Socio-Economic Services for European Research Projects (SESERV)

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Deliverable D1.4
Second Year Report on Scientific Workshops

The SESERV Consortium

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1 Executive Summary

This document is deliverable “D1.4 Second Year Report on Scientific Workshops” of WP1 on “FIA Session and Scientific Workshops” within the ICT SESERV Project 258138. This document provides the Future Internet Socio-Economics (FISE) community and the European Commission (EC) with information about SESERV’s organisation (or co-organisation) of scientific workshops either as stand-alone events, i.e., the Athens workshop and the Brussels Workshop, or co-located with other FI events, i.e., the FISE workshop that took place during the Future Internet (FI) Week in Poznan, during the reporting period September 2011 to August 2012.

SESERV has successfully organized and coordinated two scientific workshops (following another successful one held in Oxford in June, 2011, (see deliverable D1.2 [8]) where a community of researchers, technologists and stakeholders participated and offered their views and experiences on socio-economic issues of the FI.

The 2nd scientific workshop was organized by the SESERV consortium on January 31, 2012, in Athens, Greece, and was titled ”*The interplay of economics and technology for the Future Internet*”. The Athens workshop continued the project’s long-term objective of *bridging the gap between those who study and those who build the Internet.* While the 1st scientific SESERV workshop in Oxford ((see deliverable D1.2 [8], and deliverable D2.1 [3]) was primarily focused on the societal aspects of the Future Internet (FI), the Athens workshop highlighted the importance of stakeholders' economic interests to Future Internet architecture and policy development. The workshop was divided in 3 sessions, following a hybrid approach of keynote presentations and moderated discussions. The morning session included 2 short welcome speeches and 3 talks by distinguished experts on several key topics of the Future Internet. The second session was devoted to introducing and applying the tussle analysis methodology to a number of case studies and research areas. The afternoon session hosted a final keynote presentation and a panel discussion on important Future Internet techno-economic issues.

The Athens SESERV workshop succeeded in attracting representatives from a broad set of stakeholders, including members from research projects, industry, regulatory bodies, policy officials, as well as academics. Out of the 53 registrations that were received eventually 50 individuals attended in person and participated in the sessions. Based on 18 responses to an online questionnaire following the event, the workshop broadened the participant’s understanding of the Future Internet landscape and engaged with them for future SESERV initiatives.

The 3rd workshop “*Socio-Economic Certainties and Change for the Future Internet*”, held in Brussels, Belgium, on June 20, 2012 had a deliberately different focus to the previous workshops. Given its timing towards the end of the project, the event presented the Future Internet Socio-Economics (SE) community a host of different SE aspects, reflecting both the work done reconciling issues investigated during the project’s lifetime – such as trust and security, networking debates and cloud computing – and at the same time opening the delegates’ perspectives to a host of interrelated SE issues – the changing market (IDC market overview), the societal issues en masse (no disconnect strategy), the changing approaches to business and societal issues (serious gaming) and how the law and legislation underpins what can and cannot be done on the SE front.

The approximately 40 delegates enjoyed a day of eclectic talks and networking opportunities including multiple Commission units and industry representatives. The approach was based on plenaries with Q&A opportunities. Feedback was positive – both on-site and followers of its web coverage – and will give the community new areas to explore in the coming periods.

The larger industry and policy representation in this concluding workshop allowed SESERV to spread its discussion to a broader sample of stakeholders not previously tapped, allowing a lasting cohesion beyond the project lifetime between FI socio-economic researchers and these key components to the covered topics.

Finally, the document reports on the FISE workshop "*How disruptive technologies influence the FI Business Ecosystem*", held in Poznan, Poland, on November 24th, 2011. Although this event preceded the Athens and the Brussels workshops, it is reported last since it was co-organized by SESERV and two more projects, i.e., UNIVERSELF (www.univerself-project.eu), and SEQUOIA (www.sequoiaproject.eu), and also due to the fact that the FISE workshop was co-located with the FI Week in Poznan, October 24-28, 2011. The purpose of this workshop was to share analysis, discuss and debate on how disruptive technologies will influence the FI business ecosystem. The motivation is that many FI projects are assessing the FI Business Ecosystem and the dynamics of stakeholders in relation to technological results (e.g. UNIVERSELF, SESERV, SEQUIOA, ETICS, FI-PPP, FI3P, etc). Therefore, this workshop provided an excellent opportunity to explore techniques for analysing FI ecosystems, how impact is achieved and what are the emerging considering for design and experimentation.

The data collected during the three workshops (2 exclusively organized and 1 co-organized by SESERV) about key economic challenges and stakeholders' concerns for candidate solutions from Future Internet projects have been analyzed by SESERV members and documented in further detail in deliverables D2.2 and D3.2.

2 Introduction

This document is deliverable “D1.4 Second Year Report on Scientific Workshops” of WP1 on “FIA Session and Scientific Workshops” within the ICT SESERV Project 258138. This document provides the Future Internet Socio-Economics (FISE) community and the European Commission (EC) with information about SESERV’s organisation (or co-organisation) of scientific workshops either as stand-alone events, i.e., the Athens workshop and the Brussels Workshop, or co-located with other FI events, i.e., the FISE workshop that took place during the Future Internet (FI) Week in Poznan, during the reporting period September 2011 to August 2012.

Sections 3, 4 and 5 provide the objectives, planning, summary of focus group sessions, advertisement and participation, results and their dissemination of the Athens and Brussels SESERV workshops and the FISE workshop co-located with the FI Week in Poznan respectively, while finally Section 6 provides conclusions.

This report does not attempt to perform an analysis of the results or draw conclusions about the workshop. These workshop findings are discussed in Deliverable 2.2 “Final Report on Economic Future Internet Coordination Activities”, as well as Deliverable 3.2 “Final Report on Social Future Internet Coordination Activities”, providing the findings of WP2 and WP3 during the project’s lifetime. Nonetheless, this document covers the organisation details such as planning, marketing, topics selection, participants selection and invitation, the structure of the event days, in particular, how many and what kind of sessions took place, i.e. presentations, focus groups, (moderated) discussion, interviewed panel, interviews, etc. Last but not least, this deliverable summarizes and highlights major outcomes, key results and lessons learnt from the three scientific workshops that took place within the second year of the project.

3 Summary of the Athens Workshop

3.1 Objectives of the Athens Workshop

The role of stakeholders' incentives and economic issues in general are of critical importance in guaranteeing the continuous success of the Internet ecosystem. The SESERV project organised the workshop "The interplay of economics and technology for the FI" to highlight the importance of such issues in FI policy development and architecture.

The objectives of the workshop were:

a) to present economic issues related to the adoption and usage of technologies (e.g. new pricing schemes) as well as to other regulatory aspects of the Future Internet (such as interconnection, network neutrality, infrastructure-based competition, etc.).

b) to discuss and elaborate through breakout working sessions on the potential advantages and drawbacks of following the "tussle-awareness" paradigm upon designing Internet technologies. To this end, selected case studies from several FP7 research projects will be used to identify how conflicts of interest arise when existing and foreseen technologies are utilized and what the potential economic externalities may be.

c) to debate topics such as "one Internet vs. multiple internets", the role of regulator, the role of economics etc. Participants with opposing viewpoints were invited to ensure the debates were robust.

d) to advance the awareness of SESERV on the related needs of the FI community, and give/receive feedback.

