Enterprise COllaboration & INteroperability

COIN Winter School

COIN System Demos

Ljubjana, Nov 29th 2011
Michele Sesana
TXT e-solutions S.p.A.

After COIN Strategic Assets

1. **EI/EC services commoditization** to be extracted & separated from state-of-the-art Enterprise Applications in order to constitute a Service Utility (ISU) available to all the Enterprises
2. **Interoperability Service Utility** as an essential component of the European Future Internet service infrastructure currently under development in the RTD Framework Programme 7
3. **FInES Arch**, a new reference architecture for next generation Enterprise Applications, integrating Public and Private Clouds & specific methods & tools for Business Innovation Management
4. **Open-Trusted Platform Federation**, as the implementation paradigm for evolutionary and scalable distributed architectures of Global Service Delivery Platforms

COIN IP Lessons Learned

1. COIN VISION

- Anticipating EU2020 Strategy, DAE, IU initiatives
- DAE Pillar II “Interoperability & Standards”, Act 25
- SME orientation, breaching the Digital Divide
- Inspiring FInES Research Roadmaps and vision

EU 2020 Strategy priorities

1 Innovation Union

2 Youth on the move

3 A digital agenda for Europe

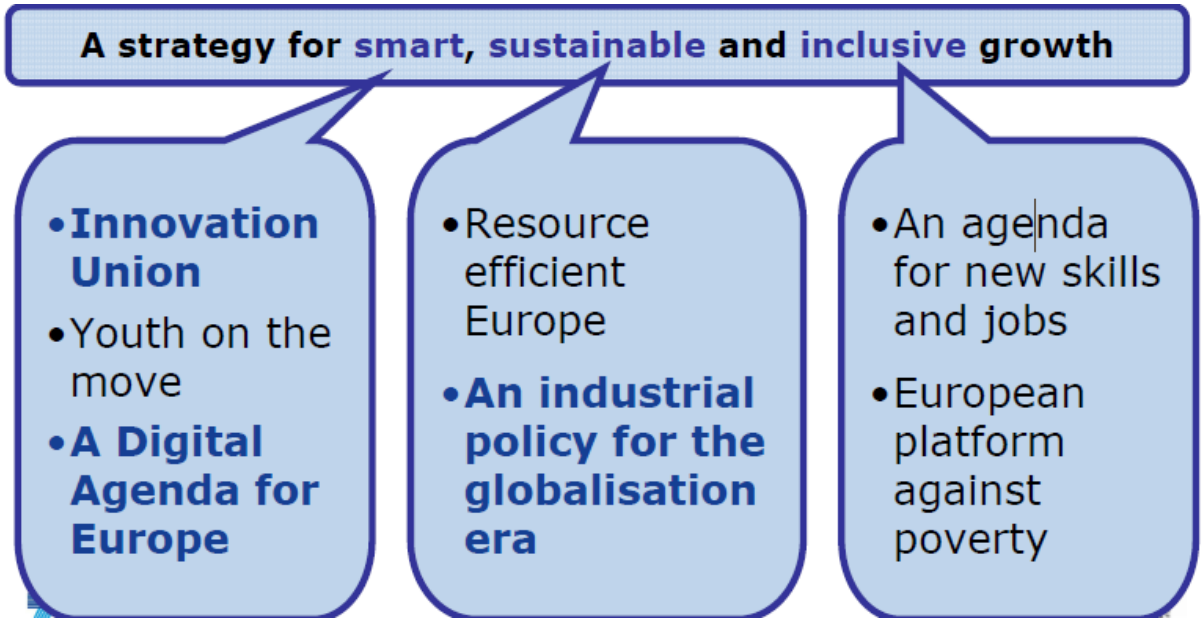
4 Resource efficient Europe

5 An industrial policy for globalisation

6 An agenda for new skills and jobs

7 European platform against poverty

Josè Manuel BARROSO (2010): EUROPE 2020, A European strategy for smart, sustainable, inclusive growth



5 years Priorities for a Digital Europe

1 Access to Digital Content

2 European m-payment Space

3 Open Digital Economy to SMEs

4 ICT for a low-carbon economy

VIVIANE READING 2009 Ludwig Erhard lecture on Digital Europe, July 9th 2009

3. **Europe's digital economy should be opened up to small businesses.** In Europe, we have 23 million small and medium sized enterprises (SMEs) which make up 99% of all firms. Accounting for over 100 million jobs, SMEs can be the mainspring of Europe's economic resurgence. But in the use of productivity-boosting ICT tools, SMEs lag substantially behind big firms: only 9% of SMEs use electronic invoices, and only 11% of them have technology-based human resource management. If SMEs could access computing power over the web, they would no longer need to buy and maintain technologies or IT applications and services. Such web based services – called "cloud computing" – are the medicine needed for our credit squeezed economy: they can make businesses more productive by shifting from fixed costs (i.e. hiring staff or buying PCs) to variable costs (i.e. you only pay for what you use). However, today these new services are nearly all US-owned and US-based. Once again, the US has started to exploit a business model before Europe has managed to do so. We cannot let this continue. In my view, we need a major effort to set up Europe-hosted "clouds" to give European SMEs access to fast, open and productivity enhancing services. A recent study estimated that online business services could add 0.2% to annual GDP growth, create a million new jobs and allow hundreds of thousand of new SMEs to take off in Europe over the next five years.

So what are we waiting for?

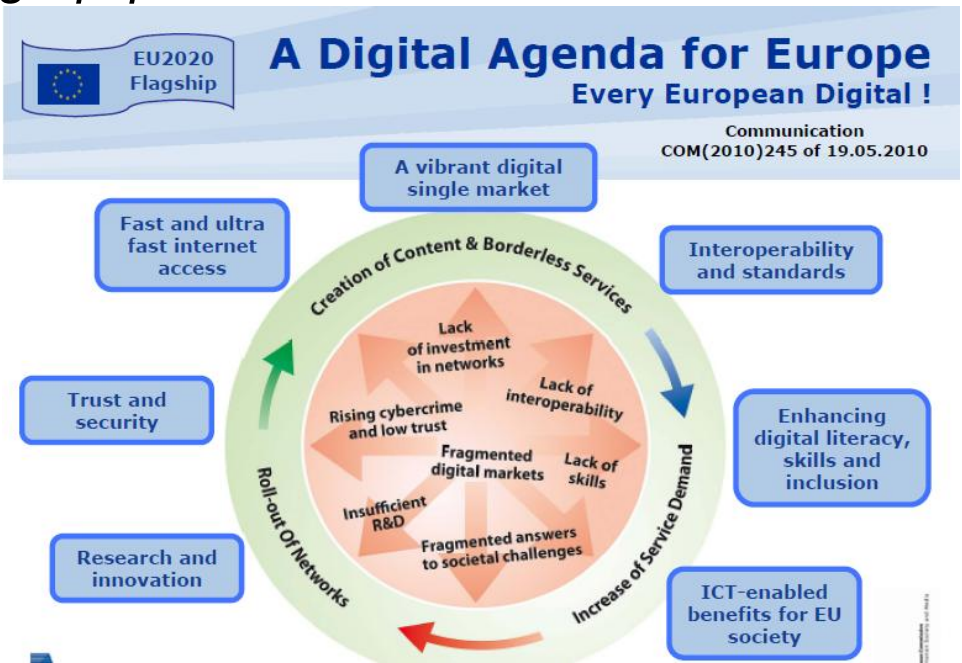
EUROPE 2020: EU Digital Agenda

Neelie KROES, Commissioner for the Digital Agenda (2010): Economic Growth in EUROPE (Maastricht, The Netherlands, March 12° 2010)

***Action 25**: … significant market players to licence information about their products or services. … measures that could lead significant market players to license interoperability information. If their products are incompatible … users feel locked into the dominant company's product range angequipment.*

Digital Agenda will consist of 7 key themes, which will have an impact on your daily life – both as business people and as citizens:

2. **Interoperability and Standards**: a digital society can only take off if its different parts and applications are interoperable and based on open platforms and standards



Future Internet Enterprise Systems

1 Inventive Enterprise

2 Cloud Enterprise

3 Cognizant Enterprise

4 Community-oriented Enterprise

5 Green Enterprise

6 Glocal Enterprise

Cristina Martinez (FInES Cluster Chair) and Gerald Santucci (DG INFSO D4 Head of Unit)

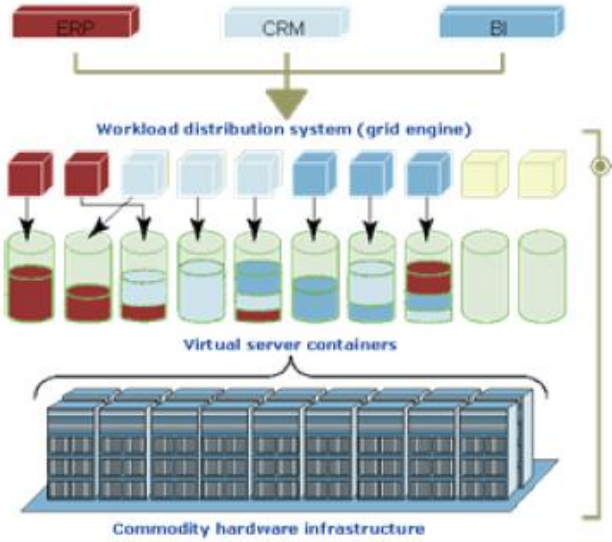
The shift from management-centric to **innovation-centric enterprise systems** will represent a major discontinuity in current ICT solutions and will pose key research problems. This research will be successful only if, in parallel, Future Internet, and the supporting technologies (from **Internet of Things to Software as a Service, from Social Networking to Semantic Knowledge Management**) will be consolidated and openly available. In particular, the paradigm of the Cloud Technologies appears able to provide the necessary flexibility and agility that today's enterprise systems are far from exhibiting.

How to make next generation Enterprise Systems compliant not just to FI architecture and philosophy but also at the service of the Enterprise new Qualities of Being? What about an Enterprise Innovation Management System?

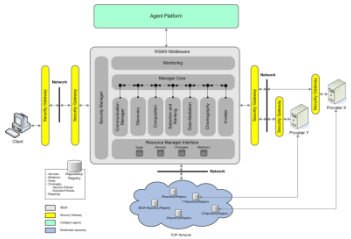
COIN IP Lessons Learned

1. **COIN Generic Service Platform**
   - **Linking Collaboration Networks with the IoS**
   - **Professional- and User-generated EI/EC services**
   - **A double Cloud of federated open platforms**
   - **An evolutionary system for IT providers/consumers**

COIN General Concept

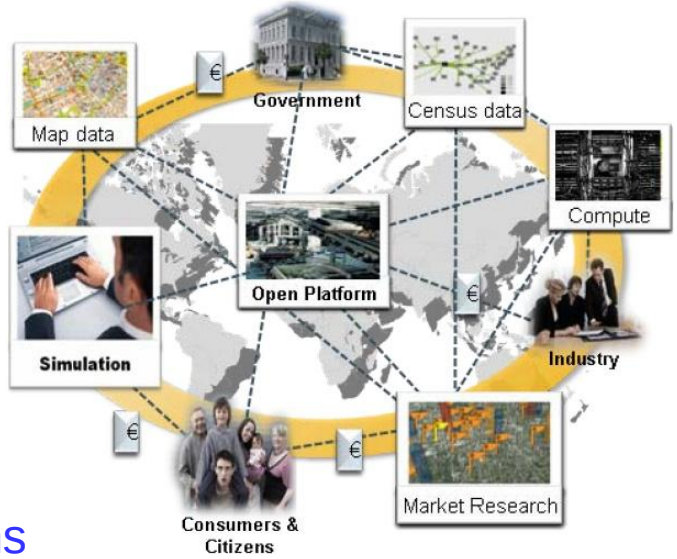


Service Parks
(Cloud Computing)



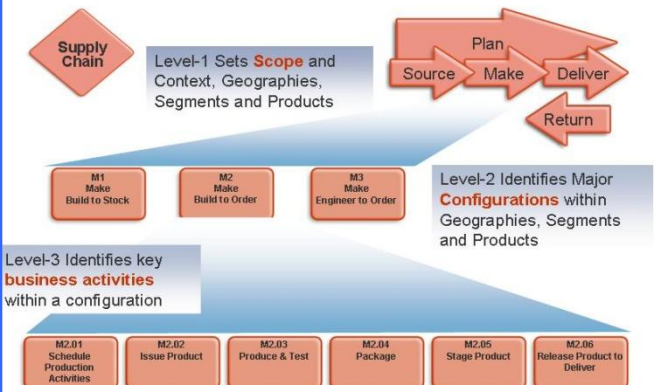
COIN
EI/EC Platform

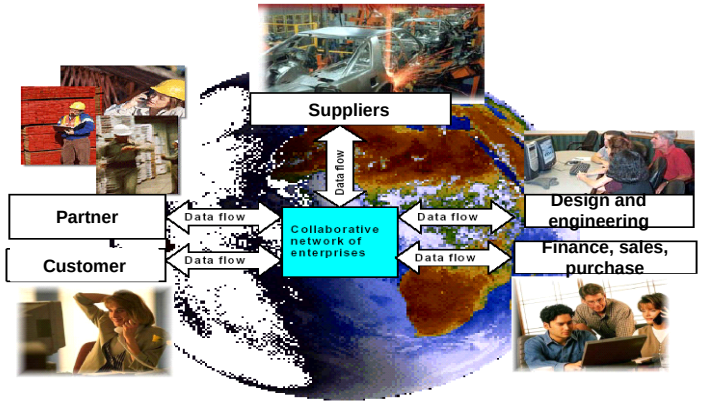
Service Federations
(incl. EI/EC Service Platforms)
INTERNET OF SERVICES

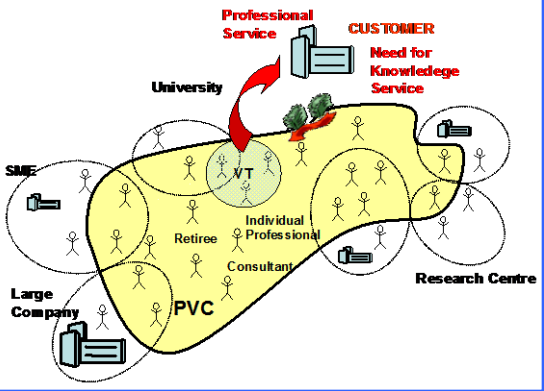


Service Galaxies
(Billions of Services)

ENTERPRISE COLLABORATIVE ENVIRONMENTS







COIN and Cloud Computing IoS

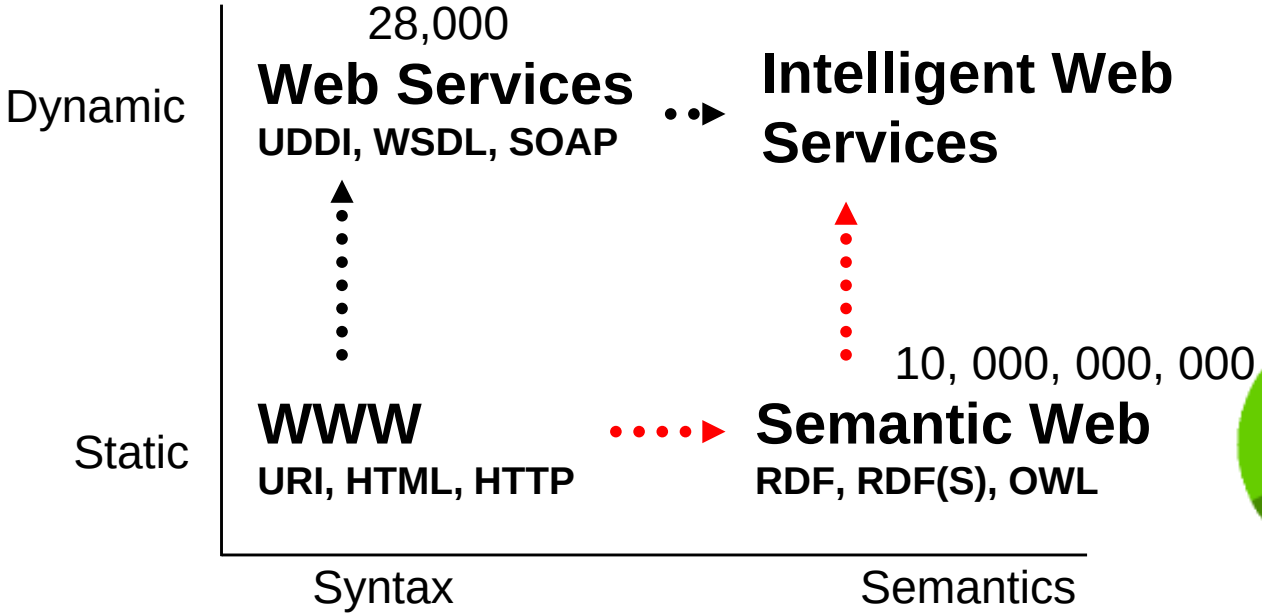
Data Storage	App Development	Applications
Utilize servers, storage, or network infrastructure via an Internet connection.	Design, develop, test, deploy and host applications on Web-based platforms.	Use a Web browser as a platform from which to run Web-based applications and services.
"Infrastructure as a Service"	*"Platform as a Service"*	*"Software as a Service"*
Example: Amazon S3 Storage	**Example: Google App Engine**	**Example: Zoho.com**

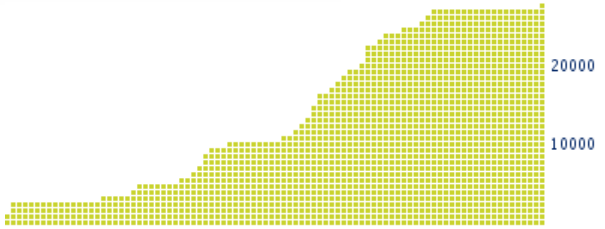
Source: Sebastian Muller, Google EU Policy Manager. The Future of Cloud Computing, DG INFSO D3, Bruxelles Jan 26th 2010

