



Project Deliverable

Project Number: 611115	Project Acronym: CPSoS	Project Title: Towards a European Roadmap on Research and Innovation in Engineering and Management of Cyber-Physical Systems of Systems
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Instrument: COORDINATION AND SUPPORT ACTION	Thematic Priority ICT
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Title D4.1 Web Portal

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PU	Public	X
PP	Restricted to other programme participants (including the Commission)	
RE	Restricted to a group defined by the consortium (including the Commission)	
CO	Confidential, only for members of the consortium (including the Commission)	



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Abstract :

As part of the communication and outreach strategy of the project, a dedicated Web Portal has been set up. This document is a presentation of the initial version of the Web Portal, which shall be regularly updated during the project duration.

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Web site, communication, dissemination

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Revision History

The following table describes the main changes done in the document since it was created.

Revision	Date	Description	Author (Organisation)
V1	28/01/2014	Creation	Dagmar Marron (inno TSD)
V2.1	06/02/2014	Initial Review and Contribution	Svetlana Klessova (inno TSD)
V2.2	12/02/2014	Review and Contribution	Bertrand Copigneaux (inno TSD)
V3	13/02/2014	Final Review	Svetlana Klessova (inno TSD)



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1. Executive Summary

CPSoS will deploy a variety of approaches and well-focused actions to optimize the dissemination of the project and results to its interested stakeholders across Europe.

One of the main tools for dissemination of knowledge gained during the project life-time is the CPSoS web site, which shall be acting as the project’s virtual dissemination vehicle and cooperation platform with other SoS projects.

It provides public access to valuable information, such as e-newsletters, project publications such as the policy document “European research and innovation agenda on SoS”, reference to supporting technical papers, useful links to relevant sources, etc.

The web site is hosted at: <http://www.cpsos.eu/>



Figure 1 - Web Portal overview

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2. Description

In order to assure easy navigation for visitors of the web site, the following eight main sections have been defined and have been placed clearly visible on the top of the page:



Figure 2 - Web Portal menu

Those main sections then redirect the visitor of the web site towards the related sub-sections.

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2.1. Responsive Design

The web site has been designed following the “Responsive Web Design¹” lines, the web site is thus able to adapt to the screen size of the device used to offer an optimal experience to the user.

The following images present the website as viewed on a mobile, tablet or PC.



Figure 3 - Mobile view

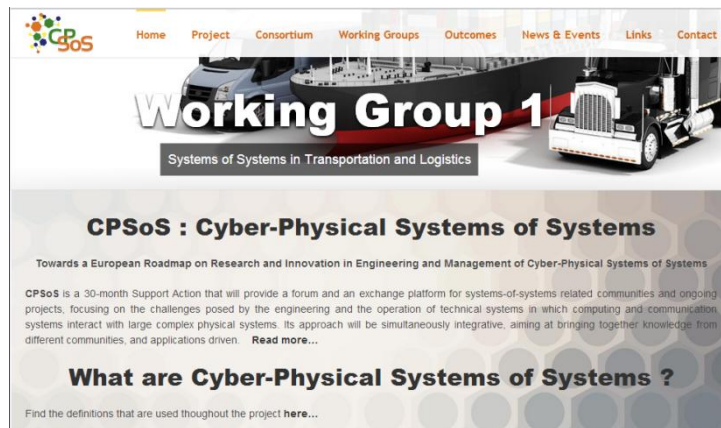


Figure 4 - Tablet view



Figure 5 - PC View

¹ <http://alistapart.com/article/responsive-web-design>

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2.2. Home

The CPSoS home page has been dedicated to provide a first overview about the project, such as

- Title of the project
- Project Headlines (slideshow)
- Brief description of the project
- Link to definitions used
- News section



Figure 6 - Home page

2.3. Project

This section contains the following three sub sections, providing more detailed information about the project, its activities and used definitions.

