Enterprise COllaboration & INteroperability

COIN COLLABORATIVE SERVICES

COIN / ACTIVE Summer School
Aachen, October 18-22, 2010
VTT / Kim Jansson
Content

• Introduction
• Collaboration issues
• EC Services in brief
  – Baseline
  – Innovative
• Collaborative Project Management
  – Project Alignment
  – Project Alignment Booster & Model
• Collaborative projects meeting process management
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| **October 18-Mon**            | 9:00-10:30   | **WELCOME**
|              |              | Prof. Volker Stich (FIR)                                                                     |
|              |              | **ACTIVE Introduction**                                                                      |
|              |              | Paul Warren (Eurescom)                                                                       |
|              | 10:30-11:00  | **COI COLLABORATIVE SERVICES**                                                                |
|              |              | Kim Jansson (VTT)                                                                            |
|              | 11:00-13:00  | **COLLABORATION AND INTEROPERABILITY - COIN APPROACH**                                        |
|              |              | Sergio Gusmeroli (TXT e-Solutions)                                                           |
|              |              | Patrick Sitek (BIBA)                                                                         |
|              | 13:00-14:00  | **Lunch**                                                                                    |
|              | 14:00-16:00  | **BUSINESS PROCESS MINING AND FORMALIZATION**                                                |
|              |              | Marko Grobelnik (Jozef Stefan Institute)                                                      |
|              |              | Klaus Fischer (DFKI)                                                                         |
|              | 16:00-16:30  | **coffee break**                                                                             |
|              | 16:00-18:00  | **SEMANTIC MEDIAWIKI**                                                                        |
|              |              | Frank Dengler (Karlsruhe Institute of technology)                                            |
|              |              | Michele Sesana (TXT e-Solutions)                                                             |
|              | 19:00-21:00  | **Dinner (7PM-10PM)**                                                                        |
| **October 19-Tue**            | 9:00-10:30   | **Information and knowledge interoperability**                                              |
|              |              | Francesco Taglino (CNR)                                                                       |
|              | 10:30-11:00  | **coffee break**                                                                             |
|              | 11:00-13:00  | **COIN COLLABORATIVE SERVICES**                                                               |
|              |              | Paolo Paganelli (Insiel)                                                                     |
|              | 13:00-14:00  | **Lunch**                                                                                    |
|              | 14:00-16:00  | **COIN Baseline services and negotiation support**                                            |
|              |              | Dirk Oedeikoven (FIR)                                                                         |
|              |              | Boris Ansoerge (FIR)                                                                          |
|              | 16:00-16:30  | **coffee break**                                                                             |
|              | 16:00-18:00  | **COIN INNOVATIVE SERVICES**                                                                  |
|              |              | Michele Sesana (TXT e-Solutions)                                                             |
|              | 19:00-21:00  | **Aachen City Tour**                                                                          |
| **October 20-Wed**            | 9:00-10:30   | **Intelligent Cargo Integrated Environment (EURIDICE IP)**                                    |
|              |              | Igor Dolinšek (Comtrade)                                                                      |
|              | 10:30-11:00  | **coffee break**                                                                             |
|              | 11:00-13:00  | **COIN PLATFORM DEMONSTRATION**                                                               |
|              |              | Michele Sesana (TXT e-Solutions)                                                             |
|              | 13:00-14:00  | **Lunch**                                                                                    |
|              | 14:00-16:00  | **SMART Objects Lab (concept)**                                                               |
|              |              | Sebastian Kropp (FIR)                                                                         |
|              |              | Boris Ansoerge (FIR)                                                                          |
|              | 16:00-16:30  | **coffee break**                                                                             |
| **October 21-Thur**           | 9:00-10:30   | **Active Knowledge Work Space demonstration**                                                 |
|              |              | Igor Dolinšek (Comtrade)                                                                      |
|              | 10:30-11:00  | **coffee break**                                                                             |
|              | 11:00-13:00  | **PRO-ACTIVE KNOWLEDGE PROCESSES SUPPORT**                                                   |
|              |              | Carolina Fortuna (Jozef Stefan Institute)                                                     |
|              | 13:00-14:00  | **Lunch**                                                                                    |
|              | 14:00-16:00  | **ACCENTURE CASE STUDY**                                                                      |
|              |              | Divna Djordjevic (Accenture)                                                                  |
|              |              | Spase Drakul (Thyia)                                                                          |
|              | 16:00-16:30  | **coffee break**                                                                             |
| **October 22-Fri**            | 9:00-10:30   | **Large Knowledge Collider and CYC (LarKC IP)**                                              |
|              |              | Michael Witbrock (Cycorp)                                                                     |
|              | 10:30-11:00  | **coffee break**                                                                             |
|              | 11:00-13:00  | **Data from sensors and knowledge about sensor networks: why is it so hard to get?**        |
|              | 13:00-14:00  | **Lunch**                                                                                    |
|              | 14:00-16:00  | **HPBANDWIDTH SERVICES AND CONTENT (OMEGA IP)**                                              |
|              |              | Carolina Fortuna (Jozef Stefan Institute)                                                     |
|              | 16:00-16:30  | **coffee break**                                                                             |
|              | 16:00-18:00  | **ISOIN CASE STUDY**                                                                          |
|              |              | Timo Syrjänen (POYRY)                                                                         |
|              |              | Michele Sesana (TXT e-Solutions)                                                             |
|              |              | Ian Thurlow (British Telecom)                                                                 |
|              | 19:00-21:00  | **Dinner (7PM-10PM)**                                                                        |
Enterprise COllaboration & INteroperability

