Project ADVANCE
Grant Agreement 287563
"Advanced Design and Verification Environment for
Cyber-physical System Engineering"

ADVANCE Deliverable D.6.3

Dissemination&Exploitation Plan

Public Document

March 19th, 2013

http://www.advance-ict.eu

D.6.3 DISSEMINATION&EXPLOITATION PLAN
ADVANCE

Approval

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Access List

Internal Access
ADVANCE Consortium Project Team

External Access
To Be Defined

Revision History

Issue	Date	Description	Author
1	19-12-2011	Initial Plan	Luke Walsh
2	25-03-2013	Several Updates, including list of conferences, papers, journals, exploitation plans from each partner	José Reis

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1. Introduction

1.1 Objective

The objective of this document is to set out the plan for dissemination and exploitation of results and information with regard to the ADVANCE project, both during the course of the project and after the project completion

1.2 Scope

The ADVANCE project is a European Research & Development (R&D) project presented under the European Union (EU) Seventh Framework Programme (FP7) Information and Communications Technologies research programme.

The ADVANCE project is composed of seven (7) Work-Packages:

- WP1 – Dynamic Trusted Railway Interlocking Case Study;

- WP2 – Smart Energy Grid Case Study;

- WP3 – Methods and Tools for Model Construction and Proof;

- WP4 – Methods and Tools for Simulation and Testing;

- WP5 – Process Integration;

- WP6 – External Dissemination and Exploitation;

- WP7 – Management;

The Dissemination & Exploitation Plan is produced inside the scope of Work Package 6 (WP6) "External Dissemination and Exploitation", "Task T6.3 Dissemination of Research Results" (with contributions from the remaining WP tasks), whose main goal is to define and execute the plans for dissemination and exploitation activities, including standardisation and the management of end-user interest groups in all operational scenarios.

1.3 Audience

This document is targeted to all project consortium members since all partners are engaged and contribute to the project dissemination activities. More specifically, it is most relevant to partners with assigned responsibilities within WP6.

It is also intended for EC stakeholders, evaluators and independent experts who have special interest on the regular monitoring, progress and dissemination results of the project for evaluation and auditing purposes.

1.4 Definitions and acronyms

Table 1 presents the list of acronyms used throughout the present document.

Acronyms	Description
AD	Applicable Document
CSWT	Critical Software Technologies, Ltd
HW	Hardware
R&D	Research & Development
RD	Reference Document
SW	Software

Acronyms	Description
TBC	To Be Confirmed
TBD	To Be Defined

Table 1: Table of acronyms

1.5   Document structure

Section 1.   Introduction, presents a general description of the contents, pointing to its goals, intended audience and structure.

Section 2.   Executive Summary, provides an executive summary (focused on project goals, objectives and impacts, non-technical) of the ADVANCE project to be used for dissemination purposes by all partners.

Section 3.   Target Audiences / Stakeholder Analysis lists all the stakeholders (interested parties) related to the project and describes their relevance.

Section 4.   Publications, Conferences and Others identifies conferences, journals, and other outlets where the project plans to disseminate its knowledge/results.

Section 5.   Dissemination Material gives details of dissemination instruments to be used in the project.

Section 6.   Internal Dissemination Activities describes dissemination flows within the project.

Section 7.   Partners Exploitation Plan describes each partner exploitation plan for methods and tools developed in ADVANCE.

2. Executive Summary

This document describes the dissemination & exploitation plan for the ADVANCE project. It details how the results and knowledge created in the project will be exchanged with stakeholders, including the project consortium partners, other European projects, the scientific community and other relevant organisations.

The document describes the following dissemination activities to be performed during the project:

- Internal dissemination activities oriented towards ensuring the effective diffusion and application of the results of the project within the consortium, not necessarily limited to project members. To ensure such a transfer, internal meetings will be scheduled by partners and the results will be made public.

- External dissemination activities oriented towards raising public awareness, promoting the products and methodologies of the project and then to consider and plan the application of patents and standards if applicable.

- The scientific results of the project will be presented in refereed conferences and journals related to the areas of formal methods, the railway, transport and energy industries, etc.

