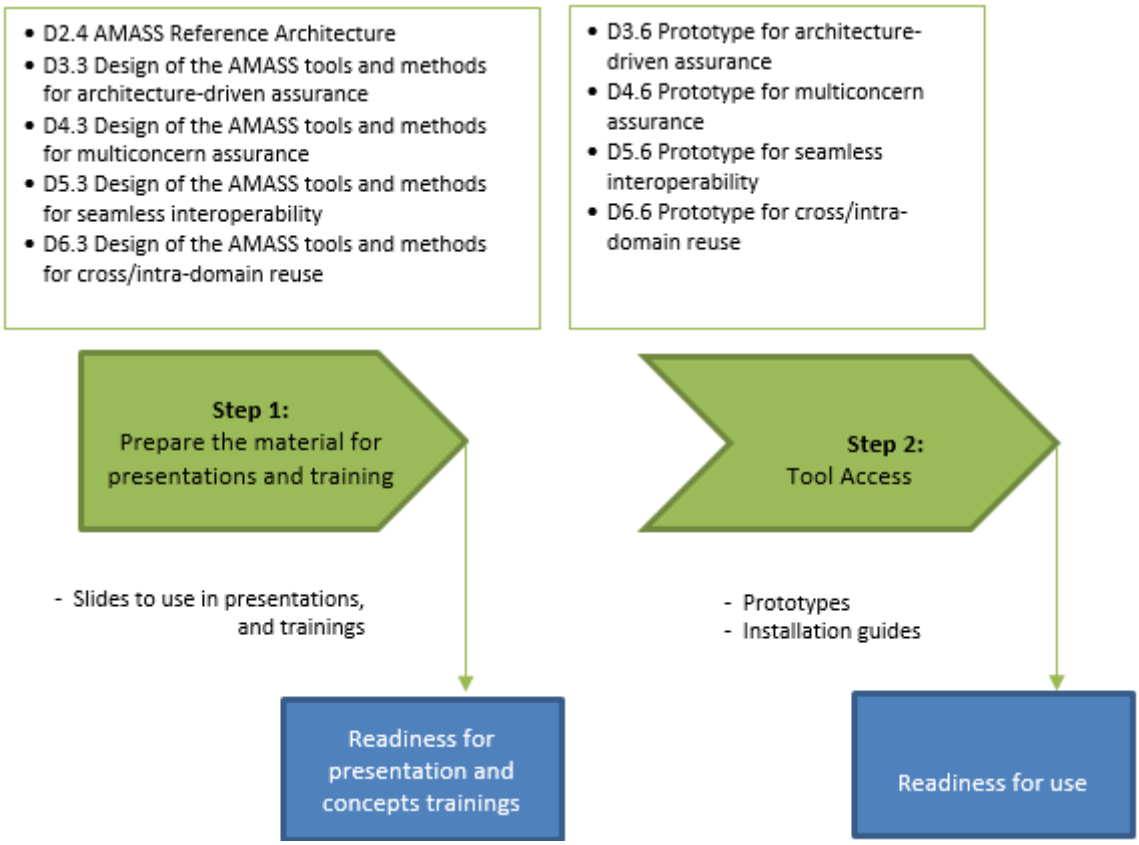

Figure 6. Workflow for the Research and Scientific Communities user group

Table 12 shows the actions taken to promote AMASS in this user group, as documented in D8.6 [6], D8.7 [7] and D8.8 [8]. These actions have been focused on: the exhibition of posters, presentations, flyers; participation in workshops and other events; and trainings.

Table 12. Actions taken for the promotion related to the Research and Scientific Communities user group

Actions	Description
Exhibition of AMASS posters, presentations, flyers.	• MESS 2016 (Microelectronics Systems Symposium) • International Requirements Engineering Conference 2017 (RE 2017) • EclipseCon France 2017 • ICSE 2017 • MODELSWARD 2017 • ER 2017 • EclipseCon France 2018 • EclipseCon Europe 2018 • Safecomp 2018 • Euromicro 2018 • ECSEL JU Symposium 2018 • ICSE 2018 • MODELSWARD 2018 • IDIMT 2019
Participation in conferences	• Euromicro 2016, SEAA & DSD • European Robotics Forum • 10th Zürcher Conference • QUATIC 2016 • Safety and Security of Railway Systems: Modelling, Analysis, Verification and Certification (RSSR-2016)

Actions	Description
	• 16th International SPICE Conference (SPICE 2016) • 17th International Conference on Product-Focused Software Process Improvement (PROFES-2016) • 35th Digital Avionics Systems Conference (DASC-2016) • 36th Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2016) • ECSEL Symposium 2017 • 24th EuroAsiaSPI 2017 • IMBSA 2017 • 5th Scandinavian Conference on SYSTEM & SOFTWARE SAFETY 2017 • SAFECOMP 2017 • ICSE 2017 • 36th International Conference on Conceptual Modeling (ER 2017) • 2nd International Conference on Reliability Engineering (ICRE 2017) • 2017 IEEE INTERNATIONAL CONFERENCE ON VEHICULAR ELECTRONICS AND SAFETY (ICVES 2017) • 6th Scandinavian Conference on SYSTEM & SOFTWARE SAFETY 2018 • Model-Driven Engineering and Software Development, MODELSWARD 2018 (MODELSWARD 2018) • GT Safety Spanish platform (PESI) • Modellierung2018 • EUROSPACE-DASIA 2018 • 17th International Conference on Software Reuse (ICSR 2018) • 4th international workshop on agile development of safety-critical software (ASCS 2018) • Euromicro Conference on Software Engineering and Advanced Applications (SEAA 2018) • 11th International Conference on the Quality of Information and Communications Technology (QUATIC 2018) • SAFECOMP 2018 • EclipseCon 2018 • 17th International Conference on Software Reuse (ICSR 2018) • 22nd International Systems and Software Product Line Conference (SPLC 2018) • 23rd International Conference on Reliable Software Technologies – Ada-Europe 2018 • European Conference on Software Architecture (ECSA 2018) • DECPS 2018 • 16th International Conference on Software Engineering and Formal Methods (SEFM 2018) • 13th International Conference on Software Technologies (ICSOFT 2018) • 16th International Symposium on Automated Technology for Verification and Analysis (ATVA 2018) • 7th International Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems (SASSUR 2018) • 40th International Conference on Software Engineering (ICSE 2018) • 26th IEEE International Requirements Engineering Conference (RE 2018) • INCOSE Symposium 2018 • Nordic Systems Engineering Tour (NOSE 2018) • 18th International SPICE Conference (SPICE 2018) • 10ª Conferencia del Programa Marco de Investigación e Innovación de la Unión Europea en España Hacia un Nuevo Horizonte • 25th EuroAsiaSPI 2018

Actions	Description
	• DIF 2018 • ICECCS 2018 • HASE 2019
Participation in Workshops	• Con.nect Informunity (FutureNet), Workshop Security Trends 2016 • Attendance to SASSUR 2016 • Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems at SASSUR 2016 • Functional Safety Community (FUSACOM) at Virtual Vehicle: “Safety and Security Analysis in the Automotive Domain" • DECSoS Workshop at SAFECOMP 2016 • Workshop “"Highly Autonomous Systems and Vehicles: Society, Economy, Technology” at IDIMT 2016 • Safety meets Security in 2016 • Workshop (Summit) at CPS Week 2016 • 5th Scandinavian Conference on SYSTEM & SOFTWARE SAFETY, co-definition of the call for workshop-presentations in the context of AMASS/SafeCOP • Project presentation at De-CPS Workshop 2016 • ADCSS (Avionics, Data, Control and Software Systems) at ESTEC 2016 • International workshop on Interplay of Security, Safety and System/Software Architecture (ISSA) 2016 • CARS 2016 • 4th International Workshop on Assurance Cases for Software-intensive Systems (ASSURE2016) • OSS4MDE workshop 2016 • SASSUR 2017 • Functional Safety Community (FUSACOM) @ Virtual Vehicle: “Safety and Security Standards in the Automotive Domain” • ISSA 2018 • FMEA Workshop 2017 • Italian Workshop on Embedded Systems (IWES 2017) • GARTEUR workshop 2017 (The group for Aeronautical Research and Technology in Europe (GARTEUR) is an important organization for research collaboration in Europe in the field of aeronautics) • 7th IEEE International Workshop on Software Certification (WoSoCER 2017) • 1st Workshop on Technologies for Regulatory Compliance (TeReCom 2017) • International Symposium on Software Testing and Analysis (ISSTA 2017) • 3rd Italian Workshop on Embedded Systems (IWES 2018) • Lorentz Center Workshop "Safety of Future Systems: Science meets Industry 2018 • Eclipse Community Day 2018 • SASSUR 2018 • DECSoS Workshop at SAFECOMP 2018 • 2nd Workshop on Technologies for Regulatory Compliance • QUATIC 2019 • REFSQ 2019
Participation in other events	• Presentation of AMASS at Universidad Andres Bello (Chile) • Some AMASS-subgoals related to WP6 were presented at IRIT • Some AMASS-subgoals related to WP6 (especially to compliance management and systematic reuse of process compliance artifacts) were presented at City University of London

Actions	Description
	• Some AMASS-subgoals related to WP6 (especially to compliance management and systematic reuse of process compliance artifacts) were presented at LAAS/CNRS.
Trainings	• Training for Polarsys members. • External training on Assurance cases and AMASS approach to the PDP4E project.