COIN
EU FP7 Integrated Project 216256

Introduction
Background – The COIN project

COIN VISION:

“By 2020 enterprise collaboration and interoperability services will become an invisible, pervasive and self-adaptive knowledge and business utility at disposal of the European networked enterprises from any industrial sector and domain in order to rapidly set-up, efficiently manage and effectively operate different forms of business collaborations, from the most traditional supply chains to the most advanced and dynamic business ecosystems.”
Background – The COIN project

COIN EC
**Enterprise Collaboration** comes from a business perspective and identifies the process of enterprises - mainly SMEs - to set-up and manage cross-enterprise win-win business relations in response to business opportunities.

COIN EI
**Enterprise Interoperability** originates by the ICT world and identifies a capability of enterprise software and applications to exchange information and to mutually understand the information exchanged at the level of data, applications, processes and enterprise models involved.
COIN promoters believe that EC and EI are different concepts which cannot be merged or confused but that they are so interdependent and simultaneously present in every networked enterprise, that they can be really considered as the two sides of the same COIN.

**COIN MOTTO:** “Enterprise Interoperability and Enterprise Collaboration are the two sides of the same COIN”

- **The SIDE A of the COIN:** Enterprise Collaboration
- **The SIDE B of the COIN:** Enterprise Interoperability
- **The Metal of the COIN:** Service Platform
- **The Value of the COIN:** Software as a Service Utility
- **The Market of the COIN:** Manufacturing Enterprises
The COIN Project develops services for European SMEs enterprise aggregation, synchronization and co-operation in response to the more and more demanding and complex business opportunities coming from the global market.

Solutions from previous EU FP6 project and other sources have been used as starting point → EC baseline services

COIN has further developed **EC innovative services** for
- Collaborative Product Development,
- Collaborative Production Planning,
- **Collaborative Project Management**, and
- Collaborative Human Interaction.
Background – Cooperation or Collaboration?

Networking – involves communication and information exchange for mutual benefit.

Coordinated networking – in addition to exchanging information, it involves aligning / altering activities so that more efficient results are achieved. Coordination, that is, the act of working together harmoniously, is one of the main components of collaboration.

Cooperation – involves not only information exchange and adjustments of activities, but also sharing resources for achieving compatible goals. Cooperation is achieved by division of some labor among participants.

Collaboration – a process in which entities share information, resources and responsibilities to jointly plan, implement, and evaluate a program of activities to achieve a common goal. It implies sharing risks, resources, responsibilities, and rewards. Collaboration involves mutual engagement of participants to solve a problem together, which implies mutual trust and thus takes time, effort, and dedication.

[Denise 1999; Himmelman 2001;...]
Background – Collaboration levels

(Source: L.M. Camarinha-Matos)
COIN EC Services support various collaborative business forms, from supply chains to business ecosystems. Industrial test cases deployed for requirements capture and proof of concept.

