

Cyber-physical systems - a Key Enabler for the Digitalisation of European Industry

CPS Week

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"Digital inside": Innovations in products (all types)



Digital transformations of processes









Radical/disruptive changes in <u>business models</u>







The challenge of digitising industry

Digital transformation of all industry in Europe requires a strong digital sector in Europe

European Commission



Broad digital transformation of all industry offers a unique opportunity to strengthen Europe's digital sector

> "push-pull" or the "virtuous circle"







- A potential <u>1 Trillion Euro added to GDP</u>
 - in the next 10 years from digitisation

- Loss of 600 B€ of GDP per year if Europe lags behind
 - If Europe is slow in in digital transformation

- An annual 10 % increase in industry Added Value
 - (Roland Berger for BDI 2015)
- Up to an additional 1.5 trillion \$ to US GDP by 2025
 - (Mc Kinsey for US admin)



Digitising Industry Initiatives across Europe





European Commission







Platform-building:

- Artemis CRYSTAL, EMC2, ...
- ECSEL Lighthouse Initiatives

Standardisation

CP-SETIS (CPS-IOS)

Linking up and coordinating EU, national and regional initiatives

Boosting EU Innovation Capacity

Widespread digital innovations in all industries: a pan-EU network of **Digital Innovation Hubs**

Strengthening Leadership through Partnerships & Platforms

> ICT standards and Interoperability Testbeds

Smart Regulations for Industry

Preparing Europeans for the Digital Age



Platforms, standardisation, interoperability

- European leadership in open digital platforms for industry
- Building on strengths in vertical markets, develop Europe's presence in cross sector platforms





ΔυτοΣΔR

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Standardized architecture for embedded automotive HW/SW

- Eases cooperation of car manufacturers, suppliers and tool developers
- Facilitates innovation through open standards
- "Cooperate on standards, compete on implementation"

Success story

- Bootstrapped by EU industry (manufacturers, suppliers)
- Worldwide use
- Strong framework programme support (FP6, FP7, ARTEMIS)

Challenges for AUTOSAR

- Connected Car
- Autonomous Car
- Fully electric vehicle

Similar platform in agricultural machinery: ISOBUS

- emerging ecosystem of agricultural OEMs, suppliers, seed companies, IT/big data
- standardise communication/data exchange between tractors, land machines, mobility and control SW
- compete on components and their functionality.

The CRYSTAL platform for safety-critical systems





European Commission

ARTEM

What -reference architecture:

- Open and driven by EU actors Builds on EU leadership on
 - safety-/time-critical systems
- Builds on IOS Interoperability Specification + RTP Reference Technology Platform
 - Reference solutions available Involved in international standardisation efforts

Who – ecosystem:

- 68 actors directly involved
 - Cutting across sectors: rail, automotive, aerospace, health
 - Involving market actors across the full value chains

Potential next steps:

- Synergies with EMC2 platform?
- Reinforce integration across verticals?
- Address new requirements, e.g. autonomy, energy, ...?

PPPs: preparing the supply of digital technologies across the value chains







- Collaborate on digital industrial platforms
 - Across entreprises and grouus of market actors even competitors
 - On a pan-European scale beyond national silos
 - Across PPPs and ECSEL JU
 - Pool MS and regional investments
 - Align MSs Research and Innovation Programmes
 - Reference architectures, testbeds and experimentation, validation
 - Gradually build ecosystems
- ECSEL and PPPs are strong instruments, e.g. lighthouse initiatives
- Good starting point









Programmes related to Cyber-Physical Systems in Europe





Commission

- Build on well identified market-pull demands related to societal needs
- Offer visionary solutions for those demands creating ecosystems along the relevant value and supply chains
- Have a strong pan-European dimension in each of the steps: demands, solutions, ecosystems, technologies, demonstrators.
- Have a <u>strategic IP management policy</u> when possible and agreed by the consortia.
- Whenever appropriate, work towards clustering of projects in the identified areas and therefore organize the attraction of other contributing projects as needed, through a transparent competitive process
- Establish a <u>standardization strategy</u> and drive it
- Address the relevant <u>non-technical aspects</u> (such as legislative, regulatory, social, etc)



Starting from **2016 Calls**







- Digitising European Industry Action Plan
 - Complements and builds on EU, MSs, and regional structures
 - Support building the "glue" providing EU added value
 - 19 April 2016: Communications by EC to EP and Council
 - 25 April 2016: Hannover Messe high-level conference
- CPS: one of the key technologies driving the change
- ECSEL and its Lighthouse Initiatives have a key role to play
- The ARTEMIS SRA 2016 well addresses the Challenges
- International co-operation is important
 - Pre-competitive research
 - Standardisation and interoperability

THANK YOU

Digitsing European Industry http://ec.europa.eu/digital-agenda/en/digitising-european-industry