Recommendations for the future promotion of AMASS

The following recommendations are suitable for the promotion of AMASS in the Research and Scientific Communities:

- Publications of final AMASS results in scientific papers.
- Publication of some benchmarking outcomes in scientific papers.
- Preparation of case study-based demonstrations for academic audiences.
- Tutorials on AMASS results at scientific conferences.
- Provide some sample material to be used for training purposes.

3.4 Other User Groups

3.4.1 Policy Makers

Policy Makers are responsible for industrial development to adapt national and regional policies and standards. Consultancy providers, assessor companies and standardization and regulation bodies are the intended audience within this user group.

The content to promote, the means and the corresponding workflow are the same that applies to the Industry user group (see Table 9 and Figure 5).

Table 13 shows the actions taken to promote AMASS in the Policy Makers user group, as documented in D8.10 [28] and D8.11 [29].

Table 13. Actions taken for the promotion related to Policy Makers

Actions	Description
AMASS EAB	Invitation of experts involved in policy making to join the AMASS EAB (e.g. Thor Myklebust).
Dissemination at selected events	Dissemination of AMASS and its results at event in which policy makers participate (e.g. H2020 ICT events).
Participation in standardisation groups	Participation of AMASS partners (e.g. AIT) in groups that work on standardization activities related to the project (safety engineering, safety and security co-assurance, etc.).
Presentation to standardisation and regulation bodies	Presentation of AMASS results at meetings and workshops that standardisation and regulation bodies (ISO groups, ERA…) usually attend.
Influence Automotive Cybersecurity standardization	The upcoming standard SAE/IEE/IEC 21434 replaces and details the Cybersecurity Guidebook for the Automotive industry SAE-J3061. AIT is intensively engaged in the standardization committee and brings in AMASS multiconcern assurance concepts into the committee draft.
Influence Industrial domain Cybersecurity standardization	The IEC 62443 series of IACS cybersecurity standards has been developed for years now and the majority of the 13 planned parts of the standard is available. Recently a committee-internal draft for an update of IEC 62443-1-1 “Concepts and models” has been circulated, which proposes corresponding safety and security activities within parallel Functional Safety and IACS Cybersecurity

Actions	Description
	lifecycle phases. AIT is active in the standardization committee to ring in AMASS concepts.
Influence Industrial domain Functional Safety standards	In December 2019 AIT presented the basic concepts of AMASS at the IEC TC65 WG20 Standardization Meeting in Sydney/Australia, raising awareness among standardization experts and thereby preparing the way towards integrating AMASS concepts in the new edition of the generic norm IEC 61508.

Recommendations for the future promotion of AMASS

The following recommendations are suitable for the promotion of AMASS to Policy Makers:

- Revision of standards according to AMASS results.
- Provision of recommendations to standardization and regulation bodies for future norms based on the insights gained in AMASS.
- In general, influencing Functional safety and Cyber security standardization is the appropriate way to spread knowledge about the AMASS concepts among industry and achieve a respective change in industrial system development lifecycles.
- The generic Functional Safety standard IEC 61508, which is widely used in the industrial domain, is currently undergoing a maintenance phase until 2022. AIT as a TC65 member will use the opportunity to bring in concepts and approaches developed in AMASS also after the project ends.
- Furthermore, AIT is involved in the standardization effort for the Industrial domain Cyber security standard series IEC 62443 and will continue bringing in AMASS concepts also in the development of further parts of the standard series.

3.4.2 Open Source Communities

Some specific open source communities are relevant for AMASS and can be seen as special stakeholders: Eclipse[9], PolarSys[10], and Open Service for Lifecycle Collaboration[11] (OSLC). They play a vital role as a way of maintaining and further deploying the AMASS results.

The following table and figure show the adoption program defined for the Open Source Communities user group.

Table 14. Adoption program for the Open Source Communities user group

Intended Audience	Content to promote	Means
Open-source communities: Developers of open-source tools for embedded systems engineering	Common Assurance and Certification Metamodel (CACM)	Training Tool Kits

[9] https://www.eclipse.org/

[10] https://www.polarsys.org/

[11] https://open-services.net/

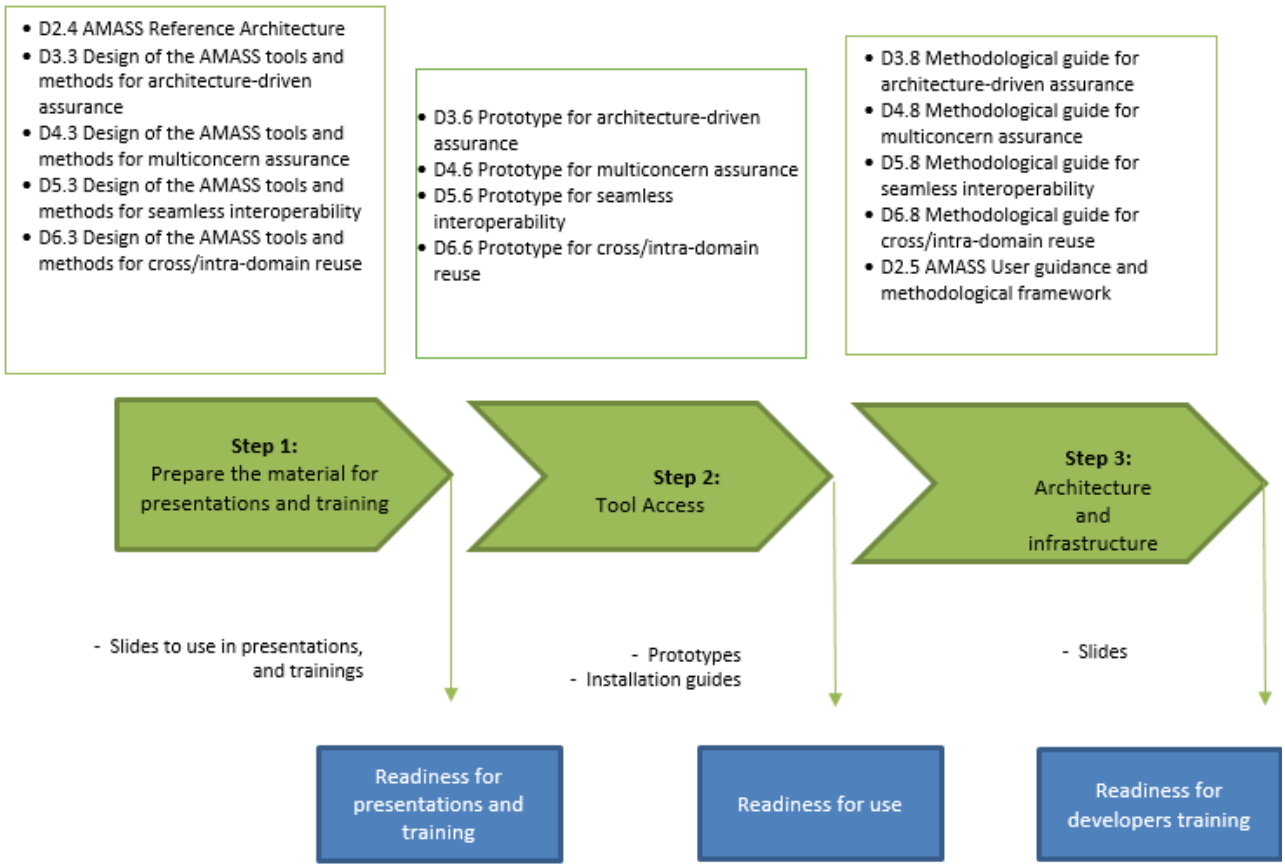

Figure 7. Workflow for the Open Source Communities user group

Table 15 shows the actions taken to promote AMASS in the Open Source Communities user group, as documented in D7.7 [26].

Table 15. Actions taken for the promotion related to the Open Source Communities user group

Actions	Description
Creation of the AMASS Open Source Community	The AMASS Open Source Community has been created and is being developed and maintained in the scope of Eclipse's OpenCert project (https://www.polarsys.org/opencert/)
Participation in conferences	AMASS partners have participated in conference on open source software (e.g. 4 EclipseCon) and presented AMASS results.
Article to the open source audience	An article about AMASS has been published in the Eclipse Newsletter, July 2018 (https://www.eclipse.org/community/eclipse_newsletter/2018/july/amass.php)
Link of AMASS with existing open source projects	The clearest example of this action is the collaboration that has taken place with the group managing the EPF Composer tool, which has been upgraded by AMASS partners (MDH) in coordination with this group. http://www.es.mdh.se/publications/5091-Get_EPF_Composer_back_to_the_future__A_trip_from_Galileo_to_Photon_after_11_years

Recommendations for the future promotion of AMASS

The following recommendations are suitable for the promotion of AMASS to Open Source Communities:

- Engage further open source stakeholders in the AMASS community.
- Increase the number of committers to the AMASS open source results.
- Link the AMASS open source results with other open source initiatives (e.g. Capella; https://www.polarsys.org/capella/).
- Provide some sample material to be used for new users and /or developers to get used with the open-source results.