3.2 Planning of the Athens Workshop

The workshop was divided in three sessions, following a hybrid approach of keynote presentations and moderated discussions. The morning session included two short welcome speeches and three talks by distinguished experts on several key Future Internet topics. The second session was devoted to introducing and applying the tussle analysis methodology to a number of case studies and research areas. The afternoon session hosted a final keynote presentation and a panel discussion on important Future Internet techno-economic issues. Figure 1 shows the full workshop agenda.

3.2.1 Morning Sessions

Costas Courcoubetis, a member of the SESERV consortium, started the workshop "The interplay of economics and technology for the FI" with a short welcome speech. After giving the program overview he introduced the EC representative Petronela Burceag, who outlined the changes in the European Commission's future Framework Program and highlighted that FISE aspects will be a key ingredient.

Three 30-minute keynote presentations followed during the morning session; the first one entitled "*Internet Market Failures: Technological Causes and Solutions*" was given by Bob Briscoe, Chief Researcher at British Telecom, UK. He started by stating that the ISPs' capital expenditures to cope with the increasing demand for bandwidth are not commercially justifiable. In that respect, he

stated that the number of bytes sent by a user is not the right metric to measure the congestion they cause, as volume does not represent usage. In order to measure a user's contribution to congestion, the marginal cost of used capacity should be used; an idea that is well-known in the economic literature but cannot be applied on the Internet currently since the necessary information is invisible to ISPs (an example of information asymmetry). Then he argued that consequences of market failure are congestion and poor quality, 'random slaughter', vertical integration and resort to governmental subsidy and control. He concluded that a way to resolve this market failure is changing the Internet protocol and presented an attractive mechanism (for this very complicated task), called IETF Congestion Exposure (ConEx).

The next keynote, entitled "*The Evolution of Business Models in the Internet: Sending Party Network Pays as the basis for quality of service support (QoS) in the Internet*", was given by Falk von Bornstaedt, Head of IP Transit & Peering at Deutsche Telecom. Similarly to the previous speaker, he raised the question of how ISPs should match bandwidth demands that double every two years while the operation funds remain constant. In that respect he proposed an input/output business model where providers who originate traffic are those who pay, which is similar to the one used in traditional telephone network interconnection (PSTN).

Alissa Cooper, Chief Computer Scientist at the Center for Democracy and Technology, gave the third keynote speech called "*Internet Traffic Management in the UK*", which was related to the network neutrality debate. She addressed the question to which extent network operators should be free to manage certain Internet applications differently from others and whether competition prevents operators from immoderate traffic shaping. Her study of the UK market revealed that traffic management strategies can be influenced by market structure but competition does not necessarily safeguard discriminatory traffic management.

The full webcast of the above speeches are available online on the SESERV website and in particular in the following links:

Bob Briscoe	http://www.seserv.org/athens-ws-1/webcasts#briscoe
Falk von Bornstaedt	http://www.seserv.org/athens-ws-1/webcasts#bornstaedt
Alissa Cooper	http://www.seserv.org/athens-ws-1/webcasts#cooper

3.2.2 Tussle Analysis Sessions

The second session was about introducing the tussle analysis methodology and how this methodology could be applied by means of a set of presentations as well as three parallel focus groups.

3.2.2.1 Tussle Analysis Methodology

Costas Courcoubetis introduced the tussle analysis methodology [5] that has been developed by SESERV following the *Design for Tussle* principle (introduced by D. D. Clark et al. in [6]) in order to highlight the importance of predicting the impact of candidate Internet technologies to other existing technologies as well as tussles between major stakeholders of FI scenarios. Important concepts, such as stakeholders, their interactions by means of technologies, tussle outcomes (as the subset of those interactions due to conflicting socio-economic interests) and spillovers (as the negative cascaded effects of one technology to another due to unexpected uses of the former technology) have been explained.

Costas Kalogiros, member of the SESERV consortium, continued the introduction to tussle analysis methodology by giving a presentation called "*Illustrative Tussle analysis for DNS and TCP*". By using the DNS protocol for naming & addressing and TCP for bandwidth sharing as case studies, he gave examples of popular protocols that were used in different ways than had been designed for. In this way, he argued that when designing new technologies it is important to understand the incentives of the major stakeholders and identify those critical control points that

can allow them to negotiate at run-time the tussle outcome. Possible iterations of the tussle analysis to find ways to resolve these conflicts were also outlined.

Manos Dramitinos, member of the ETICS FP7 research project, gave the final introductory presentation called "*Tussle analysis for FP7 research project ETICS case studies*". The first ETICS functionality where tussle analysis had been applied is the establishment of QoS-aware, inter-domain paths. He argued that allowing fine-grained control over major properties of interconnection agreements (such as set of IP destinations) could help adoption of the ETICS system and sustain a healthy ecosystem for all participants. The second functionality presented was service delivery with assured quality between multiple ISPs, where it was found that even if ISPs are honest in primary paths they may still overbook backup paths. Thus, without adequate monitoring it would not be possible to correctly assign responsibility for breaking the end-to-end SLA in case of failure along the path (where the backup should be used).

The full webcasts of all tussle analysis presentations can be viewed online on the SESERV website:

Costas Courcoubetis	http://www.seserv.org/athens-ws-1/webcasts#courcoubetis
Costas Kalogiros	http://www.seserv.org/athens-ws-1/webcasts#kalogiros
Manos Dramytinos	http://www.seserv.org/athens-ws-1/webcasts#dramitinos

3.2.2.2 Parallel Focus Groups on Tussle Analysis

After the introductory presentations to the tussle analysis methodology, three parallel focus groups on understanding and dealing with tussles that may arise due to introduction of new Internet technologies by research projects were organised.

These topics were directly related to the fifteen topics that had been identified in deliverables D2.1 [3] and D3.1 [4]. As Table 1 indicates, the first topic may be considered social in nature; the second socio-economic; and the third is about economic aspects. Furthermore these topics were selected by considering the results of the online survey, as documented in deliverable D1.5 [9].

Several weeks before the workshop, participants from various backgrounds and interests were asked to indicate up to two preferences for the following topics:

1. User-centricity and transparency of Future Internet technologies, with an emphasis on (but not restricted to) technologies for opportunistic wireless network formation, wireless mesh networks, flexible spectrum sharing, cross-provider collaboration for network off-loading, applications based on locality and crowd-sourcing, among others.
2. Content and service delivery architectures for the Future Internet, with an emphasis on (but not limited to) technologies following the information-centric paradigm, such as publish-subscribe architectures, cache placement techniques, new inter-domain routing systems, etc.
3. Interconnection agreements and monitoring, with an emphasis on technologies promoting (semi)automated collaboration between ISPs for QoS-aware service provision (including inter-domain routing) and service management.

Based on the background of the participants that indicated their preferences to the doodle poll, the workshop organizers identified possible stakeholder roles that participants could play and grouped them into focus groups so that there are enough stakeholder representatives to each focus group, by taking into account their preferences. Table 1 outlines the allocation produced, together with the moderator's name as well as the projects that were represented.

