

Editorial

It is our pleasure to present the second issue of our Road2CPS Newsletter that includes the activities implemented from the beginning of the project in February 2015 with the aim of carrying out strategic action for future CPS through roadmaps, impact multiplications and constituency building.

All Newsletters are available on our website www.road2cps.eu, as is other interesting information and we invite you to visit the web and also follow us on our social networks (twitter and Facebook).

The Road2CPS Consortium

This second issue reports on activities and events implemented within the Road2CPS project.

Special attention will be given to the initial results achieved since the beginning of the project. A number of external experts and

alliances with entities such as ARTEMIS have actively contributed to the achievement of these results.

We hope this information will be interesting for you.

Yours sincerely,

Strategic action for future CPS through roadmaps, impact multiplication and constituency building



Coordinator:

Dr. Meike Reimann
Steinbeis-Europa-Zentrum

reimann@steinbeis-europa.de
+49 721 93 51 9119

The Road2CPS consortium

What do we understand by CPS?

The term Cyber-Physical System (CPS) describes hardware-software systems which tightly couple the physical world and the virtual world, under the control of humans. They are established from networked embedded systems that are connected with the outside world through sensors and actuators, acquiring data streams from the physical world, establishing and

continuously updating a virtual twin of the physical world and with the capability of interacting with the physical world, following instructions from the virtual sphere. Furthermore, CPSs are not merely networked embedded systems but software-intensive, intelligent systems with the capability to collaborate, adapt, and evolve. CPS can be considered to be the technological foundation for the Internet of Things in which every physical object has a virtual representation and in which the physical and virtual reality form a continuum.

What are you going to find in this Newsletter?

Results of the Roadmapping Workshop

Paris, 24th June 2015



Results of Turin's Workshop

Turin, 8th October 2015



Smart CPS Clustering and Communication Event

Vienna, 14th April 2016



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Road2CPS- Roadmapping Workshop

The first Road2CPS roadmapping workshop took place on 24th June, 2015 in Paris. The workshop was set to discuss and compare visions and priorities of ongoing or recently produced roadmaps in the area of Cyber-Physical Systems (CPS), namely [ARTEMIS-IA_SRA](#), [CPSoS](#), [CyPhERS](#), [Road2SoS](#), [T-Area-SoS](#), [COMPASS](#), [Road4FAME](#), [TAMS4CPS](#) and [Road2CPS roadmaps](#) as well as the [ATOS_Vison](#) on CPS. 22 experts from industry, academia and policy-making participated in the workshop to elaborate on specific CPS-themes, detail priority topics and strategies for implementation.

The discussions between experts coming from the areas systems engineering, CPS, and IoT but also from the domains of manufacturing, energy, transport, and smart city, revealed today's main challenges, possible future strategies and areas where investments and EC funding would be needed.

Strong consensus was on priority themes like interoperability, safety & reliability, modelling & simulation, requirements, engineering verification and reference architectures. Furthermore, for successful implementation particularly demonstrators, platforms, and CPS education were stressed as the most essential (non-technical) themes.

The experts recommended to focus EC incentives on (open) platform building, supporting demonstrators, CPS research, and further open approaches – such as open calls and open source solutions. As show-stoppers, next to high implementation costs, lacking interoperability/standardisation and safety and security issues, as well as the lack of appropriate regulatory and legal frameworks and business models were highlighted.

For more details please find a report on the workshop on our webpage, following the [link](#)