4. Conclusions

This AMASS report is the final deliverable for tasks T7.1 Networking and Coordination of External Advisory Board and T7.2 Industrial Adoption Outreach Program.

The main conclusions of this deliverable are the following:

- The collaboration activities with the most relevant projects and initiatives on which the AMASS networking activities have been focused, have created both impact (e.g., standardization of AMASS solutions at OMG) and reuse opportunities (e.g. collaboration with the eITUS RobMoSys cascade funding project to use AMASS fault-injection approach). However, the community must still foster more to open business collaboration opportunities.
- The EAB instrument has been very effective as most of the ideas provided by EAB members have been used to improve both the AMASS technical and technological approach (e.g. the need of managing AMASS complexity by using dashboards and more guidance) and also the community building and project outreach (e.g. the need to focus on specific industries and market needs, and the implementation of AMASS demos in concrete industrial usage scenarios).
- Several actions have been taken in order to promote the early adoption of AMASS: posters exhibition, presentations, participation in conferences and workshops, trainings, information in social media, videos publication, etc. The actions have been focused in different user groups, such as: industry, research and scientific communities, policy makers and open source communities. In addition, a set of recommendations for the future promotion of AMASS have been provided by several partners.

Abbreviations and Definitions

Abbreviation	Explanation
ARTEMIS	ARTEMIS Industry Association is the association for actors in Embedded Intelligent Systems within Europe
ARTA	AMASS Reference Tool Architecture
AUTOSAR	AUTomotive Open System ARchitecture
BVR	Base Variability Resolution
CA	Consortium Agreement
CACM	Common Certification and Assurance Metamodel
CPS	Cyber-Physical Systems
CS	Case Study
CTIC	Certification Together International Conference
EAB	External Advisory Board
EABC	Advisory Board Coordinator
EC	European Commission
ECSEL	Electronic Components and Systems for European Leadership
EPF	Eclipse Process Framework
ESR	Early Stage Researcher
EU	European Union
FMVEA	Failure Modes, Vulnerabilities and Effect Analysis
GA	Grant Agreement
GPDR	General Data Protection Regulation
HARA	Hazard Analysis and Risk Assessment
IMA	Integrated Modular Avionics
IA	Innovation Action
IOS	Interoperability Specification
JU	Joint Undertaking
NDA	Non-Disclosure-Agreement
OEM	Original Equipment Manufacturer
OMG	Object Management Group
OSLC	Open Services for Lifecycle Collaboration
SACM	Structured Assurance Case Metamodel
SME	Small and Medium-sized Enterprise
STO	Scientific and Technical Objectives
TARA	Threat Analysis and Risk Assessment
TRL	Technology Readiness Levels
UMA	Unified Method Architecture
V&V	Verification and Validation
WG	Working Group
WP	Work Package

References

[1] AMASS Deliverable D7.1 External Advisory Board and Industrial Adoption Program, January 2017

[2] AMASS Deliverable D1.3 Evaluation framework and quality metrics, September 2017

[3] AMASS Deliverable D2.5 AMASS user guidance and methodological framework, November 2018

[4] AMASS Deliverable D2.8 Integrated AMASS platform (c), December 2018

[5] AMASS Deliverable D2.9 AMASS platform validation, February 2019

[6] AMASS Deliverable D8.6 Dissemination and Training Progress (a), March 2017

[7] AMASS Deliverable D8.7 Dissemination and Training Progress (b), March 2018

[8] AMASS Deliverable D8.8 Dissemination and Training Progress (c), March 2019

[9] AMASS Deliverable D1.2 Report of case study data collection, March 2017

[10] AMASS Deliverable D1.4 AMASS demonstrators (a), April 2017

[11] AMASS Deliverable D1.5 AMASS demonstrators (b), March 2018

[12] AMASS Deliverable D1.6 AMASS demonstrators (c), March 2019

[13] AMASS Deliverable D2.4 AMASS reference architecture (c), May 2018

[14] AMASS Deliverable D3.3 Design of the AMASS tools and methods for architecture-driven assurance (b), March 2018

[15] AMASS Deliverable D3.6 Prototype for architecture-driven assurance (c), August 2018

[16] AMASS Deliverable D3.8 Methodological guide for architecture-driven assurance (b), October 2018

[17] AMASS Deliverable D4.3 Design of the AMASS tools and methods for multiconcern assurance (b), April 2018

[18] AMASS Deliverable D4.6 Prototype for multiconcern assurance (c), August 2018

[19] AMASS Deliverable D4.8 Methodological guide for multiconcern assurance (b), October 2018

[20] AMASS Deliverable D5.3 Design of the AMASS tools and methods for seamless interoperability (b), June 2018

[21] AMASS Deliverable D5.6 Prototype for seamless interoperability (c), September 2018

[22] AMASS Deliverable D5.8 Methodological guide for seamless interoperability (b), October 2018

[23] AMASS Deliverable D6.3 Design of the AMASS tools and methods for cross/intra-domain reuse (b), July 2018

[24] AMASS Deliverable D6.6 Prototype for cross/intra-domain reuse (c), October 2018

[25] AMASS Deliverable D6.8 Methodological guide for cross/intra-domain reuse (b), November 2018

[26] AMASS Deliverable D7.7 AMASS open source platform provisioning and website (b), December 2018

[27] AMASS Deliverable D8.4 Exploitation Results and Final Market Megatrends Analysis, January 2019

[28] AMASS Deliverable D8.10 Standardization Plan, March 2018

[29] AMASS Deliverable D8.11 Standardization Roadmap and Report, March 2019

Annex 1: Report of the First EAB Workshop

Agenda

Monday, September 11 (FBK premises)

Start	End	Description	Speaker
9:00	9:30	Project Outline	Huáscar Espinoza
9:30	10:00	Technical Overview	Barbara Gallina
10:00	10:30	Selected Case Studies	Benito Caracuel, Helmut Martin and Thierry Lecomte
10:30	11:00	Coffee break	
11:00	11:50	Project Outreach and Community Building	Ran Bi and Gaël Blondelle
11:50	12:20	Intra and Cross-Domain Reuse	Barbara Gallina
12:30	13:30	Lunch	
13:30	14:00	Architecture-Driven Assurance	Stefano Puri
14:00	14:30	Multi-concern Assurance	Thomas Gruber
14:30	15:00	Seamless Interoperability	José de la Vara
15.00	16:30	EAB Feedback Brainstorming	Moderated by Huáscar Espinoza
16.30	17:00	Coffee break	
17:00	17.30	Wrap-up	Moderated by Huáscar Espinoza

Minutes

Everybody introduced themselves. Presentations are available in the link indicated above. Some selected noted are collected below.

1. <u>Project Outline (Speaker: H. Espinoza)</u>

- AMASS promotes a strong connection between architectural design and certification issues
- AMASS looks for achieving a balance on safety and cybersecurity
- AMASS develops a platform to harmonize the terminology of different domains by means of the AMASS Reference Architecture: including meta-models (how to harmonize the management of the assets).
- AMASS also enhances the connections with other external tools
- AMASS partners are involved at OMG (UC3 and TEC), in particular in the System Assurance task force.
- First AMASS prototype is centered on the basic building blocks in terms of the baseline tools: Papyrus/CHESS, OpenCert and EPF Composer.
- It is emphasized how important industrial impact and dissemination is.
- Question from Laurent Fabre: are all the work packages on going? Answer: Yes, all the WPs are already running.
- Question Laurent Fabre: more than one year has passed by since the project started. Are the results right now what you expected at the beginning of the project? Answer: Yes, it will be shown during the meeting in the different slots and videos.