Table 1: Workshop Topics as Relating to the Topics of the Online Survey[1]

Overall topic as advertised	Related topics from online survey
User-centricity and transparency of Future Internet technologies	S5: Whether there is a need for more user-centricity and control in the design and use of online services S8: The importance of increased transparency of data and systems to end-users S10: The importance of multi-disciplinary collaboration to the success of the Future Internet
Content and service delivery architectures for the Future Internet	(E.1): How network security is achieved (SE.3): How access to sensitive data is handled E.4: Achieving appropriate and efficient routing across networks (SE.7): How we clarify digital rights (including copyright, privacy, and so forth) SE.11: How content and service delivery are controlled
Interconnection agreements and monitoring	E.4: Achieving appropriate and efficient routing across networks E.6: Who is responsible for agreement violation across networks E.9: How interconnection agreements between ISPs are resolved

At the beginning of the focus group, a moderator explained the procedure that would be followed. Then, each participant chose a stakeholder role that he or she would play, and subsequently expressed his/her (initial) interests on the topic. The next step involved a project representative who would demonstrate the proposed technology using 1 or 2 case studies. Finally, after each presentation, all stakeholders expressed how they would perceive the presented future technology, and discussed any conflicts of interest among different stakeholders and how these would evolve, as well as identify any critical control points.

If a technology was found to be "biased", then participants would try finding those "control points" that would make this technology more "Designed for Tussle" (that is the involved stakeholders have enough control to determine the outcome by negotiating-tuning this control point). More information about the general methodology of organizing and realizing focus groups can be found deliverable D1.5. Excerpts of the videos have been uploaded onto the website http://www.seserv.org/athens-ws-1/webcasts.

3.2.3 Afternoon Sessions

Afternoon sessions were chaired by George Stamoulis. After the last keynote speech, a panel discussion took place and the workshop ended with a short summary of the key tussles that were identified during the parallel focus group sessions.

3.2.3.1 4th Keynote Speech

There continues to be a heated debate about network neutrality: what it means, why it is important, what effect the policy has. Robin Mason, an economist from the Exeter University, UK, started the afternoon sessions by giving the presentation entitled "*Two-sided perspectives on network neutrality*", where he discussed how economic models of two-sided markets (or platforms) can help to shed light on the above questions. He began his talk by introducing two-sided

[1] The numbers, from 1 to 15, are for ease of reference only; and run across all three topic areas:
E refers to subjects that were *economic* only
S refers to subjects that were *societal* only
SE refers to subjects shared by both

markets[2], which are economic platforms having two distinct user groups that provide each other with network benefits. He then explained his economic model and evaluated the outcomes with respect to efficiency as well as welfare. He concluded that the model is applicable but would need further improvements due to left-out assumptions.

The keynote speech can be viewed online in SESERV's website: http://www.seserv.org/athens-ws-1/webcasts#mason.

3.2.3.2 Discussion Panel

George Stamoulis moderated a discussion panel on the role of economics to the Internet evolution with the following panellists Michael Boniface, Bob Briscoe, Alissa Cooper, Nicolas le Sauze, Robin Mason and Burkhard Stiller.

Questions posed to panellists which constituted the basis for the moderated discussion were:

1. What is your view about the "The Sending Party Pays Principle"? Under what circumstances do you that it really justifiable? What would the implications of its adoption be to the current Tier-based Interconnection system?
2. There are several simple economic models published to study whether applications should be provided a premium quality service, and be charged for it. Can this matter be better investigated with the support of real data? What should be monitored in today's Internet in order to reveal the actual level of need for discrimination, if any, as well as the associated economic effects?
3. How do you see the market trend with respect to the increased spread of CDNs? How does this affect the classical interconnection model provided by Tier-1 providers? What reactions should we expect from such providers? Will they be able to maintain their market power, or will they be forced to adopt pricing schemes that are less beneficial for them? What is your view about the CDN-interconnection initiative?

The full webcast of the debate can be viewed online on the SESERV website: http://www.seserv.org/athens-ws-1/webcasts#panel.

3.2.3.3 Feedback on Focus Group Sessions

The Workshop was closed by the feedback of the break-out sessions, where the feedback of the individual sessions was presented by the respective session moderator. Executive summaries of each focus group are provided in Section 3.3 and can be also viewed on the SESERV website: http://www.seserv.org/athens-ws-1/webcasts#feedback.

3.3 Agenda

In Table 2, the agenda of the Athens workshop is presented:

Table 1: Agenda of the Athens Workshop

9.00	**Registration**
Morning session	**Chairman: C. Courcoubetis, SESERV**
9:15	**Welcome speeches** Costas COURCOUBETIS, SESERV (5 mins) Petronela BURCEAG, EC (10 mins)

[2] Example markets include credit cards, composed of cardholders and merchants, video game consoles (gamers and game developers), dating agencies, e-market places, and newspapers.

9:30	**Keynote speech 1: *Internet Market Failures: Technological Causes and Solutions*, Bob BRISCOE**
10:00	**Keynote speech 2: *The Evolution of Business Models in the Internet: Sending Party Network Pays as the basis for quality of service support (QoS) in the Internet*, Falk von BORNSTAEDT**
10:30	**Keynote speech 3: *Internet Traffic Management in the UK and the US*, Alissa COOPER**
11:00	Coffee break
Tussle analysis sessions	**Chairman: M. BONIFACE, SESERV**
11:30	Introduction to tussle analysis methodology - C. COURCOUBETIS (20 mins) Illustrative Tussle analysis for DNS, TCP - C. KALOGIROS (20 mins) Tussle analysis for FP7 research project ETICS case studies - M. DRAMITINOS (20 mins)
12:30	Lunch break
13:45	**Parallel focus groups** on understanding and dealing with tussles that may arise due to introduction of new Internet technologies by research projects, on the following topics: 1. *User-centricity and transparency of Future Internet technologies, with an emphasis on (but not restricted to) technologies for opportunistic wireless network formation, wireless mesh networks, flexible spectrum sharing, cross-provider collaboration for network off-loading, applications based on locality and crowd-sourcing, among others* ▪ Moderator: M. WALDBURGER, SESERV ▪ Presenters: ▪ A. BOGLIOLO, ULOOP ▪ A. GEORGAKOPOULOS, OneFIT 2. *Content and service delivery architectures for the Future Internet, with an emphasis on (but not limited to) technologies following the Information-centric paradigm, such as publish-subscribe architectures, cache placement techniques, new inter-domain routing systems, etc.* ▪ Moderator: I. PAPAFILI, SESERV ▪ Presenters: ▪ T. LEVA, SAIL ▪ G. XYLOMENOS, PURSUIT 3. *Interconnection agreements and monitoring, with an emphasis on technologies promoting (semi)automated collaboration between ISPs for QoS-aware service provision (including inter-domain routing) and service management.* ▪ Moderator: C. KALOGIROS, SESERV ▪ Presenter: N. LE SAUZE, ETICS
Afternoon sessions	**Chairman: G. STAMOULIS, SESERV**
15:15	**Keynote speech 4: *Two-sided perspectives on network neutrality*, Robin MASON** There continues to be heated debate about network neutrality: what it means, why it is important, what effect the policy has. In this talk, I will discuss how economic models of two-sided markets (or platforms) can help to shed light on these questions.
15:45	**Discussion panel on the role of economics to the Internet evolution** Chairman: Prof. G. STAMOULIS, SESERV Panelists (in alphabetical order): • M. BONIFACE • B. BRISCOE • A. COOPER • N. LE SAUZE • R. MASON • B. STILLER

16:45	Feedback on break-out sessions • M. WALDBURGER, SESERV (5 mins) • I. PAPAFILI, SESERV (5 mins) • C. KALOGIROS, SESERV (5 mins)
17:00	**End of workshop**

3.4 Athens Workshop Advertisement and Participation

The workshop has been advertised to a broad range of candidate participants, including technology experts, economists, social scientists, industry representatives, info-society regulation and policy officials by using several dissemination channels. For example, participants at the 8th concertation meeting in Brussels were informed about the workshop objectives and confirmed speakers, as of 5th October, 2011. Figure 1 presents the flyer used for promoting the event at the FIA week, in Poznan on October 2011.