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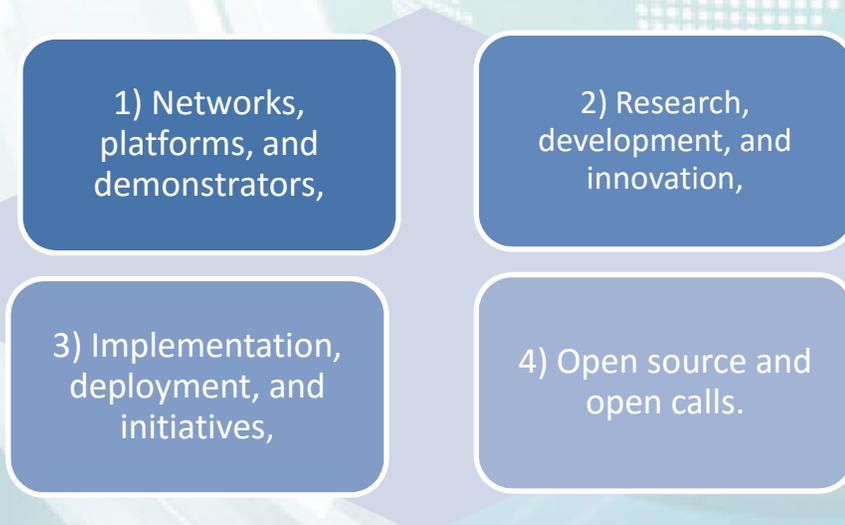
**Dr. Meike Reimann
Steinbeis-Europa-Zentrum**

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The graphs below show priority rankings performed by the participants regarding main topics the EC should invest in (picture 1), funding strategies to be used and main barriers to successful implementation.



In terms of funding strategies that should be implemented by the European Commission, should be from experts' point of view the focus of attention on the following four clusters of themes:



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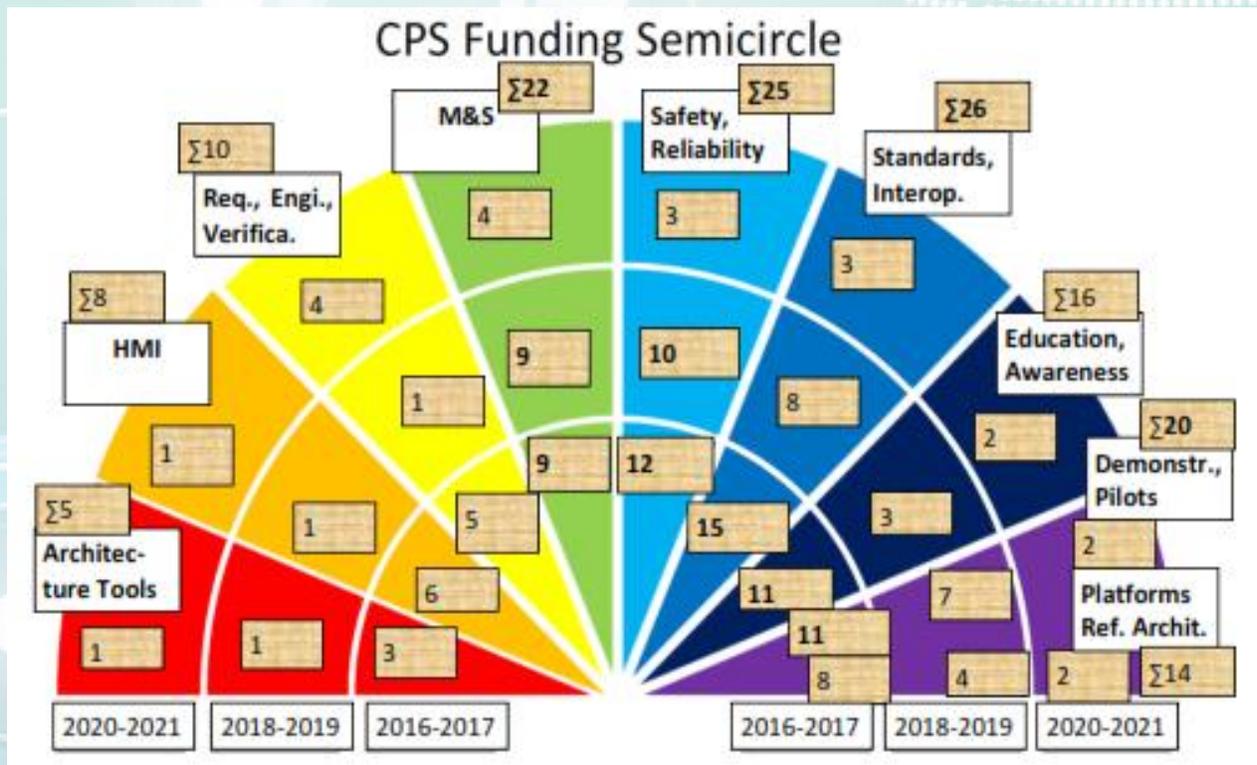