2. <u>Technical Overview (Speaker: B. Gallina)</u>

- Inconsistencies can happen when safety managers work with excels and words [Slide 4]

- AMASS aims to systematise reuse by also exploiting concepts such as product lines and ontology-based technologies [Slide 6]
- OSLC: AMASS is considering to use ontologies, which semantically relate the different pieces of information [Slide 11]
- It is important to understand the interfaces between the different teams. Of course, the safety manager would still have to "use his/her intellectual work but some of the tasks would be automated [Slide 12].
- Cross-domain case study is focused on COTS and DO-254 to the reuse of conformance with automotive standards into the avionics domain [Slide 13].
- Feature diagram for product line engineering. To link pieces of information: process + product + assurance case [Slide 14]
- Question Laurent Fabre: Have you developed any new tool for the first prototype? Answer: no new tools have been developed for the first prototype but some functionalities were added (documented in deliverables D3.4, D4.4, D5.4 and D6.4) and the baseline tools were integrated. In fact, it was not really easy to integrate the different tools from previous projects. In other words, the integration between the tools related to the first prototype and basic building blocks was quite complex: Papyrus/CHESS (system component specification), OpenCert (assurance, compliance) and EPF (compliance during the planning phase),

3. <u>Case Study CS1 (Speaker: B. Caracuel)</u>

- Compliance of IEC 61508, IEC 62443, IEC 62351 industrial standards
- Compliance gap analysis is really important for Schneider
- Two assurance projects, which will be connected in future CS1 iterations: Safety RTU and Security RTU.
- Question Tim Kelly: Have you already modelled IEC 62443 in OpenCert? Tim wanted to know if we have faced any issues when modelling, for instance, IEC 62443. Answer: We mentioned some difficulties we faced when trying to model IEC 62351, which is more product oriented. Important also to remark that only some parts of the standards have been modelled.
- Question about standardisation and SACM. We will see in future AMASS prototype iterations how to align to the SACM standard, because a new version was recently released.
- Question: What are the benefits of doing it in this way (AMASS model-based approach) with respect to no model-based approaches? Answer: We have got two tasks in the project to evaluate that related to metrics and quantification. Benchmarking Framework in D1.3 (metrics definition) and Benchmarking realization itself in D1.7. The deliverable regarding the aforementioned metrics (D1.3) will be delivered by the end of September 2017.
- We will evaluate how much we can reduce in costs because of following this approach.
- Question from Timo: which are the AMASS tools supporting compliance management? Answer: baseline tools are EPF Composer (definition of the process -activities, artefacts, …-), OpenCert: the meta-model collects information coming from the standards.
- The case studies provided feedback for the tools' refinement.
- D1.4: report for the case studies. We have notified the EAB members that they can download the deliverable from the webpage, since it is public.

4. <u>Case Study CS3 (Speaker: H. Helmut)</u>

- Model Vehicle with different platforms. Failures can happen in the vehicles or communication.
- Model-based and contract-based development
- System modelling in CHESS and contract-refinement by means of OCRA
- Question Laurent Fabre: What does degradation cascades mean? Answer: The answer has been provided by specifying it as failure and graceful-degradation related.
- Question Tim Kelly: How does everything (architecture modelling and argumentation) fit together? Answer: We consider this is a good case study to evaluate that.

- Tim Kelly considers the approach quite specific and not generic anymore. Barbara answers highlighting how variability could solve that. Tim Kelly agrees but continues arguing how it is not generic anymore because the system needs to be modelled by Papyrus/CHESS. So, to some extent, he thinks some requirements are imposed. Some aspects between the different approaches between OPENCOSS and SafeCer have been discussed (how in OPENCOSS they were not going inside the artefacts and in SafeCer yes because the architecture was modelled). Barbara explains that a conceptual meta-model exists, and that CHESS represents an instance of it. Thus, given the presence of the conceptual meta-model, the genericity is guaranteed.

5. Case Study CS5 (Speaker: T. Lecomte)

- Platform Screen Door case study for SIL 3.
- Papyrus: system functions**.** Code generation assessment
- Question Laurent Fabre: But… what does Papyrus for security mean? What´s the feedback regarding Sophia tool? Answer. Sophia tool has been explained. Good experience on using Papyrus for security (Thierry).
- Huáscar emphasized the importance of reuse also to achieve issues concerning certification between different countries (reuse).
- Timo has made a comment: "the global approach is a bit complex. Is your approach for big companies? Or is it for medium/small companies?" Good feedback in terms that AMASS approach can be applied also to SME (Clearsy is a SME).

6. Dissemination, Exploitation, Training, Standardization (Speaker: R. Bi)

- Question Laurent Fabre: what do you consider training? Answer: Internally, explanation between how tools such as EPF, Papyrus/CHESS or OpenCert work. Externally, explain how the different tools work to external industrial partners. For instance, Barbara has given a course in Sweden regarding certification by means of an e-learning platform.
- Question Tim Kelly: how are you involved in standardization? Answer: Thomas Grüber answered. How, for instance, AIT is involved in working groups: IEC 62443, railway VDE security (in Germany) and so on. Thomas has highlighted multi-concern aspects of AMASS as a key issue.
- Question Tim Kelly: Are you trying to give feedback to certification people about how the modelling should be done? Give them inputs regarding methods to be included in the standards? Answer Thomas: yes, we are trying to promote some techniques and giving inputs regarding safety and security issues (e.g. how IT security is not sufficient in such systems).
- Tim Kelly remarked how it is not easy at all to be involved and to influence certification groups. Thomas answered by saying how important it is at least to be involved in such groups and how we try to influence to the extent that we can in terms of, for instance, developing safety-security co-engineering methods.
- Huáscar mentioned that we are aware of those difficulties and we are open to recommendations about how we could better influence them.
- Ran Bi explained how we could contribute by applying open source solutions as well.
- Tim Kelly found out an issue on some timeline [slide 10].

7. Community Building and Industrial Outreach (Speaker: G. Blondelle)

- Community Building has been presented and connections to other projects explained
- We have asked the EAB to give us feedback regarding possible connected/related projects which have not been considered.
- We have explained how it is possible to create and contribute to an Open Source Community through Eclipse/Polarsys.
- Huáscar highlighted how we would like to get feedback regarding impact and open source approach.
- Question Tim Kelly: what are really the success facts? If we do not get the tools to be used, that would be an issue. Answer: Gael responded saying that the fact of storing the code on Github is not a solution. We are aware that it is difficult that by the end of the project we can have industrial adopters

of the tools, however, if industry starts using these approaches, slowly will be a big success. We want to be ready when this (like the use of models for certification) happens.

- Huáscar mentioned how we are offering some innovative results: mature for the basic functionalities and prototypes for others. We understand it is not an easy task; however, we will put a lot of effort on several activities such as external training to industry. We are aware that the main feedback should come from industry.
- Question: Antonio: What about the qualification of the tools? Answer: Huáscar answered by saying that tools do not really require qualification for now, but we are studying the needs for this in WP5.

8. Intra and Cross-Domain Reuse (Speaker: B. Gallina)

- Cross-intra domain reuse and compliance management topics addressed.
- AMASS addresses the semi-automatic generation of certification artifacts. Reuse possibility via ontologies and variability management based on product lines best practices. AMASS does not intend to build upon individual solutions for each dimension (process/product/assurance case) but proposes to adopt an orthogonal solution.
- Explanations concerning how EPF Composer supports process modelling.
- Tim does not think that it is possible to model a certain standard in only one way (different interpretations of the same standard). How to calculate the reducible amount of effort on certification. Difficult to measure. Enough mentioning it. Barbara replied that this is why a product line-based approach can be helpful. Different interpretations could be collected as variants (allowed variants), whenever certification went through successfully.
- Difficulties on understanding why within the AMASS approach different solutions such as CACM and EPF/BVR can be found. "Difficulties on understanding the big picture". Activity and artefact concepts are related within the CACM. And now you have got EPF Composer/BVR as well. I am including activities which were not considered. Does this mean that concepts of variable activities are in two different places? For instance, criticality level seems to be modelled in two different places to me. Is there an overlap of concepts? Why to do it in this way?
- Barbara and Huáscar answered by saying there could be some overlaps on certain concepts between CACM and external tools, but this will be managed by bridges and transformations between models.
- Barbara remarked how in OPENCOSS project, product and argumentation variability could not be modelled.
- AMASS Demo Video has been played.

9. Architecture-Driven Assurance (Speaker: S. Puri)

- Claim the system is sufficiently safe. Associate a contract to a system component**.** The assurance case reflects how the system has been designed.
- Question Tim Kelly: what does contract associated to the assurance mean? Answer: a contract is related to a claim.
- Question: how is the semantic behind that relation/link/transformation? Suggestion from Tim: review the system-component meta-model and we should pay attention when defining the semantics for the transformation between the system component and the assurance case.
- S. Puri reminds that in the last review we had the input regarding defining system boundaries ' "defining system boundaries is a difficult task (open systems, open environment…)"

10. Multi-Concern Assurance (Speaker: T. Gruber)

- Question Tim: How to do the trade-off method? How to resolve the conflicting requirements? A bit of scepticism on hot to perform a quantitative analysis on security. Furthermore, Tim Kelly informed as about the trade-off argument approach. We have answered by saying that we were aware of that and we considered that in D4.1. Furthermore, he has emphasized that it is not only a trade-off between safety and security, but we should consider more the following issues when deciding which is the best o most appropriate architecture:

- The best architecture will depend on the standard to apply**.** The best architecture will depend on the project costs**.** The best architecture will depend on the criticality level.
- It has been mentioned that we are also working on these areas (design trade-offs) in terms of WP3. Outcome: design trade-off really important!
- Question: more discussions ongoing about how to use contracts and what the difference to a claim is. Tim explained assurance case contracts. The main goal is to connect two assurance cases to check if they can match together. "Agreement glue between two assurance cases = assurance case bindings".
- Question Tim: are we going to update the argumentation editor? Yes, also to make it compliant to the standards.