Figure 1: The SESERV Workshop Flyer

Furthermore, as shown in Figure 2, attendees of the FISE workshop on October 27, 2011 were encouraged to participate at a survey that shaped the set of focus groups[3].

[3] http://aod-portal.u5.platon.pionier.net.pl/DocsService/ShowDocument.ashx?id=465

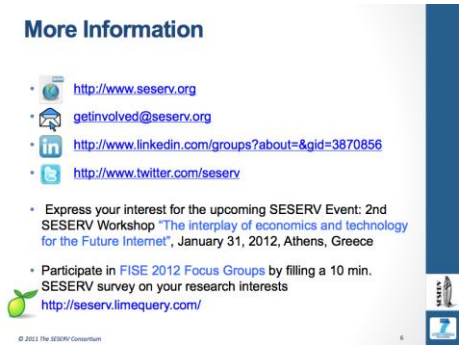


Figure 2: Example Slide Encouraging Workshop Participation

Apart from personal communication with interested individuals at related events, the high visibility of the SESERV website was utilized for attracting participants. Figure 3 presents a screenshot of the SESERV homepage with a banner that was linking to the workshop webpage.

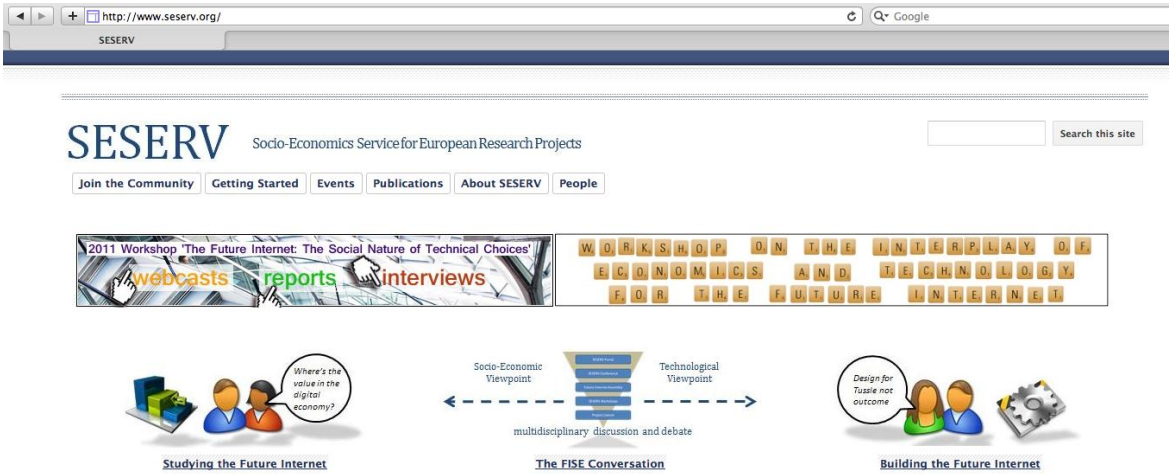


Figure 3: Screenshot of SESERV Homepage with Athens Workshop Banner

The workshop webpage[4] as shown in Figure 4 has been regularly updated with information about the logistics, agenda items and registration.

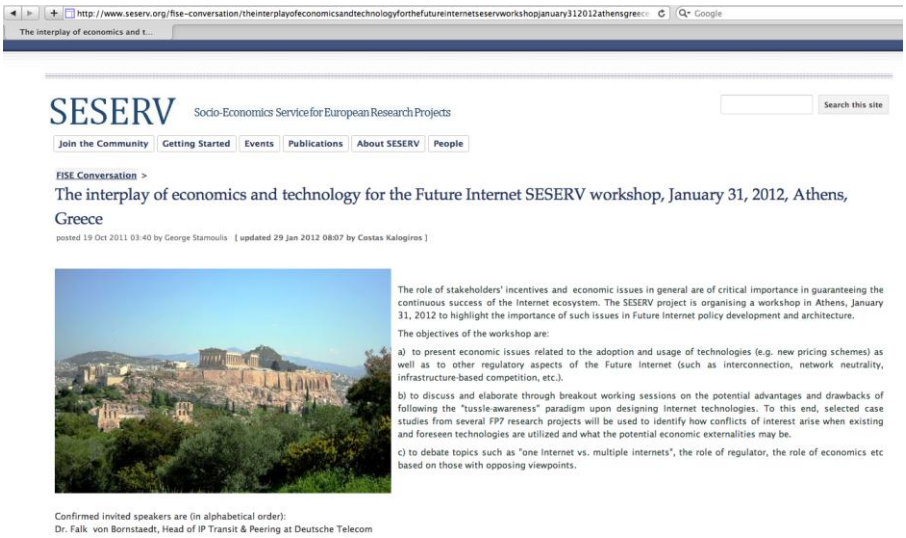
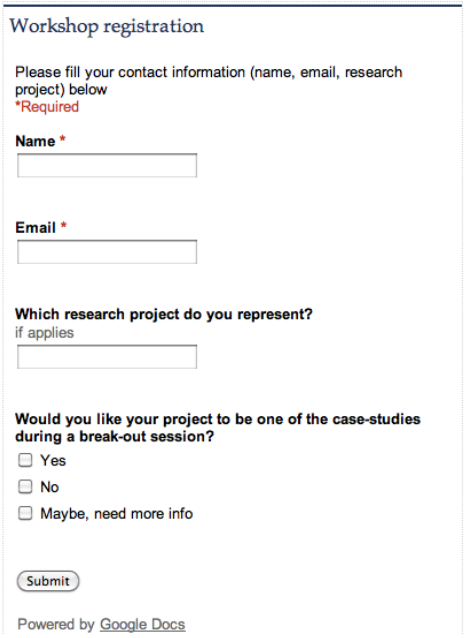


Figure 4: Screenshot of SESERV's Webpage

[4] http://www.seserv.org/fise-conversation/theinterplayofeconomicsandtechnologyforthefutureinternetseservworkshop january312012athensgreece

Attendance to the event during the day was mainly by invitation to everyone who had participated in previous SESERV surveys and questionnaires, but there were also places available on request from interested parties. People wishing to be considered for participation in the event, could use the online registration form (see Figure 5) at the workshop's webpage, or send an email to the workshop organizers.


Workshop registration

Please fill your contact information (name, email, research project) below
*Required

Name *

Email *

Which research project do you represent?
if applies

Would you like your project to be one of the case-studies during a break-out session?
Yes
No
Maybe, need more info

Submit

Powered by Google Docs

Figure 5: Screenshot of Online Registration Form

The workshop was originally planned for hosting about 45 individuals, but due to increased demand the number of registrants was restricted to 53.

3.5 Results of the Athens Workshop

This section summarizes the results of the Focus Group parallel sessions and the moderated panel discussion

3.5.1 Summary of Focus Group Sessions

This section provides a short summary of the key points discussed during the three focus groups. These key messages will be used as input when performing the tussle analysis for the related projects and will be further documented in deliverables D2.2 (mainly) and D3.2.