1. Traditional Supply Chains
2. Collaborative Networks
3. Business Ecosystems

<table>
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<th>EC form / EI challenge</th>
<th>Knowledge i/op</th>
<th>Business i/op</th>
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<td>Supply Chains</td>
<td>Aerospace DTA Lazio (ITA)</td>
<td>Automotive Slovenian Net (SLO)</td>
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<td>Collaborative Networks</td>
<td>ICT Network (HUN)</td>
<td>Aeronautic Cluster of Andalusia (SPA)</td>
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<td>Business Ecosystems</td>
<td>Pulp &amp; Paper Poyry (FIN)</td>
<td>Healthcare VEN (UK)</td>
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Enterprise collaboration systemisation

Enterprise collaboration – an attempt to systemize (based on Hess 2001)
Traditional Supply Chains

Flows of information, products, services etc.
Collaborative Networks

A network that:

- Consists of a variety of entities - organizations and people ... even machines that are
  - largely autonomous
  - geographically distributed
  - heterogeneous in terms of their: operating environment, culture, social capital and goals

- Collaborate to (better) achieve common or compatible goals

- Interactions are supported by computer network.

- (More than Coordinated networking – as in previous slides)

Source: ECOLEAD Project
Business Ecosystem

in the early 1990s James F. Moore introduced he concept in Harvard Business Review in May/June 1993, and won the McKinsey Award for article of the year.

Moore wrote:

“An economic community supported by a foundation of interacting organizations and individuals—the organisms of the business world. This economic community produces goods and services of value to customers, who are themselves members of the ecosystem. The member organizations also include suppliers, lead producers, competitors, and other stakeholders. Over time, they co-evolve their capabilities and roles, and tend to align themselves with the directions set by one or more central companies. Those companies holding leadership roles may change over time, but the function of ecosystem leader is valued by the community because it enables members to move toward shared visions to align their investments and to find mutually supportive roles”.
Business Ecosystem

- Outsourcers
- Customers
- Related Service Organisations
- Makers of Related Products
- Suppliers
- Value-Added Resellers
- Your Organisation
The Digital Ecosystem concept emerged worldwide as an innovative approach to support the adoption and development of ICT.

"Digital Business Ecosystems" aims at implementing the enabling technologies and paradigms for fostering endogenous local development, local capacity building and knowledge sharing processes providing tailored and personalized ICT services to citizens and business networks.
Life Cycles of Collaborative Networks

Creation
- Partners search and selection
- Contract negotiation
- Definition of rights
- Join/Leave procedure
- Infrastructure configuration

Operation
- Secure data exchange
- Sharing and visibility rights
- Orders management
- DBP planning & scheduling
- High level coordination
- Collaborative engineering

Evolution
- Add / remove partner
- Change roles

Dissolution
- Liabilities definition
- Access rights definition

Source: ECOLEAD Project
EC baseline services

Solutions from previous project and other sources have been used as a starting point.

From a business perspective: the COIN Baseline EC services for collaboration phases.
The COIN Project develops a pervasive, adaptive service platform to host Baseline and Innovative COIN services for Enterprise Collaboration and Enterprise Interoperability.

The services will be available under on-demand, utility-oriented SaaS-U business model for European enterprise (mainly SMEs).

The Services are part of the “COIN SYSTEM”
COIN Metal: “The COIN System”

The COIN System is a federation of utility platforms which allow EI/EC Services to be searched, discovered, ranked, orchestrated and executed by cross-organizational business processes embedded in Collaboration Platforms.

There are three main components of the COIN system, which could be interfaced in several different ways:

A **COIN Utility Platform** which is an open source instantiation of a generic SESA (Semantically Enabled Service Architecture), specialized in the EI/EC domain, and empowered with advanced capabilities for trust & security, distribution & scalability, reasoning & negotiation.

A **constellation of COIN EI/EC Services** which are able to implement state-of-the-art and innovative technologies to support information, knowledge and business interoperability as well as Human Collaboration in a collaborative business context of Product Development, Production Planning and Project Management.

A **COIN Collaboration Platform** which is a generic open source web portal encompassing Social Networking interaction, Knowledge Assets accession and Business Process management in a unique integrated multi-enterprise collaboration environment customized for more or less hierarchical organizational networks.
A first cloud of open COIN and non-COIN Utility Platforms (providing utilities for service development, registration, publication, search & discovery, orchestration & execution)

A unique COIN Access Point allows human and IT consumers to access the services provided by both clouds while a COIN cloud-to-cloud middleware supports the communication and interoperability of the two clouds.