11. <u>Seamless Interoperability (Speaker: J. de la Vara)</u>

- We need to provide interoperability means that can be used by any tools.
- The possibility of generating connectors for any tool is ongoing.
- Automatic transformation between artefacts.
- Connection between artefacts: this functionality should be extended.
- How to exploit information on traceability based on OCRA: the different EAB members didn´t quite understand the need of OCRA.
- Traceability with CAPRA: Question Tim: Do all the models not have traceability to artifacts? Which is the universal model of traceability? Answer: Yes, the link is modelled. Maybe the link of the meta-model is not enough for what we would need to relate. For instance, indirect dependencies to allow reuse.
- Question Tim: why not to add the information we would need directly in the meta-model? Otherwise, we have got the risk that people can create links "on-the-fly". There should be some reasoning on what information can be related to what by means of a meta-model.
- Different discussions have taken place on why to have different tools doing the same thing. Then, we have explained how we have got many external tools. However, we should better define which tools are going to be external and which ones are part of the AMASS platform.

BRAINSTORMING SESSION

Mind maps of the brainstorming at shown at the end of this section.

<u>A. AMASS Challenges</u>

<u>Architecture-Driven Assurance (Contract-Based Approach)</u>

- Link design assumptions or contracts to the assurance case information. The meta-model should be reviewed (Tim). The system component meta-model has been presented and analysed.
- Tim: methodologically is difficult to comprehend what a design contract is. Review the semantics between contract and argumentation.
- Jose Luis has remarked that anyway we need to take into account that maybe someone does not want to develop the argumentation.
- In brief: work more on the semantics: system/component/design ' argumentation
- Tim´s remarks:
    - Assurance cases are just about behaviours, the assurance of the component of course depends on the behaviour,
    - design by contracts: then how the modular assurance is aligned (clarify)
    - Connection of formal languages for contracts can be an issue (formal specification of contracts)
    - SACM goes behind anything that exists nowadays.

    - Review IEC 15026
- Stefano Puri: yes, the semantics of the links need further work and we need to better clarify certain issues; it will become clearer when we will provide information about argument fragments generation approach.
- Question: which are the benefits with respect to RECOMP? RECOMP only works on compliance checks with Standards. TEC uses RECOMP results for OPENCOSS and AMASS.

Multi-concern Assurance (Safety and security co-assurance)

- Question Tim: is security aware safety only our goal?
- Question Lauren Fabre: Are the authorities demanding a security case alone? Answer: Tim: we have got a UK defence project asking for a separated security case on its own. (It is a project requirement, not a standard)
- Tim: safety cases were stable, with automated driving not anymore.
- Tim: Adding monitors in different places ' autonomous systems.
- Thomas: Approach to safety and security is different. Security process should adapt to safety.
- Tim: we will really need to understand each other and align.
- Laurent Fabre: the approach looks promising but many things you have mentioned are not really possible in real life.

Interoperability and Tool Support

- Tool Qualification: we are aware regarding the difficulties on providing reliable tools.
- Assurance of our tools was not planed, and we have not currently the effort to do so.
- Huge number of tools to make everything work together, too ambitious.
- Tim: I have the impression that it only works in the context of certain configuration of the tools. You really need to document how to do the wrapper or to connect tools together. "To document everything is scary"
- We are already working on how to connect everything on Semantics Level. For instance, Sabotage with Papyrus/CHESS or model-based safety analysis tools.
- Tim: there are a lot of set-up costs. If you want to take people cost realistically you need to model that set up costs in a good way. How consuming or how much effort does it have to model the standards? Like it happened in OPENCOS…
- Take into account the effort on configuration (standard modelling and so on)
- General comment (not only here): clearly state which tools are going to be implemented and which ones are part of AMASS building blocks. Make clear which tools are going to be used in which case study: CASE STUDIES and WPs and TOOLs require better relationship (moved to AMASS industrial impact).
- Laurent Fabre: issues regarding Open Source and Qualification need to be considered and better explained.
- Huáscar: evaluate the approach of the qualification of the assurance case editor in comparison with other alternatives like performing a manual review.
- Lauren Fabre has suggested that we should take into account what is feasible and what is not. Tim has suggested that maybe Rapita can offer support on tool qualification.

Reuse of assurance/certification issues

- How to deal with specific needs from different domains? This approach can be more useful in some domains compared to others.
- We have modelled some generic taxonomy (SEooC, IMA…)
- Tim suggested changing the problem into product families. According to Tim, "everything" goes in the direction to solutions such as AUTOSAR even if this does not make the problem easier.
- The problem of component integration is really relevant.

- Process families: requirements of standards. Specific process model of a standard. Take care of this when meta-modelling not to model the things twice.

B. AMASS Industrial Impact

- Timo: Acronyms. It would be nice for people who are not familiar with the terminology to explain those terms: INDUSTRIAL TERMINOLOGY ADOPTION. (Take care of the language).
- Marion Lepmets: Why AMASS tools are better compared to other possible solutions? A global view with respect how, for instance, WP3 tools could help to the state of the art/practice or with respect to the assurance tools they use could help. → Include user stories.
- How to influence the standardisation bodies need to be better addressed. → Tim suggested on giving them feedback regarding difficulties when modelling for instance the security standard mentioned before (IEC 62351).

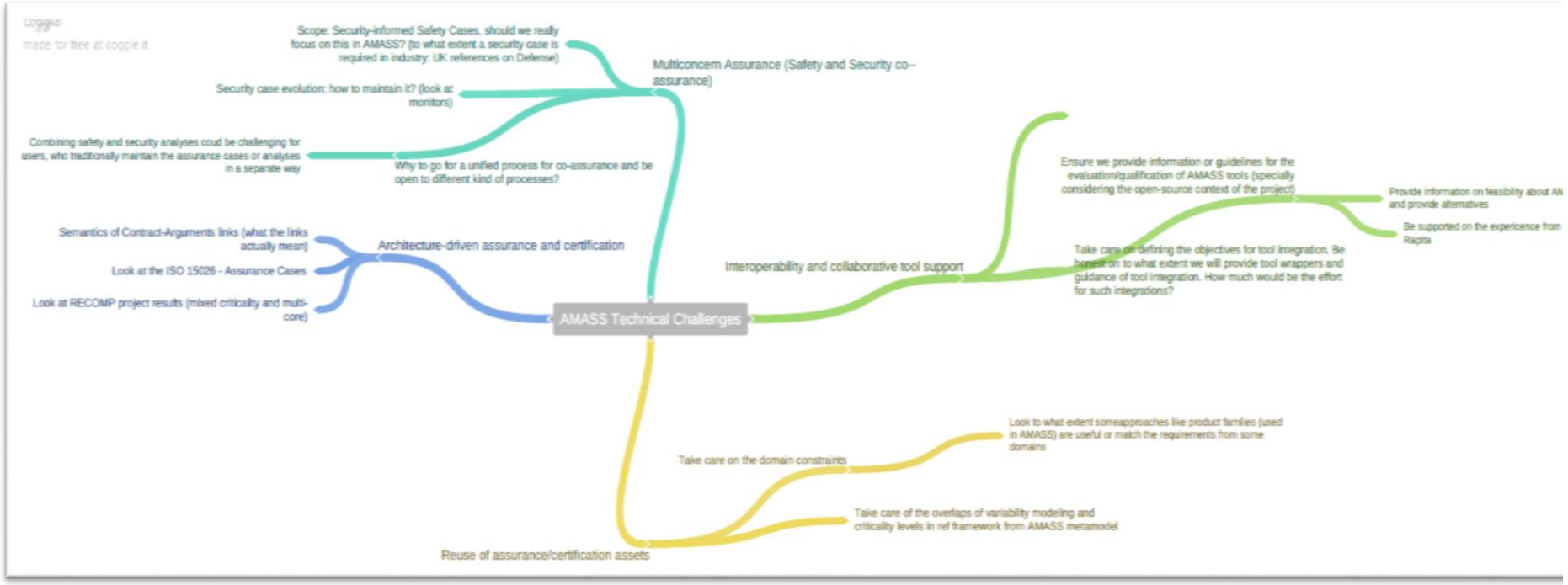

Figure 8. Mind maps of the brainstorming session (I)