3.5.1.1 "User-centricity and Transparency" Focus Group

The focus group on "User-centricity and Transparency of Future Internet Technology" shed light on user-centric networking on the one hand and opportunistic networking on the other hand. Both aspects were covered by a European research project each that aims at the study, design, and implementation of the respective Future Internet technology. User-centric networking was represented by the ULOOP project. Opportunistic networking was represented by the OneFIT project.

The format of a focus group session was unique in that it was highly interactive: All participants assumed a stakeholder role, including the technology makers (ULOOP and OneFIT). This characteristic was of great interest to session participants and organizers as it facilitated dialogue between technology makers and the assumed stakeholders of relevance to both technology cases looked at. It is important to understand that the expected outcome of this focus group was to anticipate the impact of both Future Internet technologies.

With this outcome in mind, the focus group moderator (Martin Waldburger, SESERV, University of Zurich) gave an introduction into the setting and 'rules' of a focus group so that all participants were on the same page. The moderator emphasized in particular that tussle analysis was the main structuring approach in use for this focus group. He reiterated briefly the three steps of tussle analysis (stakeholder identification, tussle identification, and tussle evolution/impact assessment), and he proceeded to involve the participants in a focus-group-based discussion, whereby each would assume a specific stakeholder role and actively represent that stakeholder in the discourse about the ULOOP and OneFIT technology cases.

3.5.1.1.1 User-centric and Opportunistic Networking Technology Cases

Alessandro Bogliolo (University of Urbino) presented user-centric networking as investigated in ULOOP. The project foresees a user-centric wireless local loop to be built. This vision endorses users to become a key component in providing networking services. The user-centric network formed from user equipment is meant to complement access infrastructures. The project adopts two use cases accordingly, namely (1) expanding coverage and 3G offloading as well as (2) traceability and collaborative monitoring. Figure 6 provides a graphical sketch of how the first ULOOP use case could be implemented. Each use case sees 6 so-called scenes, which are sub-cases explained in more detail.

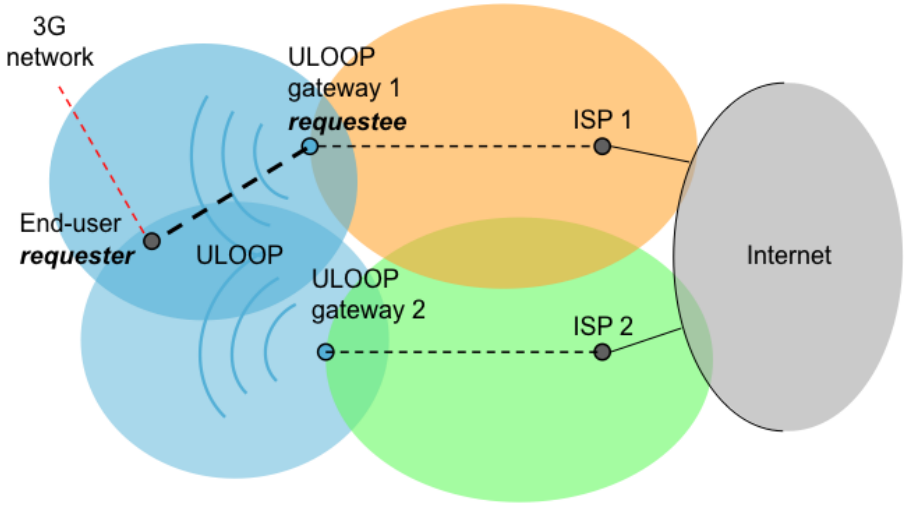


Figure 6: ULOOP Use Case "Extended Coverage/Offload" [1].

Alessandro outlined results from a socio-economic analysis that the ULOOP project had performed for its technology. Interestingly, this analysis for both use cases and their assigned scenes resulted in users being understood to have only benefits or negligible effects (and no disadvantages) in 10 scenes. Furthermore, those stakeholder roles with disadvantages resulting from using ULOOP technology were found to be those that anyway would not need to be incentivized (malicious users, attackers, untrusted users).

This positive anticipation of pros/cons (see Figure 7 for details) resulting from each scene to users was complemented by three possible tussles that ULOOP had identified to potentially emerge in user-centric networking:

- Requestee vs. Requester: Resources on the ULOOP gateway are limited. Extra costs may be incurred by a requestee to serve requests.
- ISP vs. ULOOP: Extra traffic may be caused without an extra income. ISPs may fear loss of control on end-users. Due to ULOOP's open approach, ISPs may be exposed to enhanced competition in the access business.
- 3G operator vs. ULOOP: Operators may fear a loss of revenue.

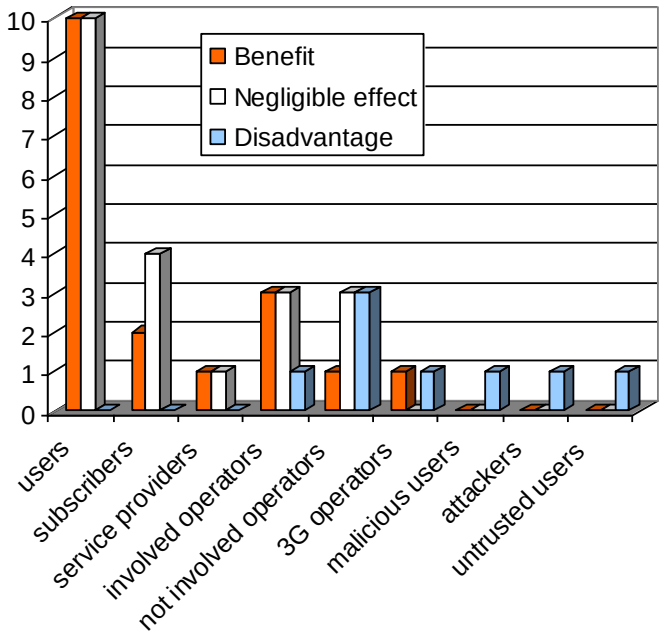


Figure 7: Pro-/Con Analysis of ULOOP for Considered Scenes (Sub-Use Cases) [1]

In the light of these tussles, the project realized that cooperation incentives may become necessary to motivate different stakeholders. Consequently, ULOOP initiated a study on a cooperation incentive framework which incorporates intrinsic motivations (direct benefits, pro-social nature, sense of community) and extrinsic motivations or rewards (reputation, reciprocity, and monetization by means of a virtual currency).

The presentation given by Andreas Georgakopoulos (University of Piraeus) on the opportunistic networking technology case as investigated by OneFIT revealed that opportunistic networks share a number of characteristics with user-centric networks. Commonalities and differences are reflected by the two use cases that OneFIT adopts: (a) Coverage extension of infrastructure, and (b) capacity extension of infrastructure. Figure 8 sketches a possible implementation regarding the capacity extension use case.