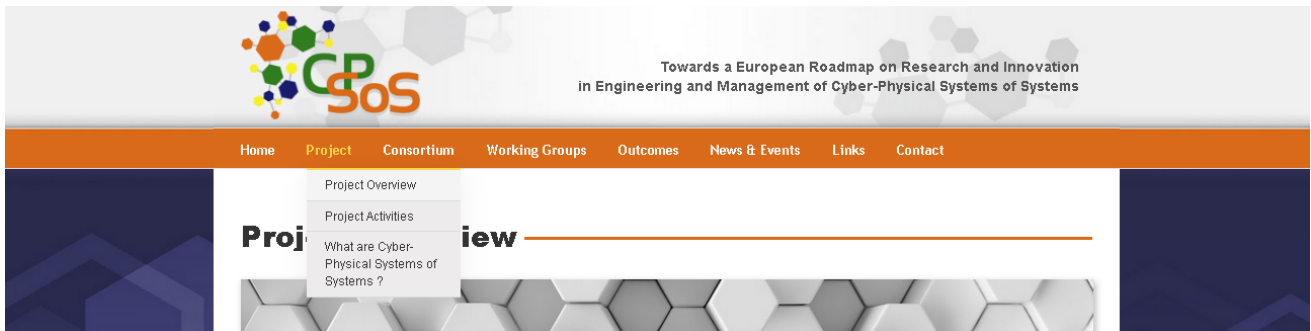


Figure 7 - Project page

2.3.1. Project Overview

Information about background, approaches, methods and tools, as well as the final outcomes of the project are presented in this section.



Figure 8 - Project Overview page

2.3.2. Project Activities

This page provides information about work plan that is followed by the project.



Towards a European Roadmap on Research and Innovation
in Engineering and Management of Cyber-Physical Systems of Systems

[Home](#) [Project](#) [Consortium](#) [Working Groups](#) [Outcomes](#) [News & Events](#) [Links](#) [Contact](#)

Project Activities

The overall aim of CPSoS is to contribute to the coherence of SoS related projects by analysing the needs of the application domains and the state of the art, by deriving common concepts and research challenges, by proposing a European R&I Agenda on Cyber-physical Systems of Systems and by building constituencies for Cyber-physical Systems of Systems.

The project will proceed as follows:

1. Setting up three Working Groups, involving a group of leading specialists from computer science, systems and control, systems engineering, domain experts, end-users and vendors of solutions and equipment and interacting with them throughout the project
2. Analysing the needs and challenges of the application domains and the proposed solutions that are being developed in on-going SoS projects
3. In parallel collecting and relating the theoretical approaches and tools for dealing with systems and systems, in particular those developed by on-going SoS projects
4. Integrating the two views to provide a full picture of which tools and theories seem to be promising for which type of applications and where there are unresolved issues for which new research directions are needed
5. Presenting these findings to the Working Group Members as well as to a larger audience and reviewing the feedback
6. Finalization of the "demand and supply" map of theories and tools for systems of systems
7. Presenting recommendations for a policy document "European research and innovation agenda on cyber-physical systems of systems", supported by a set of technical papers, in a final public symposium "Cyber-physical Systems of Systems Meeting Societal Challenges"
8. Publish the project materials in an edited volume

In order to achieve the project's overall aim, a 30-month work plan has been designed based on 5 interrelated work packages



WP1: Working Groups set-up and preparatory work

WP2: Analysis of the state of the art and of the future challenges

WP3: Contribution to the European Research Agenda

WP4: Outreach and coordination

WP5: Project management

Figure 9 - Project Activities page

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2.3.3. What are Cyber-Physical Systems of Systems

In order to make very clear and understandable what CPSoS is talking about and to make the work of the project and its Working Groups more efficient, definitions have been set up and will be used throughout the project for:

- Systems of Systems (SoS)
- Systems of Systems Engineering (SOSE)
- Cyber-physical systems
- Cyper-physical systems of systems

Those definitions are made public on this page.

The screenshot shows a website page with a navigation menu at the top: Home, Project, Consortium, Working Groups, Outcomes, News & Events, Links, and Contact. The main content area is titled 'What are Cyber Physical Systems of Systems' and contains the following text:

An evolutionary development process is typical for SoS as for any large system that is in operation over a significant period of time. Partial autonomy of several components of a system of systems is constitutive for the concept. Autonomy in this context does not necessarily mean human-free operation except in very specific areas; in contrast, human supervision and human interventions and utilization are usually an important element of the subsystems as well as of the overall system.

From an engineering point of view, this leads to uncertain behaviours but also to the need of making the systems transparent to the users as much as possible.

2) Systems of systems engineering (SOSE)

deals with planning, analysing, organising, and integrating the capabilities of a mix of existing and new systems into a system of systems with greater efficiency or additional capabilities compared to the constituent parts. SOSE is a developing multidiscipline, spanning across and drawing from a variety of disciplines to address complex situations characterised by ambiguity, high uncertainty and emergence.

