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| Strategic Objective |
| Business process fusion based on Semantically-enabled Service-oriented Business Applications |
| STREP / Work Package Title |
| Specific Targeted Research Or Innovation Project |
| Acronym |
| FUSION |
| Project No |
| 027385 |
| FUSION – Work Package Name |
| Innovation Management, Dissemination and Exploitation |
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Workshop Report

Work package – 6

Leading Partner: SEERC

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Versioning and Contribution History

Main Contributors:

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| Version | Date | Modification reason | Modified by |
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1 Objective of the workshop

This report comprises the results of the workshop on **Advancing European Research in Enterprise Interoperability (session 12g)**, which took place in The Hague on the 26th of October 2007, during the e-Challenges 2007 Conference. The workshop was held as part of a series of planned regular meetings/workshops of the **Enterprise Interoperability Cluster** that are co-organised by the cluster's projects and the European Commission.

The main objectives of these cluster meetings are to exchange knowledge and raise awareness about research activities carried out in the projects that belong to this cluster or other related European research initiatives, pursue potential collaborations, co-operations, and synergies in this domain, build a common understanding on the core business and technological issues emerging from the work in the cluster, and identify promising directions for future research activities (in FP7 and beyond).

The particular workshop focused on the *Interoperability Service Utility (ISU)* concept, as put forward in the latest version of the Enterprise Interoperability Research Roadmap that was published on the 31st of July, 2006 (version 4.0). During the presentations of the workshop and the discussion that followed, emphasis was placed on business, technology, and regulatory framework aspects relating to the concept of ISU, as well as on the refinement of research priorities in the domain of ICT for Enterprise Networking for the forthcoming version of the FP7 ICT Work Programme (2009-2010).

This report summarises the main points from the seven presentations in the workshop and from the discussion that followed. It includes insights into future Interoperability Service Utility provisioning, business and organisational perspectives, emerging business models and ISU take-up scenarios as provided by the participants, and also includes suggestions for future directions and next steps.

All the workshop presentations and this report will become available from the EI Cluster website: <http://cordis.europa.eu/ist/ict-ent-net/ei.htm>

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2 Overview of the workshop

The workshop was well attended by 30 representatives from businesses, industry associations, standards organisations and academic institutions from 17 countries, together with two CEC representatives. The list of participants and presenters is provided in the table below.

2.1 Participants

| First Name | Last Name | Organisation | Country |
|------------|-------------|--------------|-------------|
| Dimitris | Bibikas | SEERC | Greece |
| Dimitrios | Kourtisis | SEERC | Greece |
| Igor | Santos | ESI-TECNALIA | Spain |
| Iakovos | Delioglanis | Q-Plan | Greece |
| Aggelos | Liapis | STARLab-VUB | Belgium |
| Robert | Meersman | STARLab-VUB | Belgium |
| Arian | Zwegers | EC | Belgium |
| Antonio | Grib | FCT-UNL | Portugal |
| Ricardo | Gonçalves | UNINOVA | Portugal |
| Michele | Missikoff | CNR | Italy |
| Sergio | Gusmeroli | TXT | Italy |
| Cox | Verdouw | WUK | Netherlands |

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|--------------|--------------|--|-------------|
| Michal | Zaremba | DERI Innsbruck | Austria |
| Sotiris | Koussouris | NTUA | Greece |
| Klans-Dieter | Platte | PLATTECONSULT/SAP | Belgium |
| Mehmet | Olduz | SRDC | Turkey |
| Marco | Di Girolamo | HP | Italy |
| Reka | Moksony | Regens | Hungary |
| Andras | Balogh | CAS | Germany |
| Marija | Jankovic | University of Belgrade | Serbia |
| Effie | Vlahopoulou | Technopolis | Greece |
| Amelia | Stanesti | University POLITEHNICA of Bucharest | Romania |
| Jan | Goossenaerts | TUE | Netherlands |
| Arne | Berre | SINTEF | Norway |
| Irena | Pavlova | ISOFT | Bulgaria |
| Vladislav | Jirkov | Unisoft | Bulgaria |
| George | Gionis | NTUA | Greece |
| Nenad | Ivezic | NIST | USA |