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As potential show-stoppers and barriers a lack of or in other words missing solutions were:

- 1) Standards, interoperability, and integration
- 2) Skills, knowledge, training
- 3) Policy, regulatory, security, and safety
- 4) Business models together with financial issues

The workshop participants underlined that the issues of integration, interoperability, and standards (only where needed) are the most relevant topic in terms of the successful development of Cyber-Physical Systems.



Picture 1

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Road2CPS – Workshop on Future Platforms

8th October 2015. The questions to be solved during the workshop were: **Are platforms a solution for our industrial competitiveness? How can they benefit from CPS, IoT and Big data?**



The main motivation of the workshop was to understand the current situation of European players in the field (ongoing platform activities) and analyse to which extent existing efforts are addressing needs and demands from different industrial sectors in an effective way. Road2CPS gathered 35 experts from industry, academia and policy making bodies with knowledge and experience in open platforms and architectures, both horizontal (cross-sectorial) and vertical (domain-oriented) for this purpose.

They contributed to a lively discussion on platform concepts where some characteristics and challenges for future platforms were identified. Discussions were also useful to create awareness about the different European initiatives and stimulate the alignment and coordination between them.

Participants pointed out that there is a need to further elaborate on such discussions, exchanging views and aligning supply and demand side of platforms. In a next step, the direct platform users / customers should be involved more deeply, as it is crucial to reply to real needs and create a relevant value proposition (avoiding pure technology-push approaches). EU funding for this topic is a need to accelerate the process and has proved to be effective in the last years in terms of maturing platforms as well as strengthening the related ecosystems.

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Such investment is seen to be crucial to bring main actors across the industrial sectors and various disciplines together, to jointly face the challenge. In order to bring EU-platforms to a successful implementation we need to ensure that there is collaboration in research and development, openness in finding new business opportunities, de-fragmentation of initiatives and efforts, constructive dialogue on conveying themes (regulation, privacy, legal frameworks, etc.), building and sustaining the ecosystem, and involving SMEs and getting the commitment of large industry. You can find the complete report by clicking this link

More specifically, seven presentations from the supply side (a view on existing/developing platforms) were provided:

- Crystal (Christian El Salloum, AVL LIST GmbH)
- Arrowhead (Pär-Erik Martinsson, Lulea University)
- Virtual Fort Knox (Ursula Rauschecker, Fraunhofer-IPA)
- FITMAN (Sergio Gusmeroli, TXT)
- [FIWARE](#) (Nuria de Lama, Atos)
- Industrial Ring 4.0: A platform for the Catalan Smart Industry (Sergi Fuiguerola, i2CAT)
- HANA Platform (Raik Hartung, SAP)



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Regarding the demand side (a view on the sectorial requirements and needs), five presentations were provided:

- [CPSos](#) (Christian Sonntag, Eutexoo)
- [Manufacturing/Automotive](#) (Óscar Lazaro, Innovalia)
- [Energy](#) (Alexander von Jagwitz, Baumgroup)
- [Smart Cities](#) (Lanfranco Marasso, Engineering)
- [Manufacturing \(FoF\)](#) Sergio Gusmeroli, Politecnico di Milano

Joint workshop with ARTEMIS to elaborate the SRA update in Turin (the results are confidential): On 7 October a workshop on the future themes of the ARTEMIS-SRA was facilitated by Road2CPS at the ARTEMIS Technology conference in Turin.

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Other project's activities

Upcoming event: Save the date

Smart Cyber-Physical Systems – Clustering and Communication Event



When? 14 April 2016 (all-day event)

Where? Hofburg Vienna, Austria

How do I participate? Registration will open soon.