A second cloud of domain- and sector-specific COIN and non-COIN Collaboration Platforms provides Supply Chains, Collaborative Networks and Business Innovation Ecosystems with advanced Value Added Services supporting the whole product/service life cycle and collaboration phases.
Enterprise Collaboration Services

On top of the Baseline services

COIN has further develop EC innovative services for

– Collaborative Product Development,
– Collaborative Production Planning,
– **Collaborative Project Management,**
– Collaborative Human Interaction.
Main results achieved so far:

– Collaborative Knowledge-based Product model.
  – first prototype completed: Semantic Cluster Management System (SCMS)
  – final specifications obtained

– 3D data and collaboration through visualization
  – first prototype completed: Collaborative 3D Designer Service (C3DDS)
  – final specifications obtained
COIN c-Production Planning

• Main challenges addressed
  ➢ Strong Support to Collaboration among value-chain actors
  ➢ Collaborative creation of Production Plans
  ➢ Collaborative prediction and management of exception
  ➢ Software design following SaaS paradigm
  ➢ Enhance Process Quality

• Main results achieved
  ✓ PnP Collaborative Production Planning Portal (C3P)
  ✓ SaaS Production Planning Service (PPS)
  ✓ Collaborative Quality Management Service (cQMS)
  ✓ Supply Chain Intelligence Service (SCIS)
Main challenges
Develops services for project partners in the business ecosystem to participate in and interact with the PM process.

Develop services for “The Social and Collaborative internet based project management”

Results achieved
New type of services for industry in change

Project Alignment Booster – Services

Collaboration for Project Management (Coll^4P_M) – Services for Collaborative creation of a reference project WBS - Services

Collaborative project meeting space. Management of project meeting processes over different time zones and latitudes (From agenda planning to minutes distribution) - Specification
COIN c-Human Interaction

- **Flexible Collaboration Support**
  - Ad-hoc activities underneath pre-planned project structures.

- **Human Interaction Support in SOA**
  - Guidance of interactions based on observed collaboration performance.

- **Trust-based c-HI Support**
  - Optimization of partner selection and group formation.

- **Active Participation of Humans in SOA**
  - Flexible context-aware discovery and ad-hoc involvement of experts in a service-oriented manner.

- **Adaptive Network-based Information Sharing**
  - Dynamically adapting document sharing behavior relying on social relations and collaborative success.
The Innovation Knowledge Ecosystem
Enterprise COLlaboration & INteroperability

c-Project Management
c-Project Management
Introduction

Success in a business segment requires product and services that match customers demands, are of sufficient quality and delivered at an affordable price.

To be able to deliver specialized and high quality product and services you need to have a trimmed organisation together with unique production facilities and equipment.
Introduction

Larges scale one-of-a-kind facilities like power plants, process factories, ships or communication infrastructure are normally built and established through projects.

Managing a large scale engineering project is a very challenging task and must be supported by efficient IT tools.
Introduction

- Complicated large engineering projects are often time critical and requires skills and competencies not available in single organisations.

- Engineering project are often today geographical distributed
  - Need highly specialized knowledge
  - Standard bulk work must be delivered at a competitive cost

Example: Over 900 companies contributed to the Royal Caribbean's Oasis of the Seas - the largest cruise ship in the world.
Introduction

Collaborative Projects also need Collaborative Project Management

This presentation report progress in the area of collaborative project management with a special focus on large scale and complicated engineering projects.
Typical Phases and Life Cycle of a Plant Delivery Project

1- 5 years, 2- 20 persons  
1- 2 years, 10 – 500 persons  
10- 50 years
Collaborative Project Management

Collaborative Management of Projects, or Management of Collaborative Projects?

“Collaborative Management of Collaborative Projects”.

The objective is to develop services for project partners and personnel to participate in and contribute to the PM process.
Project Management

- The discipline of project management is well established.
- Professional associations are active.
- The diversity of market available Project Management IT-applications is huge.

Social median

- The development within internet technology, social median, participative co-creation and WEB 2.0 applications enables also new working methods on the PM arena.
Future success will build on the combination of two paradigms

1. Fully automated and IT supported engineering process
2. Totally networked and efficient global operation
Social media and project management

“Project Management 2.0”

Also referred as Social Project Management, is an evolution of project management practices and software built above Web 2.0 technologies and applications.

- Enable project partners and people to create and interact with content rather than just consume information
- StoA in PM is not enough, do not meet Web 2.0!
- Need support and IT-tools for:

The Social and Collaborative internet based project management
Based on

- industrial requirements
- analysing the current state of the art and research progress in the area of
  - CNO,
  - PM and
  - Web2.0,

we have come to the conclusion that there is a need for development in the area Collaborative Project Management.