- Project results will also be disseminated through the organization of satellite events to top-ranked conferences in the related areas, such as parallel workshops or special tracks/sessions.

The document describes processes to achieve the above goals and instruments that will be developed and used to facilitate dissemination.

The document also describes the plans from each partner to exploit the methods and tools develop in ADVANCE, from a commercial and educational perspective.

3. Target Audiences / Stakeholder Analysis

This section presents the list of project stakeholders identified by the consortium (both internal and external), together with a description of each stakeholder and its relevance to the project. Identifying project stakeholders is the first step towards correctly managing, engaging and identifying their needs, interests and expectations, thus maximizing project success and awareness.

Stakeholder Name	Type of Organisation	Description	Relevance to ADVANCE
Seventh Framework Programme (FP7)	Customer/Project Sponsor	Customer and Project Sponsor	Customer and main stakeholder interested in project objectives and success
End-User Networks	End Users	Already existent End User Networks in the industry and academia	Potentially interested in project results and achievements. Are major networks and instruments for raising project awareness, sharing knowledge and dissemination purposes
Other R&D Projects (incl. ICT Programme Workshops)	R&D Projects	Other R&D projects worldwide that have similar research focus and developments	ADVANCE is interested in the work and research results of other R&D projects within the Formal Methods technological domain. Goals are to: - Stay updated with respect to latest state of the art developments; - Incorporate potential results from other R&D projects into ADVANCE research; - Exchange and share contacts with potential end users; - Raise ADVANCE project awareness and visibility within these other R&D projects.

Stakeholder Name	Type of Organisation	Description	Relevance to ADVANCE
Scientific Community	Scientific Community	R&D experts and scientists working in the field of application	Potentially interested in project results and achievements. Are major recipients for raising project awareness and dissemination purposes

Table 2: List of Project Stakeholders

The following table describes the external dissemination activities to be carried out by the project involving external entities and organizations to ADVANCE. Specific details regarding conferences, journals, etc. are presented in the next sections. The internal dissemination activities, involving internal project stakeholders are detailed in Section 6.

Audience / Stakeholder	Type of Communication	Frequency	Template / Document	Source of Information	Delivered by / to	Notes
ICT working group members	Verbal	Once every year	N/A	ADVANCE Project Information	As applicable	
Customer/Project Sponsor	Written, Verbal	As defined by DoW	N/A	ADVANCE Project Deliverables & Project Progress Reports	Co-Ordinator	
Everybody	Internet via project website	Website will be updated on a quarterly basis depending on the availability of results. This could change as result of events that may occur in between	N/A	ADVANCE Project deliverables	Co-Ordinator	

Audience / Stakeholder	Type of Communication	Frequency	Template / Document	Source of Information	Delivered by / to	Notes
Formal Methods experts	Verbal	This will depend on the periodicity of conference or publications				

Table 3: External Dissemination Activities

4. Publications, Conferences and Others

This section presents the list of relevant conferences where the project plans to submit publications. This list is not complete and should be seen as a first candidate list, subject to additions as project progresses.