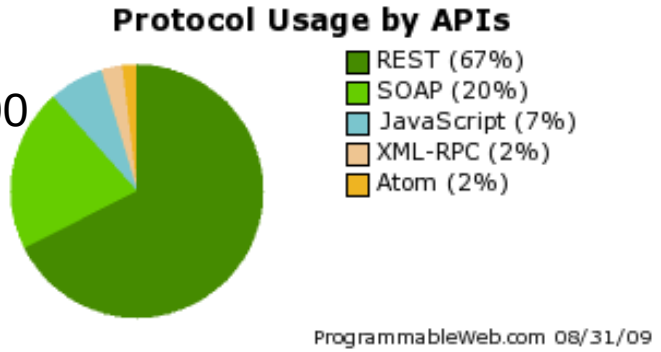
COIN related Research Issues:

- ICT Commoditization: from Applications to Platforms, from Platforms to Infrastructure
- EI & EC services/platforms Value Added & Utility Services/Platforms (SaaS-U BModel)
- Platforms federations: IaaS & SaaS are already here, what about PaaS? In the FI?
- Service Delivery / Development Platforms / Platforms Interoperability

COIN and Service Web IoS







COIN related Research Issues:

- More powerful/expressive Service Description languages
- Semantic crawling & search engines for providers
- Need for easy-to-use development platforms (beyond delivery): Front-End, pro-sumers
- Long-lasting Service Level Agreements for Enterprises and Business Processes

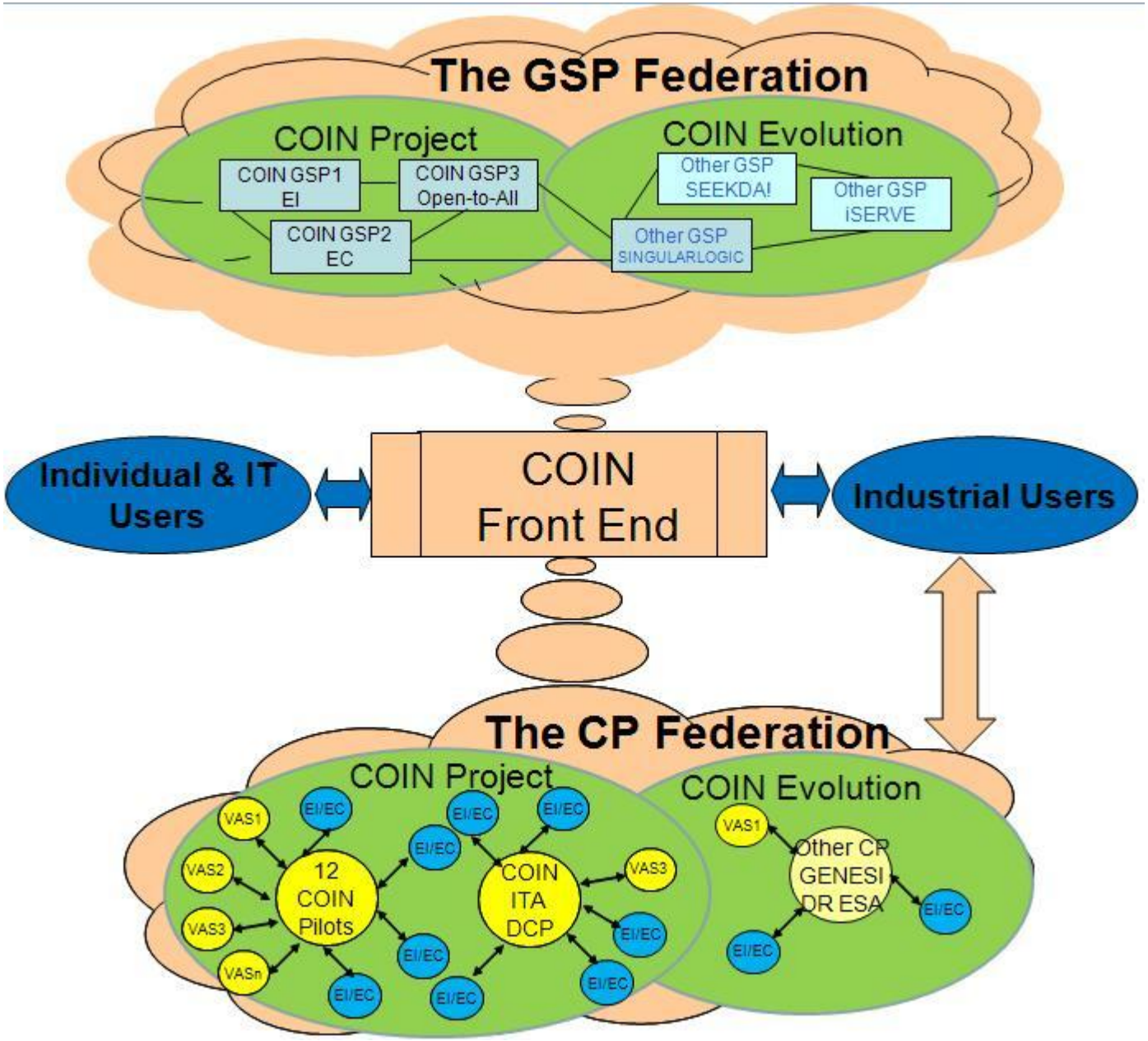
Tuesday 15 September 2009

PM welcomes Sir Tim Berners-Lee to Downing Street

The Prime Minister welcomed the creator of the World Wide Web, Sir Tim Berners-Lee, and Professor of Artificial Intelligence at the University of Southampton, Nigel Shadbolt, to Downing Street this morning.

Mr Berners-Lee and Mr Shadbolt presented an update to Cabinet on their work advising the Government on how to make data more accessible to the public.

Gordon Brown has already spoken publicly about his aim of making the UK a world leader in opening up government information on the internet, an important element of Building Britain's Future.


The GSP Federation
COIN Project
COIN GSP1
EI
COIN GSP3
Open-to-All
COIN GSP2
EC
COIN Evolution
Other GSP
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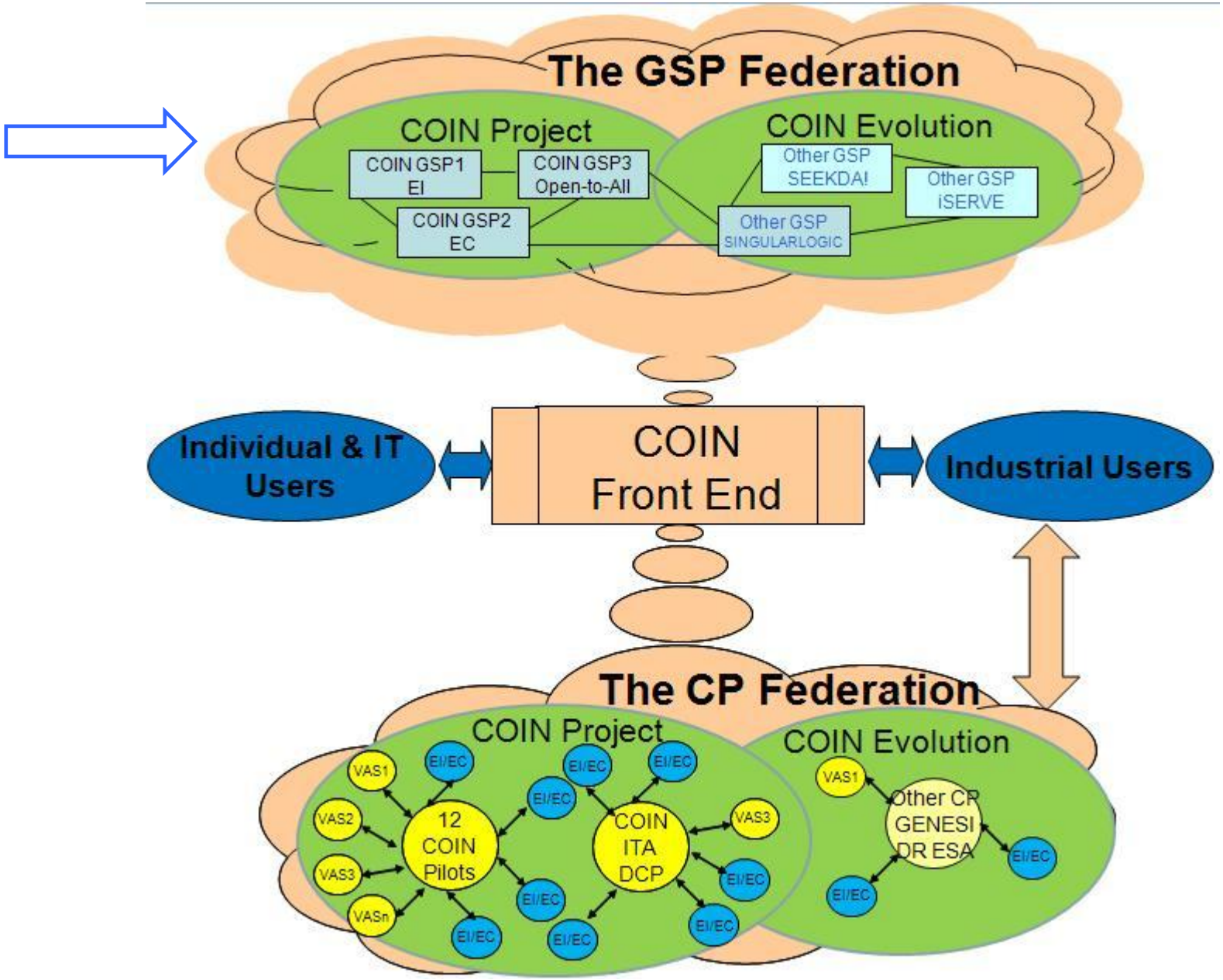
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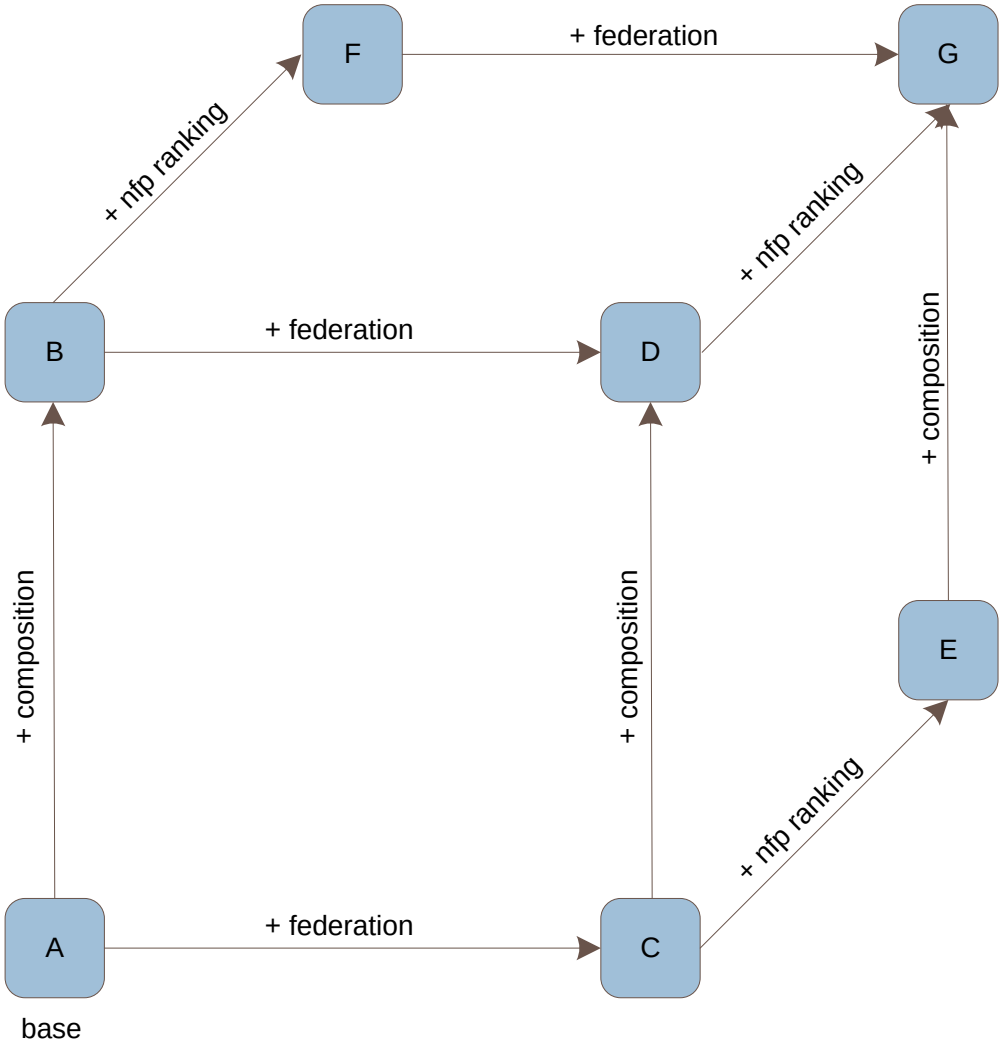
GSP Evolution Scenarios

"Emergent" scenario	*"Planned" scenario*
• **Different authorities** • Different GSP instances established **independently**, then federated • Platform instances may be specialised to some extent, but not by design • Federation may not be transparent to users	• **Single authority** • Different GSP instances deployed as a distributed architecture • **Specialisation** of instances can be by design • Distributed architecture is transparent to users (logically a single entity)

GSP Evolution Hypercube

- Incremental scenarios
- Three dimensions:
  - service composition
  - federation
  - NFP-based ranking

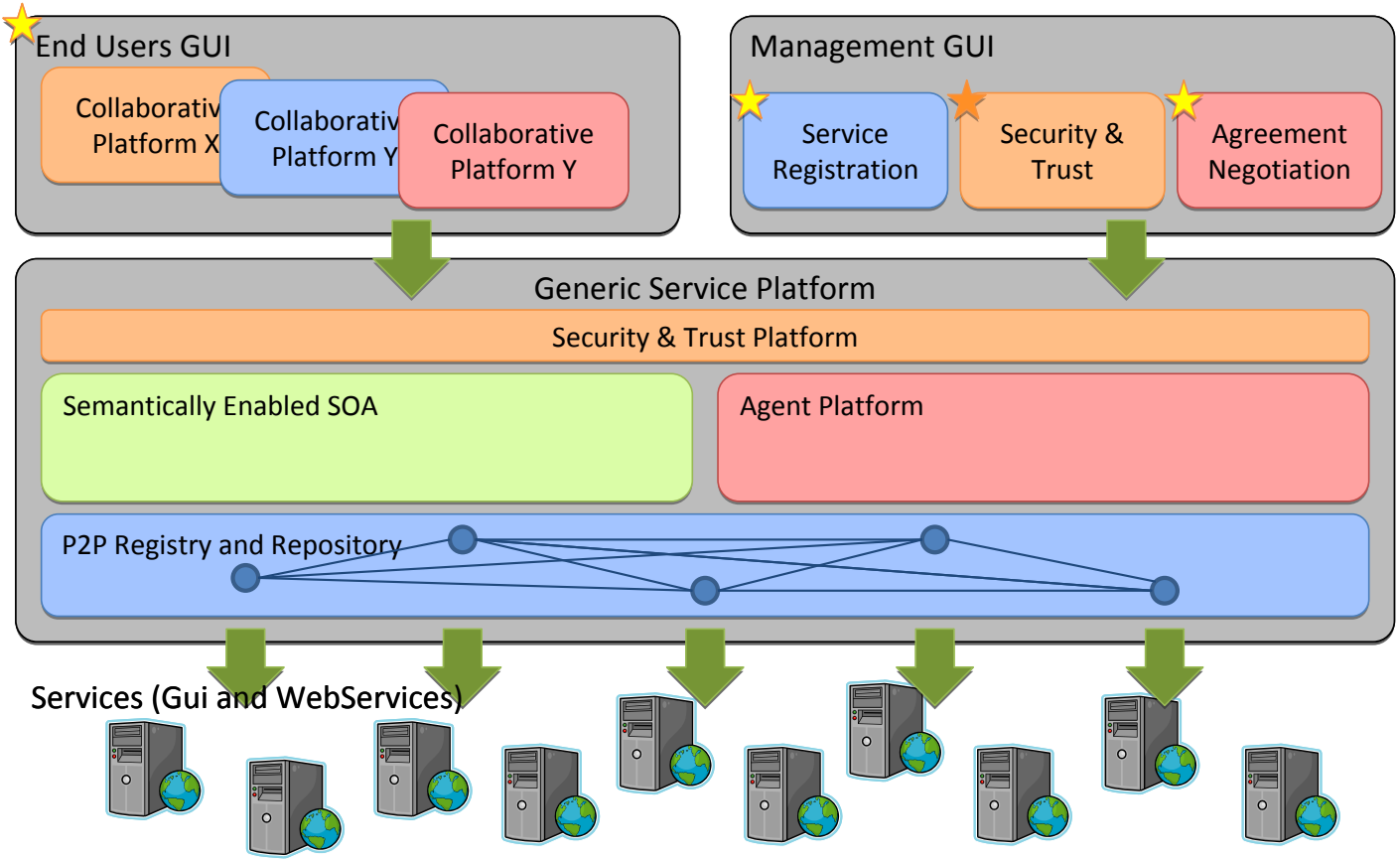


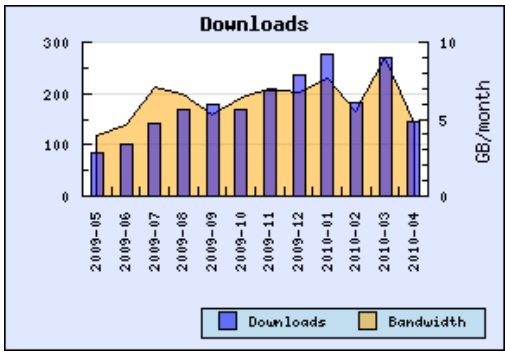
GSP Evolution “cube”