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| Thomas | Knothe | Fraunhofer IPK | Germany |
| Milan | Marinov | IMI, uni karlsruhe | Germany |

2.2 Organisers / Speakers

| First Name | Last Name | Organisation | Country |
|------------|---------------|---|----------|
| Iraklis | Paraskakis | SEERC | Greece |
| Man-Sze | Li | IC Focus | UK |
| Stelios | Pantelopoulos | SingularLogic | Greece |
| Cristina | Martinez | European Commission | Belgium |
| Yannis | Charalabidis | National and Technical University of Athens | Greece |
| Alper | Okcan | Middle East Technical University | Turkey |
| Keith | Popplewell | Coventry University | UK |
| Michal | Laclavik | Institute of Informatics, Slovak Academy of Science | Slovakia |
| Lefteris | Leontaridis | NetSmart | Greece |

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The workshop was structured as follows:

- Welcome message and introduction by a representative of the FUSION research project (member of the Enterprise Interoperability Cluster).
- 7 participant presentations (each approx. 10 minutes) with questions for clarification
- Discussion (approx. 35 minutes)
- Closure

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3 Presentations

3.1 Welcome and introduction

Stelios Pantelopoulos, SingularLogic S.A.

Mr. Stelios Pantelopoulos, acting as workshop chair in the absence of Dr. Iraklis Paraskakis, welcomed the participants and presented the workshop's agenda. He focused on the intended contribution by each of the planned presentations to the refinement of the Interoperability Service Utility (ISU) concept. In addition, he stressed the importance of the discussion session to follow after the presentations, and kindly drew the attention of the presenters to the 10' time limit. He concluded with a short overview of the main points and perspectives in each of the following presentations, outlining the different aspects that they intended to cover, and their thematic complementarity.

3.2 Results from ICT Call 1 (Objective 1.3)

Cristina Martinez, European Commission

Mrs. Cristina Martinez presented some key characteristics of research proposals submitted under ICT Call 1 (addressing Challenge 1 of the ICT Work Programme 2007-08), which were mainly focused on the pervasiveness of ICT technologies and the proliferation of networked technologies, services and devices, and the concept of interoperability. Moreover, she observed that research work addressing Challenge 1 contributes to a world class European industry in the field of networked technologies, systems and services and to the enablement of ICT technologies to industrial/enterprise sectors that lie outside the limits of the ICT domain. Subsequently, Mrs. Martinez depicted several statistical facts concerning the results from the evaluation of ICT Call1 proposals addressing the particular Challenge, and made references to a number of proposals that were invited to negotiations. Preliminary analysis of these results shows that the focus on Enterprise Interoperability (EI) was well covered, despite some individual gaps, while the concepts of Software as a Service (SaaS) and Interoperability Service Utility (ISU)

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proved to be central to the evolution of the domain. As a concluding remark Mrs. Martinez presented some significant open questions concerning the association of EI business models with open innovation, the establishment of the scientific foundations of EI and the positioning of EI with respect to “The internet of the Future”.

3.3 From People to Systems Interoperability: the ISU Concept

Yannis Charalabidis, National Technical University of Athens, Greece

Dr. Yannis Charalabidis started his presentation by outlining six important characteristics of the Interoperability Service Utility (ISU) concept, focusing on end-to-end service provisioning, services integration and composition, emerging business models, targeting SMEs, low cost availability, and ISU ownership and control. Subsequently, he illustrated an ISU model focusing on the Demand and Supply side of the ISU envisioned market. On the Service Provisioning layer, SMEs, Enterprises, Governments and cross-country ISUs could play an important role, while on the Service Aggregation side Core Business Services, Extended Services, Business Orchestration and Knowledge Services can have a significant contribution to the formation of this market structure. Also, Dr. Yannis Charalabidis presented a comparison between the Electricity industry and the ISU envisioned concept, focusing on their similar characteristics, such as the ubiquitous nature, simplicity, federation, co-generation and de-regulation. Conclusively, he stressed existing open issues, such as the means of developing an ISU, the creation of value and business models for an ISU, the provision of a framework for ISU operation and the ownership of an ISU.

