



D6.2: Communication Plan

M3

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Collaborations from UAQ, UCAN.

Executive summary

Communication plan for the first 12 months of the project. This plan will contribute to the further dissemination and exploitation reports.

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1. Introduction

Communication activities have the aim of generating awareness and interest for the project, both to the benefit of the project, its results and the field in general. Consequently, it will strive to:

- attract potential users, partners and investors for exploitation;
- attract third parties with an interest in the field who may wish to collaborate;
- educate students of the value of the field;
- raise awareness of the importance and potential of the field;
- raise awareness of the availability of public funding in the field, and of the investment made by the Commission to improving the industry.

In particular, we have identified a preliminary list of stakeholders that could be specially interested in the project and that should be a specific target for our communication and dissemination plan:

- Scientific community interested in the new techniques and methods developed as part of the project.
- Industry involved in all kinds of activities around the embedded systems domain.
- Civil society and general public.
- Media that could find our results relevant enough to be disseminates to their own readers.
- Investors that could see opportunities in the commercial exploitation of MegaM@rt2 results via partnerships with some of the consortium partners.
- Customers that could see the benefits of applying MegaM@Rt2 tool to solve their specific problems.

Awareness of the project among all these communities will be realized by conducting the activities described in the next sections with the goal of achieving the following KPIs by the end of the project:

KPI for Dissemination Outputs	Quantitative aim
Scientific publications (and presentations) in conference proceedings	21
Workshops at specialized conferences	5
Videos	2
Scientific papers in peer-reviewed journals	6
White papers	4
Press releases	6
Website visits	15000 (50% spending over 2 minutes)
Presence in Social Media	Twitter followers: 400 Linkedin discussions: weekly

Note that each community will be targeted through one or more of the following channels: online presence, scientific dissemination, standardization actions and open source software development. Each section provides more details on the specific actions and venues to target, including those actions that are planned for the first year of the project.

Subsequent updates on the communication and dissemination plans will refine the targeted stakeholder profiles and the most effective ways to reach them based on a continuous monitoring of the current actions and the evaluation of their effect.

2. Online presence

2.1. Logo

The project logo was chosen out of several logo proposals prepared by designers at Design-hill¹. Several versions of the logo are available to facilitate its integration in the different MegaM@Rt2 documents (color, black and white, landscape,...)



Figure 1: MegaM@rt logo - landscape version

2.2. Project website

The website of the project is now live at <https://megamart2-ecsel.eu/>

The website is powered by WordPress², the most popular content management system nowadays. The site resides in a WPEngine³ (a specialized WordPress hosting provider) account administered by the UOC partner. WPEngine offers automatic backups, automatic WordPress updates, security protection and other services that guarantee the uptime and responsiveness of the website. The design of the website has been created with the Divi theme by Elegant Themes⁴.

The website is currently composed of a home page, an overview page, a partners page, a news page as well as a follow and contact pages. The **home page** provides basic information on the project challenges, technical contributions and potential impact. The **overview page** elaborates on the main objectives and the technical approach to be followed in the project. The **partners page** lists all project

¹ <http://www.designhill.com/logo-design/>

² <https://wordpress.org/>

³ <https://wpengine.com/>

⁴ <https://www.elegantthemes.com/gallery/divi/>

partners, grouped by national clusters. The **news page** will report on all kinds of news related to the project evolution: meetings, presentations, articles, tool releases,...

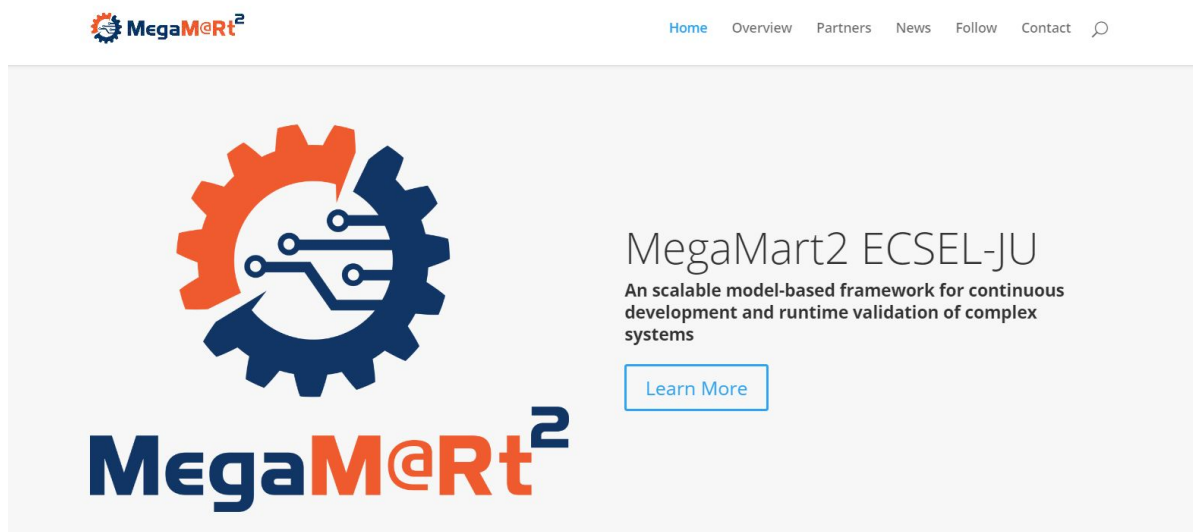


Figure 1: Home page

Tracking and web analytics have been also put in place so that we can monitor the growth and behaviour of visitors to the website.

2.3. Social Media

The twitter account of the project is @MegaMart2_ECSEL⁵. Both this twitter account and the hashtag #MegaMart2 are monitored to be able to interact with other twitter users

2.4. Interactions with other existing online communities

As part of community building tasks, we will make sure to interact with other established communities. In particular, we will cover at least:

- LinkedIn groups relevant to the project, including UML Lovers⁶, MBSE⁷ (Model-based Systems Engineering), Model-driven Architecture⁸ and Model-Driven Development Forum⁹, with around 20.000 members altogether.
- Eclipse community, including its working groups Polarsys¹⁰ and IoT¹¹. Given that many of the MegaM@Rt2 tools will be based on Eclipse infrastructure we expect the Eclipse community to be very receptive to MegaM@Rt2 improvements. We aim to present MegaM@Rt2

⁵ https://twitter.com/MegaMart2_ECSEL

⁶ <https://www.linkedin.com/groups/143183>

⁷ <https://www.linkedin.com/groups/4036633>

⁸ <https://www.linkedin.com/groups/50539>

⁹ <https://www.linkedin.com/groups/155446>

¹⁰ <https://www.polarsys.org/about-us>

¹¹ <https://iot.eclipse.org/working-group/>

components in the diverse set of Eclipse-based conferences and events (EclipseCon, Eclipse DemoCamps, ...)