Conference/Workshop	Description	Participant	Web Address	Date
Dagstuhl Seminar #12271: AI meets Formal Software Development, Germany	Presentation	Systerel	http://www.dagstuhl.de/mat/index.en.phtml?12271	2012
FM2012 conference and Industry Day in CNAM, Paris	Networking	Systerel	http://fm2012.cnam.fr/	2012
21st Safety-Critical Systems Symposium and at Design, Automation and Test in Europe 2013, Bristol, United Kingdom	Included ADVANCE Booth and presentation on day 3 "A Formal, Systematic Approach to STPA using Event - B Refinement and Proof"	University of Southampton	http://www.safety-club.org.uk/file/210/SSS-2013---v11.pdf	February 2013
Dependability Workshop 2nd Workshop on Dependability and Certification, Coimbra, Portugal	Presentation on track 4 : "Integration of Safety Analysis with Formal Modelling" Knowledge Transfer with STEP (FP7)	University of Southampton	http://www.criticalsoftware.com/dependability-workshop-2013/	February 2013
Design Automation and test (DATE), Grenoble, France	Includes presentation University Booth (Session 5 and 6)	University of Southampton	http://www.date-conference.com/exhibition/ub-programme	March 2013
Reconf 2013, Munich, Germany	Presentation	University of Dusseldorf	http://www.hood-group.com/reconf/reconf-2013/	March 2013
19th International Working Conference Requirements Engineering Foundation for Software Quality, REFSQ 2013, Germany	Presentation	University of Dusseldorf	Refsq.org/2013	April 2013
The Rodin User/Developer Workshop will be co-located with integrated Formal Methods 2013, Finland	Rodin Workshop	University of Southampton, Systerel, University of Dusseldorf	http://wiki.event-b.org/index.php/Rodin_Workshop_2013	June 2013
Dagstuhl proposal Integration of Tools for Rigorous Software Construction and Analysis (TOOLS)	The intention is to to raise broader awareness of the opportunities and need for a more coordinated tool building effort across the state-based formal methods landscape. This workshop should have a lasting effect on future formal method tools and their applications.	University of Dusseldorf	-	September 2013
FMICS	Presentation	University of Southampton	http://lvl.info.ucl.ac.be/Fmics2013	September 2013

Conference/Workshop	Description	Participant	Web Address	Date
24th IEEE International Symposium on Software Reliability Engineering ISSRE, Pasadena, USA	Industry Track Paper Submission	Critical Software Technologies	http://2013.issre.net/	Nov 2013
Complex Systems Conference - CSD&M, Paris, France	Presentation	Alstom, Systerel	http://www.csdm2013.csdm.fr/	December 2013
Forms Format 2013	Details to be confirmed	University of Dusseldorf	http://www.forms-format.de/	TBC
ERTS2 2014 - Embedded real time software and systems, Tolouse, France	Presentation	Alstom, Systerel	http://www.wikicfp.com/cfp/servlet/event.showcfp?eventid=29616&copyownerid=27894	February 2014
NMI Event on Formal Methods, United Kingdom One day event planned for Spring 2014	Workshop will include presentation from CSWT. This workshop will be jointly organised by CSWT and NMI and it aims at bring industry prime contractors and SMEs together to discuss application of formal methods to safety critical software	Critical Software Technologies	http://www.nmi.org.uk/	April 2014

Table 4: Conferences/Workshops

Table 5 presents a list of prestigious journals and technology news websites where the project plans to submit articles.

Journal	Web Address
Control Systems Magazine	http://www.ieeecss.org/publications/control-systems-magazine.html
Vita Technologies	http://vita-technologies.com/
COTS Journal online	http://www.cotsjournalonline.com/
Aviation Today Magazine	http://www.aviationtoday.com/
Military and Aerospace Eletrocnic	http://www.militaryaerospace.com/index.html
Electronics Design	http://electronicdesign.com/
Electronics Weekly	http://www.electronicsweekly.com/Home/
EDN Network	http://www.edn.com/
Automated Software Engineering	http://link.springer.com/journal/10515
Software Tools for Technology Transfer	http://www.springer.com/computer/swe/journal/10009
Formal Aspects of Computing	http://www.springer.com/computer/theoretical+computer+science/journal/165
Intl Journal of Critical Computer-Based Systems	http://www.inderscience.com/ijccbs
IEEE Tran on Software Engineering	http://www.computer.org/portal/web/tse/home

Table 5: Journals

5.   Dissemination Material

5.1   Logo

Logo Type	Logo Image
Base Logo for Print Documents	
Base Logo for Black & White Print Documents	
Logo for Web use	
Large Icon	
Small Icon	

Table 6: Project Logos and Icons

5.2   Press Releases

The project will publish press releases of any major developments that are of interest to the scientific and end user community. The press releases will be event driven. An example of a trigger event could be one of the following: achievement of a milestone suitable for public dissemination; press or media coverage of the project; project participation in an international meeting and others.