Comment from the audience: A doubt has been expressed concerning the applicability of the referenced business models’ characteristics (as introduced by Professor Michael Rappa) on real-world settings, despite the fact that they seem to fit well with the existing ISU value proposition framework.

Answer: Agreed. These very generic rules will have impact and transformative effects, provided the full potential characteristics of an ISU are in place and workable

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(e.g. high bandwidth, ubiquity, etc).

3.4 iSURF: An Interoperability Service Utility for Collaborative Supply Chain Planning across Multiple Domains Supported by RFID Devices

Mr. Alper Okcan, Middle East Technical University, Software Research and Development Center, Turkey

Mr. Alper Okcan opened his presentation with a reference to the EI vision and the main contribution of the iSURF future project (under negotiation at the time of this presentation). He continued by presenting the project's research motivation and objectives, and illustrating the envisaged project's role on the ISU utilisation and the associated core component realisation methodology. Conclusively, he presented the envisioned system's architecture and the consortium synthesis.

3.5 Knowledge Oriented Collaboration: Evolving beyond the EI Roadmap

Prof. Keith Popplewell, Future Manufacturing Applied Research Centre, Coventry University

After a short reference to the purposes and history of the EI roadmap, Prof. Popplewell illustrated the structure of the EI Roadmap, focusing on the vision, the four Grand Challenges and the detailed research challenges. Concerning the vision of the EI roadmap, Prof. Popplewell stressed that the future trends can be pinpointed on the "ecosystems" and competitive collaborating networks of enterprises. Furthermore, he briefly described the anticipated benefits of such a vision, focusing on the exploitation potential of new business opportunities, decreased time to market, increased access to new markets and increased access to innovation ecosystems (particularly for SMEs). He then introduced the Knowledge Oriented Collaboration concept, which was based on the idea that Virtual Organisation (VO) partners should have the ability and expectation to collaborate closely in order to exploit product opportunities and achieve enhanced competitiveness and profitability. Consequently,

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he described the “Next phase of Enterprise Interoperability”, having as a core component the sharing of knowledge within VO for the mutual benefit of the VO partners, an issue mostly unaddressed to date. The Knowledge Oriented Collaboration as the next phase of EI was presented as a continuation from Data Interoperability, Application Interoperability and Information Interoperability achievements (despite the fact that there still exist numerous unresolved issues at the abovementioned layers). Also, Prof. Popplewell illustrated the Collaboration Knowledge Sharing map taken from the EI Research Roadmap, which emphasised on Collaboration Knowledge Sources, different Categories of Knowledge and associated Key Enterprise Benefits. He presented a research snapshot, concerning the Knowledge Oriented Collaboration, depicting the main points of research, focusing on the research in progress, the synergies between research topics and the spreading and overlapping of the research agenda. He concluded with a brief description of INTEROP-VLab’s main contributions to the EI Cluster.

Comment from the panel (Cristina Martinez): INTEROP-VLab has been proposed to assume the responsibility of hosting all the public deliverables that are produced by projects in the Enterprise Interoperability Cluster.

3.6 COMMIUS: ISU via email

Dr. Michal Laclavik, Institute of Informatics, Slovak Academy of Sciences

Dr. Michal Laclavik opened his presentation with a brief introduction on the concept of ISU, which proposes the use of electronic mail (e-mail) as a promising candidate for ISU realisation. Subsequently, he presented the merits of this approach, summarising them in certain key characteristics of e-mail, such as its use for interoperability tasks, action oriented scope, asynchronous nature and context sensitive features. Also, he mentioned that e-mail infrastructure resides in every organisation and that knowledge workers interact with their e-mail systems on a daily basis. Finally, Mr. Laclavik presented COMMIUS (a project under negotiation at the time of this presentation) outlined its envisaged architecture, its scientific and technical advantages and its business orientation, concluding with a summary of the

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project's objectives and consortium synthesis.

3.7 Technology and Service Interoperability Requirements from Clusters and Networks of SMEs

Mr. Lefteris Leontaridis, NetSmart S.A.