- Modelio.org will be used for communication about experimental tools related to Modelio in order to engage the Modelio user's community¹² to try the MegaM@Rt2 tools and methods. Specific tools will be added to Modelio forge¹³.
- Model checking and model-based testing community related to UPPAAL¹⁴ (an environment for modeling, validation and verification of real-time systems). UPPAAL has an open discussion forum group¹⁵ intended for users of the tool.

2.5. Project Summary / Fact sheet

We have prepared a short summary for the project giving the main ideas and key numbers so that any interested party can quickly grasp how the project can help her. This summary is also available online.

¹² <https://www.modelio.org/forum/index.html>

¹³ <http://forge.modelio.org/projects>

¹⁴ <http://www.uppaal.org/>

¹⁵ <http://groups.yahoo.com/group/uppaal/>

MegaM@Rt: MegaModelling at Runtime

MegaM@Rt will provide scalable model-based framework for continuous development and runtime validation of complex systems.

Project coordinator

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Partners:

	SOFTEAM, Thalès, ClearSy, Smartesting, ARMINES, Uni. Pau
	ATOS, Telvent, fentISS, Uni. Cantabria, Uni. Oberta de Catalunya / ICREA, IKERLAN
	TEKNE, Uni. Aquila, Intecs, Ro Technology
	Åbo Akademi Uni, AinaCom, Space Systems Finland, Nokia, VTT, Conformiq
	Mälardalen Uni, SICS, Bombardier, Volvo CE
	Brno University, Camea

Duration: 36 months

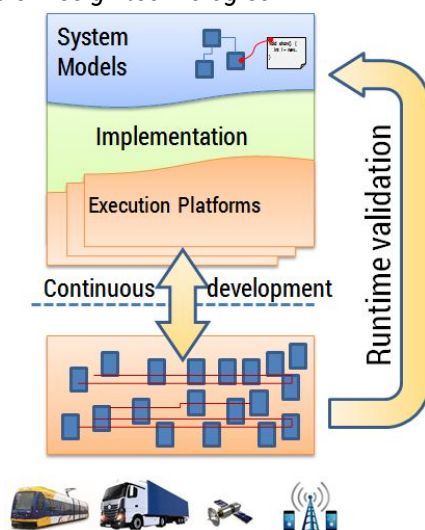
Start: 01.04.2017

Total Cost: €16,5M

EC Contribution: €5M

Call: H2020-ECSEL-2016-1

Topic: Design technologies



Keywords: CPS, Model-based System Engineering, Megamodelling, Runtime validation, Continuous development.

Main Objectives

*MegaM@Rt will create a framework incorporating methods and tools for continuous development and validation leveraging the advantages in scalable model-based methods to provide benefits in **significantly improved productivity, quality and predictability** of large and complex industrial systems.*

European industry faces stiff competition on the global arena. The electronic systems become more and more complex and call for modern engineering practices to tackle productivity and quality. The model-driven technologies promise significant productivity gains, which have been proven in several studies. However, these technologies need more development to scale for real-life industrial projects and provide advantages in runtime. MegaM@Rt brings the model-driven engineering to the next level in order to help European industry to reduce development and maintenance costs as well as to reinforce productivity and quality.

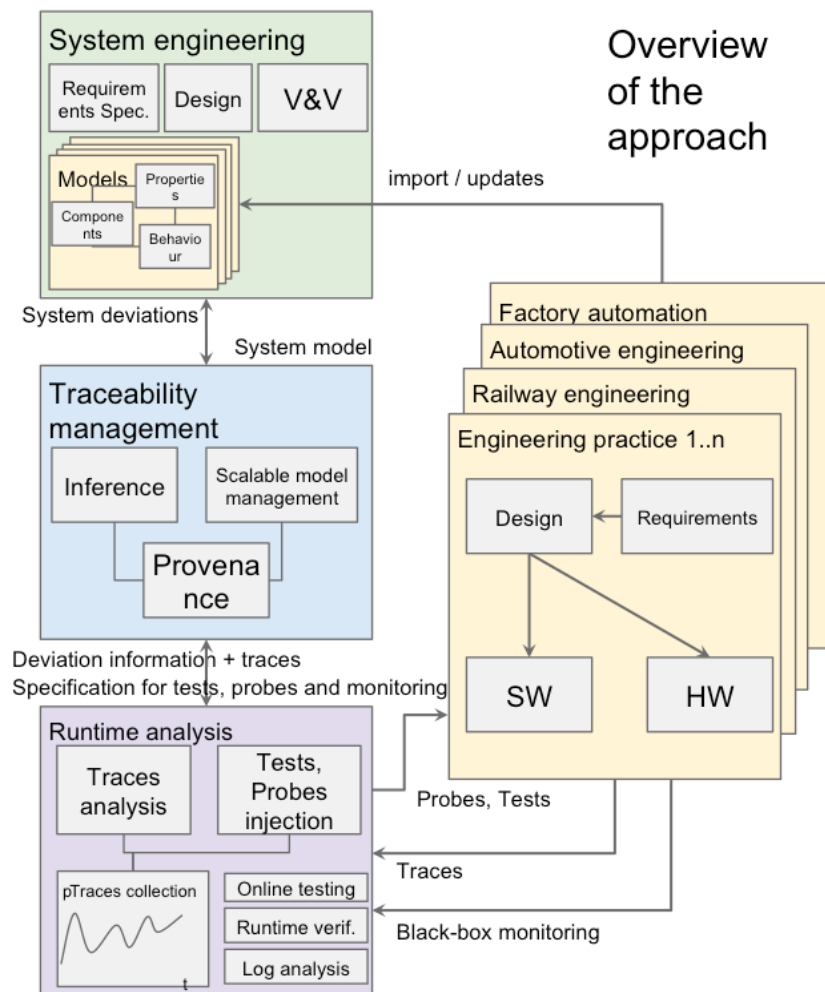
The specific scientific and technological objectives include development of:

- scalable methods and tools for modelling of functional and non-functional properties such as performance, consumption, security and safety with mechanisms for representation of results of runtime analysis.
- scalable methods and tools for application validation at runtime including scalable methods for models@runtime, verification and online testing.
- infrastructure for efficient handling and management of numerous, heterogeneous and large models potentially covering several functional and non-functional domains.
- holistic traceability 1) capable to link and manage models and their elements from different tools as well as 2) suitable for large distributed cross-functional working teams.
- specific demonstrators and validate MegaM@Rt technologies through 10 complementary industrial case studies.

Technical approach:

The overall approach of MegaM@Rt is to scale up the use of model-based techniques by offering proper methods and related tooling interacting between both design time and runtime, as well as to validate the designed and developed approach in concrete industrial cases involving complex systems. To this intent, MegaM@Rt proposes an overall model-based approach combining existing techniques to be enhanced when relevant and novel ones to be developed when needed. A fundamental challenge notably resides in providing efficient traceability support between the two levels (i.e. from design models to runtime ones) and also in collecting corresponding feedback in terms of best practices (e.g. runtime data mining propagated back to design time). In parallel to these, modern large-scale industrial software engineering processes require thorough configuration and model governance to provide the promised productivity gains. Thus, a scalable megamodelling approach will be designed and deployed to manage all the involved artifacts (e.g. the many different models), corresponding workflows, configurations, etc. and to better tackle their large diversity in terms of nature, number, size, complexity, etc.