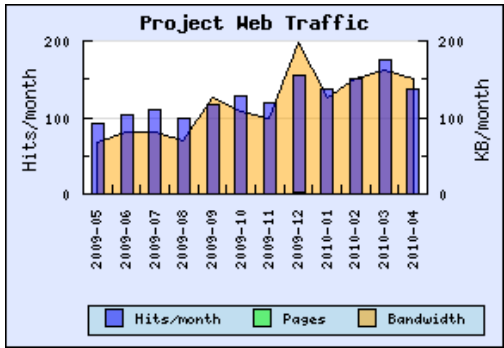
The COIN GSP: a WSMX evolution

http://sourceforge.net/projects/wsmx/

- More than 800 downloads in the last year of the version 1.0 beta (the one delivered by COIN)
- 8 active developers communities
- More than 5k read transactions on SVN

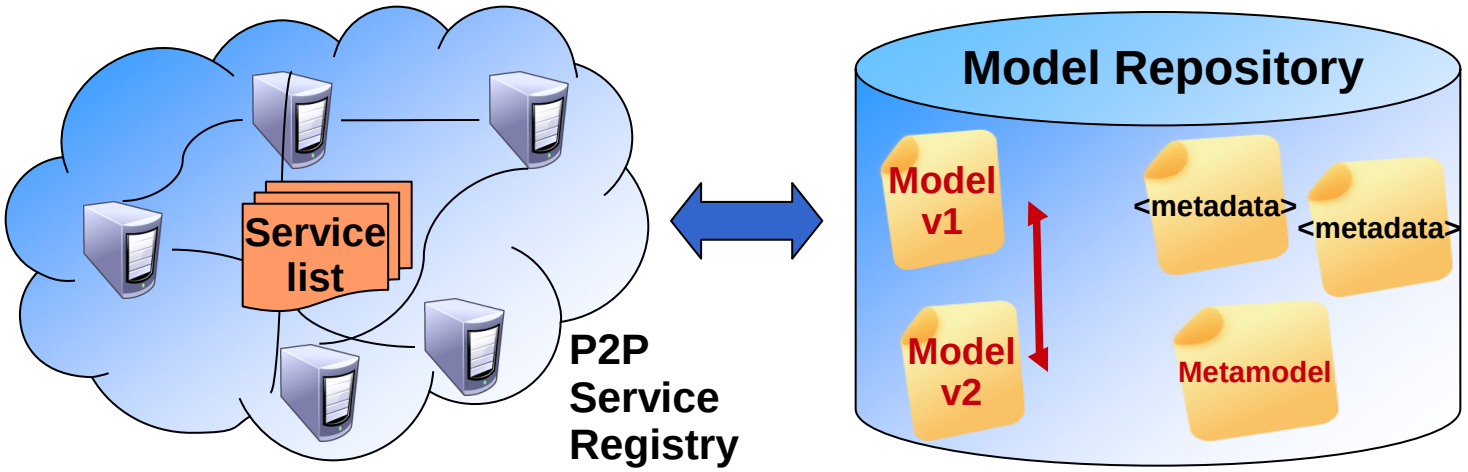






The COIN P2P Models

- In line with Digital Ecosystem: avoid having a single central server
  - Use of a decentralization technique to create the Registry network.
- Evolutionary aspect: tracing of model versions
  - Implementation of model versioning
- Decoupling between:
  - Service model (IT and Business)
  - Service data
  - Service endpoint
- The registry is an index of services; the repository is a meta-data container



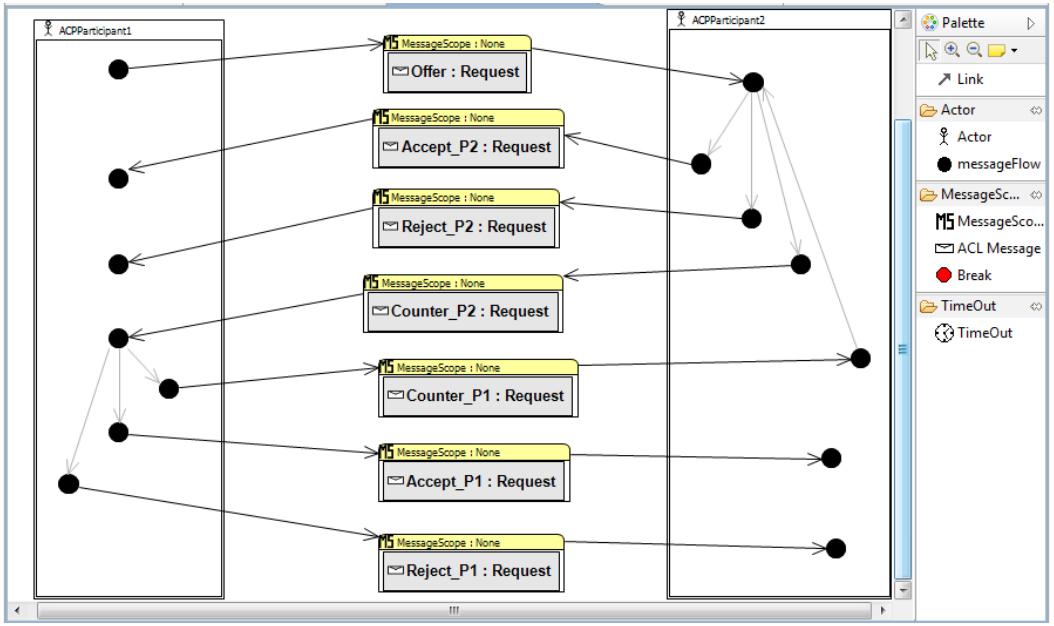
A model is never deleted, but a link is created between versions (Evolutionary aspect).

The COIN Security Gateway

- Reputation Manager
  - Complete Reputation Conceptual Model, with weighed measurements from SLA (QoS metrics), service descriptions, external references, service provider descriptions, etc
  - Distribution of adapted Reputation measurements among different Partners and Platforms
  - Integration with WSMX
- Trust Negotiation
  - To establish a sufficient level of trust on-line between two negotiating parties through bilateral credential disclosure
    - Definition of negotiation objects, protocols and decision-making model.
    - Specification of Trust Negotiator Architecture.
- Policy Administration
  - Storing and managing of Policy documents (includes wrapping and combination of several Policies in a PolicySet)
  - Analysis of SME Consortium Agreement policy enforcement (based on own COIN Grant Agreement and Consortium Agreement) to obtain a digital Consortium Policy.and Semantics
  - Specification of how each Policy Component (Enforcement, Decision, Administration, Information) will behave under the constraints of each kind of Policy.

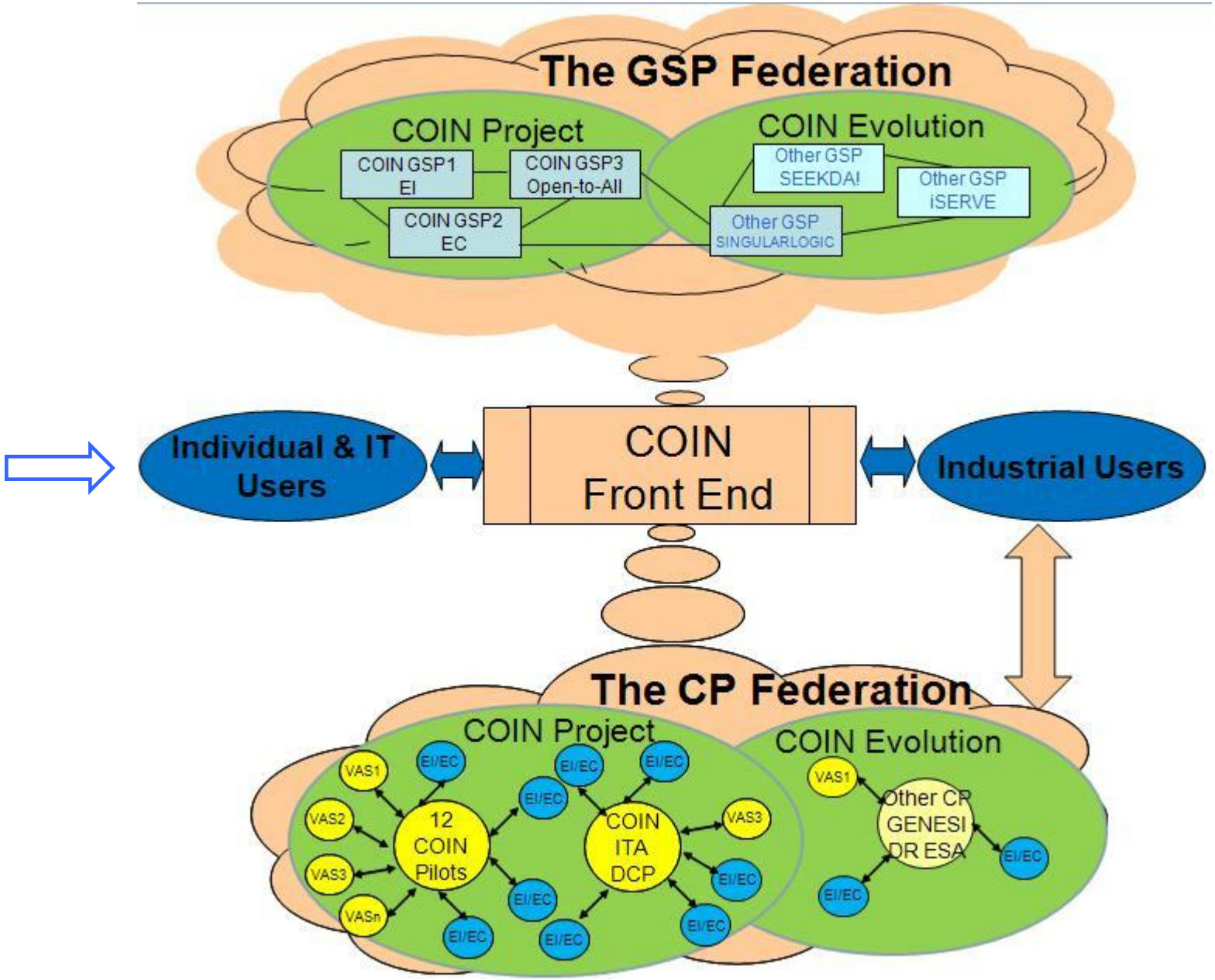
COIN Reasoning / Negotiation

- **Methodology & Tools for „Negotiation as a service“ (NaaS):**
  - Create a generic negotiation protocol description
  - MDA Transformations to PSM agent-based web application-service
  - Configure preparation phase
  - Connect to the COIN GSP for service/provider selection



- **Service composition on top of COIN GSP**
  - Model-driven approach
  - Flexible composition based on planning techniques

Rapid prototyping of new/configurable negotiation services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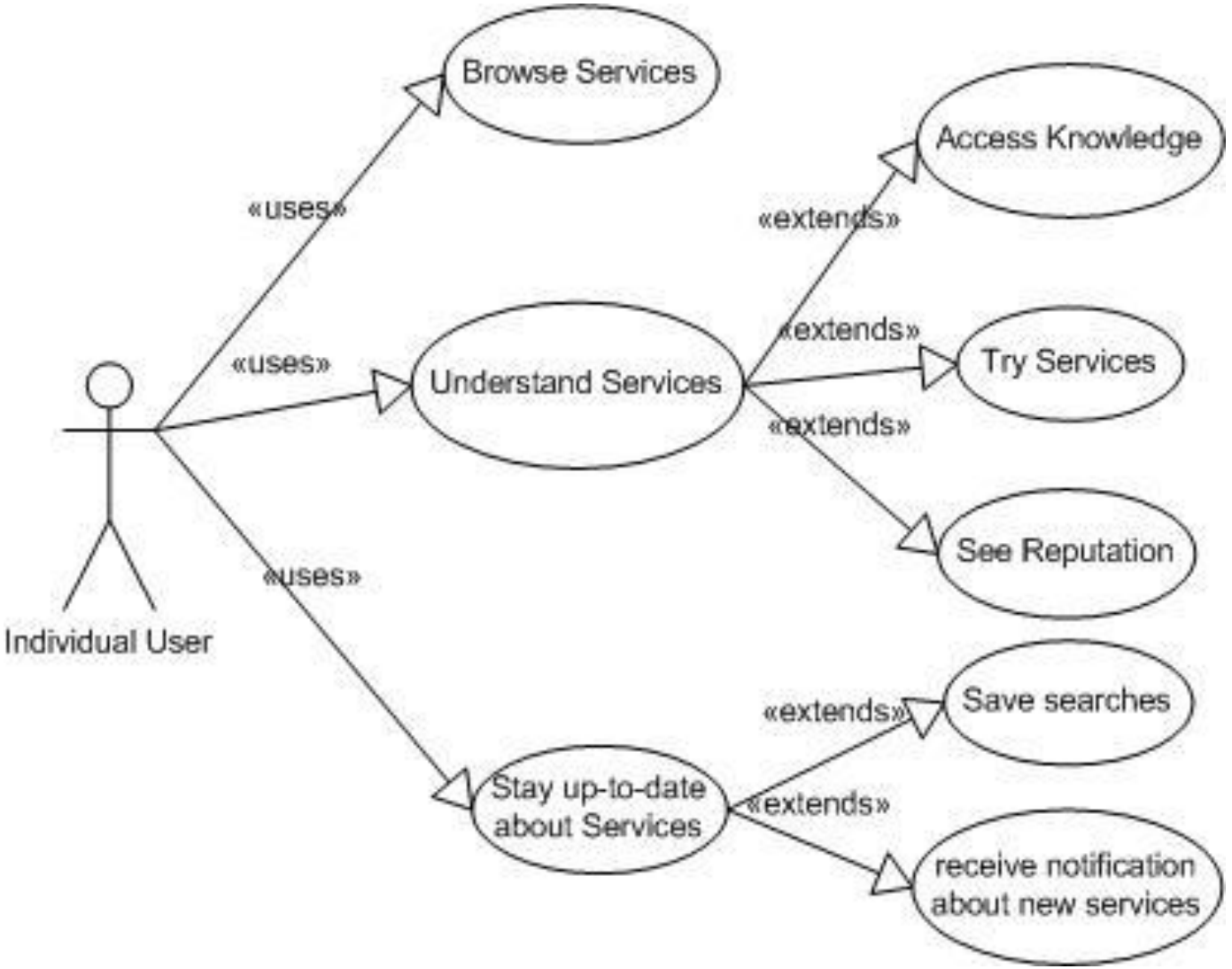
Who is the individual user?

- Individual user
  - Few or No IT experience
  - No knowledge about ontologies - PRE/POST conditions
  - No time/willing to learn technical stuff

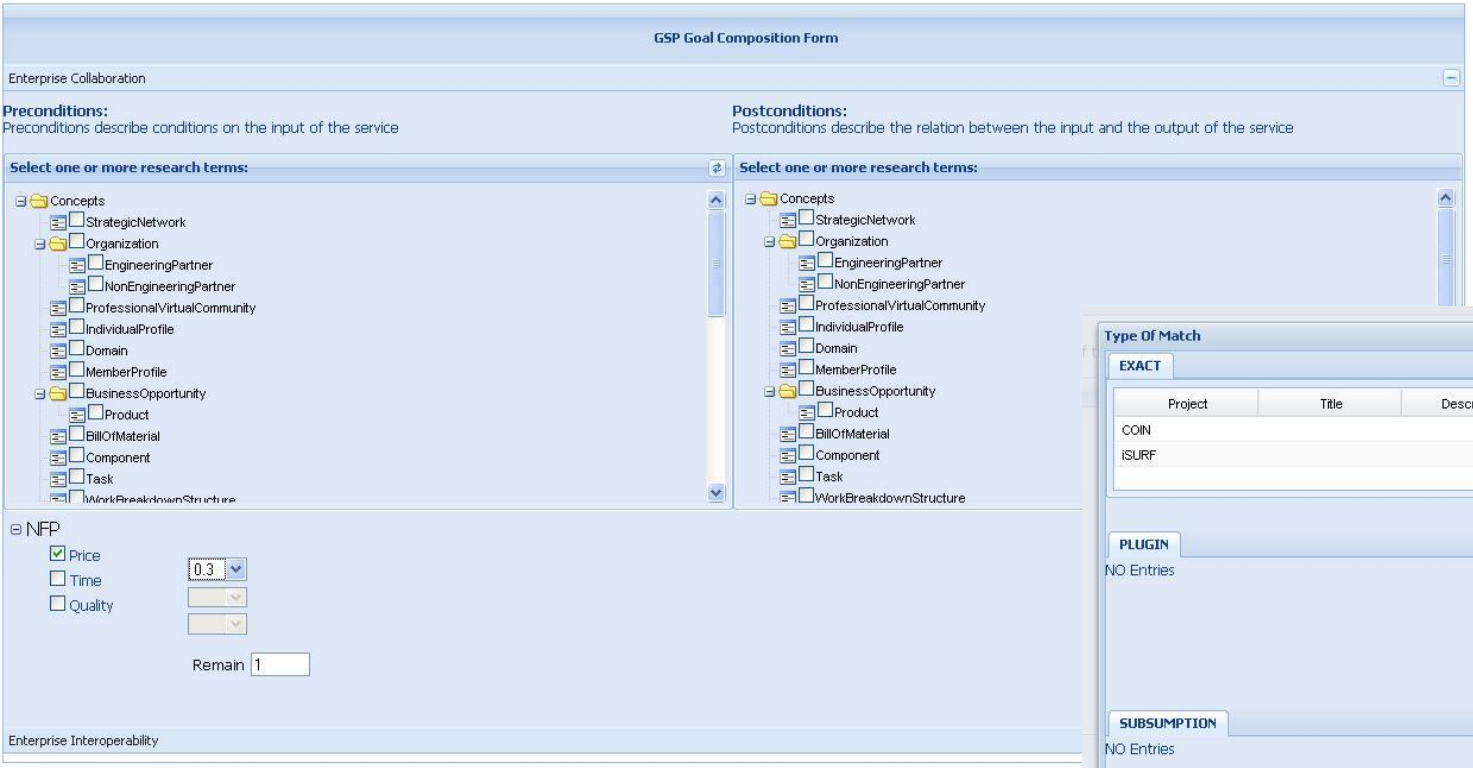
Which are the offered functionalities?