5.3   Newsletter

The project will publish a e-Newsletter every six months which will be sent to the mailing lists and made available in the project web site. The project e-Newsletter is an important communication and information dissemination tool, which will contain project updates, related to the work being developed in the project, experiments and field test results, publications made, latest deliverables released, news in the press and on internal events, news regarding the project team, end-user engagement news, etc. The current plan is to publish a newsletter on the following dates: March 2013, September 2013, March 2014, September 2014.

CSWT is going to publish updates on the project through internal newsletters and also external newsletters published on the company website http://www.critical-software.co.uk/media/newsletter/. A first news article has been published on the aforementioned website on the 1st of November 2011.

5.4   Mailing Lists

Mailing lists of stakeholders, including general scientific community and end users will be developed, maintained and grown. The lists will be used for distribution of the dissemination material, such as press releases, newsletters, and other relevant material.

5.5   Media

Project members will seek opportunities for interviews with newspapers and TV networks in order to raise the public awareness about the ADVANCE project.

Social media such as Linkedin and Tweeter are being targeted and the following channels have been created:

The plan is to use these channels for instance to advertise events, conferences, project releases and to reach out industrial partners.

5.6   Leaflets, Flyers & Posters

A project leaflet will be created to distribute at public events. A project poster will also be created using a pop-up roller stand to display at public events.

5.7   Project Web Site

The project web site can be found on www.advance-ict.eu. It was developed as part of deliverable D.6.2. Figure 1 shows the front page of the ADVANCE website and clearly displays the format and layout. The website will be maintained regularly to give up-to-date information about the project and it will grow as the project progresses.

The following materials will be kept regularly updated in the project website:

- List of Publications;

- Project e-Newsletters;

- Press Releases

- Public Access Deliverables

- Other Relevant Project News

Figure 1: Screen Image of the Project Website

5.8   Training Material

Training materials are going to be produced throughout the project mainly by the University partners and they will be made available on the project website under the following URL http://www.advance-ict.eu/training

6. Internal Dissemination Activities

In order to raise internal project visibility, increase buy-in, raise awareness of project activities and results and strengthen group motivation and unity towards ADVANCE team members, several internal dissemination activities will be carried out by WP6 & WP7 inside the project consortium.

Audience / Stakeholder	Type of Communication	Frequency	Template / Document	Source of Information	Delivered by / to	Notes
ADVANCE Consortium	Email	Quarterly	Project e-Newsletter	TBD	Project Manager / Mailing List	Availability Announcement
ADVANCE Consortium	Email?	As per plan	Project Deliverables	Project Deliverables	Co-Ordinator or Project Manager / Mailing List	Availability Announcement
ADVANCE Executive Board	Meeting / Teleconference	Monthly	Meeting Minutes	Meeting	Co-Ordinator or Project Manager / Executive Board	
ADVANCE Consortium	Meeting	Six Monthly	Meeting Minutes	Meeting	Co-Ordinator or Project Manager / Consortium Mailing List	

Table 7: Internal Dissemination Activities

7. Partners Exploitation Plan

7.1   University of Southampton

Educational exploitation: The University of Southampton teaches courses at Bachelors and Masters level on formal design methods. Rodin, Event-B and UML-B are already major components of those courses. We also teach specialised short courses on Rodin and on multi simulation to PhD students. Over the next 18 months, the curriculum for our Bachelors and Masters programmes is being updated. This will give us the opportunity to incorporate new results coming from the ADVANCE project into our teaching programme, in particular, material on combining hazard analysis and requirements traceability with Event-B (WP5), multi-simulation and testing (WP4), decomposition (WP3) and theory extension (WP2).