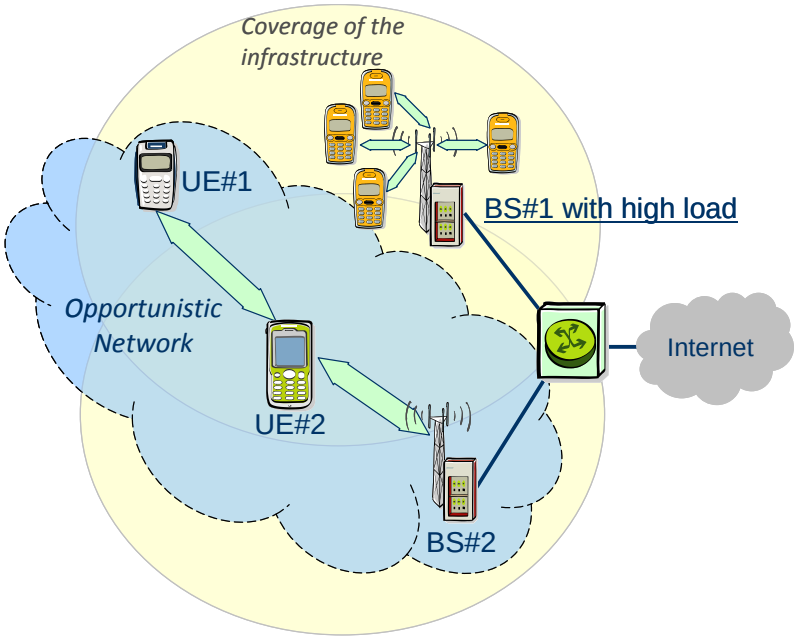


Figure 8: OneFIT Use Case “Capacity Extension” [2]

While OneFIT's use case (a) is comparable with ULOOP's use case (1), capacity extension is of dedicated interest to OneFIT. Andreas pointed out that capacity may be extended in two ways. Through neighbouring terminals and/or through the use of femtocells. For both use cases, the project was able to demonstrate feasibility by means of a proof of concept simulation.

Where the two projects and their technology differentiate is especially in the question of control points (which was a central aspect in this focus group, as the discourse would substantiate later on). Andreas stressed the nature of opportunistic networks as to be operator-governed networks. This would imply that an opportunistic network would be governed (*i.e.*, managed) by a single operator (as opposed to a more competitive environment in ULOOP's case) by means of the respective policies, cognition algorithms, and information about managed resources being in place.

3.5.1.1.2 Stakeholder Roles in Focus Group

Based on the presentations for the two technology cases of interest to this focus group, all participants selected a stakeholder role they would adopt and represent in the discourse. In order to ensure common terminology, stakeholder roles were assigned according to the ones listed in Figure 9.

The distribution of stakeholders resulted in assignments (in total the focus group saw 10 participants) as follows:

- Users: Covered by multiple participants. Especially for the ULOOP case, users were adopting sub-aspects of ULOOP users (with ULOOP-enabled devices), end-users (recipients of services), users (providers of associated services).
- Connectivity providers: Here in terms of network operators acting as edge ISPs. Covered by multiple participants.
- Policy makers: Covered by a single participant.
- Information providers: Covered by a single participant.
- Technology providers: Covered by two participants (representatives of the two research projects).

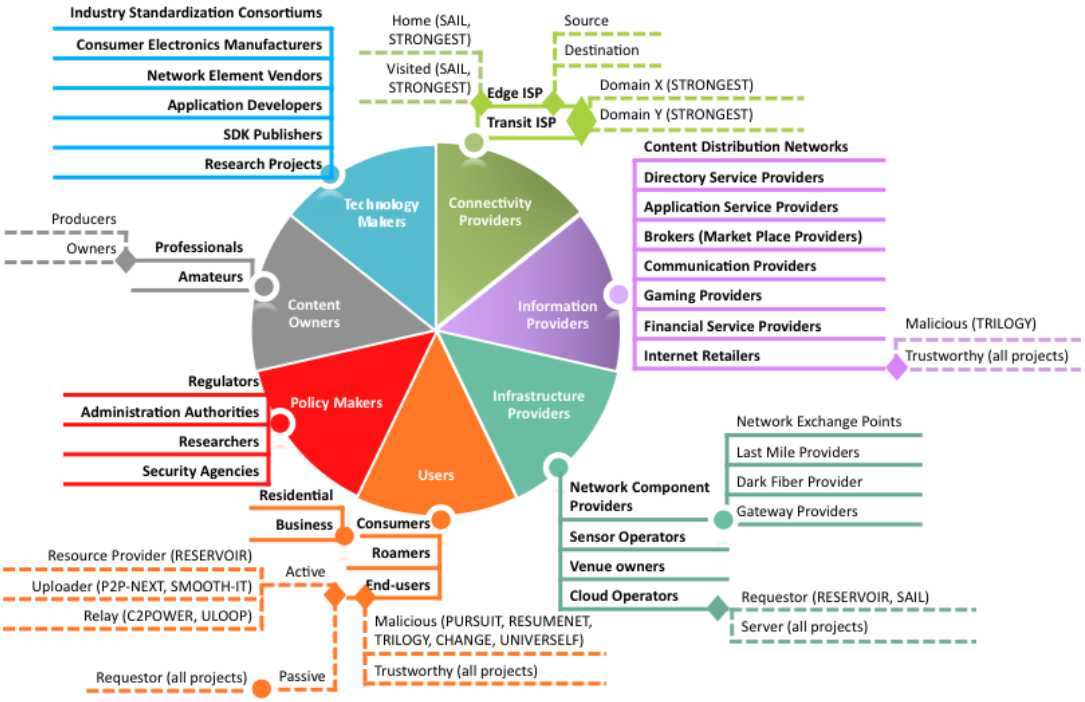


Figure 9: Future Internet Socio-Economic Stakeholders [3]

After distributing stakeholder roles, everyone was given a few minutes time to reflect on the perspective and arguments for the respective stakeholder to be represented in the focus group debate. As an input to this self-reflection, a number of potential questions of interest was presented by the moderator:

- *What do you think of the scenario presented?*
- *Was it realistic? Could it happen?*
- *What kind of problems could you foresee?*
- *Do you think there are any problems associated with the technology?*
- *What would happen if this technology were introduced into a real network/environment?*
- *What would have to be in place technically or commercially for the technology to be deployed successfully?*
- *Would you accept the technology? What would have to change about it for it to be acceptable?*

3.5.1.1.3 Focus Group Debate and Outcome

The focus group revealed during a quite early phase of the debate that there are hurdles to overcome mainly between users and connectivity providers in order to make the technologies beneficial to either or both sides. A number of interesting tussles among these stakeholders were identified.

Users were reluctant to adopt the technology as is. This means that users were not per se intrinsically motivated to use the technology. Instead of intrinsic motivation, users asked soon for means of extrinsic motivation – especially for monetary compensation for making available their resources to other users and, partly, to support needs of connectivity providers in a user-centric/opportunistic network. The main argument for monetary compensation was driven by a certain fear expressed other users might perform illegal or simply unwanted actions on their/by help of their resources. Users also expressed that they just want (and they would assume) 100% coverage – while they would not be ex ante willing in supporting a connectivity provider in extending coverage. Hence, users were characterized by lack of trust (in other users and in connectivity providers) as well as by a lack of incentive to allow a connectivity provider to gain certain access to and over user resources.

This aspect of control was exactly an item of concern for connectivity providers, albeit with an issue of control at another end: Connectivity providers would fear giving up control over users in the access business – in particular in ULOOP's more open case – and by that risk increased inter-provider competition. The point here is that ULOOP technology has the potential to open up access to different access networks (maybe also different access technologies) for users that participate in a user-centric network while not being part of a bilateral provider-customer relationship.