3) Cyber-physical systems

are systems where real-time computing and physical systems interact tightly. This is also the case in embedded systems, and sometimes cyber-physical systems is used as synonymous for embedded systems, with a stronger emphasis on the interaction with the physical world and on connectivity, e.g. over the internet. The German "Agenda CPS4" is an example of this view.

We here take the concept of cyber-physical systems as **meaning large complex physical systems that are interacting with a considerable number of distributed computing elements for monitoring, control and management which can exchange information between them and with human users.** The elements of the physical system are connected by the exchange of material, energy, or momentum while the elements of the control and management system are connected by communication networks which sometimes impose restrictions on the exchange of information. Prototype systems are the electrical grid, a power plant, an airplane or a ship, a manufacturing process with many cooperating elements as e.g. robots, machines, warehouses, and conveyer belts, a large processing plant with many process units, a building with advanced distributed HVAC control, etc.

4) Cyber-physical Systems of Systems

are cyber-physical systems which exhibit the features of systems of systems:

- Large, often spatially distributed physical systems with complex dynamics
- Distributed control, supervision and management
- Partial autonomy of the subsystems
- Dynamic reconfiguration of the overall system on different time-scales
- Possibility of emerging behaviours
- Continuous evolution of the overall system during its operation.

Figure 10 - What are Cyber Physical Systems of Systems page

2.4. Consortium

This section is presenting the Project Coordinator as well as the Consortium Partners and their main tasks in the project.

The screenshot displays the CPSoS website's 'Project Coordinator' and 'Partners' sections. The top navigation bar includes links for Home, Project, Consortium, Working Groups, Outcomes, News & Events, Links, and Contact. The 'Project Coordinator' section features a profile of Professor Sebastian Engell, detailing his role as the Scientific Project Leader and his expertise in process dynamics and operations. Below this, the 'Partners' section lists four consortium partners: Technische Universität Dortmund (Germany), Haydn Consulting Ltd. (United Kingdom), Technische Universiteit Eindhoven (Netherlands), and inno TSD (France). Each partner entry includes a logo, a brief description of their research focus, and a 'Read more...' link. The 'Technische Universiteit Eindhoven, Netherlands' section is expanded, providing a detailed overview of the university's Systems Engineering group, its research interests in model-based systems engineering, and its participation in various EU and national research projects. The expanded section also lists 'Main tasks in the project' and identifies the user as responsible for the WG3 'Tools for Systems of Systems Engineering and Management'.

Figure 11 - Consortium Page

2.5. Working Groups

The core activity of CPSoS will be three Working Groups, with interactions between them. In order to make their activities easy to understand, four sub sections have been set up.

2.5.1. Overview

This section has been set up to provide information about the topics the Working Groups will be involved with as well as an overview about their objectives and composition.

The core activity of CPSoS will be **three Working Groups**, with interactions between them:

- **Working Group 1: Systems of Systems in Transportation and Logistics**
(Chair: Professor Haydn Thompson, Haydn Consulting, GB)
- **Working Group 2: Physically Connected Systems of Systems**
(i.e. Systems of Systems in Electrical Power Grids, Industrial Systems, Distribution Networks, Smart Buildings – Chair: Professor Sebastian Engell, TU Dortmund, DE)
- **Working Group 3: Tools for Systems of Systems Engineering and Management**
(Chair: Professor Wan Fokkink, TU Eindhoven NL)

OBJECTIVES OF THE WORKING GROUPS

The main objective of the Working Groups will be to prepare a **proposal for the “European Research and Innovation Agenda on Cyber-physical Systems of Systems”**.

The first two working groups will analyse the situation in the application domains in a bottom-up fashion and collect needs for research and development in tools and methods for systems of systems. The third working group will assemble a broad picture of the available tools and methods and of the existing gaps from a methodological point of view. **In synthesizing both views, we expect to develop a broadly supported research agenda for the next decade.**

The Working Groups will:

- identify and analyse common features and differences between applications, industrial and societal needs and the tools and approaches currently adopted
- help assess and interrelate relevant activities as related to systems of systems, synthesise the

Figure 12 - Overview of working groups page

2.5.2. Working Group 1, 2 and 3

One page per Working Group gives more detailed information about the Working Group Chair and Members and will be updated with any other upcoming relevant information during the lifetime of the project.