To cover all these topics and deal with the complete value chain, MegaM@Rt will bring together prominent tool vendors and research organisation with state-of-the-art methods and tools that will be validated in highly relevant European industry case studies. The end users from the maritime, railway, telecom and industry domains will drive the project by providing real-world requirements and case studies as well as by validating and endorsing the MegaM@Rt results.



The MegaM@Rt System Engineering tool set will be designed and developed in order to provide several key features at design time such as (system) model analysis, model verification and validation, or code generation. Its main role is to offer the sufficient tooling support for ensuring consistency between the

system initial requirements or specifications and its models describing both its functional and non-functional properties (existing system models could be enriched with specific properties, including performance ones notably). In addition, the linking and coherence between these system models and their corresponding implementation models will be considered too.

The MegaM@Rt Runtime Analysis tool set will be similarly designed and developed covering fundamental features at runtime such as (runtime) model execution and analysis from reports, logs (error logs, execution traces...), system interfaces, etc. Importantly, it will also provide the needed runtime-specific verification and validation capabilities (relying notably on previously mentioned monitoring and analysis support). To this intent, if not directly available (as models), the required input data will first have to be discovered, retrieved and represented accordingly. Then, traditional methods for model checking and model-based testing will have to be rethought and/or extended in order to fully tackle the specificities of runtime models and contained information.

In a transversal way, a global megamodelling approach will be defined in order to allow integrating together and properly deal with the two MegaM@Rt tool set, related workflows, involved artifacts, etc. Relying on the unification power of models and model-based techniques, this megamodelling approach will notably provide efficient means of describing, handling and managing many different heterogeneous artifacts (models, metamodels, transformations, generators, etc.) implied by the large-scale industrial scenarios in MegaM@Rt. Based on this, a fundamental aspect to be addressed in the project will consist in offering solutions for preserving the relevant traceability information between the design time and runtime time levels, notably in order to be able to report some feedback gained from runtime models/traces observation. Appropriate model-based traces analysis capabilities will also have to be introduced in order to provide useful feedback that actually brings some added-value at design level (e.g. design patterns/anti-patterns identification). Finally, the support for integrating information collected from runtime via the identification of some relevant patterns and anti-patterns (see also hereafter) will be provided as part of this MegaM@Rt Model Management and Traceability tool set.

Key Issues:

As stated in the ECSEL MASP, design methods and related technologies should fully support the constant technology push and corresponding new user/society demands of products/services based on more and more complex Electronic Components and Systems (ECS). This is particularly true in the context of the involved software components (relying on hardware configurations) and their interactions (e.g. with their underlying environment), both being very often numerous, complex, heterogeneous and strongly interrelated. In the past, Model-Based Engineering principles and techniques have already shown promising capabilities that have been experimented in such context. However, they have generally failed in terms of 1) scalability to support real world scenarios implied by the full deployment and use of complex ECS and 2) efficient traceability, integration and communication between two fundamental system levels which are design time and runtime, notably as far as non-functional properties and their verification & validation are concerned.

Expected Impact:

MegaM@Rt targets the following main impact objectives:

- Significantly increased productivity and quality of system development and shorten time-to-market for complex systems.
- Reinforced European scientific and technological leadership in the design of complex systems.
- Improved competitiveness of European companies that rely on the design and integration of complex systems in their products by reducing design and maintenance costs as well as the time-to-market.

3. Standardization

Standardization is one of the most effective mechanisms to project into society research results and long term industrial efforts. Besides, in order to conduct research more fruitfully it is also advisable to follow recommendations from standards that are or may result being relevant in our domains. As part of our MegaM@Rt2 proposal we already stated the need to regularly survey the relevant standardisation landscape to ensure that all applicable standards are adopted. Also, if needed, we envision actions to provide feedback and motivated extensions to their corresponding standardisation bodies in order to promote our needs in the related specifications.

Standardization activities include our influencing participation in standardization bodies like the Object Management Group (OMG)¹⁶ and the International Council on Systems Engineering (INCOSE)¹⁷, but also our presence in other collaborative environments for tools like the eclipse working group Polarsys¹⁸ and the ECSEL project AMASS¹⁹ in order to keep track of those related technologies.

The concrete standardization efforts that MegaM@Rt2 plans to follow and over which we are in disposition to have impact if necessary are shown in Table 1. It also summarizes the current and further envisioned actions we are taking and plan to take towards these efforts. This table enhances the one initially included in the project proposal with more precise activities. Those planned along the first period of the project are meant to keep involvement in the standardization efforts, identify the spaces for improvement and create links of trust to make the community more receptive to our proposals. New actions with concrete extension or modification proposals as well as an assessment of the results of the currently planned actions will be reported as part of the project status periodic reviews.

Table 1: Summary of planned standardization actions

Standards	MegaM@Rt2 standardisation actions	Liaison partners
OMG SysML	<p>SysML offers opportunities to contribute in several efforts in parallel:</p> <p>We participate as voting members in the current Revision Task Force (RTF) for SysML 1.6.</p> <p>Also we follow and participate in its Ports, Flows & Behavior Integration Working Group</p> <p>There is an initiative to prepare a Request for Proposals (RFP) for a new version of SysML denominated SysML 2.0 for which we have provided some initial inputs and in which we will continue to work. This new standard is extremely ambitious and may lead to very disruptive modeling strategies in the OMG.</p> <p>If the timing allows it, MegaM@Rt2 partners will participate in a SysML 2.0 submission team, which will facilitate the inclusion of our project results.</p>	SOFT, TRT, UCAN

¹⁶ <http://www.omg.org/>

¹⁷ <http://www.incose.org/about>

¹⁸ <https://www.polarsys.org/about-us>

¹⁹ <http://www.amass-ecsel.eu/>

	<p>If the submission is not ready by the time the project ends, the work on the system engineering practices integration will be promoted to the community by a specific SysML-like profile, with the needed extensions.</p>	
OMG MARTE	<p>Two main actions are currently active for MARTE:</p> <p>Participation in the new RTF for MARTE 1.2. This encompasses the resolutions and voting for the current active issues in the specification and the editing of the final RTF report.</p> <p>The preparation of a new RFP for MARTE 2.0 which is envisioned as an extended version with capacities to manage complementary DSLs, plus various technologies to serve IoT domain applications and other kinds of specialised analysis for non-functional properties in conjunction with software and hardware design.</p> <p>MegaM@Rt2 plan to contribute to the preparation of the MARTE 2.0 RFP and participate in an initial submission team that responds to it. If possible we may even contribute to the revised submission in the course of the project.</p>	TRT, SOFT, UCAN
OMG UTP2	<p>MegaM@Rt2 will follow and present needed enhancements as issues and resolutions in the context of the Finalisation Task Force (FTF) for the UML Testing Profile 2 (UTP2).</p> <p>Considering MegaM@Rt2 work on the online testing and traceability, the project will propose extensions to UTP2 towards links with SysML and MARTE.</p>	SMA, SOFT, UCAN
OMG Executable UML WG	<p>The executable UML groups of standards is an initiative that promotes the clarification and precision of the semantics of a sufficient subset of UML for its automated executability in functional terms. MegaM@Rt2 will follow and try to impact these efforts in order to maximize the semantic power of the models in place.</p> <p>The currently ongoing actions involve the planning of a roadmap that will align the new efforts for SysML and MARTE with recent specifications like the Precise Semantics for State Machines (PSSM), and the Precise Semantics for Composite Structures (PSCS). PSSM, PSCS, Alf, and fUML are all part of this initiative and will serve as the basis for the new additionally needed specifications. In particular, aspects like timing, interactions, and the precise semantics of profiles application are candidates for the next efforts to address in this context.</p>	UCAN, TRT