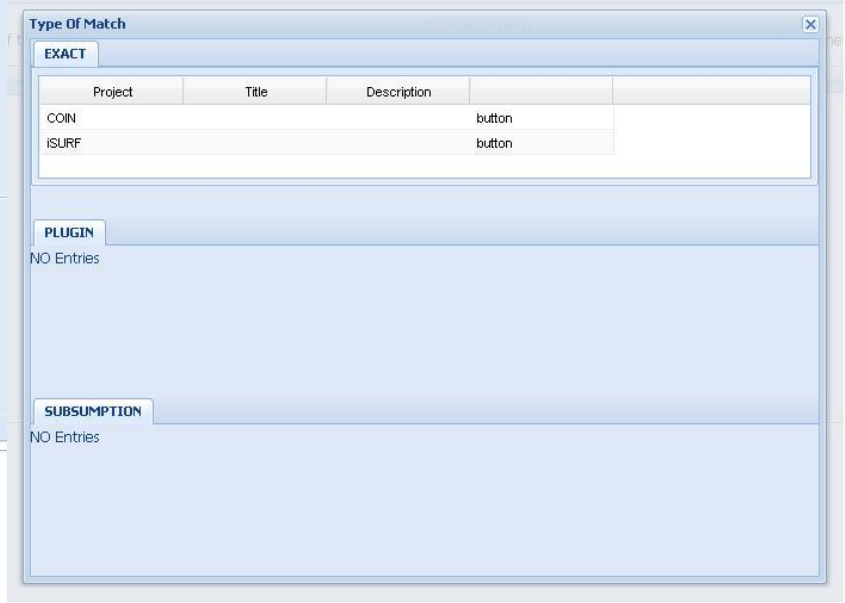


Where we were (Y2)

- Single Graphic User Interface role access
- Search by PRE and POST conditions
- Rank and display services
- Show simple information about services

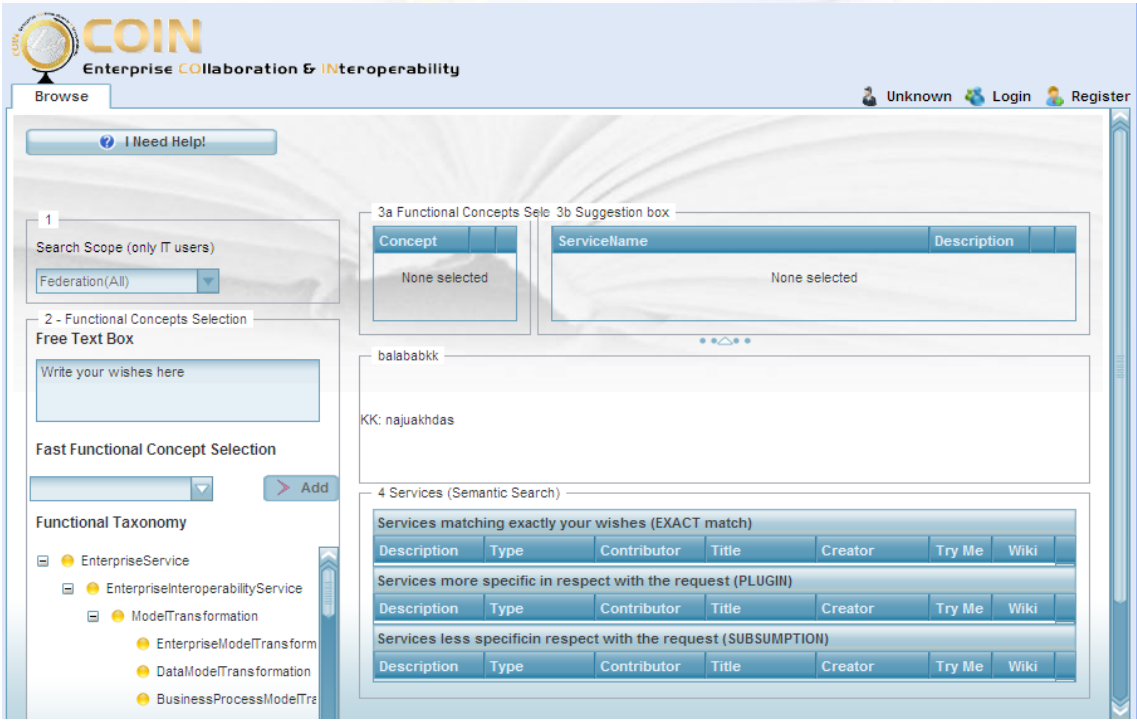
- Serch by NFP
- New services notification in Push





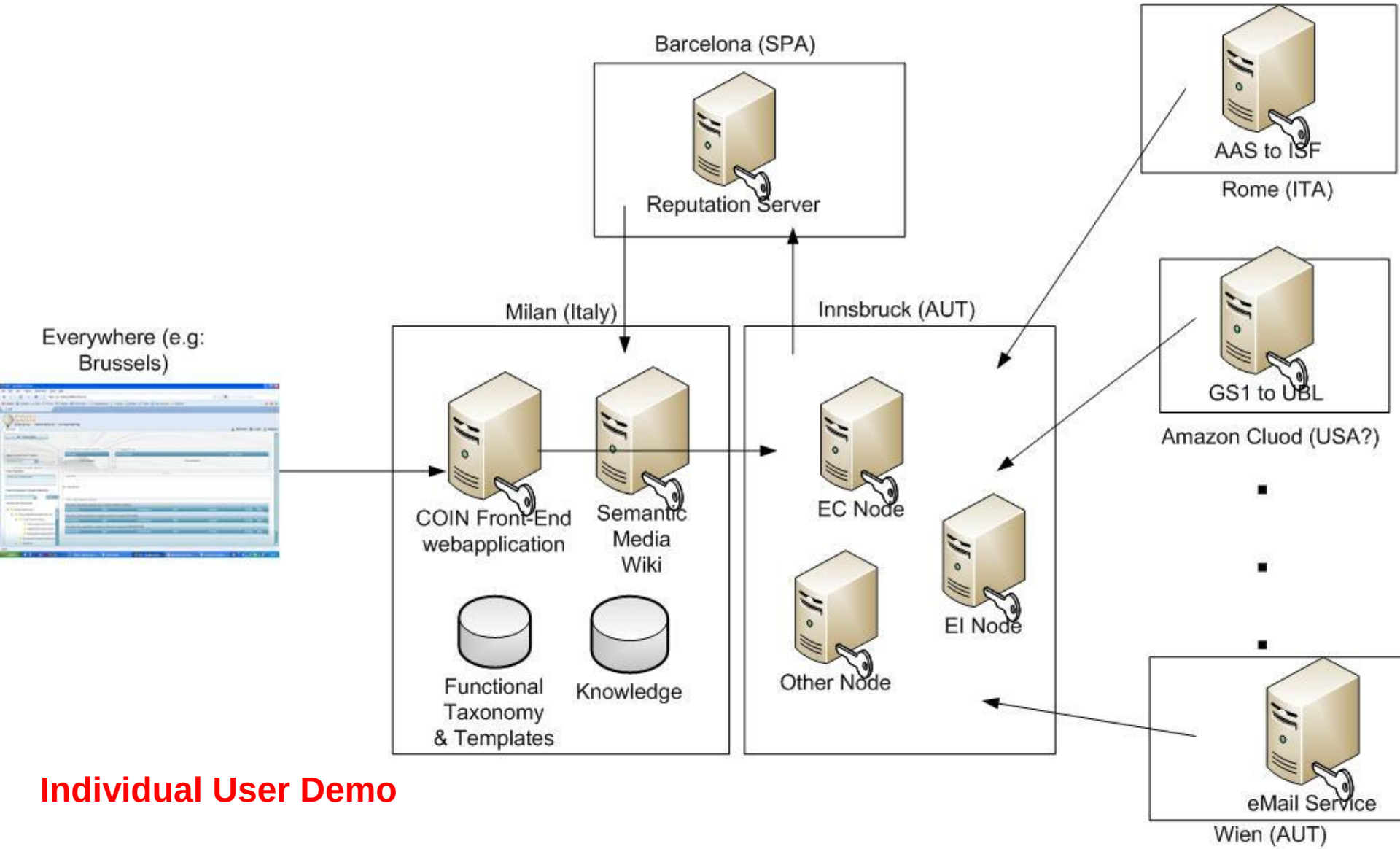
Advancements

- Totally ***new* GUI**
  - Labels improved
  - Content displyed improved
  - GIU Integrated support to user
- ***New*** way to **browse** repository
  - Functional taxonomy & templates (!)
- Free access to the **knowledge** associated to services (***new***)
- Free access to the **reputation** of services (***new***)



- Functionalities under development
  - New ways to express whises (e.g: free text)
  - Private page to stay up-to-date with desired services
  - Others will come

Architecture & Deployment



Individual User Demo

Who is the IT user?

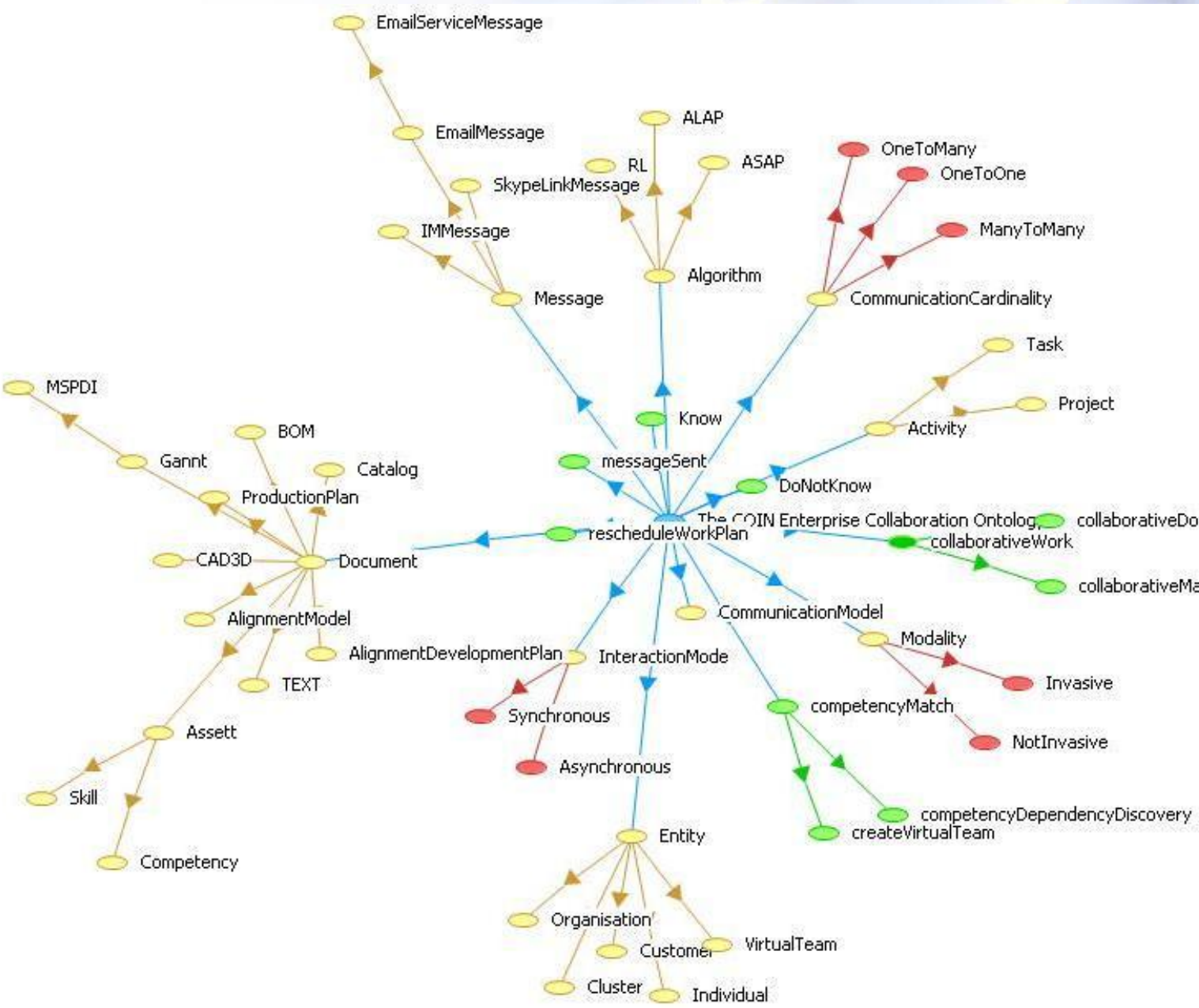
- IT user
  - IT company
  - Service provider
  - Node provider
  - With or without knowledge about ontologies

What teh IT User can do?

- Individual User Functionalities

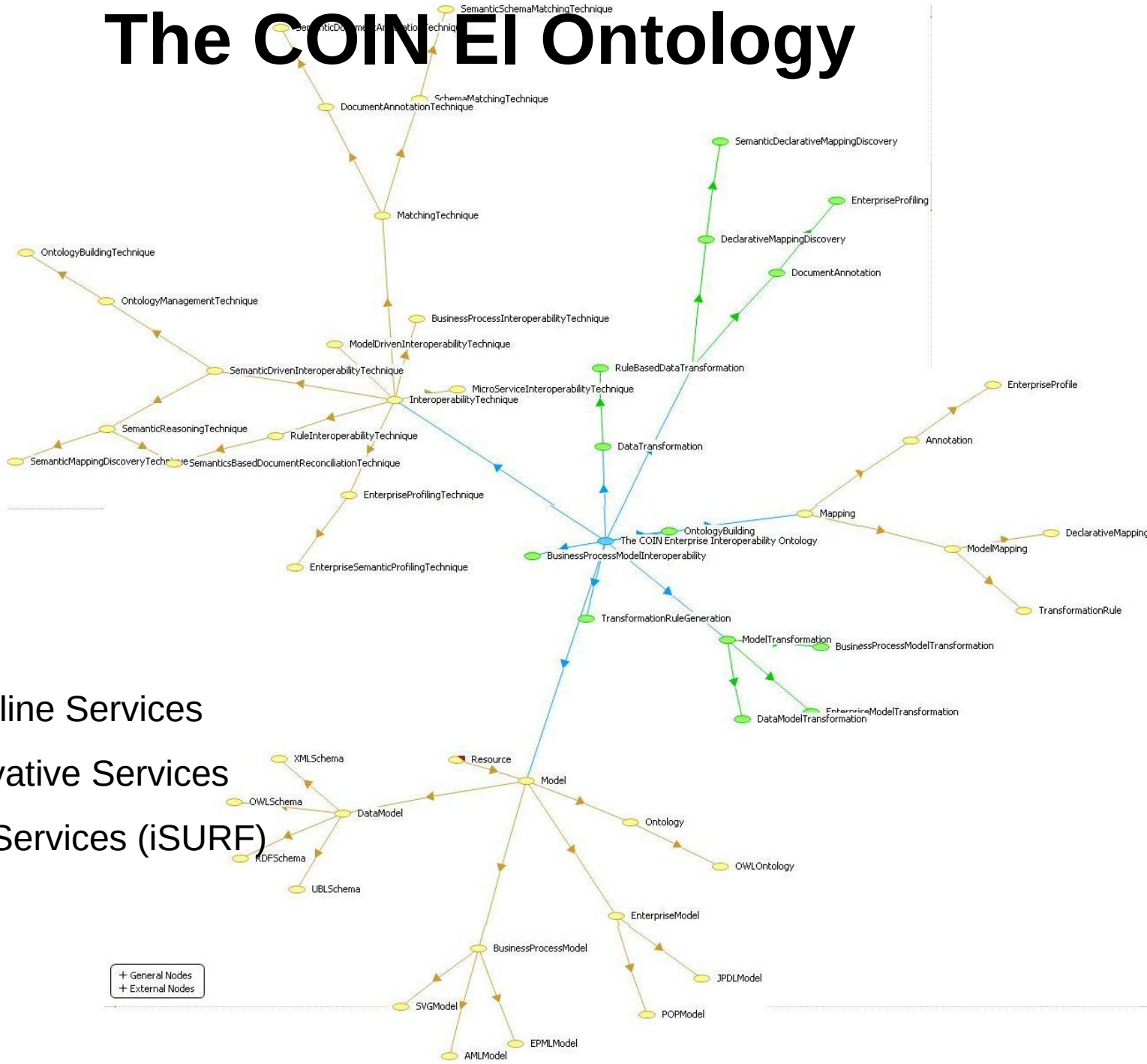
- Register a new node
- Register a new service
- Download COIN assets (Open Source)