Innovative information technology solutions are needed for efficient PM in networked and non-hierarchical environments.

The development of a “Project Alignment Booster” is a response to such requirements.
What is “Project Alignment” in Collaborative Projects?

What is the “Project Alignment Booster”?

**Project alignment** is a project activity to ensuring that stakeholders in a distributed project have a shared understanding of project goals, customer expectations, project plans and **work processes**, tools to be used, etc.

**Collaborative Project Alignment** is about agreeing in a collaborative fashion how to organize project plans and **work processes**

The **Project Alignment Booster** is a set of services used to promote project alignment.

Business ECO-System

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<th>Collaboratively define reference working process</th>
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<td>Self-evaluate &amp; announce partner capability</td>
<td>Agree on project processes and tools</td>
</tr>
<tr>
<td>Analyse gap and monitor deviation</td>
<td>Implement action plan</td>
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Project Alignment Model

- Project demand for unified work processes
- Project partners’ skill and capabilities
- Shared project working methods
- Need for additional competence and learning
- Identified projects risks
- Effects on project schedule (Gantt)

Collaborative Project Alignment

Experience based & Socially evolving
The Project Alignment Model is a configurable framework that describes for alignment elements different levels (1-n) how they can be carried out.

The development of the model takes inspiration form existing maturity level bases models (However there are significant differences).
Project Alignment Model

Guidelines and recommendations from International PM Associations and Institutes.

Knowledge Areas -> Project Management Processes

Top Down Model Population

Project Alignment Model Abstraction Levels

- Collaboration Alignment Meta Model
- Domain Specific Reference Model
- Business Eco-system Specific Model
- Project Specific Instantiation Of Model

Industry and Application Domain specific Maturity schemes and models
Project Alignment Model

Socially Evolving Model

Project Alignment Model Abstraction Levels

- Collaboration Alignment Meta Model
- Domain Specific Reference Model
- Business Eco-system Specific Model
- Project Specific Instantiation of Model

Business Eco-System Collective Intelligences

- Project Experience & Practices
- Collaborative Project Operation
- Model Assessment
Project Alignment Model Data
(example of from pulp and paper mill projects)

Project Management Tasks
Alignment Element
Introduce Project Organizations
Communicate Project Scope
Prepare Detailed schedule
Prepare IT Usage plan
Prepare tools and software plan
Prepare Communication management plan, external
Prepare Communication management plan, internal
Prepare Coordination plan with customer
Prepare Change management plan
Prepare Security plan
Define Sustainability objectives
Define Document management processes
Define Inspection and approval process
Define Progress monitoring method
Prepare Quality Management Procedures
Define Site services and conditions

Collaboration and networking readiness
Alignment Element
Collaboration attitude
Openness towards new ideas
Innovation attitude
Project scope conception
Clearly defined tasks
Personal responsibility
Collective responsibility
Self monitoring readiness

Systems and Technology
Alignment Element
Coll4PM
Sametime
Skype
Genesys
DocHotel, admin
DocHotel
Autocad
ProElina
ProElina, admin
PDMS
Cadmatic

Work Process
Alignment Element
Networked meetings
Document management
E-learning methods
Engineering Management
Local standards
Sustainability and public relations
Project Alignment – Future Vision

- Contract
- Project Scope
- Project specific work process
- Participative alignment development
- Automatic competence and capability capture
- Networked Partner Competence
- Gap Analysis
Message

- Collaboration word wide
- Focus on engineering projects
- Communication is the key to success
- Need to communicate and share project working methods to achieve aligned project working and management processes
- IT tools are needed to increase project alignment
- Few tools are available on the market
- Need to develop a PAB
- Report progress
Collaborative projects meeting process management - service

Background
• Global project organizations need distributed meetings.

• Distribute meetings should be conducted more efficiently than a traditional local meeting, through new processes and IT tools.

• The most suitable tool for each meeting process steps are selected on-line

• In meetings involving participants from different time zones and latitudes, all meeting participants cannot always be present at the same time. Participants should be given the possibility to contribute to project management decisions in advance.

→ Develop services for the management of asynchronous and long meeting processes.

→ The process extends from the planning of the meeting all the way to finalization of the meeting. e.g. from agenda planning to distribution of meeting minutes
Support to the management of a long meeting process involve steps e.g.:

- participative definition of agenda,
- call for participation,
- scheduling standard,
- contribution asynchronously in advance,
Thank You for Your Attention

Questions?