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in Engineering and Management of Cyber-Physical Systems of Systems

Home Project Consortium Working Groups Outcomes News & Events Links Contact

Working Group 1: Systems of Systems in transportation and logistics

Chair: Haydn Thompson

Haydn Thompson is a Professor of Systems Engineering with a wealth of industrial experience working with major companies. He has been intrinsically involved in European Union System of Systems initiatives being involved in development and coordination of SoS strategy, being an expert advisor to studies commissioned by the EU, funding and review of on-going SoS projects as well as contributor to EU SoS roadmapping exercises.

Working Group Members:

Haydn	THOMPSON	Haydn Consulting Ltd (WG Chair / Project Coordinator)
Carlos	CANUDAS DE WIT	CNRS GIPSA-Lab
Uwe	CLAUSEN	Fraunhofer IML & ITL, TU Dortmund University
Charles	DIBSDALE	OSyS (Rolls Royce)
Philippe	LIATARD	CEA – Leti
Antonio	PASCOAL	IST, Istituto Superior Tecnico
Hermann	KOPETZ	Vienna University of Technology – Delegate FP7 project AMADEOS

- > Working Group 1: Systems of Systems in transportation and logistics
- > Working Group 2: Physically connected systems of systems
- > Working Group 3: Tools for systems engineering and management

Figure 13 - Working Group page

2.6. Outcomes

Public Deliverables and Project Publications shall be made available in this section.