The COIN EC Ontology



- 35 Concepts
- 22 Relations
- 10 COIN EC Baseline Services
- 15 COIN EC Innovative Services
- 1 non-COIN EC Service (ECOSPACE)

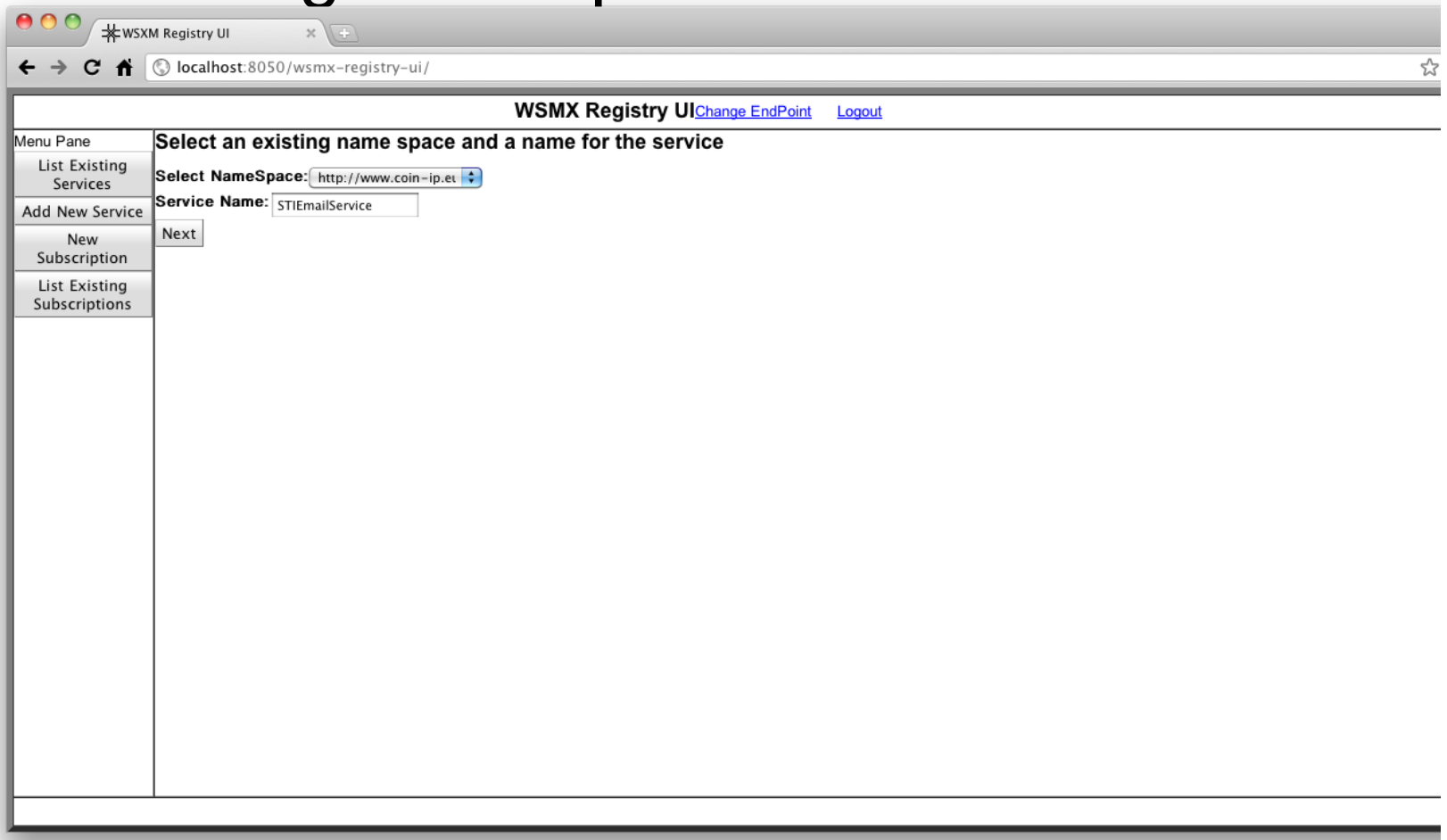
The COIN EI Ontology



- 39 Concepts
- 14 Relations
- 7 COIN EI Baseline Services
- 9 COIN EI Innovative Services
- 2 non-COIN EI Services (iSURF)