4. Dissemination

Effective dissemination is indeed key for attaining scientific and technological cutting-edge results and for fostering the long-term success of the project. The MegaM@Rt2 project will establish a substantial framework for the dissemination of the project results amongst relevant parties and the exchange of useful knowledge among the Consortium itself.

Dissemination is targeted at specific broad audiences: the academic and research audience, the industrial parties, the technical staff of commercial operations and the management of relevant commercial organizations. Additionally, other audiences include policymakers, students, analysts and the media, although the larger portion of the actions aimed at these latter groups will be part of the communication activities.

4.1 Dissemination objectives

The purpose of the dissemination within the MegaM@Rt2 project can be broken down in the following objectives:

- To increase the awareness of the project results among the various stakeholders (e.g. those focusing on a technology specialism, a segment of the market or on use case fields such as energy or transport) within each of the audience identified above.
- To engage and interact with relevant stakeholders outside the project Consortium, both within academia and industry.
- To ensure the visibility and the influence of the project results.

In what follows, we will detail the dissemination plan, along with the groups we target, and the tools we use to disseminate and to communicate the research results. At the end of the section, we will then specify the activities that will be taken in the first 12 months of the project.

4.2 Dissemination plan

The project dissemination activities are planned to be fully aligned with the needs of the various constituencies that will benefit from the project results. The dissemination actions will include coordination with the groups we target.

- **Academic and research communities** - The project will work with existing formal and informal scientific networks including international leading academic, research center and industrial organizations. It will be aimed at organizing conferences and opportunities to disseminate the project results and gain further input from industry and the university. Furthermore, the communities will be targeted through journals and papers.
- **Industry** - The project will work with the industrial partners and existing international networks of organizations targeted to increase the knowledge available. On site demonstrators will be established at industrial organizations who are partners in the project and who will deploy within their own organizations the results from MegaM@Rt2 within an industrial context of software engineering and development. The experiences will be documented and benefits quantified to showcase the MegaM@Rt2 results within actual industrial environments in the form of case studies to motivate and assist other industrial organizations. Such audience will be targeted also through short white papers and webinar briefings.

- **Commercial organizations** - The project will work with the technical staff of commercial operations and the management of relevant commercial organizations. Such audience will be targeted through demonstrators, walk-throughs, and web material.
- **Other audiences** - The project will work also with other kinds of audience that include policymakers, students, analysts and the media, although the larger portion of the actions aimed at these latter groups will be part of the communication activities. Such audience will be targeted through demonstrators, walk-throughs, and web material.

Dissemination is focused on transferring knowledge, and depending on the knowledge to be transferred and the target audience, different mediums are more apt. The approaches can be combined: for instance, having a journal reference to back up assertions made in a business whitepaper provides credibility. Similarly, associating a technical demo with a business whitepaper allows management to involve more technical staff or vice-versa.

The dissemination actions include the following:

- **Horizontal dissemination material** – Project website, social networks, logo, brochures, templates, and other action that create identity, consistency and awareness of the MegaM@Rt2 project.
- **Event participation** – Project's partners will organize and actively participate in European and International events (such as conferences, workshops, fairs, and congresses, summer schools and special sessions) to transfer the knowledge resulting from the project to the international scientific community.
- **Publications** - Results will be submitted for publications to scientific journals, conferences and workshops relevant to the project's topic. This will ensure the high visibility of MegaM@Rt2 partners' work within the scientific community.
- **Educational material** - Curricula of relevant graduate courses will be updated with the project's results, i.e. developed design methodologies and tools. In addition to this, Master and PhD students will be invited to work on specific topics linked to the project.

4.2.1 Dissemination approach

Wherever possible, research results will be communicated for the creation of external awareness and knowledge building within the targeted European software developer and scientific communities. The communication should guide and prepare potential users for the benefits and improvements that will be made possible by the expected outcomes of the MegaM@Rt2 project. For dissemination to be effective, several means will be used covering academic and industrial domains: publications in journals, and conferences, participation in national and international events, workshops and press releases. Each beneficiary will ensure open access (free of charge online access for any user) to all peer-reviewed scientific publications relating to its results.

MegaM@Rt2 is an enabling technology to the field of embedded systems software. While developers of embedded software will see the technical benefits directly, their management level must also be addressed by the MegaM@Rt2 offering, by making the benefits clear and understandable for a less-technical, broader audience. Furthermore, simplifying embedded systems software development should make it available to a wider set of IT companies, currently seeing this area as too specialist. MegaM@Rt2 must also get through to potential new entrants to the industry, who will not be able to identify directly with the technical benefits. Thus, to get the technology widely accepted its potential must be clear and understandable for a broad audience. MegaM@Rt2 will ensure its potential benefits

are easy to grasp by several actions, of which the most important ones are the involvement of the industry follower group and the regular surveys that will be carried out.

4.2.2 Dissemination mediums

The main mediums considered for dissemination in MegaM@Rt2 are:

- Peer-reviewed journals;
- Conference presentations and proceedings;
- Whitepapers;
- Tutorials (such as web tutorials or hands-on workshops);
- Demonstrators (both downloadable and video);
- Website documentation;
- Webinars;
- Workshops;
- Academic and industrial communities
- Other European Projects (for instance two other ECSEL projects, Enable3S and SeFeCop, have expressed such interest).

Regarding the scientific publications, we strive to follow EU/EC regulations to publish in open access forums. In addition, we will make all the publications freely available on the project website.

Dissemination KPIs are combined with communication KPIs, shown below. By way of illustration, the following is a collection of potential publication channels. This collection contains significant journals and conferences both within software engineering in general, as well as more specialized ones within fields such as System engineering, Embedded Systems, Formal methods, MDD, Complex Systems, Quality in Software Engineering. The idea is to introduce the major project results to the software engineering community at large, while also stimulating further advances in research in related areas.