Mr. Lefteris Leontaridis briefly introduced the scope of the EFFORT project and its relevance to the concept of Virtual Organisations and emerging and innovative business models, with a focus on SME ICT take-up. Subsequently, he presented the main organisational collaboration formations and the associated tension parameters (i.e. extended, local, static, dynamic). He continued by depicting the working hypothesis of the EFFORT project, the achievements and the next steps of the project, and their relation to the main research drivers in the Enterprise Interoperability Cluster. Mr. Leontaridis observed the potential relevance between the progress of the EFFORT project and Enterprise Interoperability open value proposition issues, such as the legal framework, the governance approaches and the contextualisation of existing technologies especially in SME settings. He concluded with brief illustration of the project's future work.

3.8 Business and Governance Issues for Enterprise Systems of the future

Mrs. Man-Sze Li, IC Focus, UK

Mrs. Man-Sze Li opened her presentation by outlining the gaps that need to be addressed in the process of building the next version of the FP7 ICT Work Programme (2009-2010), and the need for placing an emphasis on innovative Business Models, scientific foundations for EI, and the positioning of EI with regard to the Internet of the Future. Mrs. Man-Sze Li continued by illustrating the main drivers for EI change during the last years: Web 2.0, ecosystems, innovation, SaaS, Future Internet and Interoperability. She later depicted the most significant business characteristics of Web 2.0 companies, and their impact on value proposition. The

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main characteristics are: the novelty of their business model, the customer-centric approach, their reliance on the network effect, their cross-industrial positioning, and their involvement with a wide array of revenue streams. Regarding the first component (Novelty), Mrs. Man-Sze Li presented an innovative value path, which Web 2.0 companies seem to follow, increasing their value proposition almost in a linear manner with risk and time, while the traditional organisational value and risk relationship is often presented by the “hype cycle” curve. Subsequently, she illustrated the Global Market Size of SME IT spending, which seems to follow the “Long-Tail” distribution model: the IT spending of SMEs is shown to be roughly equivalent with large enterprises IT spending. Regarding the customer-centric focus of emerging Web 2.0 companies, Mrs. Man-Sze Li stressed the emerging role of the users, the democracy of access, open innovation, the balance of power between the provider and consumer, as major characteristics of future software service provisioning strategies and potential components of the ISU infrastructure. Concerning the Ecosystem component of emerging Web 2.0 companies’ business models, Mrs. Man-Sze Li briefly presented a list of well-known examples of Web 2.0 companies that exploit user communities and service co-creation, in relation to the realisation of an environment where the idea generation process will be able to flourish. With respect to the service paradigm of the Future Internet, Mrs. Man-Sze Li presented the conversion of network environments from merely data-centric information exchange networks into programmable service environments. Radical change drivers were mentioned, such as software capability, networked services, service paradigm and software economy. Mrs. Man-Sze Li later depicted the ISU as an entity built upon Telecommunications, Internet and the Web, offering Value-added & Proprietary IT services in order to enable Enterprise Collaboration and Ecosystems. She concluded with an outlook to the path towards the Future Internet, through a single European Experimental Facility, Network convergence and continuous commoditisation, Service Utility, and Enterprise Systems in the Future Internet.

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4 Plenary discussion

This section summarises the ground rules that were set for the discussion taking place after the workshop presentations, and the results obtained through the contributions of the workshop participants..

4.1 Ground rules for the discussion

Mr. Stelios Pantelopoulos outlined the ground rules for the discussion addressing Enterprise Interoperability open issues and the refinement of the Interoperability Service Utility (ISU) concept.

4.2 General Observations

The following table summarises the issues raised by the participants in the open session. For convenience in reading the issues and discussions, each row of the table reflects the comments by participants and the initial responses given by the presenters or the chair of the workshop.