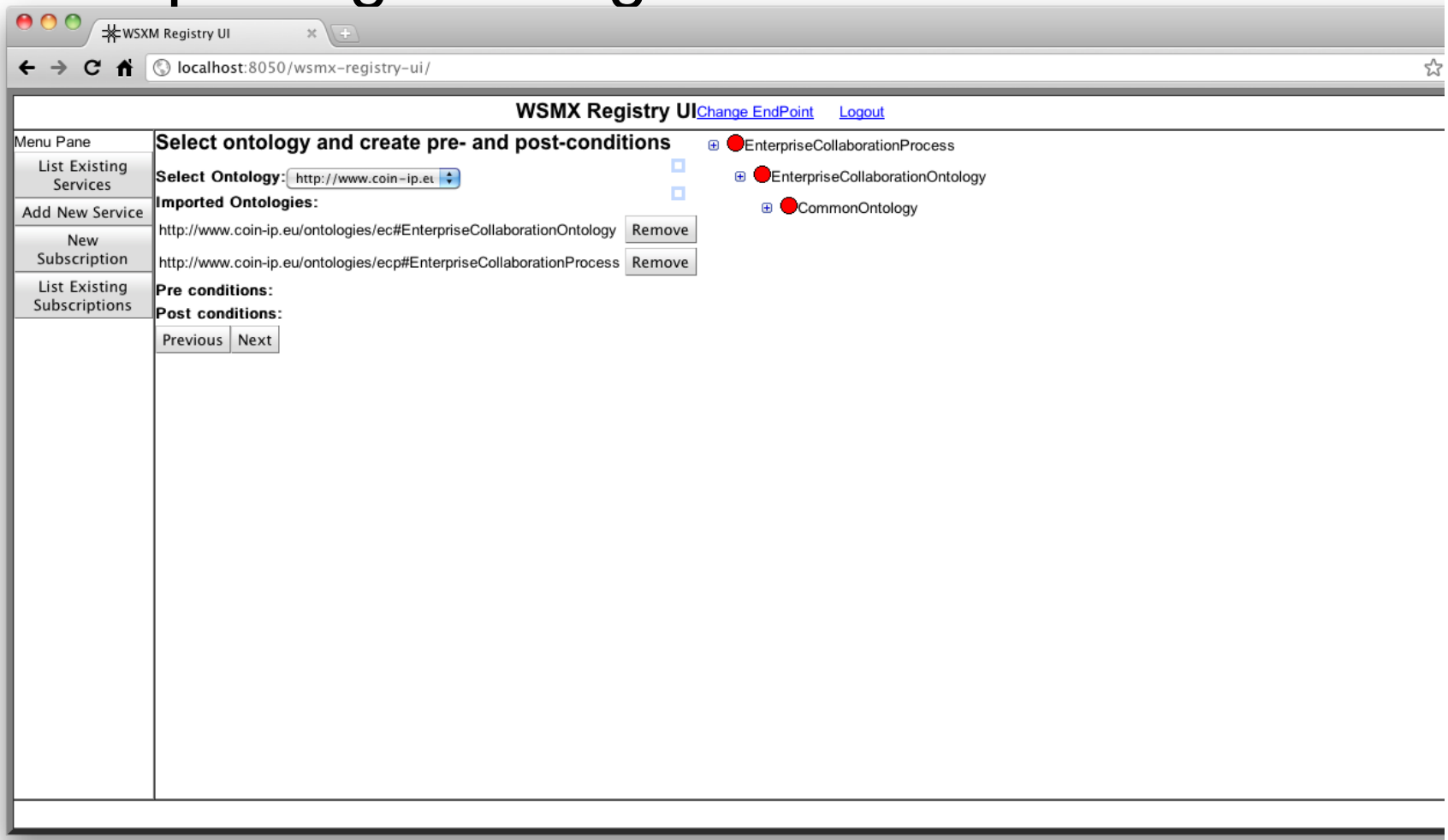
Registration process

- Selecting namespace and SWS identifier



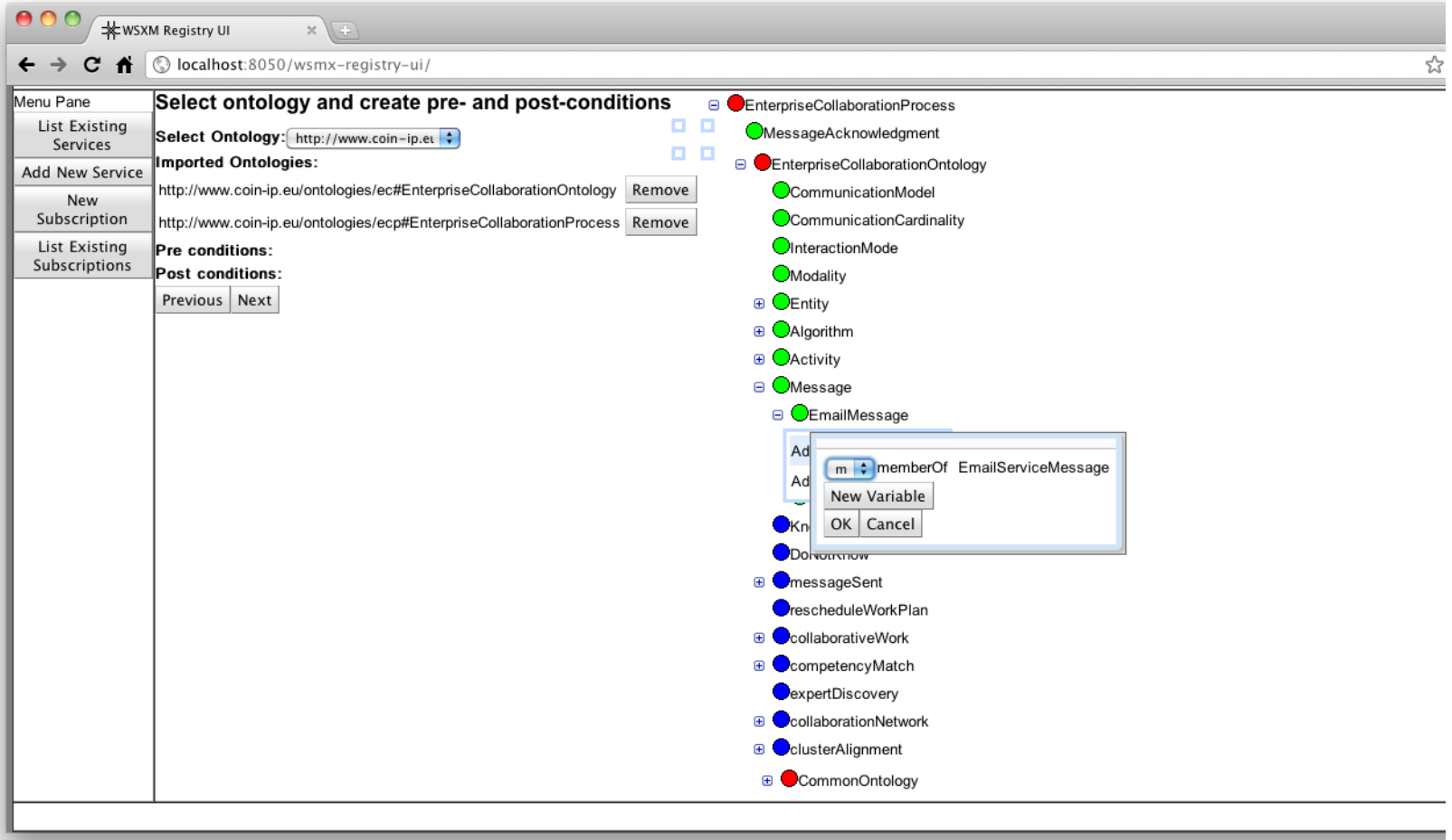
Registration process

- Importing ontologies



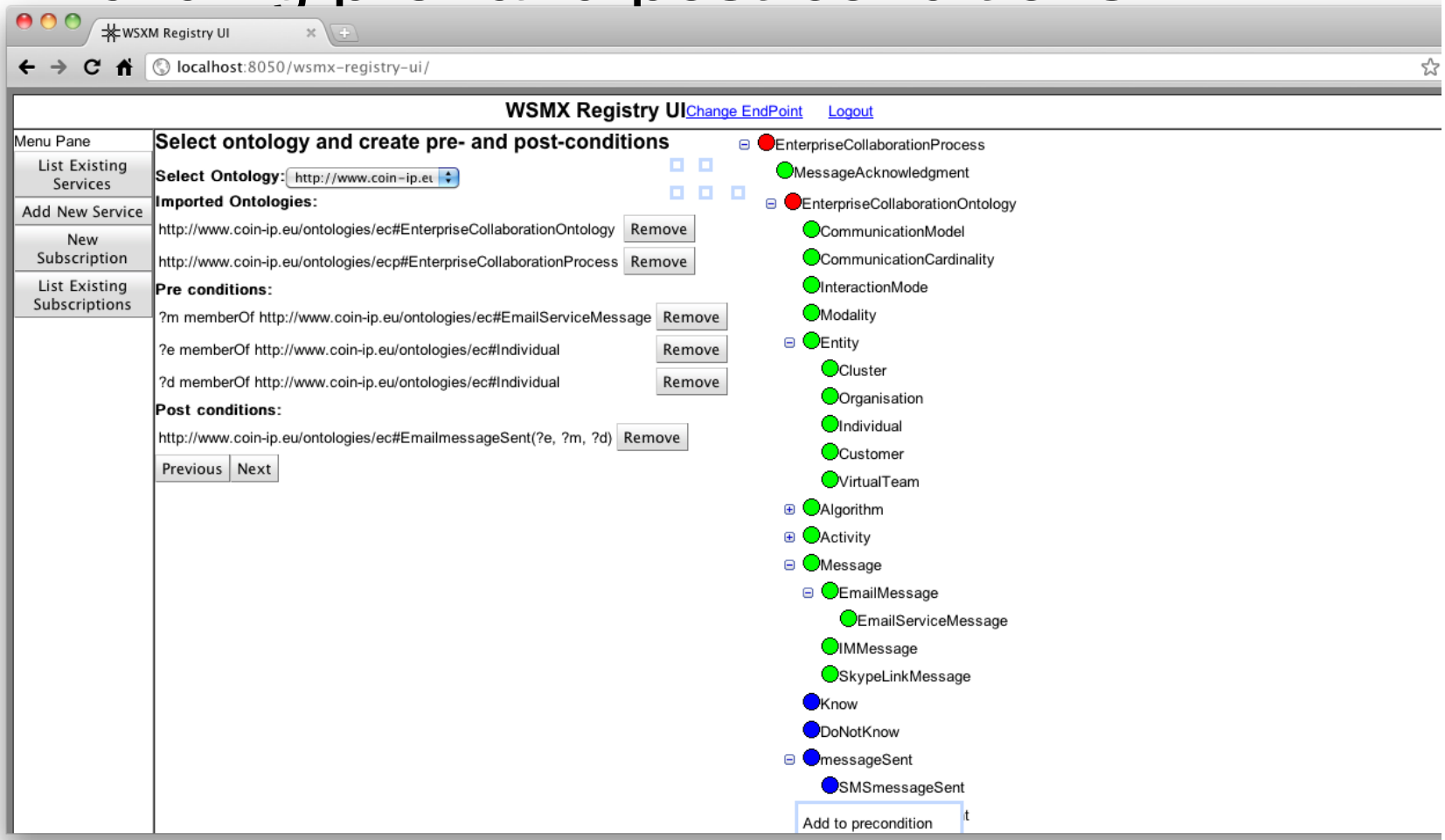
Registration process

- Building pre- and post-conditions



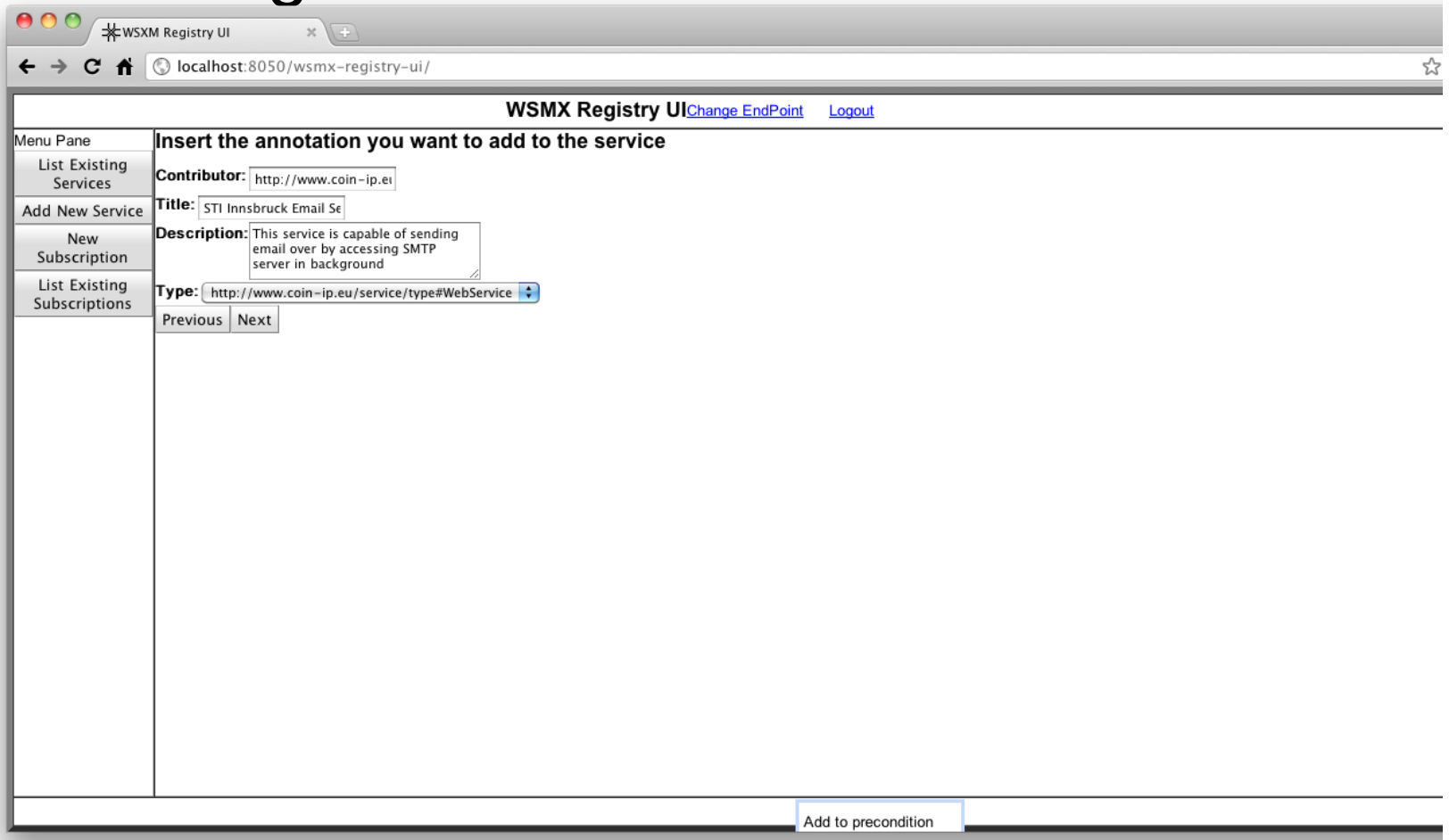
Registration process

- Building pre- and post-conditions



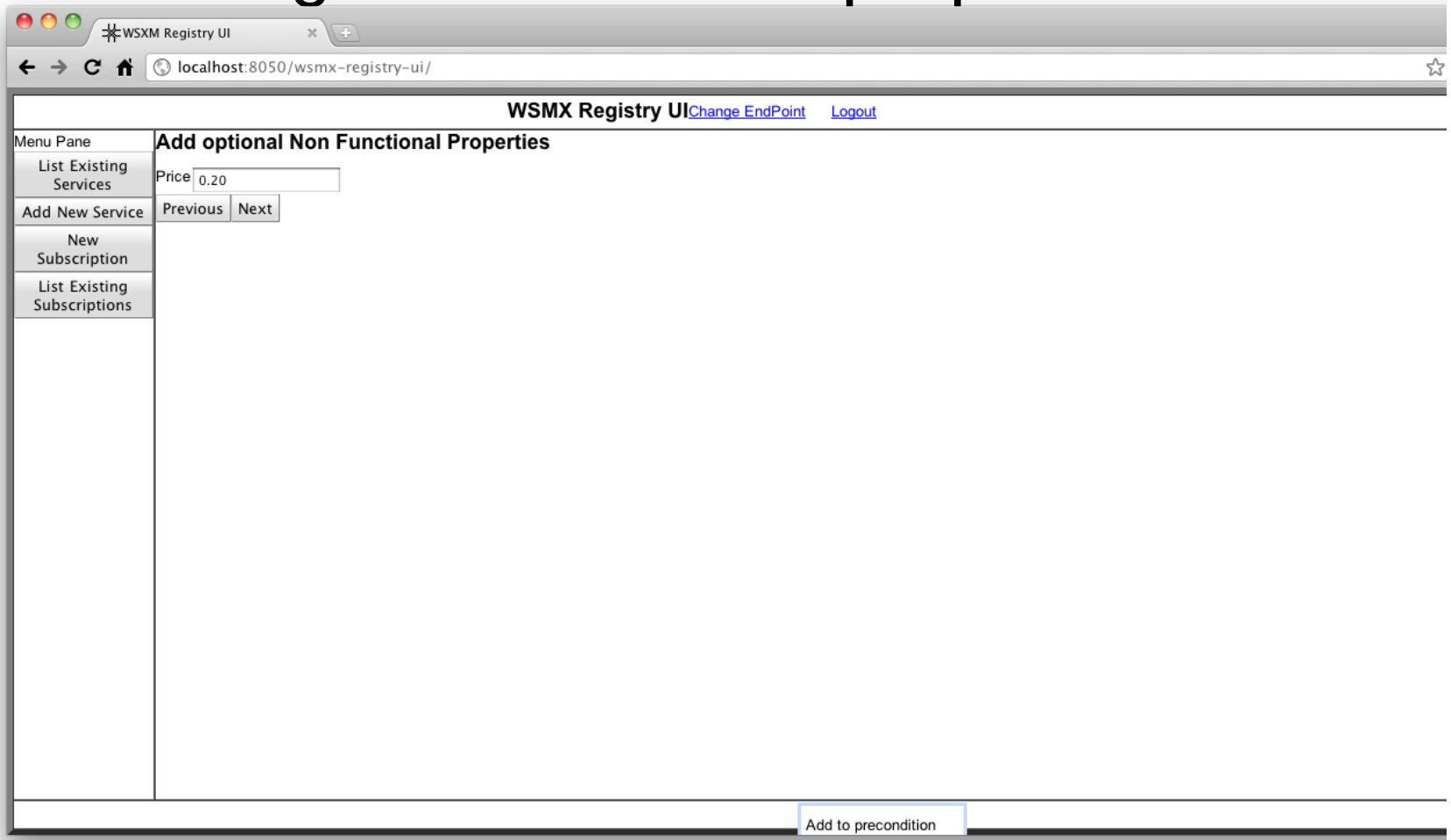
Registration process

- Defining annotations



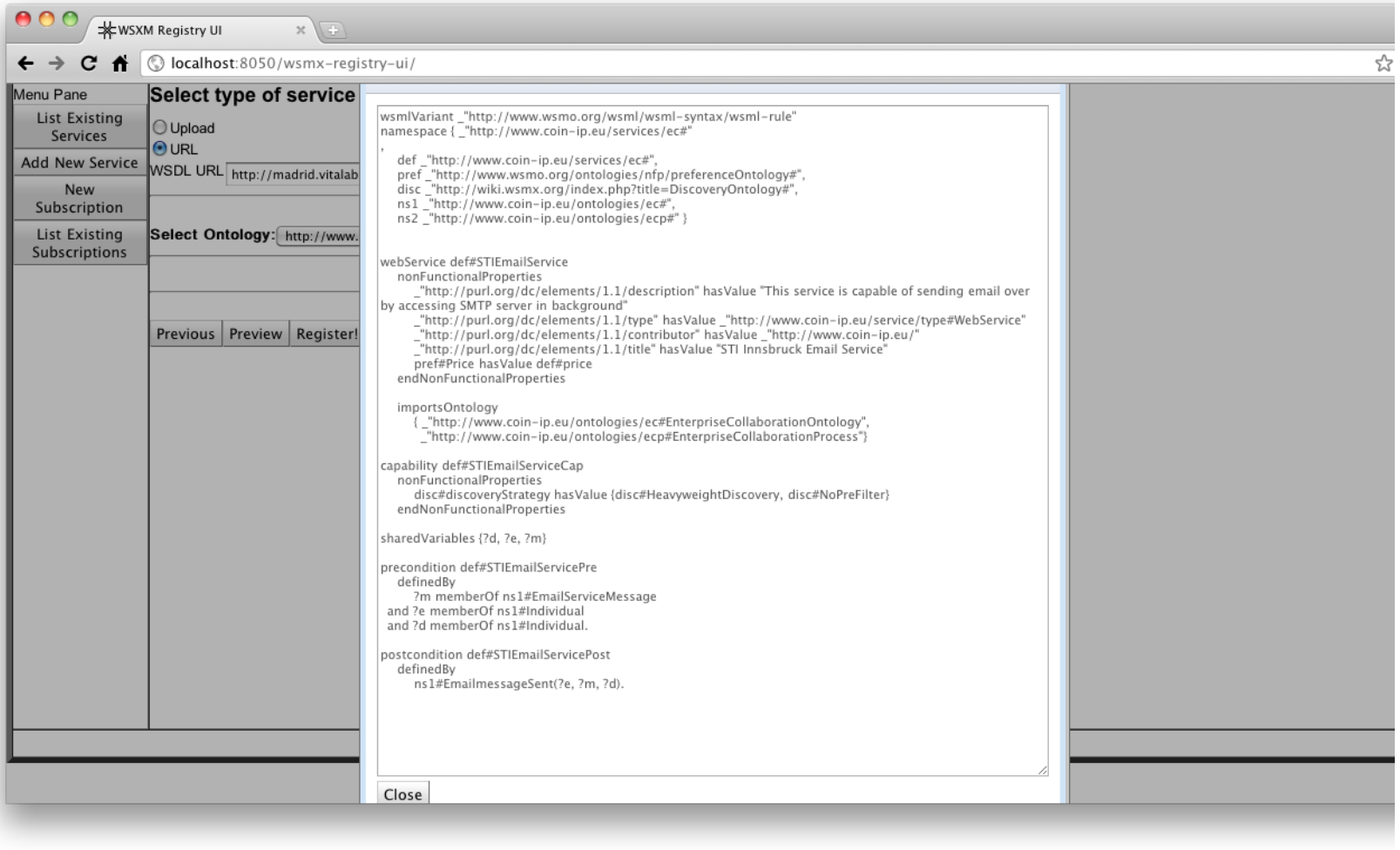
Registration process

- Defining non-functional properties



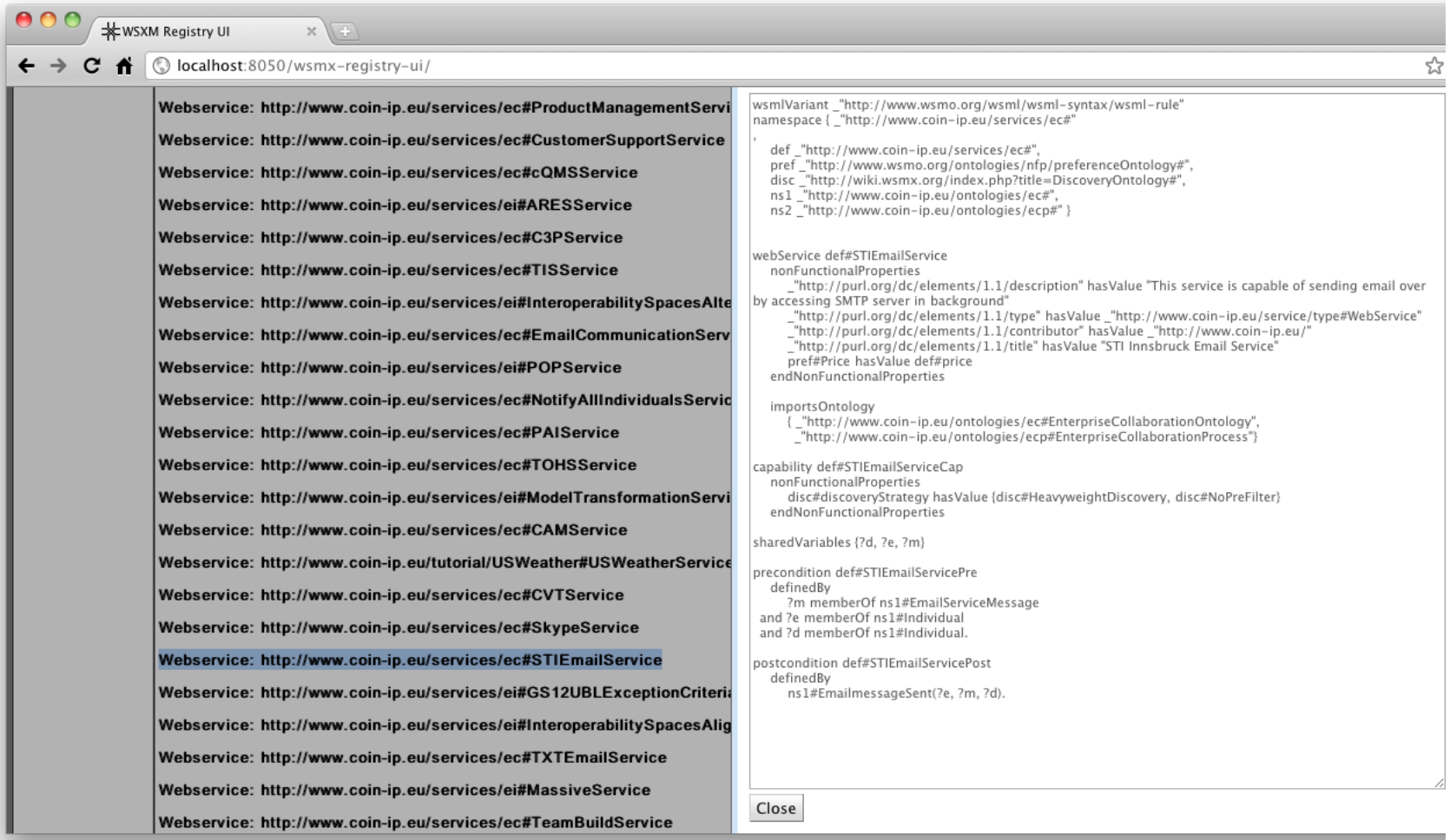
Registration process

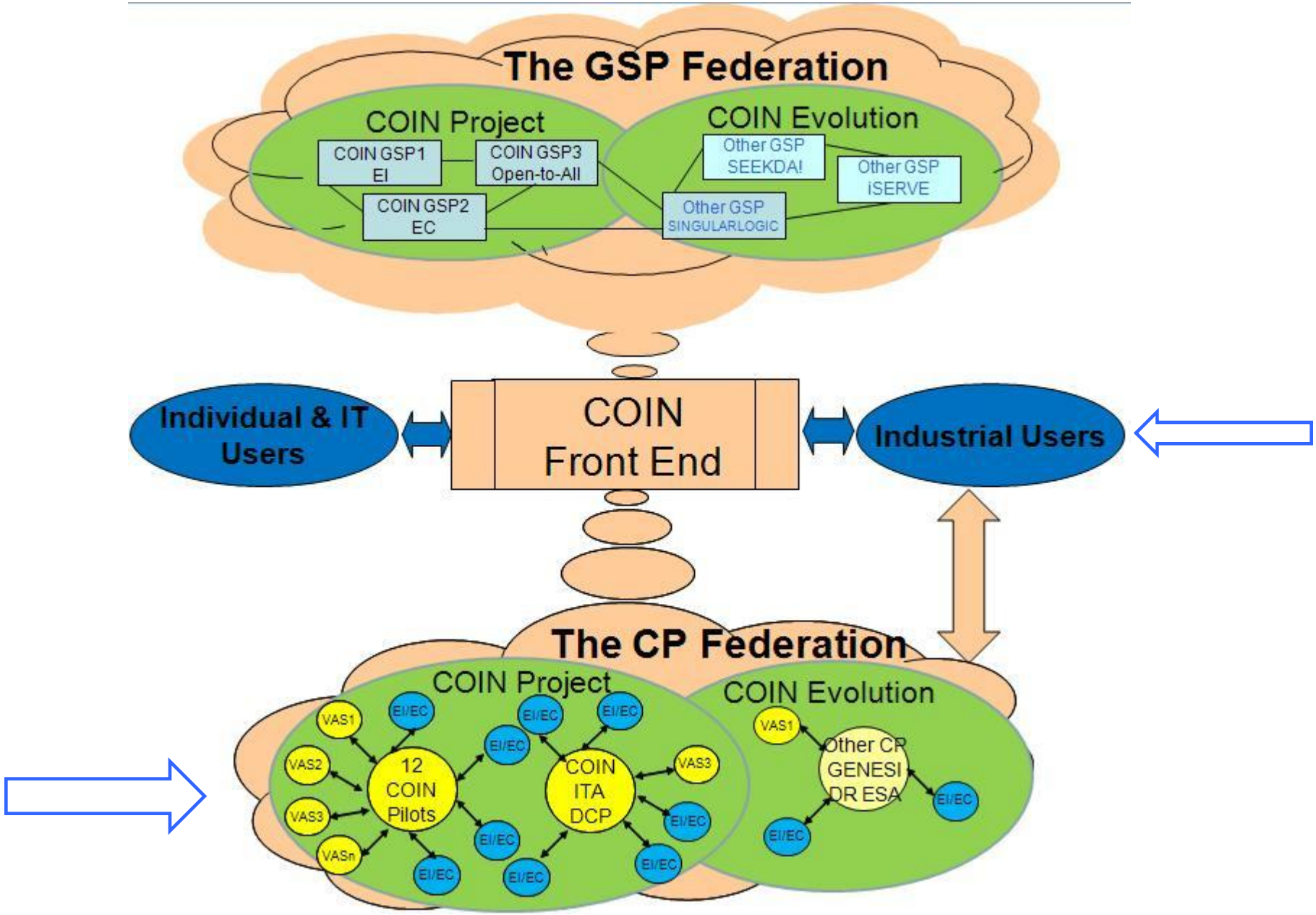
- Final shape of the service description