Table 1 : List of selected relevant conferences and workshops

Research area	Conferences & Workshops
Software / System engineering	ICSE - International Conference on Software Engineering ASE - International Conference on Automated Software Engineering FSE - International Symposium on the Foundations of Software Engineering ICSA - International Conference on Software Architecture CSER - Annual Conference on Systems Engineering Research INCOSE - Annual INCOSE International Symposium SoSE - International Conference on System of Systems Engineering Embedded World - Embedded World Conference HiPEAC - European Network on High Performance and Embedded Architecture and Compilation

	<p>MODELS - International Conference on Model Driven Engineering Languages and Systems</p> <p>EMCFA - European Conference on Modelling Foundations and Applications</p> <p>MODULARITY - International Conference on Modularity</p> <p>SEAA - Euromicro Conference on Software Engineering and Advanced Applications</p> <p>SAM - The System Analysis & Modelling Conference</p> <p>ISSE - International Symposium on Systems Engineering</p> <p>SysCon - Annual International Systems Conference</p>
Embedded Systems	<p>DATE - Design, Automation & Test in Europe</p> <p>SEAA - Euromicro Conference on Software Engineering and Advanced Applications - Embedded Software Engineering (ESE) track</p> <p>FDL - Forum on specification & Design Languages</p> <p>DeCPS - Dependable Cyber-Physical Systems Workshop</p> <p>ESOFT - International Conference on Embedded Software</p> <p>CPS Week - Cyber Physical Systems Week</p> <p>ICCPs - International Conference on Cyber-Physical Systems</p> <p>ESC - Embedded Systems Conference</p> <p>RTAS - Real-Time and Embedded Technology and Applications Symposium</p> <p>SAC - Symposium on Applied Computing</p> <p>EWiLi - The Embedded Operating System Workshop</p> <p>SIES - International Symposium on Industrial Embedded Systems</p> <p>RTCSA - International Conference on Embedded and Real-Time Computing Systems and Applications</p> <p>RTNS - International Conference on Real-Time Networks and Systems</p> <p>RTSS - Real-Time Systems Symposium</p> <p>ECRTS - Euromicro Conference on Real-Time Systems</p>

Formal methods	<p>FM - International Symposium on Formal Methods</p> <p>iFM - International Conference on integrated Formal Methods</p> <p>SEFM - International Conference on Software Engineering and Formal Methods</p> <p>ICFEM - International Conference on Formal Engineering Methods</p> <p>ABZ - International ABZ Conference</p> <p>ISOLA - International Symposium On Leveraging Applications Of Formal Methods, Verification And Validation</p> <p>MEMOCODE - International Conference on Formal Methods and Models for System Design</p> <p>NFM - NASA Formal Methods Symposium</p> <p>TACAS - Tools and Algorithms for the Construction and Analysis of Systems</p> <p>FASE - Fundamental Approaches for Software Engineering</p> <p>FORTE - International Conference on Formal Techniques for Distributed Objects, Components and Systems</p> <p>TAP - International Conference on Tests & Proofs</p> <p>ATVA - International Symposium on Automated Technology for Verification and Analysis</p> <p>FACS - International Conference on Formal Aspects of Component Software</p>
Complex systems	<p>ICECCS - International Conference on Engineering of Complex and Critical Systems</p> <p>HSCC - International Conference on Hybrid Systems: Computation & Control</p> <p>ICCPS - International Conference on Cyber Physical Systems</p> <p>IoTDI - International Conference on Internet-of-Things Design and Implementation</p>

Software quality	<p>Conquest - Conference on Quality Engineering in Software Technology</p> <p>MoTIP - Workshop on Model-based Testing in Practice</p> <p>STV - Systems Testing & Validation Workshops</p> <p>TESTCOM – International Conference on Testing of Communicating Systems</p> <p>TTCN-3 User Conference</p> <p>ICST - International Conference on Software Testing</p> <p>ICTSS - International Conference on Testing Software and Systems</p> <p>ISSTA - International Symposium on Software Testing & Analysis</p> <p>ISSRE - International Symposium on Software Reliability Engineering</p> <p>QRS - International Conference on Software Quality, Reliability & Security</p> <p>SAFECOMP - International Conference on Computer Safety, Reliability and Security</p> <p>QUATIC - International Conference on the Quality of Information and Communications Technology</p> <p>REFSQ - Foundation for Software Quality</p> <p>RV - Runtime Verification</p> <p>A-MOST - Advances in Model Based Testing</p> <p>TAIC PART - Testing: Academic & Industrial Conference on Practice & Research Techniques</p> <p>AST - Automation of Software Test</p> <p>MVV - Model Based Verification and Validation</p> <p>ICPE - International Conference on Performance Engineering</p>
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4.3 Partners' specific dissemination plan

ATOS

ATOS is the WP6 leader, thus it coordinates the dissemination and exploitation activities of all the partners in the project. As individual partner, ATOS will take advantage of its media channels, through its marketing department, for disseminating and communicating the project results. ATOS will participate at least in one scientific publication will be produced during the project about its research contributions to the project. ATOS may attend to at least one industrial event per year where to present the project. In Spain, ATOS is chairing the presidency and secretary of the spanish technological platform for promotion and adoption of ICT, named PLANETIC, and therefore, it can use this platform for promoting at spanish level the project results and to engage with local similar initiatives. Both embedded systems and software engineering are two research pillars of PLANETIC.

UAQ

UAQ is the T6.3 leader, thus it coordinates the dissemination through academic activities and industrial interest groups; including participation in conferences, summer schools, workshops, industry

fares and demo days. It coordinates research partners in preparation of courses dedicated to popularize the MegaM@Rt2 approach. Actions will be planned considering the who, when, what, how, why attributes and the KPIs will be established for each area of the dissemination strategy and the results achieved fed back into a constantly evolving plan.

UDA has developed substantial experience in the field of software engineering, model-driven engineering, model management, software evolution and analysis. UDA plans to exploit the theoretical and practical results of the project by disseminating them in terms of international journal and conference papers, and also as tool demos in the context of international events.

UDA will also disseminate the results of the project to undergraduate and post-graduate students of the Computer Science Department. In particular, Advanced Software Engineering and Model-Driven Engineering courses are offered to MSc students where all the aspects related to the development and evolution of complex software systems are taught. Demonstrating concrete applications of such techniques in the context of collaborative research projects such as MegaM@Rt2 is of particular interest to students, who, if properly motivated, can even play an active role in the creation of user communities around the MegaM@Rt2 technologies.

SOFT

SOFT is the Technical Coordinator of the project. SOFT produces Modelio tool suit distributed as open source at Modelio.org and commercially via modeliosoft.com. SOFT will disseminated to the Modelio community with the News Letters, dedicated Webinars and modules to showcase progress and advantages of MegaM@Rt2. In addition SOFT collaborates with many companies and several EU research projects such as INTO-CPS and CPSwarms. SOFT will bring the project results to those communities and will pull new partners to the Foundation. SOFT is active in talks and papers about the research projects. The project ideas and results will be communicated at conferences and industry fairs. Finally, with other MegaM@Rt2 partners, SOFT contributes to the standardization activities at the Object Management Group and the Open Group. SOFT intends to communication about the project in the relevant working groups such as MARTE.