The aspect of stronger control (and not increased inter-provider competition) was stated as a clear plus from a connectivity provider's perspective for OneFIT's technology. Opportunistic networks are foreseen to be operator-governed, and so would be the choices for access be operator-governed. On the other hand, users would have even stronger need for extrinsic motivation to adopt the opportunistic network case over their control concerns not allowing users to choose the access network/technology freely.

Connectivity providers expressed willingness to give up some control if this would result in more satisfied customers, and either increased revenue or reduced costs. The debate would, however, not reveal clearly how to successfully map those objectives onto the two technology cases and the tussle with users. In particular, connectivity providers would not see offloading and extended coverage to result always and automatically in a benefit per se.

As for the opinion and interest expressed by the information provider in the focus group, the statement made was simple and straight-forward: An information provider would not care about the underlying access technology or whether reaching end-users is done with the help of a user-centric/opportunistic network at all. Information providers would, hence, not focus on access technology, they would act in a technology-neutral way. At least as long an information provider does not dispose of a special agreement (partnership) with a connectivity provider (*see* Kindle case for Amazon).

The policy maker, on the other hand, expressed quite a strong interest into either technology case looked at for multiple aspects. For instance, it is not fully clear today under current regulation how a user-centric/opportunistic network would have to be characterized (and thus, under which regulation, if at all, it would fall). Does it show key characteristics of a public or a private network? Furthermore, questions of liability (who is held liable for illegal acting and who is assigned to a node?) as well as of appropriate taxation (especially when monetization comes into play as a means of extrinsic motivation) may come up. A technology maker stated here that this might end still in a win-win situation as long as no player would raise an issue from a regulatory point of view. It remains to be seen whether this argument would be sustainable and for how long, however.

In summary, the focus group substantiated clearly ULOOP's direction of studying cooperation incentive schemes. The tussles identified among different types of users, between users and connectivity providers as well as between competing connectivity providers (not in OneFIT's case though) have shown that intrinsic motivation alone is not expected to lead to a stable tussle outcome. The need for a combination of intrinsic and extrinsic motivation mechanisms has become apparent. Consequently, future collaboration in the area of user-centric and opportunistic networking will focus on motivation.

3.5.1.2 "Content and Service Delivery Architectures for the Future Internet" Focus Group

The target of this parallel focus group was to understand and investigate tussles that may arise due to the introduction of new content and service delivery architectures for the Future Internet by EU FP7 projects PURSUIT and SAIL. In particular, the emphasis was on technologies following the Information-centric paradigm such as publish/subscribe architectures, cache placement techniques and new inter-domain name resolution systems.

Two representatives of the aforementioned projects gave presentations on Information-centric Networking (ICN) architectures, respectively, and questions were asked on the two architectures and their modules. The focus of both presentations was on the content delivery scenario, and specifically in the use-case of the ISP deploying a cache network of his own, a local CDN controlled by him. Afterwards, the major stakeholders have been identified and a discussion followed on the interests of the various stakeholders and a tussle analysis has been performed.

The major stakeholder that have been identified during the presentation of the two ICN architectures and include: the Access Network Provider (ANP) or edge ISP or access ISP, the Interconnectivity Provider (IC) or backbone ISP or tier-1 ISP, the Content Distribution Network Provider (CDN), the Content Provider (CP), and the End-user.

Major statements on the interests and incentives of the various stakeholders are summarized subsequently:

1. **End-users**: End-users are interested in having access to the most recently updated content and in an accepted level of quality. Additionally, they have interest in having the opportunity to signal their preferences regarding the requested content item, e.g., in terms of Quality of Experience.

   However, the end-users have fear of being restricted by the ANP only to specific content, especially if they are not multi-homed and have only a single choice as a rendezvous network. In particular, if the ANP deploys and fully controls such a local CDN, users were afraid that their requests (subscriptions) for content might either be re-directed to similar

content items, e.g., outdated copies of the requested content item or content items with less features or lower quality, located in local cache servers, or be totally banned, if the requested content cannot be found locally.

A tussle has been identified here between what is best for the ANP (e.g. local cache server) and what is best for the end-user (e.g. another publisher). For the aforementioned reasons, the end-user has a lot of interest in who controls the rendezvous network/or name resolution service.

Moreover, if a user is not multi-homed then besides having a single choice only as a rendezvous, he also has large switching cost (i.e., migrate to another provider).

Another aspect presented regarding end-users was that they are not interested in knowing where they get the content from, but in just getting the piece of content. They just need to signal their preferences somehow.

2. **Content Provider**: The CP's interest is to make content available to as many end-users as possible, as soon as the content is updated and in a good level of quality. In the scenario of the local CDN that will be controlled and owned by the ANP, the CP is concerned about his content being banned by the ANP, unless they have established an agreement. Therefore, the CP is highly interested in who controls the rendezvous or name resolution service, and whether and what kind of agreements he has with the entity performing name resolution; the CP itself would be interested in taking this role.

3. **Access Network Provider**: The ANP has strong incentive to deploy such a localized CDN, because this way he enters the content delivery market and increases his revenues since he will not only sell connectivity to his customers but also access to content. Additionally, the deployment of the localized CDN is beneficial for him, since he may achieve to minimize his operational cost, in terms of reduction of the transit cost due to the caching, and more efficient traffic management within his network. Of course, the ANP is also very interested in controlling the name resolution service / rendezvous network to improve his own performance and minimize his cost.

   The ANP claimed that he has no interest in restricting the CP, or the end-users in terms of banned content, or in redirecting their requests to outdated content items. The ANP instead is interested in providing a service successfully end-to-end and to optimize his own network locally. As an example, the IPTV paradigm was mentioned which is completely accepted by the end-users; the IPTV architecture is restrictive on the one hand, since the end-user can only have access to specific content provided by the ANP (walled garden), but on the other hand, it meets the users' expectations in terms of quality, as well as efficiently covers security aspects towards the CP.

4. **Interconnectivity Provider**: Regarding the IC, two major aspects exist. The first one supports that all the proposed caching architectures probably decrease the value of pure connectivity and that the IC becomes much weaker in this specific setup. Additionally, it was claimed that ICs, i.e., tier-1s, do not have incentives to participate in the content delivery; no business case is there to provide evidence that such an action would be beneficial for an IC.

   The second one supports that ICs can evolve to a provider offering interconnection between islands of local CDNs, i.e., ICs will not sell only connectivity but also access to content. The supporters of this opinion claim that the ANPs will need to provide extended coverage, if they want to compete with large CDNs such as Akamai; therefore, if the ANPs need to have access to all the content that is available for their customers, they depend on ICs after all.

The supporters of the first opinion expressed also their concern about large service providers such as Google (both CP and CDN) being able to find 'everybody everywhere'; so ICs will not be needed to take the role of interconnection provider of local CDNs.

On the other hand, supporters of the second opinion claimed that ICs should deploy their own CDNs; some have already started offering their own CDN services, e.g. AT&T's CDN.

5. **CDN provider**: CDN providers are interested in increasing the content volume that is delivered to the ANP in order to maximize his revenue. The big question raised regarding the CDN provider is whether and why they would allow an ANP to take their job, whether CDN providers are in position to prevent ANPs from deploying their own CDNs, or why they would give away information given to them by a CP. As an answer to the ANP-controlled CDN was mentioned the deployment of 'cable and fiber' by some CDN providers, i.e., they deploy their own networks. An indirect tussle has been identified here between CPs, CDN providers, and now ANPs in becoming a content delivery platform.