The event is organized by the Horizon2020 project Road2CPS on behalf of the European Commission in collaboration with ARTEMIS-IA and is free of charge.

The Road2CPS Consortium and the European Commission are delighted to invite you to take part in the **Smart Cyber-Physical Systems Clustering Event**, organised in conjunction with the ARTEMIS IA Spring Event (launch of Strategic Research Agenda update on 13 April) and back-to-back to the international conference "CPS Week" (11-14 April 2016).

This all-day event will bring together about 150 experts from academia, industry and policy-making to learn about and discuss highlights of Cyber-Physical Systems projects from Horizon2020 and ARTEMIS. The event is particularly set to foster exchange on and creating synergies regarding CPS innovation perspectives and generating strategies for the future. Discussion points and inputs from this event will be taken up by the Road2CPS project and fed into the development of a joint action plan for the future development of CPSs.

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EXPERTS GROUP and TASK FORCES

The Road2CPS project will not only build a constituency united by the commonly faced challenges but will also create a joint action plan for the future development of CPSs, with dedicated task forces to further detail and implement/realise the findings/recommendations from impact analysis and foresight activities (roadmapping).

The ROAD2CPS project is carrying out constituency building activities involving experts groups and cross-cutting task forces that will cover a broad range of application domains and include actors from across value chains.

During the workshops different external experts have been invited. We would like to thank all experts for their valuable contribution.

But Road2CPS continues **looking for external experts** to increase the knowledge on CPS. Would you like to become a Road2CPS expert? Visit our webpage (<http://www.road2cps.eu/experts.html>) and register!!!

RESOURCES

Within the Road2CPS webpage (www.road2cps.eu) you can find a number of interesting documents published by the consortium:

- Deliverables

- [ROAD2CPS Deliverable 2.2 Report on market requirements and Socio Economic needs](#): This document aims at elaborating the future vision of Cyber-Physical Systems (CPS), market requirements and socio-economic needs within the domains approached by Road2CPS: Energy, Transport, Health, Smart Production and Smart Cities.

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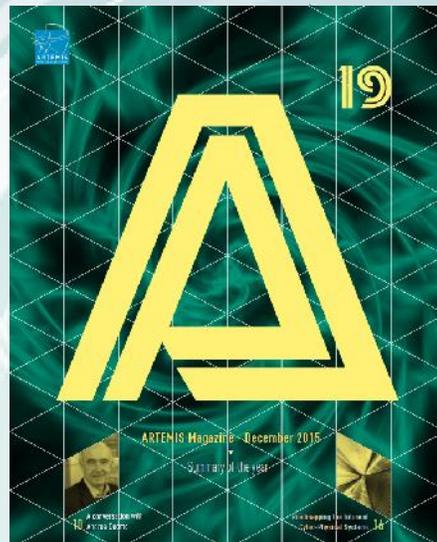
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- Papers

- [Paper based on findings in Road2CPS work accepted for presentation at the UK conference, Ergonomics & Human Factors 2016; 19-21 April](#)
- "Some implications of software-dominated manufacturing for the Ergonomics profession"

- Magazine

[ROAD2CPS in the Artemis magazine 19th December 2015](#)



As well as all the presentations from our workshops that you can find in the links on previous pages.

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Upcoming events

CeBIT 2016

March, 14th to 18th, 2016,
Hannover (Germany)

Road2CPS Workshop "CPS Clustering and Communication Event"

April, 14th, 2016, Vienna (Austria)

CPS Week and ARTEMIS-IA Spring Event

April, 14th, 2016, Vienna (Austria)

NetFutures 2016

April, 20th and 21st, 2016, Brussels (Belgium)

CONNECTED CONFERENCE

May, 25th-27th, 2016, Paris (France)

INCOSE IEEE-systems of systems engineering conference

June, 12th-15th, 2016 Kongsberg, (Norway)

INCOSE International Symposium

July, 18th, 2016, Edinburgh (UK)

If you want to be updated visit our web and social networks!!!!

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