SMA

SMA is a testing tool vendor specialized in Model-Based Testing. The SMA dissemination plan for MegaM@Rt2 will mainly target software testing industrial conference and exhibition. A first event, already scheduled in 2018 is the French Testing Day - JFTL 2018 - in April 2018 with a booth own by SMA to demonstrate the project results.

CSY

CSY is a use case provider working in railway industry. CSY is involved in several research projects about CPS and modeling (INTO-CPS, AMASS ...) and try to share ideas and progress during meetings and events such as the CPS Summer School in July 2017. CSY is also disseminating results internally, to coworkers, with the idea to reuse new methods and technology through future contracts.

ARM

ARMINES, via the participation of the AtlanModels team from IMT Atlantique, will focus on publishing and disseminating its research results and progresses to scientific and/or industrial venues. According to its main interests in the project (i.e. global model management & traceability, as well as related core modeling topics), it will primarily target peer-reviewed international workshops, conferences and journals on Modeling and/or more generally Software Engineering. Different application domains in the direct scope of the project could also be targeted, such as Cyber-Physical Systems or Industrial Engineering for instance. Additionally, and according to its usual way of working, the team will also try

to promote the implemented research prototypes/solutions (under the EPL licence) and their usages when relevant 1) to the industrial partners of the project as well as 2) more globally within the relevant open source communities (e.g. the Eclipse Foundation for Eclipse/EMF-based prototypes).

UPAU

UPAU brings to the MegaM@Rt2 project its experience around model execution. It will be enhanced through the results of the project with verification, logging and monitoring aspects dedicated to model execution or simulation. This will increase the competencies of UPAU in the general field of software engineering. UPAU will participate in the development of tools within the project and in particular in the enhancement of its PauWare engine tool. PauWare is a state machine execution Java library and is distributed under open source licence. It will be extended with technical features for monitoring and verifying at runtime a state machine execution.. These results will be disseminated twofold. First, through scientific papers published in reference journals and conferences of the domain. Second, an enhanced version of PauWare will be made available, still as an open source software (LGPL licence).

UCAN

The main purpose of the UCAN dissemination plan is to strengthen the project visibility on a large scale as well as the engagement of specific interest groups by promoting the knowledge transfer. UCAN will actively contribute to the dissemination of the project results in close cooperation with the rest of partners. To achieve that, the understanding of the target audiences and the preparation of adequate material is a must. Thus, the means used for the dissemination basically depend on the type of information being disseminated and the targeted audiences. For instance, academic audiences will be targeted through paper publications, conferences, as well as guest blogs on relevant sites. Following the best practices from Horizon2020, the key approaches taken to this dissemination and knowledge transfer include: preparation of diverse dissemination assets to assist and complement the dissemination of the project, publication of project's results in relevant scientific journals, presentation of work at scientific conferences and trade events, publication of project's results in whitepapers and trade press publications, generation of video demonstrations and tutorials to be downloadable, organization of workshops, publication of Open Source outcomes and related documentation, thus facilitating feedback from users, etc. Due to the application and innovation focus of MegaM@Rt2, main dissemination channels will be exhibitions, workshops, seminars and tutorials.

UOC

UOC leads the efforts on community building around the project for a broader audience of people, based on its expertise on knowledge dissemination through a variety of channels including blogs and social media. This expertise on social media will also be exploited as an individual partner publishing the UOC's progress within the MegaM@Rt2 project regularly. Additionally, UOC will take advantage of its twofold role as a research group within a teaching organization to disseminate its results to two different audiences. On the one hand, as a research organization, results will be mainly disseminated through peer-reviewed journals and conferences, workshops and open source communities in the systems engineering and model-driven fields. Moreover, as the coordinator of the national network on Model-driven Software Development, UOC will promote dissemination activities targeted to the Spanish community. On the other hand, from a teaching perspective, results of the project will be integrated in the contents of several courses, specially at the master level, since the UOC offers degrees related to computer science plus some masters in computer engineering, free software and information security (among others), and one PhD Programme in this area.

IKER

IKER, as industrial partner, will provide the Smart Warehouse use-case that involves a distributed supervision system. The use-case will allow to deepen on the MegaM@Rt2 Framework, in order to disseminate internally the acquired knowledge (methodologies, tools and technologies) on other IoT-related projects that are being developed by the CyberSecure-IoT group at IKER. Apart from the CyberSecure-IoT team itself, the internal dissemination will be done to other software-related research teams at IKER, with the aim of making them aware of the benefits and cost saves derived from the use of the results of MegaM@Rt2 framework. This will enable to reuse the knowledge acquired on the use-case development on other existing projects and new project definitions, allowing to complete or extend the currently existing software development life cycle, mainly on the V&V (Verification and Validation) tasks.

FTS

The main objective of FentISS within the project is the development of tools to increase efficiency and productivity of the customers that apply our tools in their companies. A model-driven engineering suite for mixed-criticality systems will enable the customer to concentrate on the models rather than having to deal with the implementation details directly. The dissemination will focus on showing to our customers the mentioned advantages. To do this, FentISS plans to have presence at national and international exhibitions and fairs (DATE, ASD Days, Industry Space Days-ESA) where Xamber and the cross development IDE tool will be presented. It is also important to make scientific dissemination in real-time systems and mixed-criticality systems community and to take part in academic and industrial clusters. We will attend and participate in some conferences (ECRTS, HIPEAC, ...). We will be also focused on the development of training material of our tools and the participation in summer schools presenting the main topic "Implementation and configuration of partitioned systems".

TEK

TEKNE, as industrial partner, will focus on the knowledge and the applicability of MegaM@Rt2 methods and tools. For the internal dissemination among its technical personnel, TEKNE will organize training courses held by the University of L'Aquila (UAQ), with whom it wants to collaborate also with stages for master degree, and with its case study that can be the experimental setup for doctoral thesis. For exploiting MegaM@Rt2 MDE practices, and on the basis of the experience resulting from its case study, TEKNE will analyse the impact the transition to consolidated MDE practices can have: the advantages, how the industrial development process must be modified, which resources are needed.

INT

Intecs is an Italian private Company, founded in 1974, at the forefront in the development of high-tech electronic systems for the Aerospace, Defence, Transportation and Telecommunication markets. Leadership in these markets is constantly pursued through innovation and product quality.

Internally, awareness actions will be implemented to propagate the use of Megam@rt2 technologies within the organisation (e.g., among other, training courses, frequently proposed to maintain the high level competencies of its personnel, will be updated including specific MegaM@Rt2 titles).

Informational and promotional activities will be also provided with respect to national and international customers and partners. Intecs therefore has the power to bring the MegaM@Rt2 technologies to a wide range of different domains in the Europe.

