COMPASS

COMPASS Web Site, Project Fiche and Online Community

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Abstract

This short report documents the setting up of the COMPASS Web Site, Project Fiche and Online Community, as initial dissemination activities that have taken place under Theme 5 (Maximising Impact), Work Package 51 (Dissemination). Short descriptions are given of each of these elements. This is followed by a brief forward look to the next deliverable for WP51.

Contents

1   Introduction

This report documents the initial dissemination activities that have taken place at the start of COMPASS, as part of Theme 5 (Maximising Impact), Work Package WP51 (Dissemination). The following sections describe the web site, project fiche and online community that have been set up. These sections are followed by a forward look to the next deliverable for this Work Package (Section 5).

2   Web site

The COMPASS website (`http://www.compass-research.eu/`) has been set up. Figure 1 shows the home page. The site provides a project overview, recent project news, project details, publications (including public deliverables) and a link to the project wiki (see Section 4). Links are given for all the consortium members, related technologies and tools such as Circus, Overture and Artisan Studio, and summary grant information.

Future development of the web site will include news of conferences and workshops that COMPASS partners will be attending, and contact details for prospective COMPASS Interest Group or mailing list membership.[1]

3   Project Fiche

A two-page project fiche (factsheet) has been produced according to the standard Cordis format. This summarises the project's key innovation, technical approach, case studies and impact. A copy is included in Appendix A.

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[1]The COMPASS Interest Group (CIG) consists of SoS stakeholders, mainly from industry and government, including providers of constituent systems, systems integrators, and those with a stake in the performance of SoSs. The CIG will provide a range of guidance to the consortium, evaluating the emerging COMPASS technology and defining challenge problems. The mailing list is intended for all parties who have expressed an interest in COMPASS and its activities and goals.

Figure 1: COMPASS Web Site, `http://www.compass-research.eu/`

4 Online Community

The online community is achieved via a $wiki^2$. The wiki has both a public (external) and a private (internal) area, with the public area providing introductory project materials. The internal area is limited to project members and, to date, has been used to plan the first convergence workshop which took place from October 17 – 28. All project members can access and edit the wiki, to add or correct project material. All pages on the wiki have an edit history and discussion section, where project members can raise questions about the project material.

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[2]`http://wiki.cs.ncl.ac.uk/compass/`

5   Forward look

The next deliverable for WP51 is the initial Dissemination Plan, due at month 6. This will give a schedule for the dissemination activities that will take place, including webinars, white papers, software and an e-Newsletter for members of the Compass Interest Group (CIG).

A   Project Fiche

COMPREHENSIVE MODELLING FOR ADVANCED SYSTEMS OF SYSTEMS

COMPASS

C O M P A S S

Key innovation

System-of-Systems (SoS) technology promises to support the networking of previously independent ICT systems so that they collaborate in a more responsive, efficient and greener way. However, SoS design is hampered by the complexity, heterogeneity and independence of c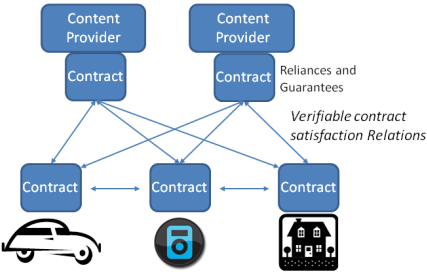onstituent systems, and stakeholders. SoS engineering lacks models and tools to help developers make trade-off decisions, and define precise contracts between constituents. This leads to sub-optimal design and expensive rework.

COMPASS augments industry tools and practice with a modelling language in which SoS architectures and contracts can be expressed. A formal semantic foundation – the first to be developed specifically for SoS engineering – will enable analysis of global SoS properties. It will be supported by an open tools platform with prototype plug-ins for model construction and analysis, and links to an established architectural modelling language (SysML). These foundations and tools will support methods guidelines that help SoS developers to take advantage of this new technology in practice.

Audio/Video & home automation as a SoS, needs to deliver a consistent "SoS experience" to the user as content, digital rights etc. change

Technical approach

COMPASS will combine and extend existing modelling techniques for SoSs. The core is a new purpose-built modelling formalism for SoS (COMPASS Modelling Language – CML) with formal semantic foundations, and methods and tools that take advantage of these. CML will allow developers to choose different levels of description, starting from a graphical architectural view in SysML that is easy for most

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Project website

www.compass-research.eu

Community contribution to the project

6 Million Euro

Project start date

01 10 2011

Duration

36 months

stakeholders to understand. SysML will be linked to CML, and extended with SoS-specific features to describe the assumptions and guarantees of constituent systems.

SysML, with CML extensions will have semantics in pure CML, in a form that can be readily processed by static analysis tools including theorem provers and model checkers, allowing automated detection of inconsistencies, and potential deviation from contract conformance. The CML representation can also form the basis of test generation and management, and can be subjected to simulation in demanding operational scenarios. The underlying semantics of CML will be given in the Unifying Theories of Programming (UTP), which helps to guarantee consistency between diverse models and analyses. CML will be open, so that extensions may be developed for other modelling languages besides SysML.

Project partners	Country
Newcastle University	UK
Engineering College of Aarhus	DK
University of York	UK
Bremen University	DE
Universidade Federal de Pernambuco	BR
Bang & Olufsen A/S	DK
Insiel S.p.A.	IT
Atego Systems Ltd.	UK

Demonstration and Use

The COMPASS tools will allow users to operate at the SysML level, or at the CML level, or both. The tool set can be extended with CML plug-ins for static fault analysis, model-checking, theorem-proving, test automation, and support for run-time checking of contract conformance. The platform is open, and links to a range of architectural modelling tools can be developed.

Industrial Case Studies are used to evaluate the emerging formalism and tools. In each case, a SoS development problem is addressed first using current best practice and then using SysML+CML, as a basis for evaluation. The main studies are:

• **Accident Response:** a SoS for dynamic coordination of diverse healthcare services in an acute emergency (ward, ambulance management, triage, hospital management systems etc.)

• **Audio/Video/Home Automation Ecosystem:** a SoS that aggregates AV and home automation systems in multiple spaces (house, car, office etc.), managing content and applications from diverse sources.

• **Challenge Problems**, which stretch the formalism in a wider range of sectors, will be solicited via the **COMPASS Interest Group** (CIG) and tackled by the consortium.

Scientific, Economic and Societal Impact

With major European SoS designers (Bang & Olufsen and Insiel) in the consortium, a leading supplier of system modelling technology (Atego), and an industrial interest group of influential SoS developers, COMPASS will have an impact on:

• **SoS engineering** by giving improved methods for trade-off analysis, managing evolution and gaining assurance of global SoS properties. Ability to innovate new SoS-based products/services rapidly.

• **SoS stakeholders** by giving the ability to offer new services on SoS structures; assurance of SoS-level properties; ability to model/verify end-user "SoS experience" early in design.

• **The SoS research community** by giving the ability to contribute new SoS-specific analysis tools, formalisms, and an advanced semantic basis for further research.

• **Standards:** inclusion of methods guidelines, architectural patterns/styles.

Key Features

• The first formal modelling language specifically for SoS Engineering, linking to architectural description frameworks in industry use.

• Viable tool support for static analysis, simulation and testing based on SoS models, leading to significant reductions in SoS development risk.

• Engagement with SoS stakeholders in current and future research on model-based approaches to SoS design.