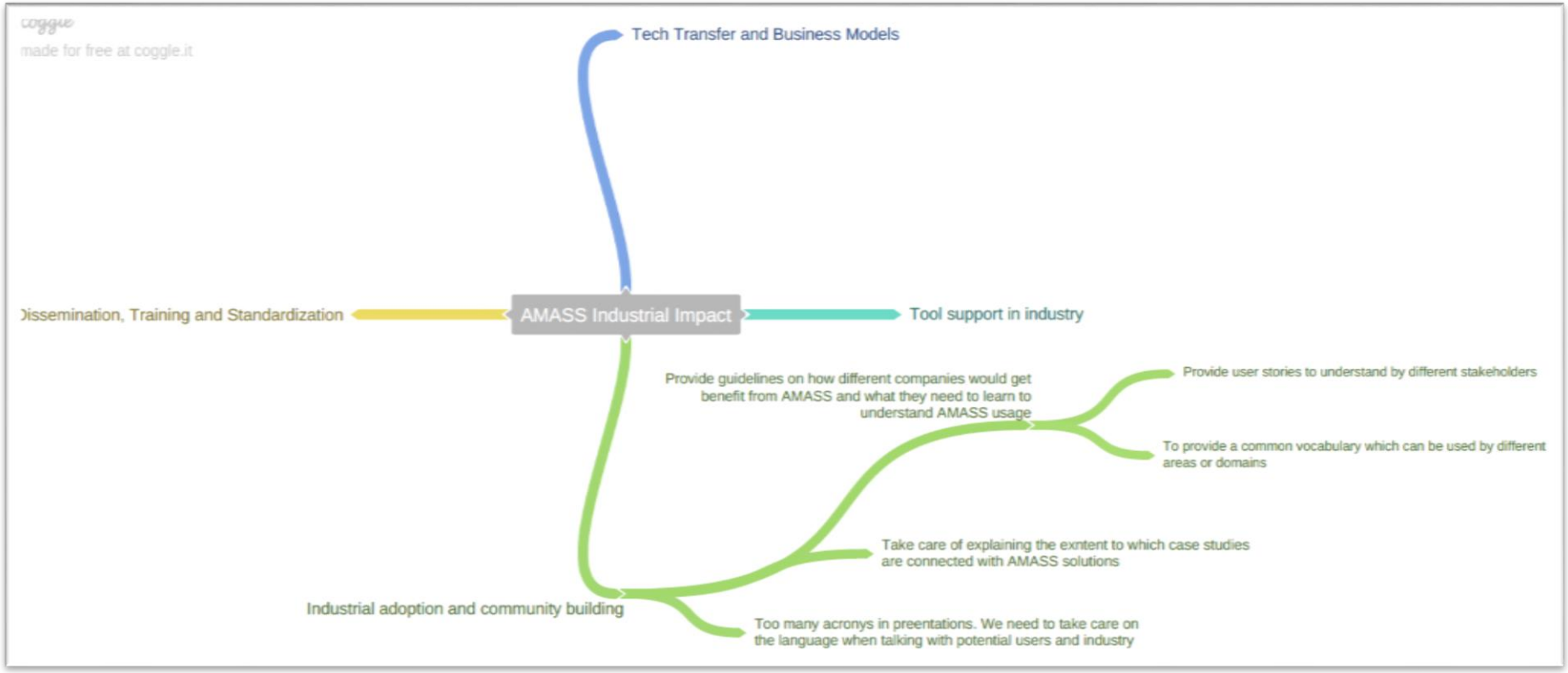

Figure 9. Mind maps of the brainstorming session (II)

Annex 2: Report of the Second EAB Workshop

Agenda

Monday, September 17 (Aros Congress Center, Västerås, Sweden)

Start	End	Description	Speaker
9:00	9:30	Welcome and Project Outline	Garazi Juez (Tecnalia)
9:30	10:00	Technical Overview	Barbara Gallina (MDH)
10:00	10:30	2nd AMASS Platform Prototype: An Overview	Huascar Espinoza (CEA)
10:30	11:00	Coffee break	
11:00	11:45	AMASS Usage Scenario 1: Architecture Refinement by using Safety Assessment	Stefano Puri (Intecs)
11:45	12:30	AMASS Usage Scenario 2: Process & Product Configuration and Compliance Management	Barbara Gallina (MDH)
12:30	13:30	Lunch	
13:30	14:15	AMASS Usage Scenario 3: Toolchain for system specification and quality assessment	José Luis de la Vara (UC3)
14:15	15:00	AMASS Usage Scenario 4: Safety and security co-assessment	Thomas Gruber (AIT)
15:00	15:30	Project Outreach and Community Building	Ran Bi (RPT) and Gaël Blondelle (ECL)
15.30	16:00	Coffee break	
16.00	17:00	EAB Feedback Brainstorming	Moderated by Huáscar Espinoza (CEA) and Gaël Blondelle (ECL).
17:00	17.30	Wrap-up	Moderated by Huáscar Espinoza (CEA) and Gaël Blondelle (ECL)

Minutes

In general, the EAB members look quite impressed about the results achieved during the last year. The EAB members depicted that showing not only the good results but the faced difficulties and the drawbacks of the different functionalities, would be beneficial.

Some selected noted have been collected below.

1. <u>Reduction on certification costs</u>

- AMASS should establish a clear argument on how the project will help reducing certification costs.
- The EAB members asked not to underestimate that proving this is not an easy task.
- It is a key point to reach the industry: not only to convince the engineers or designers but the management. Furthermore, the AMASS consortium should have a clear vision on how things are currently done in industry in order to be able to compare the obtained results versus the reality.
- The EAB members proposed to show how each of the proposed usage scenarios presented during the workshop will lead to reductions on assurance and certification.

2. <u>Dashboard: "The Dashboard really looks promising"</u>

- The EAB members agreed on the fact that such a solution presented during the workshop could help dealing with the complexity of the Project ("Tool Complexity").
- Much more Dynamic guidelines need to be embedded in the Dashboard. Not only related to roles but to usage scenarios. For example, the four usage scenarios presented during the EAB meeting, however, there could be more.

3. **Roles**
   - Clarifications made regarding current place for documenting the AMASS roles (For example in the WP2 deliverables and DX.7).
   - The current specifications and definitions for roles need to be reviewed to ensure consistency with respect to the vocabulary used in industry. The EAB members could help on reviewing the meaning of the roles, which are currently defined in AMASS to verify they are appropriate and complete. In other words, to check if those roles are sufficient for their needs.
   - The EAB member highlighted how roles can vary between companies. The AMASS consortium clarified how the AMASS platform deals with this issue.
   - The current definition for roles doesn't consider Tier levels. It would be beneficial for the Project to do so. Consider relating the Tier level with the AMASS Functionalities.

4. **AMASS Lite**
   - Different configuration of the AMASS Platform MUST be provided. This is not related to the dashboard only, but to the possibility of providing different configurations (set of plug-ins depending on the role of a person). For example, a safety manager or a system architect might not need all the plug-ins.

5. **Multi-concern related issues. Safety-security co-analysis**
   - The AMASS consortium should clarify the responsible role within a company who would be carrying out combined safety-security analysis (e.g. FMVEA). "Who is the responsible person: the safety engineer? The security engineer? They even questioned a bit these co-analysis techniques. They have emphasized how different the two worlds are and even if they agree that both roles would need to talk to each other, they agree on keeping two concerns separated but aligned**.**

6. **Open Source**
   - The use of open-source software in safety-critical environments was questioned. However, the outcome is that this should not be an issue at all.
   - Eclipse can offer qualification kits**.**
   - "Non-open source software can have bugs as well."

7. **Tool Qualification**
   - AMASS needs to improve Tool Qualification issues. → To be discussed at the October plenary meeting. The effort on validating the AMASS platform needs to be further investigated.

8. **Dissemination**
   - Consider creating a "one page" per usage scenario in the AMASS leaflet. In other words, together with the already existing general one page, having a one page per usage scenario would be beneficial. In the EAB meeting four usage scenarios were presented, however, there could be more.

9. **Usage Scenario 1: Architecture Refinement**
   - Verification based on formal methods looks very powerful.
   - Define some guidelines which help on specifying when this kind of approach could be successful. Difficulties on formalizing requirements and on applying formal methods were highlighted.

10. **Usage Scenario 2: Process&ProductConf&Compliance**
   - The EAB members wondered if there are differences on applying the approach when the focus is process reuse versus product reuse. The AMASS consortium mentioned there are no differences when applying the approach and that that´s in fact one of the major benefits.

11. **Usage Scenario 3: Tool Chain**

- Collaborative real-time modelling looks promising. The reviewers are quite interested on this. Not presented today and available for next workshop. Security management and data management features were emphasized.
- How to define the tool connectors clarified.

12. **Usage Scenario 4: Co-Assessment Scenario**
    - Difficulties when defining security levels have been pointed out by the EAB Members. Clarify how AMASS could help here.
    - Clarify the role of a person applying co-analysis.
    - The status regarding IEC 62443 has been clarified.

13. **Community Building**
    - The AMASS consortium will participate at 2019 Certification Together (CTIC).
    - The EAB members might help the AMASS Consortium on identifying potential industrial users to adopt the solution.
    - Several questions regarding the maintenance of the AMASS platform raised. Eclipse helps maintaining the project results once the time assigned to the Project ends.
    - Consider participating at ISO26262 conferences.
    - Recommendations on spreading the world going not only to Europe but other places such as North America.

Annex 3: AMASS EAB Feedback Questionnaire

AMASS EAB Feedback

Innovation Coverage

1. Do you consider that the AMASS technical focus covers the main industrial challenges in CPS assurance and certification?