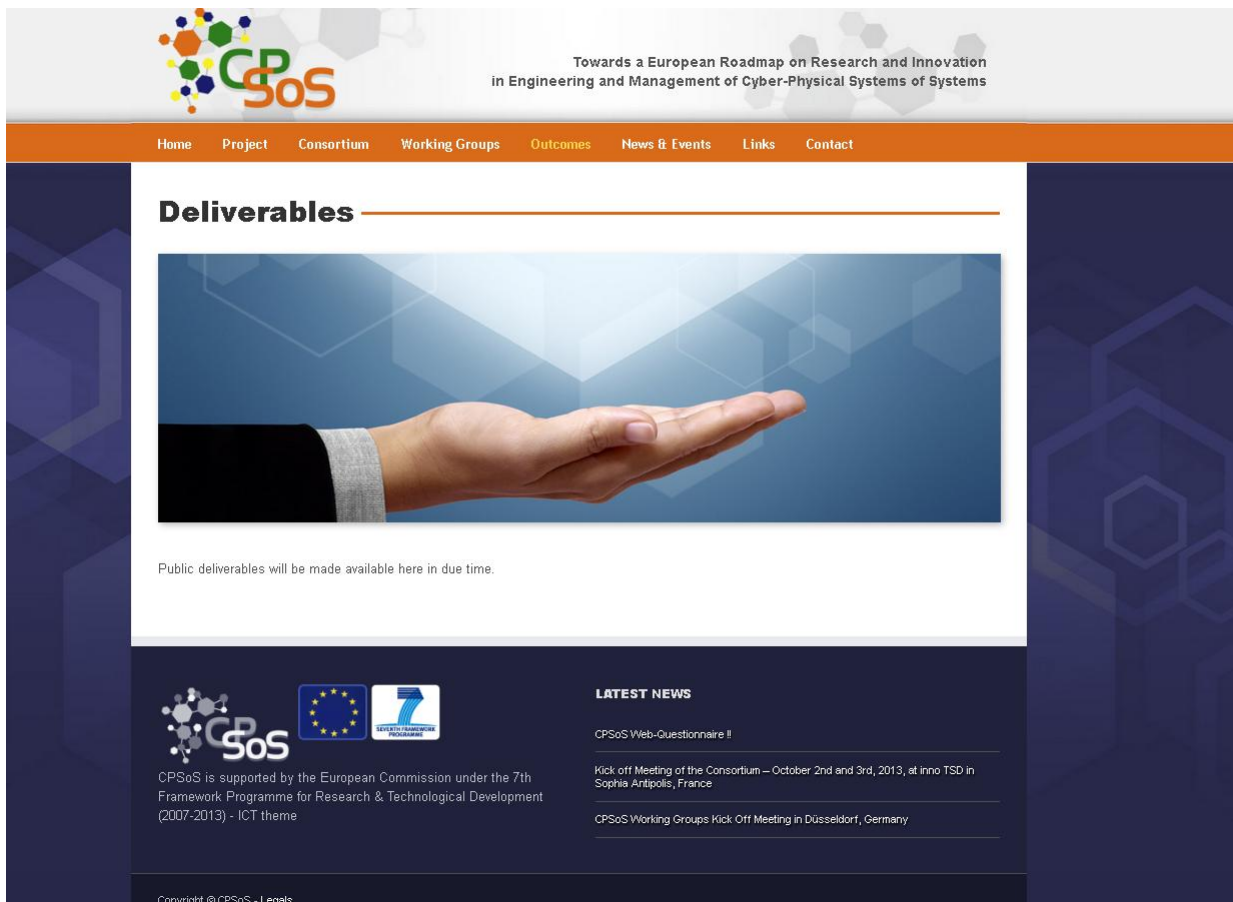


Figure 14 - Deliverable page

2.7. News & Events

This section is divided in three sub sections, dedicated to the publication of

- Project News
- Project related events
- Newsletters (E-newsletters shall be sent out by mail but also be published on the web site)



Figure 15 - News and Event page

2.8. Links

Links to

- other running SoS STREP/IP FP7 projects, having representatives participate in the Working Groups
- related European Commission web pages and
- other related documents

will be published here.

The screenshot shows the 'Links' page of the CPSoS web portal. The page has a dark blue header with a navigation menu. The main content area is white with a dark blue sidebar on the right. The 'Links' section is titled 'Links' and features a large image of a blue circuit board. Below the image, there are several sections of text and links. The 'Current EU related projects on Systems of Systems' section lists five projects: AMADEOS, COMPASS, CyPHERS, DYMASOS, and Local4Global. The 'Related information on the European Commission Web Site' section lists three categories: Cyber-Physical Systems of Systems, Systems of Systems, and Embedded Systems. The 'Related documents' section lists one document: Report from the Workshop on Cyber-Physical Systems: Uplifting Europe's Innovation Capacity. The right sidebar contains 'Recent Posts' and 'Archives' sections.

Links

Search ...

Recent Posts

- > CPSoS Web-Questionnaire !!
- > Kick off Meeting of the Consortium – October 2nd and 3rd, 2013, at inno TSD in Sophia Antipolis, France
- > CPSoS Working Groups Kick Off Meeting in Düsseldorf, Germany

Archives

- > January 2014

Current EU related projects on Systems of Systems :

- **AMADEOS:** Architecture for Multi-criticality Agile Dependable Evolutionary Open System-of-Systems
- **COMPASS:** Comprehensive Modelling for Advanced Systems of Systems
- **CyPHERS:** Cyber-Physical European Roadmap and Strategy
- **DYMASOS:** Dynamic Management of Physically Coupled Systems of Systems
- **Local4Global:** System-of-Systems that act LOCALLy For optimizing GLOBALly

Related information on the European Commission Web Site:

- Cyber-Physical Systems of Systems
- Systems of Systems
- Embedded Systems

Related documents:

- Report from the Workshop on Cyber-Physical Systems: Uplifting Europe's Innovation Capacity

Figure 16 - Links page

2.9. Contact

In order to enable interested public to contact the Project Coordinator or one of the Working Group Chairs, names and organizations are published here once more, and a contact form has been made available.

Contact Us

Home Project Consortium Working Groups Outcomes News & Events Links Contact

Project Contacts

Project Coordinator:
Prof. Dr. Sebastian Engell
Technische Universität Dortmund
Germany

Chair of Working Group 1:
Prof. Haydn Thompson
Thompson Consulting Ltd
United Kingdom

Chair of Working Group 2:
Prof. Dr. Sebastian Engell
Technische Universität Dortmund
Germany

Chair of Working Group 3:
Prof. Wan Fokkink
Technische Universiteit Eindhoven
Netherlands

For more information please contact the Project Coordinator using the form below:

Name (required)

Email (required)

Subject / Working Group

Your message (required)

Submit >

Figure 17 - Contact Us page

2.10. Data gathering

A questionnaire has been put online, asking visitors involved in CPSoS to provide some information that may help to complete the CPSoS activities by including new aspects.

This questionnaire is accessible via the home page, the news section, but also as a post made available on the side bars.