Commercial exploitation: Since 2010, the University of Southampton has been engaged in commercial activity around Rodin and UML-B through a consultancy company called ECS Partners. ECS Partners is owned of the School of Electronics and Computer Science at Southampton and has a full-time business development manager. ECS Partners has commercial contracts with a number of companies involved in safety critical domains based on Rodin and UML-B. Our role is principally around supporting adoption of Event-B, UML-B and Rodin within the organisations in the form of training, method support, tool support and tool customisation. We find that UML-B, developed at Southampton, is particularly attractive for industrial organisations and we will develop the profile of UML-B further to ease the adoption route by industrial organisations. Our immediate exploitation plans for the ADVANCE results will be to provide adoption support services for companies through ECS Partners that incorporates new results from ADVANCE, in particular, linking safety analysis and UML-B. Where customisation to ProB or ProR are required, we will consider partnering with Formalmind on commercial projects. To manage a potentially larger level of business we will also consider spinning out an adoption support service as a company that is separate to ECS Partners with a particular focus on UML-B. The business model will continue to use the open source tools developed in ADVANCE. In some cases, we will develop bespoke Rodin plug-ins for customers (e.g., specialised code generators) on a commercial basis.

7.2   Alstom

The main motivation of Alstom in participating to the ADVANCE project was to define a safety strategy relying on the validation and proof of an Event-B model allowing providing exhaustive and irrefutable evidence that an interlocking system contributes to ensure safety of train movements by avoiding train collision or derailment due to inadequate management of trackside points and signal aspects.

Concretely the ADVANCE methods and tools will be applied to specify, validate and proof a new system component that controls at runtime that the outputs of the interlocking do not create unsafe situations (i.e. point moving under a train, trains front in front, etc.). This new component, called Interlocking Dynamic Controller (IXL-DC), will be specified formally in Event-B at system level. The Event-B model will be validated regarding functional requirements by means of animation of test-scenarios. It will be checked that the Event-B model captures safety requirements and formally proved that they are satisfied.

The contribution of this approach to Alstom business is threefold. First, it renders Alstom's interlocking systems eligible by the Paris Transport Operator (RATP) that demands its suppliers to prove formally that their interlocking systems are fail safe. Second, it concentrates the IXL's safety demonstration on the IXL-DC, which is smaller and simpler than the IXL and provable, allowing decreasing the safety integrity level of the later and consequently reducing significantly its development, validation and certification costs. Third, unlike other approaches with the same goal, the proposed solution can be adapted to any interlocking, whatever its complexity or implementation technology, since the proof of the

IXL-DC is independent from the number of trackside devices in the interlocking area and since the IXL-DC considers the IXL as a black box producing outputs.

7.3   University of Dusseldorf

UDUS plans to exploit the training material developed within Advance for teaching its master's courses on formal methods.

Formal Mind bridges the gap between science and industry and was founded as a spin-off from the Heinrich-Heine University of Düsseldorf. The foundations of Formal Mind are the two OpenSource products ProB and ProR that make working with requirements and formal specifications easier and more efficient.

The spin-off company Formal Mind (FM) will thus exploit the technical developments made during Advance. ProB and ProR are at the heart of FM's business and the advances in constraint-solving, multi-simulation, test-case generation and requirements management will be directly relevant for FM's activities. The multi-simulation capabilities are also essential to try to enter new markets with formal methods, in particular the automotive sector. Here, FM plans to develop a prototype demonstrator for the automotive sector.

7.4   Systerel

Systerel plans to exploit the results of the ADVANCE project along two lines. Firstly, Systerel will take advantage of the methodological advances and practical knowledge developed within the WP1 case study. This will reinforce Systerel's capability of providing professional services about safety-critical railway systems, applying formal methods at system-level. Systerel is already a leader in this market and the progress made in the ADVANCE project will reinforce this position.

Secondly, Systerel, leading the core platform development, has an intimate knowledge of the RODIN platform internals and design. This permits Systerel to develop very quickly new plug-ins for its internal needs in other commercial projects, and also to provide professional services for developing specific plug-ins for Systerel customers.

Finally, Systerel sells commercial licences of and services using the OVADO product (developed by RATP). The OVADO product is the current leading solution for formally validating safety critical data in the railway domain. It has an architecture similar to that of the RODIN platform (Eclipse based) and shares some plug-ins of the RODIN toolchain. Some of the new developments of the RODIN toolchain can therefore benefit the OVADO platform and reinforce its commercial attractiveness.