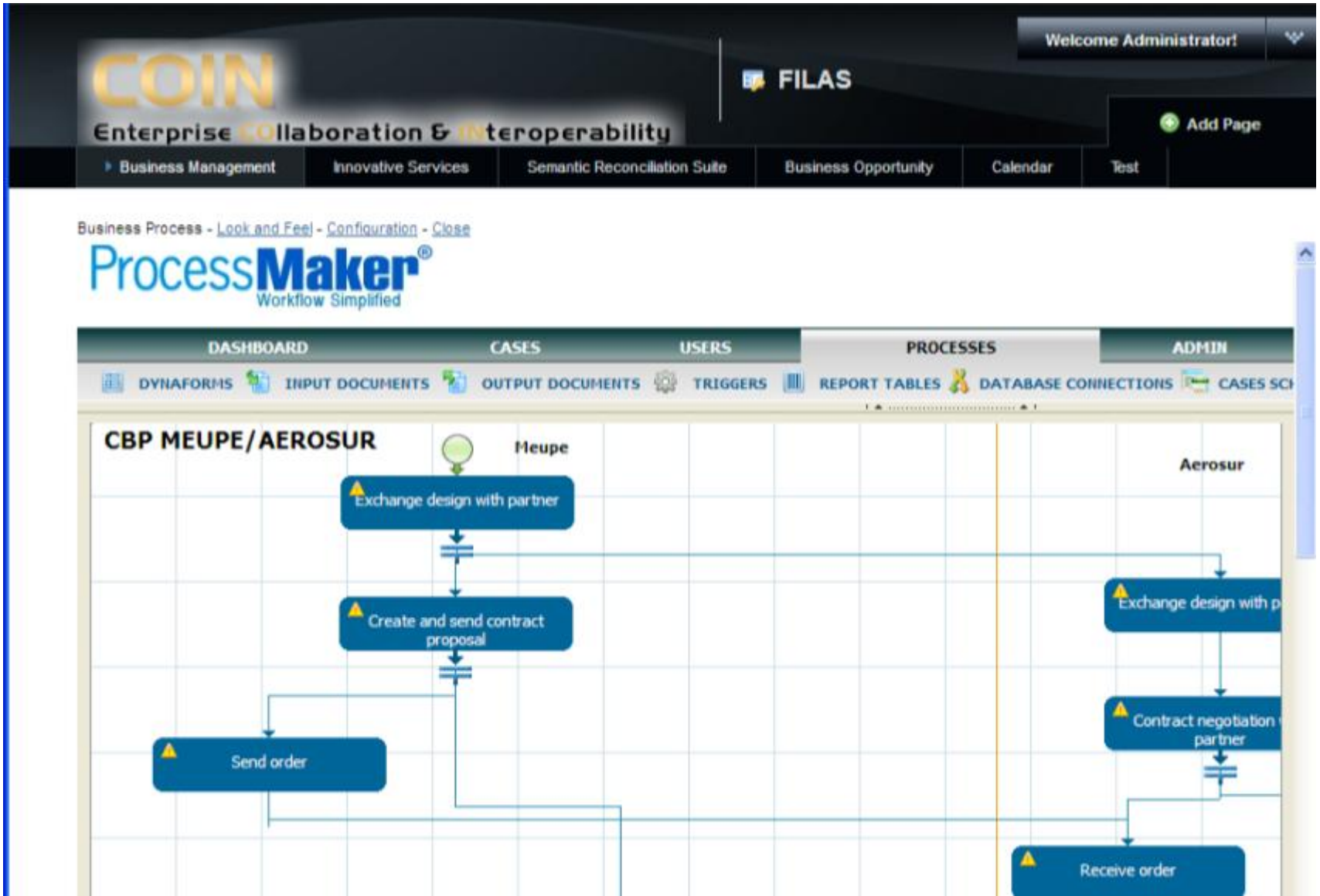
Registration process

- The service has been registered in the GSP

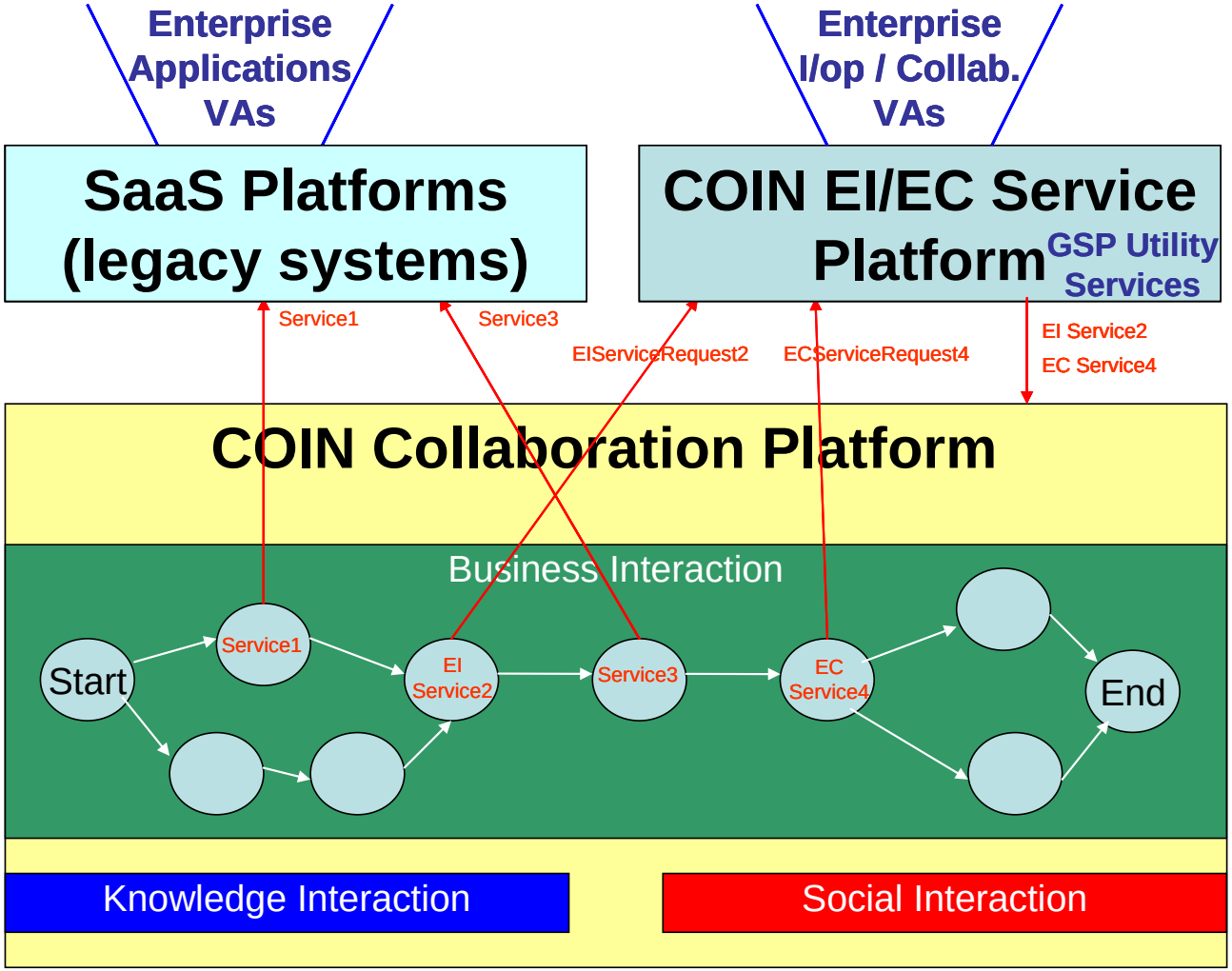



The GSP Federation
COIN Project
COIN GSP1
EI
COIN GSP3
Open-to-All
COIN GSP2
EC
COIN Evolution
Other GSP
SEEKDA!
Other GSP
iSERVE
Other GSP
SINGULARLOGIC
Individual & IT
Users
COIN
Front End
Industrial Users
The CP Federation
COIN Project
VAS1
VAS2
VAS3
VASn
EI/EC
12
COIN
Pilots
COIN
ITA
DCP
COIN Evolution
VAS1
Other CP
GENESI
DR ESA
EI/EC

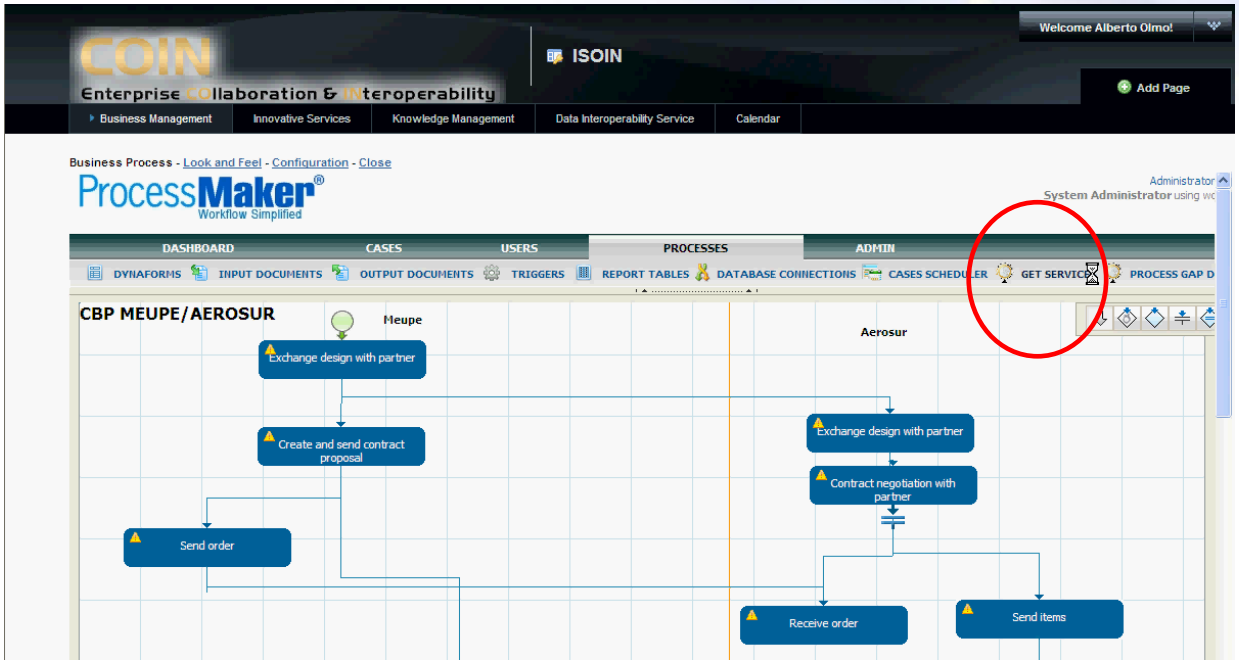
Business Process



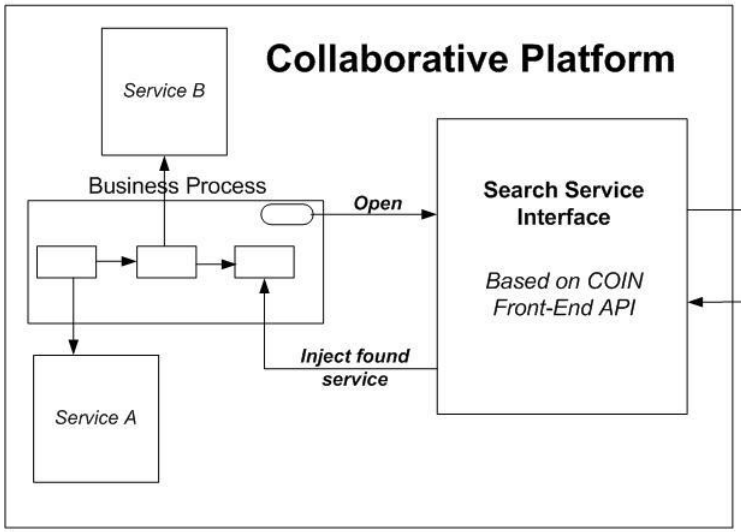
Services access from the COIN CP (integration Step 2)

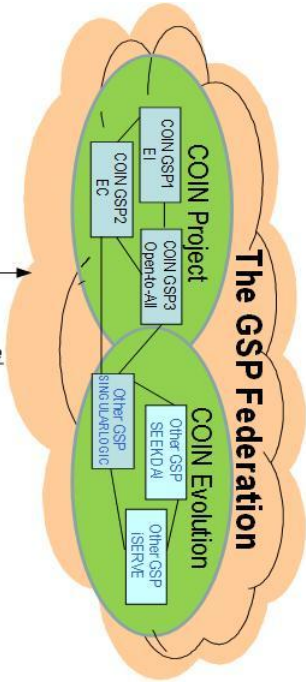


Services access from the COIN CP

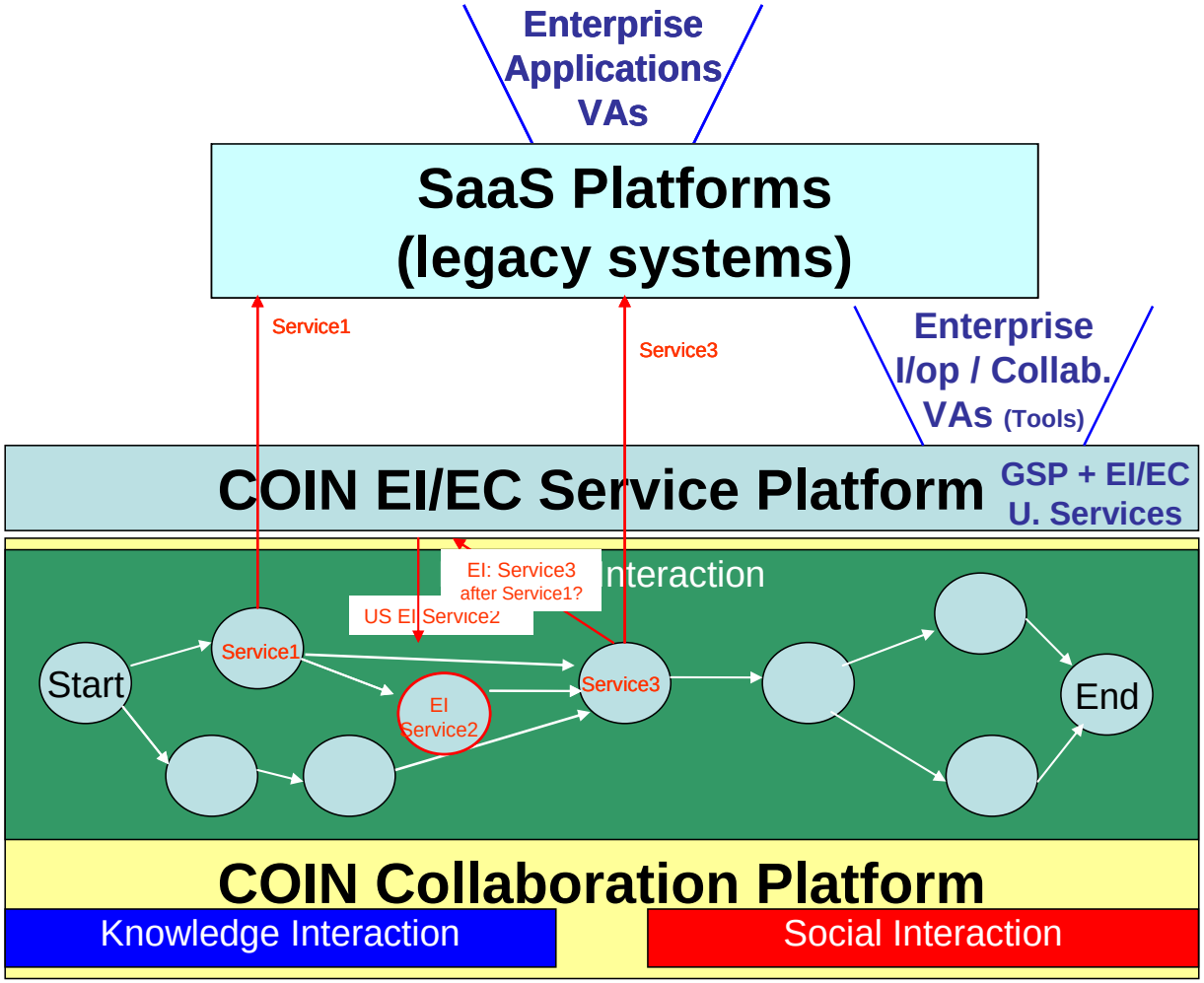


Step 2 Video



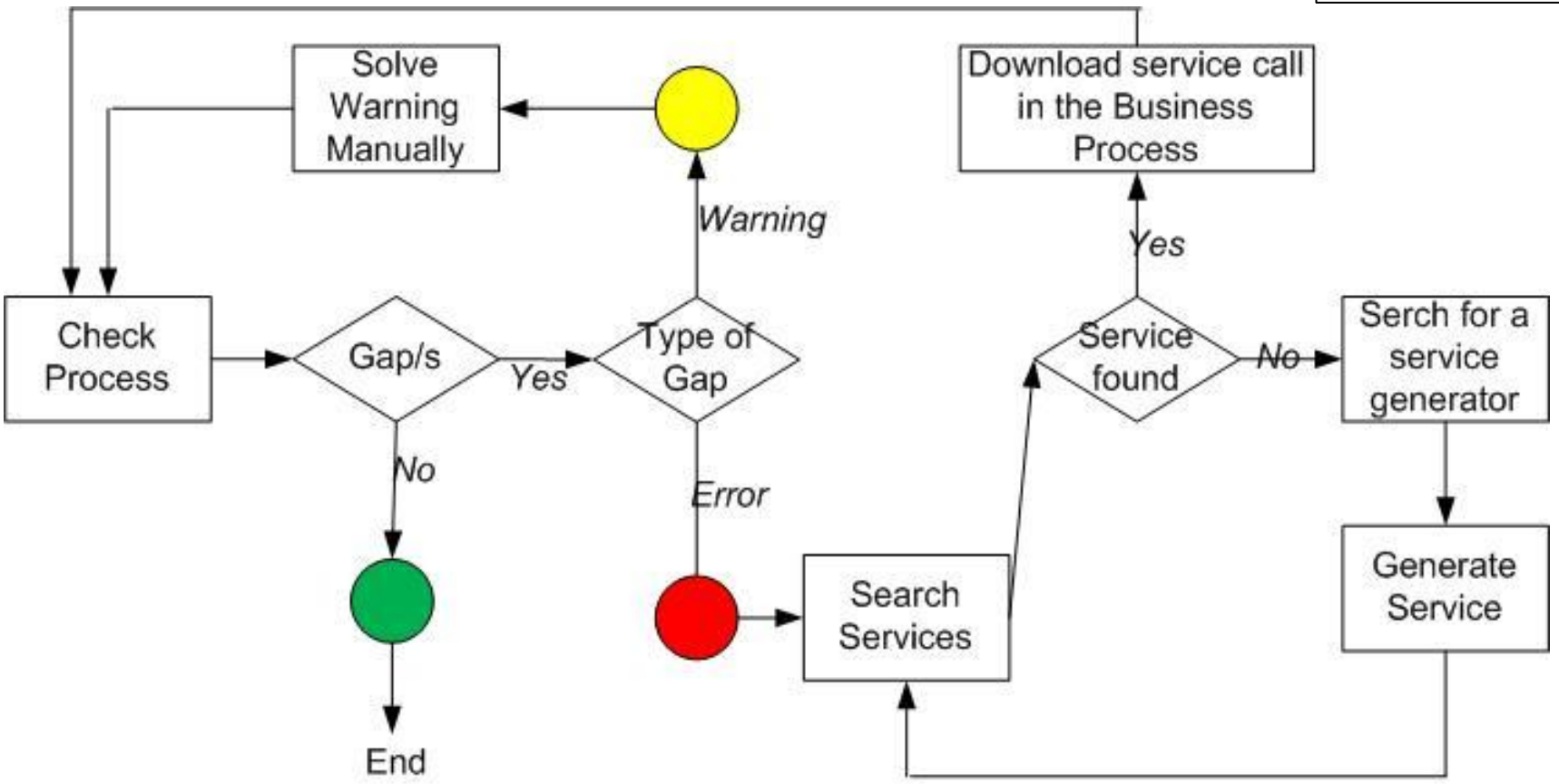


Services access from the COIN CP (Integration Step 3 - EI)