If you have an interest in cyber physical systems of systems (CPSoS), please help us and spend a few minutes to answer our questions.

Your name (required)

Email (required)

Institution (required)

Country (required)

Organisation type (required)

- University
- Research Organisation
- Major Industry
- Mid Cap Company
- SME

Applications you are working with (required)

- Aerospace
- Marine
- Rail

...

Indicate up to 3 of your major on-going projects related to CPSoS

Project 1

Title (required)

Funding source (required)

- EU
- Regional
- National
- Internal

Project 2

Title

Funding source

- EU
- Regional
- National
- Internal

Project 3

Title

Funding source

- EU
- Regional
- National

Figure 18 - Data Gathering form

2.11. RSS Feed

The web site news and events will be automatically published in a RSS feed to allow interested stakeholders to subscribe to the project information:

<http://www.cpsos.eu/?feed=rss2>

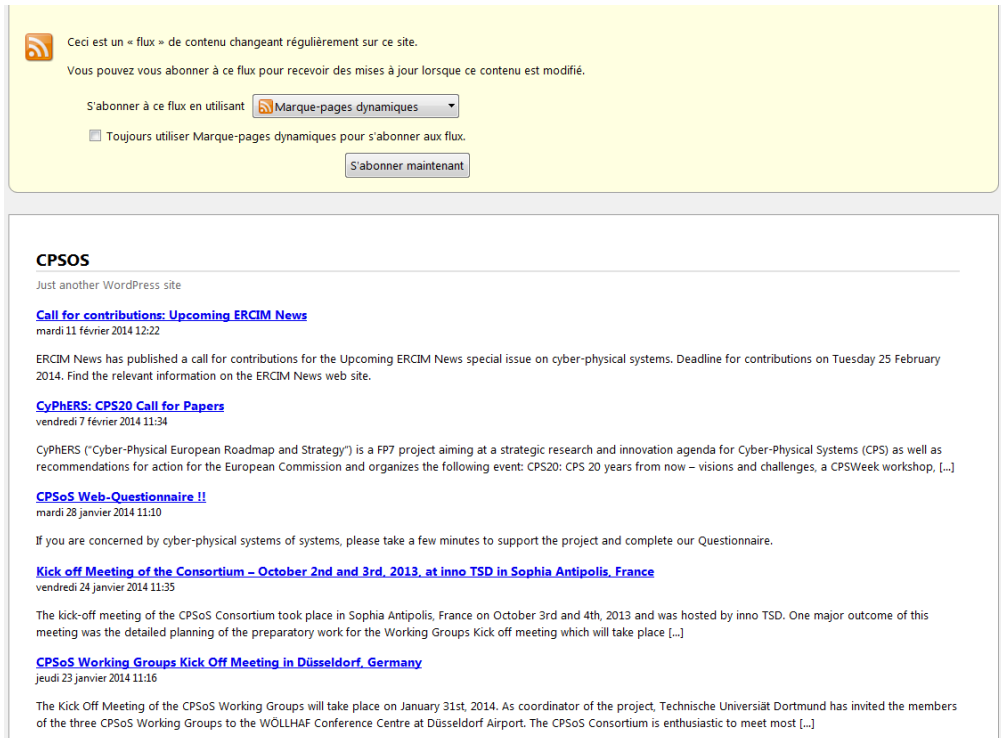


Figure 19 - RSS feed view

2.12. Hosting and backup

The web site is hosted on a dedicated server managed by inno. This server runs the Ubuntu operating system and the website has been exclusively developed using open sources technologies, such as Apache HTTPd, PHP and MySQL server as database server.

Moreover, backups of the website (structure, contents and database) are done nightly on a dedicated backup server also managed by inno. Backups are kept during 25 days and can be restored, either totally or partially at anytime.

2.13. Statistics

Web sites statistics are collected thanks to the Google Analytics tool which gathers metrics such as number of pages viewed, number of visitors and their geographical location, bounce rate...

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3. Conclusion

The CPSoS Web Site has been set up and includes most of the relevant information, known at this stage of the project.

It shall be regularly updated with content throughout the project and remain open for at least two years after the end of the project.

Upcoming additional needs and sections shall be integrated to make sure that at any stage of the project, the web site fulfils its objective to serve as the projects virtual dissemination vehicle and cooperation platform with other SoS projects.