In addition, Intecs will exploit the collaboration established by the CHESS project with the PolarSys initiative under the Eclipse Foundation. PolarSys is an Eclipse working group created by large industry

players and tools providers to collaborate on the creation and support of open source tools for the development of embedded systems.

New open source technologies as well as extensions to CHES technologies developed within MegaM@Rt2 will be submitted for distribution through PolarSys in order that the project benefits from the growing community of PolarSys supporters and contributors.

RO

Ro Technology, as SME and industrial partner, disseminates MegaM@Rt2 activities and results to its network of industrial, business, academic and public actors, along with other partners and institutions, developing a business plan based on *BPL (Business Plan Light)* and *BMC (Business Model Canvas)* methodologies.

The communication activities will be implemented by identifying customer segments and planning the better “channels” and “relationships” to reach and retain new customers. In this way, RoTechnology dissemination strategy plan will be done on two levels:

- For its consolidated relationships, it actively disseminates its results involving both partners and clients: its main clients in Italy like Ericsson, Leonardo SpA, HP, Octo-Peugeot, Reply-British Telecom, Poste Italiane, SDA, Ministry of Economy, Ministry of Agriculture, Civil protection and Municipality of Rome and with academic partners in Rome (University of Study “La Sapienza”, University of Study “Roma Tor Vergata”, University of Rome LUMSA) and L’Aquila (University of L’Aquila). In South America, through and thanks to APRE Institute: Pontificia Universidad Católica Argentina, Ministerio de Ciencia, Tecnología e Innovación Productiva Argentina, Ministerio de Salud Publica Republica del Uruguay, World Health Organization in Panama and with others partners in Singapore (through Italian Trade Agency - ICE).
- For new clients and partner: it will implement a communication strategy and campaign to reach both new clients and partners who are interested in technical solution about model-driven engineering, embedded systems design and wireless communications.

Communication activities will also be made by disseminate information on social networks, where we work very actively (especially Facebook, Linkedin and youtube), both on our website and on the web page of the project.

ABO

ABO is the Scientific coordinator of the project and will be responsible for the scientific excellence and quality control of the project. In addition, ABO will coordinate deliverables D3.1 - Report on Foundations for Model-based Runtime Analysis Methods, D3.2 - Specification of the MegaM@Rt Runtime Analysis tool set, and D3.6 Methodology and guidelines for MegaM@Rt Runtime Analysis methods and tools. ABO will disseminate the results of the project to our local and European industrial partners not present in the project via bilateral research cooperation and research publications in international conferences and journals. The methods and tool prototypes developed for different tasks will be made available to project partners and to the community.

AINA

AINA is a case study provider working in telecom industry. The case study is a pilot project to other in-house development projects. So practically this means that AINA is disseminating MegaM@Rt2 results internally with the idea to reuse new methods and technology through future development projects.

SSF

SSF is a service provider working in safety and mission critical embedded systems. In the project SSF is further developing its runtime verification technology and supporting case study providers. Internal dissemination activities in MegaM@aRT2 will focus on informing SSF customers and stakeholders. External dissemination activities aim at publishing results in scientific workshops and conferences.

NOK

Nokia is a case study provider working in telecom industry and WP5 leader. The case study is a pilot project to other in-house development projects. Nokia will study and evaluate the effects of MegaM@RT2 results by comparing them against Nokia's current solutions for R&D Way of Working. Studies and evaluations of this work will be published in master and doctoral thesis level and possible other graduate works. Results will be published in research papers at conferences.

VTT

The main focal point of VTT in dissemination is through the publication of research in the forms of symposium workshop, conference & journal papers. Additionally, presentations will be held at opportune events. The intention is facilitate the creation, development and completion of MSc (and potentially PhD) theses. VTT will perform the role of shifting state-of-the-art scientific research into tangible and practical prototypical solutions targeted at industrial case studies. The results of project will be disseminated also beyond the consortium of MegaM@RT2.

CON

Conformiq is a commercial company whose business model is based on licensing model-based testing technology. Conformiq will use to any applicable extent the results of MegaM@Rt2 to promote model-based testing in the industry and to support its own model-based testing tools business. Based on the company's long experience in the model-based testing domain, Conformiq will make contributions to the creation of presentation and productizing material. Furthermore, Conformiq aims to

- Demonstrate the state-of-the-art model-based testing technology available from Conformiq to create and boost markets for commercial model-based testing tools,
- Gain new research and technology insights and exploit these insights in the company's commercial offering to gain competitive edge
- Employ the informational and marketing material to get an increased marketing efficiency
- Capitalize the increased awareness of model-based development and testing enabled by MegaM@Rt2 to result in increased sales volume of Conformiq tools, and
- Publish academic and/or industrial research papers on international forums in order to gain credibility as the global technology leader in model-based testing and as such establish a defensible position as market leader

BT

There is an active model-driven systems engineering effort taking place at BT and MegaM@Rt2 results are exactly inline with such an internal BT initiative. In this context, BT is promoting MegaM@Rt2 internally as a relevant project, through company-wide presentations. The MegaM@Rt2 results are also expected to influence the standard procedures and processes for model-driven engineering at BT and thus the MegaM@Rt2 results will continuously be disseminated through internal seminars and presentations to relevant stakeholders. Lastly, BT is a global organization, therefore it is expected that MegaM@Rt2 results will also be spread across BT work locations

worldwide for early adoption, through internal communication channels as well as international site visits.

MDH

MDH will perform technology transfer from MegaM@Rt2 project to other research projects and divisions internally. Findings from studies within MegaM@Rt2 will be disseminated internally as well as globally within the research community through academic publishing process and scientific conferences and workshops. Project results will be used in master, graduate and PROMPT industrial education. MegaM@Rt2 results will be integrated into basic and advanced level V&V courses (e.g., Model-Based Testing course). MegaM@Rt2 results will be transferred to and validated in different industrial settings, and deployed at partner companies.

SICS

The main form of dissemination activity for SICS will be through publication of research papers and articles on MegaM@Rt2 as well as holding events and workshops where project results are communicated to researchers and practitioners outside the project consortium. Moreover, as a research institute bridging between academia and industry, SICS can also help with the transfer of project results to other industrial partners through different channels such as several other projects that involve our industrial partners. Internally at SICS, other research groups and departments will be updated on project results and progress via internal seminars and talks that are regularly held. SICS is also very active in organizing exhibitions and workshops which attract many organizations and institutes; this can serve as another dissemination channel for MegaM@Rt2.

BUT

As an academic partner, BUT will disseminate project results by means of various presentations at research and scientific as well as non-academic events and in academic courses. Master- and PhD thesis will be published linked to our contribution to the MegaM@Rt2 project too. Project results will also be disseminated to partners outside the consortium through our participation in future industrial as well as RTD projects. We will present intermediate and final project results to the members of the Industrial Board of the Faculty of Information Technology, BUT, which is mainly formed by local business players in the IT area.

5. Sustainability plan - Open source software and the MegaM@rt2 Foundation

MegaM@Rt2 commits to make available project results as open source. Given that open source policies allow service commercialisation and dual commercial licensing, MegaM@Rt2 partners are flexible to choose the commercialization routes within the joint Foundation (see below).