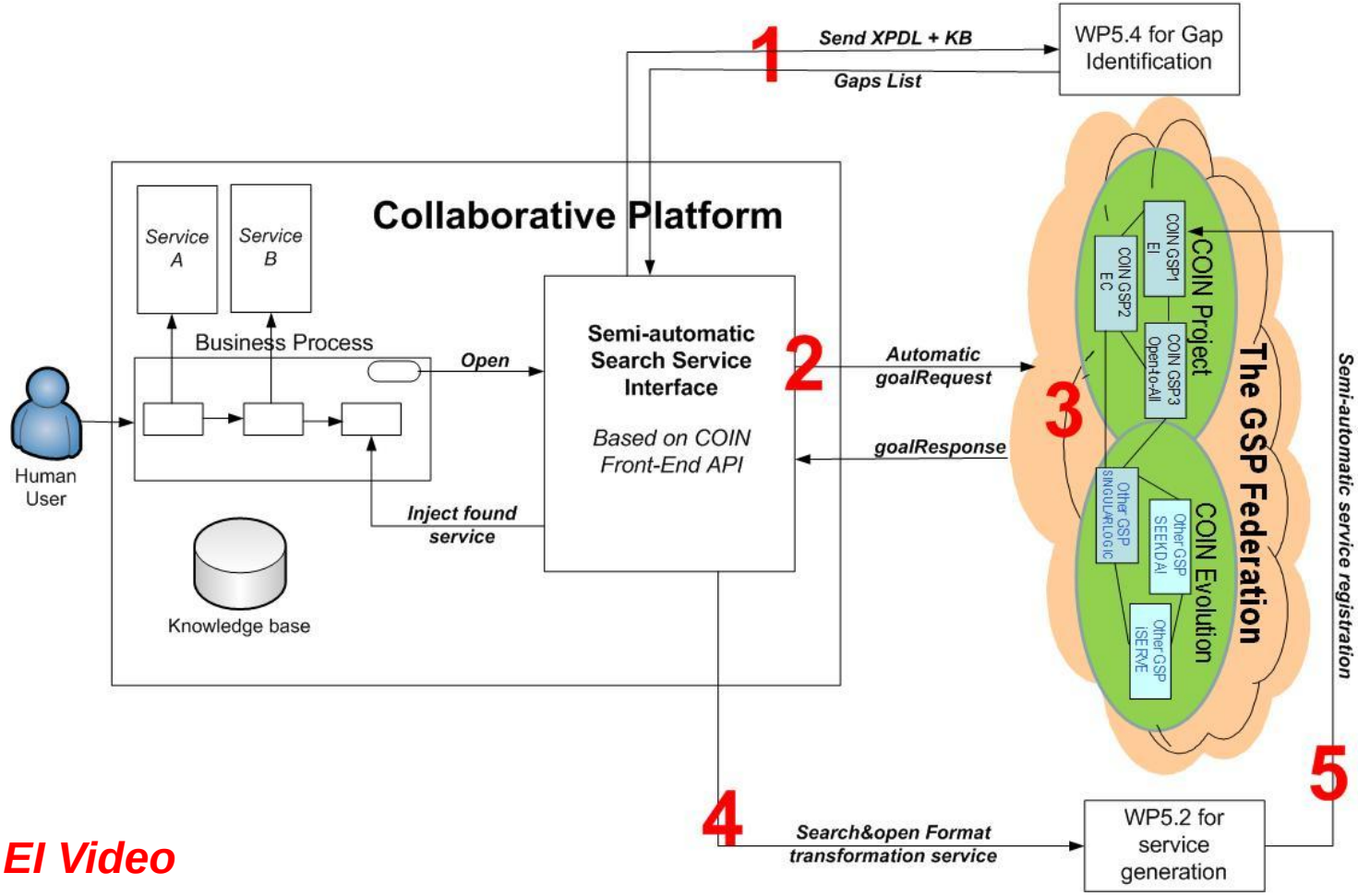


Services access from the COIN CP (Integration Step 3 - EI)

- **Mismatch**
- loop

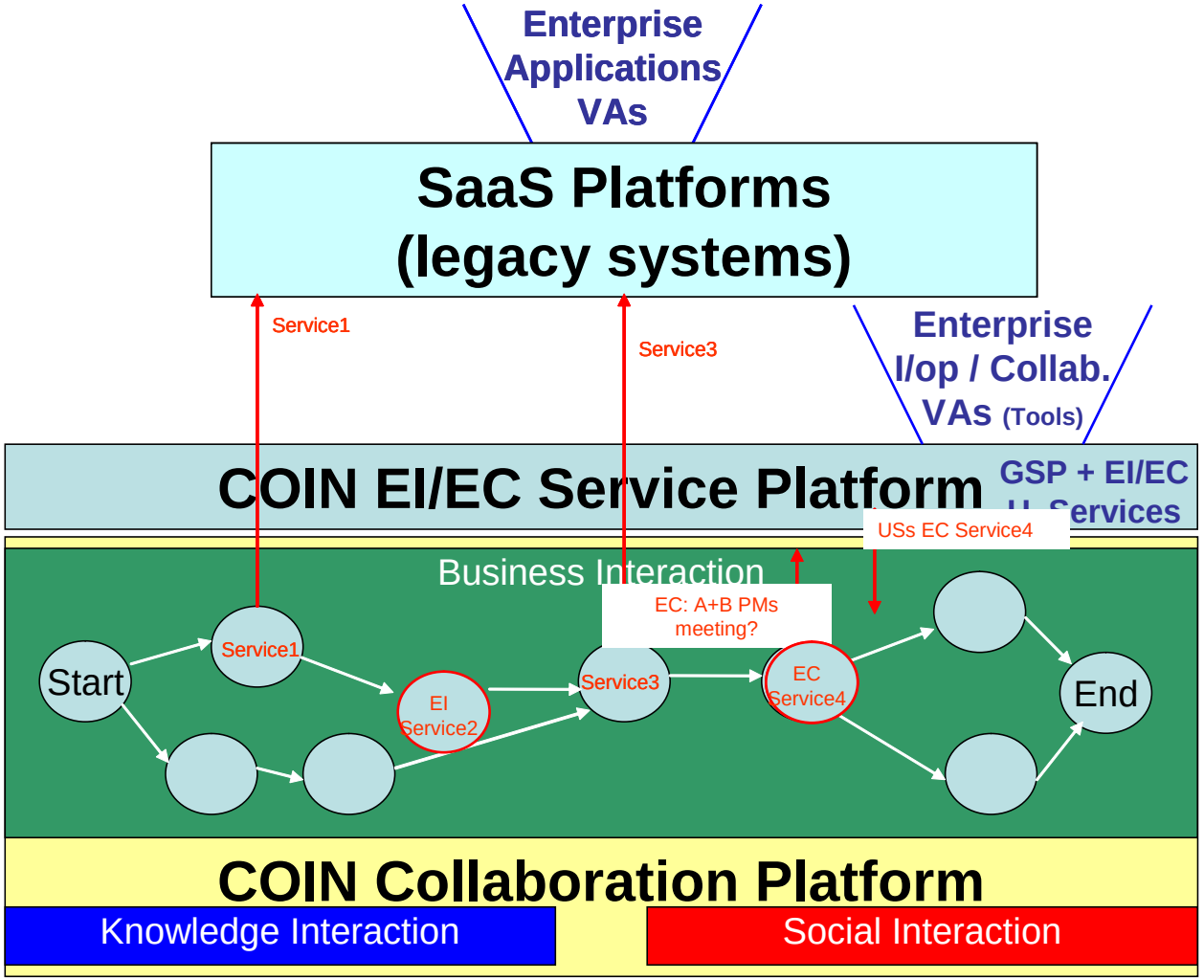


Services access from the COIN CP (Integration Step 3 - EI)

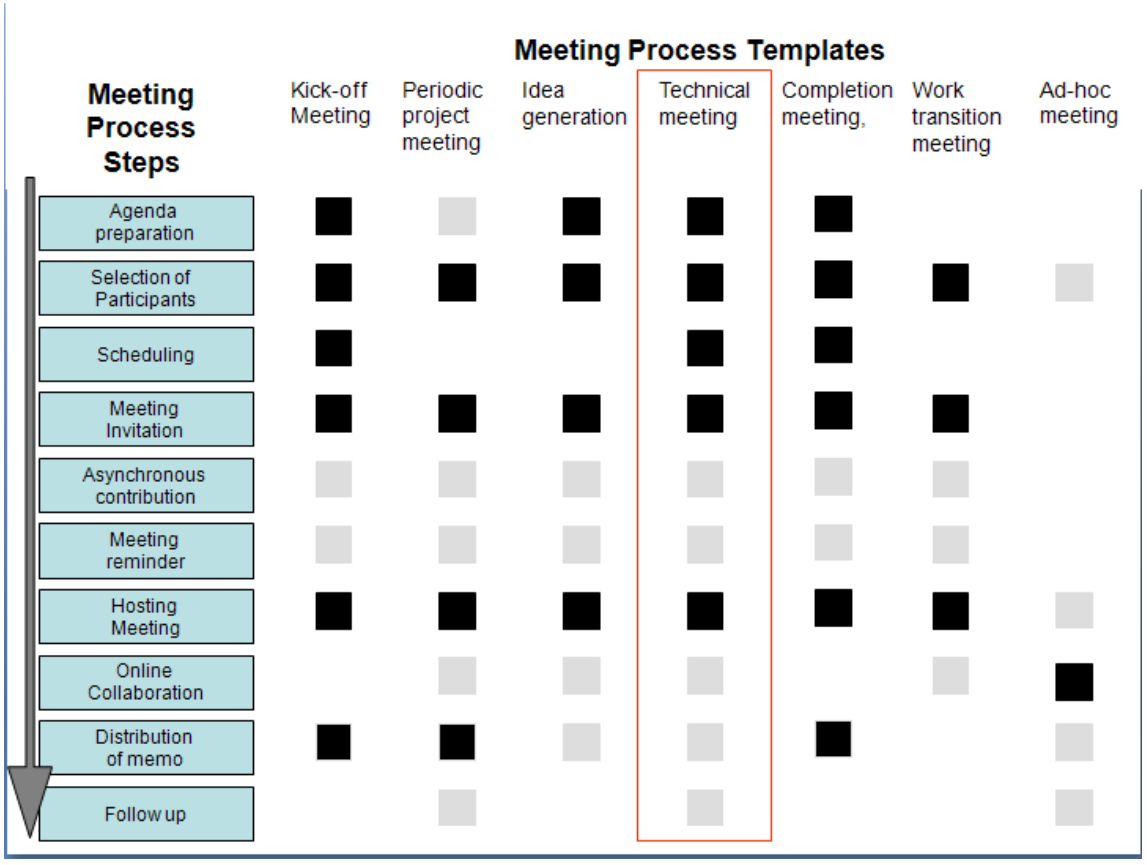


Step 3 EI Video

Services access from the COIN CP (Integration Step 3 - EC)



Services access from the COIN CP (Integration Step 3 - EC)

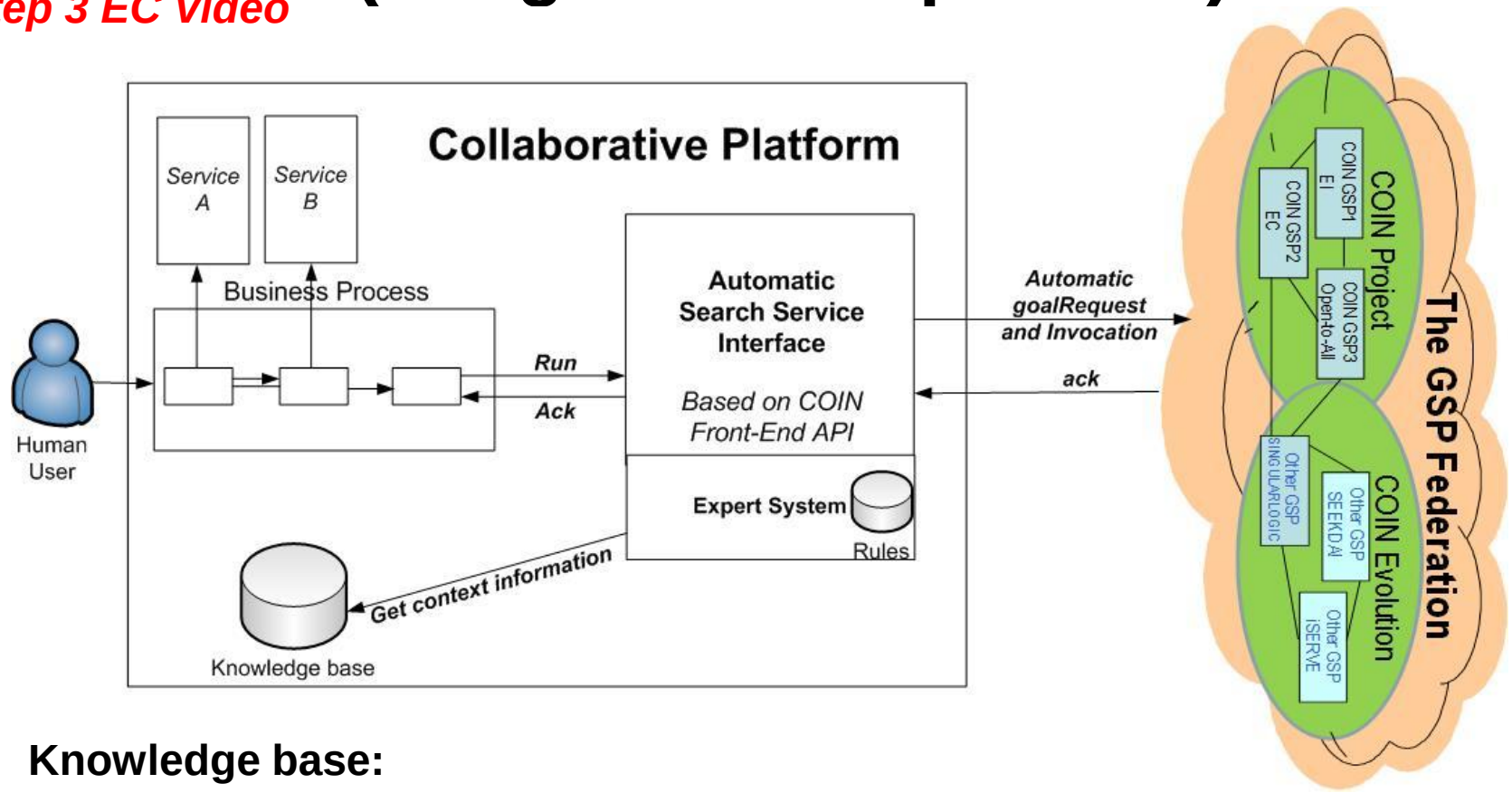


Meeting Invitation

eMail / SMS / IM / Skype chat / Phone call

Services access from the COIN CP (Integration Step 3 - EC)

Step 3 EC Video



Knowledge base:

trust == Low/Medium/High (trust among sender and receiver)
priority == Low/High (priority of the task)
availability == free/busy (from the shared agenda) – available in skype (Y/N)
communication profiles == has email (Y/N) has skype (Y/N), etc.

Enterprise COllaboration & INteroperability

COIN Winter School

COIN System Demos

Ljubjana, Nov 29th 2011
Michele Sesana
TXT e-solutions S.p.A.