Although considerable effort was dedicated to correctly reflect the discussions, there might be some errors in attribution of comments to participants and some comments might not be entirely correctly phrased. The editors of this report would like to apologise for any such errors.

| | Recommendations and comments, including summary of issue(s) and suggestion(s) | Initial response |
|---|---|---|
| 1 | There seems to be a lack of focus on the needs of the traditional brick-and-mortar service industry and in SMEs that do not share Web 2.0 business characteristics or innovative business | Agreed. This is the particular aim of this workshop. Namely, to amalgamate different approaches and opinions in order to refine the ISU and EI focus with respect to the next ICT WP (2009-2010). |

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| | <p>models. We must expand our focus on such companies too, and look into how EI could support them in enhancing their productivity. A clear and obvious business focus of ISU and EI is missing.</p> | <p>Synergies from various projects should be exploited. Furthermore, investigation of other markets' successes and failures is essential in order to avoid "re-inventing the wheel". Also, the focus of EI domain is to serve business needs, however, there must be research on the future and emerging business models, since many of them are already present in the market. This future direction research must be realised and embodied into the next WP.</p> |
| 2 | <p>In the presentation by Yiannis Charalabidis, the Interoperability Service Utility was contrasted with the electricity service utility to illustrate some of their common characteristics. The two models however have significant differences. Notably, the electricity service utility suffers from interoperability problems (i.e. different electrical appliance standards in the European Union, United States and Asia). The lack of guarantees or refunds for damaged appliances (e.g. due to variations in power provisioning) makes the lack of interoperability an even more serious problem.</p> | <p>No two markets or industries are the same. Yet, there should be an attempt to learn from other paradigms (e.g. other markets and sectors) in respect not only to the ISU, but also to the other Grand Challenges (e.g. investigate what is the nature of science and how can EI be established as a science). Moreover, we should explore the characteristics of generic Service Utilities and try to implement the existing basic principles to the ISU concept in order to start refining the roadmap for realisation.</p> |
| 3 | <p>There must be an attempt to better define Enterprise Interoperability and</p> | <p>Agreed. The investigation on EI does not start from scratch. This is reflected in the</p> |

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| | <p>move towards a more focused approach, especially researching about the obstacles of EI realisation and up-take. Past knowledge and lessons learnt should be utilised.</p> | <p>way ISU is positioned as a layer on top of other existing layers, such as those of Telecommunications, Internet and the Web.</p> |
| 4 | <p>Some are sceptic about the necessity of adopting even more goals for Enterprise Interoperability research to address (and devoting the necessary share of the funding to them), on top of the goals already existing. Instead, they suggest that we should focus our efforts on providing a better definition for the emerging Enterprise Interoperability market and on further investigating its demand and supply sides (e.g. in order to identify the final beneficiaries).</p> | <p>At this point we seem to be aware of the final beneficiaries of EI, but not of the necessary profit generation procedures (e.g. business models). Up to date, the common knowledge is that end-users (e.g. SMEs) will be the main beneficiaries from interoperability, without having clearly specified the business models and the market structures and dynamics. We should keep in mind that there are various EI issues with many solution potentials. However, we approach EI research leveraging public funding, thus, business drivers and associated models should not be the only core of our conceptualisation on that matter. High-risk research with long-term objectives and investigation of the impact that today's "buzzwords" have on EI should be a central focus in our next steps, despite the risk of failure in the path to attaining and resolving the aimed issues.</p> |
| 5 | <p>There seems to be a significant disconnection between the business-related matters of EI and the</p> | <p>The vision statement in the Enterprise Interoperability Research Roadmap shares this perspective. There is a strong</p> |

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| | <p>technological ones. From the presentations it was obvious that there is a chasm that does not seem to be closing. We should focus on the realisation of a model where business drivers and state of the art technological research will be amalgamated. There should be an environment (in both technological and organisational terms) in which Interoperability is no longer an issue, but an implicit and ubiquitous status. This environment can be the output of future research based on technology and business models that are novel and do not exist today, but more importantly, based on the synergies between these strongly conjoint components.</p> | <p>need in bridging today's gap among the separate "business and technology" teams of people. Interoperability resides both on the technology and the business domain. We must focus on revolutionary thinking in terms of the Future Internet and question our fundamental norms in order to resolve problems we are facing today.</p> |
| 6 | <p>There are various overlaps among the EI cluster and other clusters or other EU-sponsored initiatives. Which are the differentiating factors for the scope of the EI cluster?</p> | <p>Indeed there are overlaps. The differentiating factors should not be merely defined in a top-down manner, but also by letting the communities involved in each cluster investigate and select their preferred scopes. This is an issue to be addressed at a later stage, yet overlaps between groups and clusters should not be perceived as undesirable.</p> |
| 7 | <p>There seems to be a lack of a layered model for EI and the ISU concept,</p> | <p>In terms of the scientific foundations of EI and the Research Roadmap, it is clear</p> |