- [ ] Not at all
- [ ] Not really
- [ ] Undecided
- [ ] Somewhat
- [ ] Very much

Please ellaborate:

AMASS EAB Feedback

Value

2. Can you identify opportunities for using the AMASS approach (if so, which aspects and on what kind of project)?

- [ ] Not at all
- [ ] Not really
- [ ] Undecided
- [ ] Somewhat
- [ ] Very much

Please ellaborate:

AMASS EAB Feedback

Industrial Adoption

3. Do you think the AMASS approach could be integrated in current industrial practice and processes? Please describe in which conditions

- [ ] Not at all
- [ ] Not really
- [ ] Undecided
- [ ] Somewhat
- [ ] Very much

Please ellaborate:

AMASS EAB Feedback

Community Building

4. Is the AMASS community building strategy sound? What is missing?

- [ ] Not at all
- [ ] Not really
- [ ] Undecided
- [ ] Somewhat
- [ ] Very much

Please ellaborate:

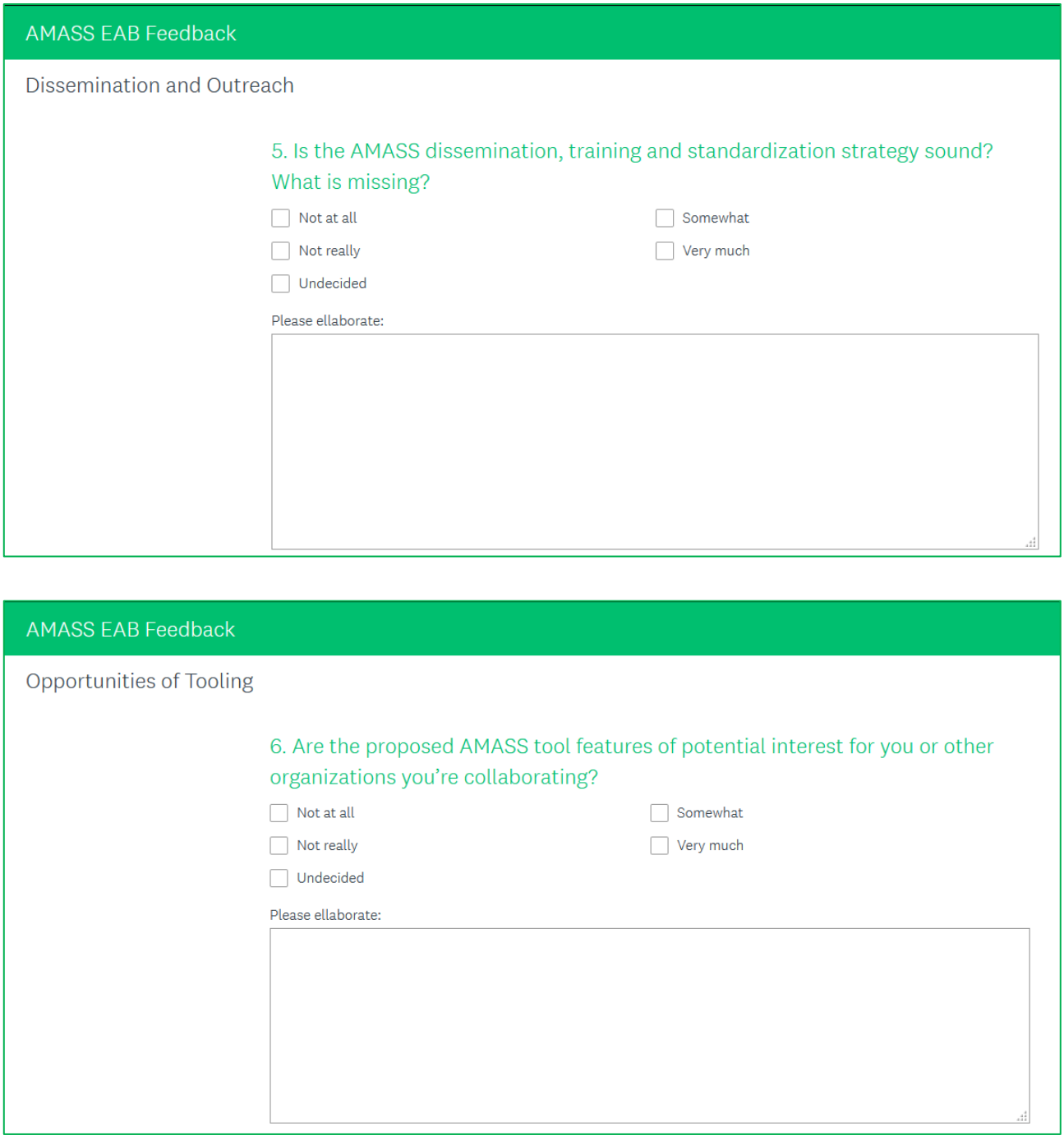

Figure 10. EAB survey questions

Annex 4: AMASS Results to Promote

The tables in this section show some AMASS results from WP1 to WP6 that have been identified as candidates for promotion during the project life and after the project execution.

Some of the promotion actions have already been carried out, as it has been reflected in the “Status” column, whereas others will take place after the project end.

Table 16. WP1 results to promote for the Industry user group

WP1 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
Prototypes analysis implementation	D1.4 [10], D1.5 [11] and D1.6 [12]	OpenCert, Papyrus, CHESS, EPF Composer, BVR tool, others	Training and demonstrations	AMASS industrial partners	1. Contact with different departments of the industrial partner 2. Explain the project and send information 3. Demonstration and Training 4. Give access to the tools and documentation	1. Time and effort needed 2. Lack of awareness 3. Lack of interest	Done for AMASS CS partners
Data Acquisition related to Standards	D1.2 [9]	-	Documentation & Information	AMASS industrial partners	1. Contact with different people and departments 2. Obtain and summarize the information 3. Send Information	1. Time and effort needed 2. Lack of awareness	Done for AMASS CS partners
Prototypes analysis and its applicability to a specific industrial domain	D1.4 [10], D1.5 [11] and D1.6 [12]	AMASS Prototype	Training and demonstrations	Space domain, automation domain, others	1. Contact with the companies 2. Prepare a training session 3. Give access to the tools and documentation 4. Get feedbacks	1. Tool maturity 2. Need of additional tool capabilities 3. Learning curve	Partially done (see D8.4 [27])

Table 17. WP2 results to promote for the Industry user group

WP2 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
AMASS Platform Prototypes	D2.4 [13], D2.8 [4]	AMASS Prototype	Training and demonstrations	AMASS and external industrial partners	1. Prepare some videos of the AMASS platform 2. Contact with the companies/select 1 or 2 beta test companies 3. Explain the project and send information 4. Demonstration and Training 5. Give access to the tools and documentation 7. Get feedbacks	1. Maturity of the approach 2. Impact on current practices 3. Tools maturity	Done for AMASS partners and to be done after the project execution for external partners

Table 18. WP3 results to promote for the Industry user group

WP3 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
Contract-based design	D3.3 [14], D3.6 [15], D3.8 [16]	AMASS Prototype	Training and demonstrations	AMASS CS partners, customers	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the Papyrus/CHESS/SAVONA tools 2. Learning curve for the adoption of a formal language 3. Impact on current practices	Done for CS3, CS4, CS5, CS7, CS9, CS10
Requirement Semantic Analysis	D3.3 [14], D3.6 [15], D3.8 [16]	AMASS Prototype	Training and demonstrations	AMASS CS partners, customers	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the Papyrus/CHESS/SAVONA tool 2. Learning curve for the adoption of a formal language 3. Impact on current practices	Done for CS7, CS10
Contract-based analysis/Model Checking	D3.3 [14], D3.6 [15], D3.8 [16]	AMASS Prototype	Training and demonstrations	AMASS CS partners, customers	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the Papyrus/CHESS tool 2. Learning curve for the adoption of a formal language 3. Impact on current practices	Done for CS3, CS4, CS5, CS7, CS9, CS10

WP3 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
Model-based safety analysis (automatic generation of fault tree)	D3.3 [14], D3.6 [15], D3.8 [16]	AMASS Prototype	Training and demonstrations	AMASS CS partners, customers	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Maturity of the supporting Papyrus/CHESS tool	Done for CS4, CS9
Generation of product-based assurance arguments from CHESS model	D3.3 [14], D3.6 [15], D3.8 [16]	AMASS Prototype	Training and demonstrations	AMASS CS partners, customers	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Maturity of the supporting OpenCert tool 3. Impact on current practices	Done for CS3, CS4
Quality Evolution analysis	D3.3 [14], D3.6 [15], D3.8 [16]	System Quality Analyzer (SQA). This tool is part of the SE Suite	Training and demonstrations	AMASS CS partners, customers, Quality managers & Quality assurance teams	1. Demonstration 2. Get feedback 3. Refinement if needed	1. Depends on other TRC product 2. New feature; maybe the market requires some adjustment for fit-for-purpose	Done for CS3, CS10
Quality Assessment Metrics (for textual requirements, for system models, for other engineering workproducts, etc.)	D3.3 [14], D3.6 [15], D3.8 [16]	System Quality Analyzer (SQA), Requirements Authoring Tool (RAT).	Training and demonstrations	AMASS CS partners, customers, Quality managers & Quality assurance teams	1. Demonstration 2. Get feedback 3. Refinement if needed	1. Depends on other TRC product 2. New feature; maybe the market requires some adjustment for fit-for-purpose	Done for CS3, CS10

WP3 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
		Both tools are part of the SE Suite					
Simulation-based fault injection	D3.3 [14], D3.6 [15], D3.8 [16]	Simulation-based fault injection framework based on Eclipse and Simulink	Training and demonstrations	AMASS CS Partners, conference attendances, other Tecnalia´s departments and contacts	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Get feedbacks	1. Maturity of the tool	Done for CS3