7.5   Critical Software Technologies

Critical Software Technologies (CSWT) has been involved in the development of safety and mission critical software and as result of that experience CSWT has identified the need to adopt sound methods to increase the quality of the software. In this sense Formal methods are strategic for the company to consolidate its presence in the aerospace, defence and energy markets. CSWT strategy is to leverage on the experience, knowledge, methods and techniques obtained in ADVANCE. The business plan includes:

- Internal training of additional resources on Event-B and Rodin toolset such CSWT is prepared to get involve in commercial projects or future R&D projects

- Recruit more engineers with relevant background and increase the size of the team specialised on formal methods

- Get involved in follow-up R&D work to further develop the toolset

- o   Invite industrial partners to get involved in the Industrial Interest Group and use that to disseminate knowledge with prime contractors

- Provide support to customers who intend to use the toolset but have not the background or have issues with it being open source

- Apply formal methods on safety or mission critical software development projects

- Apply formal methods on projects involving independent software verification and validations

- Get involved in a working group to support the development of a software/systems/safety engineering standard applicable to markets such as Energy. CSWT has already identified IEC Smart Grid standards as a target. CSWT intention is to include aspects of formal reasoning in the standards as in DO-178C (Formal Methods Suplement)

8.   Future Exploitation Planning

As ADVANCE progresses, WP6 will monitor exploitable results coming from the technical workpackages. Some of these will be in the form of open source tools freely available to any users. Others will be in the form of domain models from WP1 and WP2 whose ownership will be retained by the developing partner.

In the final period of the project, each partners will develop more detailed business plans for exploitation of ADVANCE results elaborating the initial plans outlined in the previous section. Academic partners will continue to introduce ADVANCE results into their teaching and research.

9. Collaboration with other ICT Programmes

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- The OpenETCS project (http://openetcs.org, supported by the ITEA2 program) aims at developing an integrated modeling, development, validation and testing framework for leveraging the cost-efficient and reliable implementation of the European Train Control System (ETCS). To reach this goal, the OpenETCS project has started to use formal methods at the system level. Systerel is a partner in the OpenECTS project. They picked up the Event-B notation together with the RODIN toolchain and associated plug-ins (most notably, iUMLB Statemachines, Model Decomposition, ProB, and ProR). All these tools are maintained and improved within the ADVANCE project. We therefore have excellent collaboration with the OpenETCS project, with exchanges about modeling methodology and supporting tool development. The purpose of the OpenETCS project, although in the same domain, is quite different from the WP1 case study and this collaboration reinforces the awareness of the ADVANCE methodology to other stakeholders in the railway industry.

OPENCOSS is an European large scale integrating FP7 project dedicated to produce the first European-wide open safety certification platform: an Open Platform for EvolutioNary Certification Of Safety-critical Systems for the railway, avionics and automotive markets (http://www.opencoss-project.eu). Alstom is a partner in OPENCOSS and will use this link to exchange scientific and technological results. OPENCOSS is not directly addressing formal modeling an verification so the approach being developed by ADVANCE complements OPENCOSS. The certicifcation strategy being developed in WP1 will take account of certification concepts being developed in OPENCOSS as will the generic work on linking safety analysis with Event-B in WP5.

The DESTECS Project (http://www.destecs.org) was concerned with design methods and tools that bridge the gap between the disciplines involved in designing an embedded system. Members of ADVANCE participated in the DESTECS Summer School in 2012 and concepts from DESTECS on co-simulation are influencing the design of the ADVANCE multi-simulation framework.

The Trans-Atlantic Research and Education Agenda in System of Systems (T-AREA-SoS) is a support action project funded by the European Commission with the primary purpose of formulating a research agenda for the system of systems area that spans US and European activities (www.tareasos.eu). ADVANCE participated in the **T**-AREA-SoS U.S. WORKSHOP held in the US in November 2012 where the ADVANCE case studies and tools were presented. T-AREA-SoS also provided a forum for building links with other relevant FP7 projects on modeling of systems of systems, in particular COMPASS, (www.compass-research.eu/) and DANSE (www.danse-ip.eu/).