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| | <p>which could be a differentiating driver from other clusters. Such a layered perspective could lead to the needed fusion of business, technology and policy oriented teams. There is a lack of scientific foundation of the EI concept. We must go beyond empirical solutions to more formal next steps, realising rules, guidelines, etc.</p> | <p>that Interoperability should move to the directions of the so called “soft factors”, such as business models, cultural issues, etc.</p> |
| 8 | <p>There is a lack of profiling methods, which in their turn could enhance the understanding of different procedural knowledge categories that exist inside every enterprise. We should focus on the gradual adoption of interoperable business processes and then define standards.</p> | <p>Concerning the profiling methodology, there is such a framework defined by the ATHENA project. Regarding the standardisation of business processes and the technology used, there must be a revolutionary approach on the means we define, deliver and exploit such standards. Up to date, there is a large variety of standards, each one focusing only on specific and specialised aspects. Therefore, there is no need for generating more standards, but for integration methods of existing ones on an EI context.</p> |
| 9 | <p>As a last comment, a concern was expressed concerning the lack of focus on the important issue of methodology guidance for enterprises to achieve Enterprise Interoperability through a disciplined approach.</p> | |

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| | Enterprises should be educated on EI and be given methodological support through guidelines (i.e. “cook-books”) on how to make their systems and processes interoperable. | |
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5 Workshop closing

Mr. Stelios Pantelopoulos, Mrs. Man-Sze Li and Mrs. Cristina Martinez outlined the next immediate steps:

- Slides from this workshop will be made available on the web.
- A report on the results of this workshop will be prepared by SEERC and be made available on the web.
- The next version (version 2) of the report from the Informal Study Group (ISG) on Value Proposition for Enterprise Interoperability will be made available by the 16th of November.
- All interested stakeholders are invited to submit their written contributions and comments by 30th of November 2007 for both the Enterprise Interoperability Research Roadmap and the ISG report on Value Proposition for Enterprise Interoperability (if applicable).
- The publication of the third version of the ISG Report, with a focus on “Recommendations”, will be concluded by the 3rd of December 2007.
- The deadline for comments on ISG Report Version 3 is on the 12 of December, when an EI Cluster consultation meeting will take place in Brussels.
- The final version of the ISG Report will be completed by the end of January 2008.

Mr. Stelios Pantelopoulos closed the workshop by thanking all of the presenters and the participants for their support, active engagement, and valuable contributions .

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6 Post-workshop networking

Discussions among participants and presenters continued in an ad hoc basis after the workshop's closing, with small discussion groups or one to one conversations quickly assembling across the workshop room, thus confirming the strong interest, growing involvement, and significant commitment on behalf of stakeholders in the domain of Enterprise Interoperability.

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7 Conclusions

The workshop presentations were highly complementary, approaching the theme of Enterprise Interoperability and Interoperability Service Utility (ISU) from a variety of perspectives, raising issues along technological, business, and policy dimensions, and helping stimulate a productive and useful debate on future challenges and research directions in the discussion that followed.

The conclusions from this discussion, in which different types of stakeholders were well-represented, are expected to serve as important input in the process of refining and revising the research priorities in this domain, and thus in the formulation of the forthcoming version of the FP7 ICT Work Programme (2009-2010). Based on all of the above considerations, the workshop can be considered a success.

The updated version of the Informal Study Group (ISG) report on Value Proposition for Enterprise Interoperability will be a key theme in the upcoming EI Cluster workshop to be held in Brussels on the 12th of December, 2007. Another important theme in the upcoming workshop will be the new EI Cluster projects awarded from Call 1, their visions and potential contributions to the domain of ISU, and the EI Cluster Workplan for 2008.

The organisation of the discussion to be held as part of the next workshop will most probably follow the 'Agora' style of debate. Topics in the form of questions will be submitted in advance to the workshop participants, in order for everyone to better prepare and present their viewpoint. Subsequently, all contributions will be recorded and serve as input to the open consultation process.