The consortium partners are familiar with, and proponents of, Open Source Licensing and related openness concepts. The default position is for software to be open source, publications to be open access and documents to be licensed as creative commons. However, where the business case or business model is such that disclosure is counter-productive, the individual partners will have the

option of claiming and protecting their IP rights.

The website may become a hub for the open source community, although as specialist tools exist for this, the project website may link to an alternative site for this activity. For instance, an organizational GitHub repository will be created to store and centralize all new open source projects generated during the project.

The initial list of exploitable results is shown below. During the project this list will be updated periodically, reflecting the maturity of the technical progress.

Table 2: Exploitable tool results

ID	Exploitable result description	WP	Presumed License
ER1	MegaM@Rt System Engineering Tool Set Set of tools and guidelines integrating the MegaM@Rt system modelling, design time V&V and user interface modelling methods.	2	Open source (Apache, Eclipse)
ER2	MegaM@Rt Runtime Analysis Tool Set Set of tools and guidelines for automated code generation involving aspects weaving and model execution, continuous runtime validation including runtime verification, monitoring and online testing as well as trace analysis.	3	Proprietary and open source
ER3	MegaM@Rt Model Management & Traceability Tool Set Set of tools accompanied by corresponding methodology and practical guidelines providing useful features for dealing with scalable megamodeling/model management, traceability and the related scalable model-based techniques.	4	Open source (Apache, Eclipse) and proprietary
ER4	MegaM@Rt Framework Integrated framework and guidelines of all MegaM@Rt tool sets for continuous development of complex CPS systems including integration of runtime and design time system levels.	5	Proprietary and open source
ER5	MegaM@Rt Business Plan Plan on exploitation of MegaM@Rt technologies including business models and activities planning.	6	Proprietary

It's well known that most open source projects fail shortly after they were created due to their inability to build a long-term community around them. To make sure this does not happen with MegaM@Rt2 open source projects, we have prepared a sustainability plan for MegaM@Rt2 involving the creation of the MegaM@Rt2 foundation. A lynchpin of this sustainability approach is to ensure a sustainable trajectory for the results after the project ends. This is based on two motivations. Firstly, that it is of

common interest to all the partners. All exploitation plans, including of academic partners, will require the availability, further development and support for the results, hence a common structure is a way to share costs. Secondly, there is a time to market between any research prototype and commercial offering. Frequently the final delivery of the prototypes coincides with the final quarter of the research grant, yet a buffer period in which organisations (both potential providers and users from within and outside the consortium) can react to these final prototypes is necessary. Setting in place a mechanism to govern this incubation period, and then hand over its control to interested parties is a prerequisite for success.

Indeed, the consortium must recognise this challenge and lead to an environment where beyond individual exploitation, the project encourages and foster bilateral agreements for co-marketing, co-development or co-production between its members.

In the case of MegaM@Rt this incubation structure will in the form of an open source community. During the initial stages of exploitation the consortium partners, and potentially third parties, continue to pool their investments. Later this community may evolve, and become a hub for multiple commercial offerings.

In order to oversee the evolution of the results after the conclusion of the grant, the consortium will form a new structure, founded in a governance agreement, akin to a consortium agreement. This will be termed the MegaM@Rt Foundation (or similar).

The consortium has a significant presence in the open source community, particularly through Eclipse.org and Modelio.org, where partners manage a number of open-source projects. Our previous experience has shown that creating a new community from scratch is an expensive and long-term investment, usually beyond the capabilities and resources available to individual research projects. Instead leveraging existing communities by creating projects within that community offers a cost-effective means to the same end. Consequently, MegaM@Rt will take that approach whenever possible, considering the following actions.

Table 3: Open source actions

Communities	MegaM@Rt open source actions	Liaison partners
Modelio.org open source	MegaM@Rt results will be published as open source at the Modelio.org for reinforcing system modelling.	SOFT
Eclipse open source	Megamodelling techniques (e.g. model management and traceability) of the MegaM@Rt results will be made available in the context of Eclipse-based open source projects.	ARM
Polarsys open source	MARTE specific Eclipse tools will contribute to the Polarsys Eclipse project.	TRT, INT

Allying with existing communities does have the disadvantage of being subject to the rules and regulations of the pre-existing communities. The sustainability agreements developed in MegaM@Rt

will reflect these in the governance structure, on one hand protecting the independence and common identity of MegaM@Rt results whilst on the other respecting the norms of the partner communities.

The role of the MegaM@Rt Foundation goes beyond the mere 'mechanics' of publishing code and involving developers. The Foundation must be backed by a management structure, empowered through a charter or exploitation agreement: a contract similar to the consortium agreement that legitimises the decision making, provides a mandate for participants to take decisions on behalf of the consortium, protects individual rights, limits risks and gives a clear mission to the Foundation. Two clear responsibilities of the **Foundation** are the adoption and execution of a **Foundation Action Plan**, detailing dissemination, investment and similar activities, and a **Technical Roadmap** for the future evolution of the results. This approach is starting to become acknowledged as best practice among the project community. Partner ATOS has pioneered this in several FP7 projects across several technology domains and has developed a baseline contract for establishing the structure.

These activities do not start at the end of the project, but form a continuation from the dissemination and communication actions of WP6 and the technical management of the project. That is to say that campaigns to promote the value of the results to providers, their uptake by end users and recruitment of developers from both industrial and research organisations will be ran both during and after the project. Obviously the costs of all activities executed outside of the grant period will be excluded from the grant cost claims by the partners.

Similarly, the management of the Industry Follower Group naturally will become part of the Foundation. Although there is a change from advising research to advising innovation, as part of the transition some Followers could become members of the Foundation, others effectively non-exec directors, others may leave and be replaced by representatives of other stakeholders, such as the investment community.

6. First year dissemination expectancy

According to the indicative values of KPIs for dissemination and communication and the expected academic impact, the actions that will be taken in the first 12 months will contribute to advance in the dissemination and standardization of the project. The major elements of the strategy will be the following:

- periodical newsletters will be prepared and disseminated through project website and partners existing mailing lists. Newsletters will inform readers about the project, as well as about the important milestones and deliverables;
- at least five scientific publications in conference and workshops and two publications in popular scientific magazines will be submitted;
- the project will be presented at least at two international conferences and two other events involving academic and industrial audiences;
- a number of standardization actions, some of them already ongoing, will be carried out, as listed in the standardization section above;
- each partner will participate in European and International events and conferences of relevance that will provide promotion and visibility of the project;
- in order to be cost-effective partners will also actively participate at different events organized by other institutions where the project will be presented;

- each partner will publish at least two press releases and spread it through various means of communication (social media surfaces, offline tools);
- each academic partner will present project knowledge and results in at least two graduate and post-graduate courses and seminars;
- dissemination actions will be implemented through the project website and social networks and pointed out by the number of visits and followers, as well as interactions and discussions.