Table 19. WP4 results to promote for the Industry user group

WP4 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
Assurance Case Editor	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Impact on current practices	Done for CS1, CS3, CS4, CS6, CS7, CS8, CS9, CS10, CS11
Composability of argumentations	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Impact on current practices	Done for CS1, CS3, CS4, CS6, CS7, CS8, CS9, CS10
Contract based multiconcern assurance	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Impact on current practices	Done for CS3, CS10
Support for argumentation patterns	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies	1. Maturity of the approach	Done for CS3

WP4 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
					2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	2. Impact on current practices	
Support for specification of variability at the argumentation level	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Maturity of the supporting EPF Composer and BVR Tool tools 3. Impact on current practices	Variability management is a specific way of supporting the WP6 goal of re-use. A first version of this functionality has been generated in WP6.
Interoperability with open argumentation and process interchange formats SACM and UMA	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Impact on current practices	SACM interoperability: Done for CS1, CS3, CS4, CS6, CS7, CS8, CS9, CS10, CS11; UMA interoperability: Done for CS3 and CS11.
Contract-based trade-off analysis	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training	1. Maturity of the approach 2. Impact on current practices	Done for CS3

WP4 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
					5. Give access to the tools and documentation 6. Get feedbacks		
Model-based multiconcern analysis	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Impact on current practices	Done for CS3, CS4, CS10, CS11
Automated combinations of safety and security analysis tools	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Impact on current practices	Done for CS1, CS3
System dependability co-verification and co-validation	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2.Impact on current practices	Done for CS1, CS11

WP4 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
Automatic provision of HARA/TARA-artefacts	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Maturity of the supporting EPF Composer tool 3. Impact on current practices	Done for CS3
System dependability co-architecting and co-design	D4.3 [17], D4.6 [18], D4.8 [19]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Impact on current practices	Done for CS1 and CS11

Table 20. WP5 results to promote for the Industry user group

WP5 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
Evidence Management tool in OpenCert	D5.6 [21], D5.8 [22]	AMASS Prototype	Training and demonstrations	AMASS CS partners. Practically any company interested in OpenCert	Demonstration of OpenCert to third parties, e.g. at industry-targeted events	Need for acceptance of the use of Eclipse technologies	Done for CS1, CS2, CS6, CS7, CS8, CS9, CS10
OSLC-KM approach for tool interoperability	D5.3 [20], D5.6 [21], D5.8 [22]	AMASS Prototype	Training and demonstrations	In AMASS: TRC and CS partners Other: tool interoperability developers	Prepare some video, and next (1) uploaded to the AMASS website and the YouTube Channel, and (2) distribute the links to external parties (e.g. through LinkedIn) All these actions have been performed to generate a first version of this functionality.	Insufficient integration features for a company's specific toolchain	Done for CS3, CS10
OSLC-based approaches for V&V tool integration	D5.3 [20], D5.6 [21], D5.8 [22]	AMASS Prototype	Training and demonstrations	In AMASS: HON, FBK & INT and CS partners	Prepare some video, and then (1) upload them to the AMASS website and the YouTube Channel, and (2) distribute the links to external parties (e.g. through LinkedIn)	Insufficient integration features for a company's specific toolchain	Done for CS3, CS4, CS7, CS10
Extension of Capra tool for traceability	D5.3 [20], D5.6 [21]	AMASS Prototype	Training and demonstrations	In AMASS: AMT & INT and CS partners	Prepare some video, and then (1) upload them to the AMASS website and the YouTube Channel, and (2) distribute the links to external parties (e.g. through LinkedIn)	Need for acceptance of the use of Eclipse technologies	Done for CS4
Data Mining tool for assurance information	D5.3 [20], D5.6 [21]	AMASS Prototype	Training and demonstrations	In AMASS: AMT	Prepare some video, and then (1) upload them to the AMASS website and	At this moment, the technology needs to be	

WP5 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
					the YouTube Channel, and (2) distribute the links to external parties (e.g. through LinkedIn)	further developed in AMASS	
Means for Papyrus interoperability	D5.3 [20], D5.6 [21], D5.8 [22]	AMASS Prototype	Training and demonstrations	In AMASS: CEA, INT and CS partners	Prepare some video, and then (1) upload them to the AMASS website and the YouTube Channel, and (2) distribute the links to external parties (e.g. through LinkedIn)	Need for acceptance of the use of Eclipse technologies	Done for CS4, CS7
Ad-hoc tool integration strategies	D5.3 [20], D5.6 [21], D5.8 [22]	System Quality Analyzer (SQA), Requirements Authoring Tool (RAT). Both tools are part of the SE Suite	Training	In AMASS: TRC and CS partners Other: tool interoperability developers		Need for additional work for tool integration	Done for CS3, CS5, CS11
Approach for automatic translation of requirements	D5.3 [20], D5.6 [21]	INTEROPERABILITY Studio (part of the SE Suite)	Training and demonstrations	In AMASS: TRC and CS partners Others: requirements engineers collaborating with others (customer-supplier, etc.)	Prepare some video, and then (1) upload them to the AMASS website and the YouTube Channel, and (2) distribute the links to external parties (e.g. through LinkedIn)	Dependence on some TRC products	Done for CS3
Knowledge-based automated traceability	D5.3 [20], D5.6 [21]	TRACEABILITY Studio (part of the SE Suite)	Training and demonstrations	In AMASS: TRC and CS partners Others: Quality assurance teams	Prepare some video, and then (1) upload them to the AMASS website and the YouTube Channel, and (2) distribute the links to external parties (e.g. through LinkedIn)	Dependence on some TRC products	Done for CS3

Table 21. WP6 results to promote for the Industry user group

WP6 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
Reuse Discovery	D6.3 [23], D6.6 [24]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Impact on current practices	Done for CS1
Reuse Assistant	D6.3 [23], D6.6 [24], D6.8 [25]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Impact on current practices	Done for CS1
Management of Families-Lines: Variability Management support at process level	D6.3 [23], D6.6 [24], D6.8 [25]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Maturity of the supporting EPF Composer and BVR Tool tools 3. Impact on current practices	Done for CS7 and CS11
Management of Families-Lines: Variability	D6.3 [23], D6.6 [24], D6.8 [25]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies	1. Maturity of the approach 2. Maturity of the	Done for CS7 and CS11

WP6 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
Management support at component level					2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	supporting CHESS and BVR Tool tools 3. Impact on current practices	
Generation of product-based assurance arguments from CHESS model	D6.3 [23], D6.6 [24], D6.8 [25]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Maturity of the supporting OpenCert tool 3. Impact on current practices	Done for CS3
Generation of process-based assurance arguments from EPF Composer models	D6.3 [23], D6.6 [24], D6.8 [25]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Maturity of the supporting EPF Composer and OpenCert tools 3. Impact on current practices	Done for CS11
Compliance management (informal)	D6.6 [24]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training	1. Impact on current practices	Done for CS1 and CS6

WP6 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
					5. Give access to the tools and documentation 6. Get feedbacks		
Compliance management (formal)	D6.3 [23], D6.6 [24], D6.8 [25]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Impact on current practices	Done for CS3
Ontology evolution management	D6.3 [23], D6.6 [24], D6.8 [25]	KNOWLEDGE Manager (SE Suite)	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Exploring this need in the market 2.Define a draft of the functionality to be implemented 3. Implementation 4. Demonstration 5. Get feedback	1. Depends on other TRC product 2. New envisioned feature, maybe the market does not need it or it is not mature enough	All these actions have been performed to generate a first version of this functionality.
Artefact management for reuse	D6.3 [23], D6.6 [24], D6.8 [25]	KNOWLEDGE Manager (SE Suite)	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Exploring this need in the market 2.Define a draft of the functionality to be implemented 3. Implementation 4. Demonstration 5. Get feedback	1. Depends on other TRC product 2. New envisioned feature, maybe the market does not need it or it is not mature enough	All these actions have been performed to generate a first version of this functionality.
Reuse via variability management at the	D6.3 [23], D6.6 [24], D6.8 [25]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information	1. Maturity of the approach 2. Maturity of the supporting tools	All these actions have been performed to generate a first

WP6 Result	Deliverables	Tools	Means	Specific Audience	Actions	Barriers to Entry	Status
argumentation level					3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	3. Impact on current practices	version of this functionality.
Reuse via variability management at the process level	D6.3 [23], D6.6 [24], D6.8 [25]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Maturity of the supporting tools 3. Impact on current practices	All these actions have been performed to generate a first version of this functionality.
Reuse via variability management at the product level	D6.3 [23], D6.6 [24], D6.8 [25]	AMASS Prototype	Training and demonstrations	AMASS CS partners, more broadly AMASS ecosystem	1. Contact with the companies/select 1 or 2 beta test companies 2. Explain the project and send information 3. Demonstration 4. Training 5. Give access to the tools and documentation 6. Get feedbacks	1. Maturity of the approach 2. Maturity of the supporting tools 3. Impact on current practices	All these actions have been performed to generate a first version of this functionality.