All of the stakeholders (and participants in the Focus Group) agreed that the rendezvous network – and who can control it – is one of the most interesting problems in the publish/subscribe architecture.

3.5.1.3 "Interconnection Agreements and Monitoring" Focus Group

The 3rd focus group of the workshop was related to interconnection agreements and monitoring across ISPs, discussing about frameworks that enrich the current best-effort Internet by allowing ISPs to collaborate during service management and establish QoS-aware network services. In particular, the participants were asked to express their views on socio-economic challenges that would appear, if the technology proposed by the ETICS research project was candidate for adoption.

After a taxonomy of stakeholder roles was presented by the moderator, all participants were asked to select the most appropriate role based on their experiences or preferences. Table 2 provides the actual[5] distribution of roles to focus group participants, indicating that all roles apart from the Infrastructure Provider had at least one representative.

Table 2: Distribution of Roles to 3rd Focus Group

Stakeholder role	**Number of participants per role**	**Terms used**
Connectivity Providers	2	EDGE, TRANSIT
Information Providers	1	GAMING-PROVIDER
Infrastructure Providers	0	-
End-Users	2	GAMER-1, GAMER-2
Policy makers	2	REGULATOR, ADMINISTRATIVE-AUTHORITY
Content owners	2	CONTENT-1, CONTENT-2
Technology Makers	4	PROJECT-1, PROJECT-2, VENDOR-1, VENDOR-2

The technology maker representative introduced the motivation for such a framework by stating that the existing marketplace structure provides no incentives for collectively providing Quality of

[5] One participant had declared to play the Infrastructure Provider role (Last-mile provider) but was acting as an Edge-ISP. We believe this did not negatively affect the discussion since for this particular case-study significant overlap was expected on their interests).

Experience (QoE) to end-users which creates several tussles and consequently uncertainties for the Future Internet. Then he presented the proposed technology by providing a scenario where gamers request premium quality access to a gaming server and continued by describing a number of possible coordination schemes for realizing this case study. These alternative architectural schemes define a) whether atomic offers are made available to the consortium of Network Service Providers (NSPs) proactively or on-demand and b) which entity will stitch those atomic network services (or Assured Service Quality goods) together and form the end-to-end path.

After the architecture had been presented, it was agreed to focus on a particular coordination scheme where several entities can act as facilitators and decide for the realization of a particular end-to-end path.

GAMER-1 raised his concerns on whether he would actually get the premium experience that he had paid for. PROJECT-1 replied that end-users would have SLA agreements with one or more ISPs. When a user's ticket for lower than expected performance arrives, the common monitoring mechanism in place would verify whether it is valid and who should be held responsible for the SLA violation.

As a response to the ADMIN-AUTH who asked for more details, PROJECT-2 said that the implementation details of the monitoring mechanism are still under investigation, however important issues to be considered are whether ISPs are willing to accept and the second is the cost of the monitoring system and whether it is reasonable to deploy it, or not. TRANSIT added that ISPs already have local monitoring systems in place, but the problem is that usually their metrics are incompatible. Furthermore, TRANSIT stated that Information Providers (such as news sites) and technical-savvy users bring transparency into the market by periodically announcing their findings to potential customers. The fact that the metrics and applications being measured are constantly changing was suggested to give incentives to reputable ISPs to keep their effort high. VENDOR-1 also raised the need for standardized interfaces for performing SLA monitoring and mentioned that there can be limitations by particular technologies on what can be monitored. VENDOR-2 mentioned that he would consider whether standardized or proprietary interfaces could protect its profits better. Finally, CONTENT-1 and CONTENT-2 appeared to be satisfied with the existing best-effort Internet, where all competing providers receive similar quality, connectivity costs are more predictable and ISPs have less lock-in power.

Another issue that was raised by the REGULATOR is whether having multiple facilitators, who are likely to be the larger NSPs, would make it more likely or easier for those larger NSPs to exclude smaller ones when negotiating for interconnection or setting-up paths. TRANSIT replied that there is a trade-off between the flexibility of smaller ISPs to cooperate with (e.g. to monitor comparable metrics) and the coverage of larger ISPs, especially when taking into account the lengthy process of interconnection negotiations and trials. EDGE, representing the smaller ISPs in general, replied that he would feel very uncomfortable in that particular case study, since being excluded from the facilitator role would result in totally losing control and power in the market. The reason being that he would rely solely on larger ISPs for getting good connectivity to the game server. Furthermore, EDGE revealed his preference to the case where a single facilitator exists and all NSPs are shareholders, assuming that he would exert some control on network service provision and a share of the revenue pool. PROJECT-1 replied that even though theoretically nothing would block a certain NSP from performing the Facilitator role, as in today's best-effort Internet, the main challenge for a smaller one would be to attract customers. However, both EDGE and PROJECT-1 agreed that multiple smaller operators could team-up and create their own facilitator. An alternative candidate reaction would be to ask the regulator's intervention, which was proven in the past to foster competition (e.g. by imposing local-loop unbundling). PROJECT-1 recognised that it is very difficult to build a technology in a way that imposes a specific outcome, but it may be easier to build that technology open enough and hope that market forces and regulatory forces lead to a desirable outcome.

3.5.1.4 Feedback on Focus Group Session at the Wrap-Up of the Athens Workshop

Martin Waldburger, moderator of the focus group “User-centricity and transparency of Future Internet technologies”, started his abridged description by briefly introducing ULOOP and OneFIT research projects. Both projects study and develop similar technologies to deploy users' infrastructure to offload traffic from operators. He pointed to several tussles encountered in the session, for example that against expectations, users are probably not motivated to contribute to the network. Mainly, this issue could be traced back to a lack of trust between users. He also stated that operators may be concerned about loosing control of their networks but they could be willing to release that control, if it would increase user satisfaction. The stakeholder group of information providers was identified to be mostly unconcerned with the technologies developed by the two projects, as information providers usually do not care through which access technology their content is accessed. According to Martin Waldburger, policy makers will be mostly concerned with legal issues regarding trust.

Next, Ioanna Papafili, moderator of the focus group “Content and service delivery architectures for the Future Internet”, presented the results, stating that if content centric networking is deployed, a tussle will evolve around interconnection providers, who will see decreasing revenues, due to the reduction of transit traffic, enabled by cashing in access networks. Ioanna Papafili stated that the focus group saw traditional CDNs coexisting with a new CDN service provided by ISPs.

Finally, Costas Kalogiros, moderator of the focus group ”Interconnection agreements and monitoring”, presented the main session results achieved, stating that many small ISPs are likely to retreat from the market or collaborate with other small ISPs to form larger ISPs. Further, it was predicted that end users will demand some kind of SLA monitoring tool that would allow them to make sure that the premium rates they have asked and payed for are provided.

3.5.2 Summary of the Moderated Panel Discussion

Following the first question about "The Sending Party Pays Principle", Bob Briscoe replied that this principle should not be used exclusively; the receiver could be charged variable prices by the sender in conjunction with other payment schemes. Nicolas le Sauze associated the use of the principle with QoS provision. Other members of the panel remarked that the appropriateness of the principle depends on the application, the structure of the value-chain, the benefits of the players, and the topic can be further studied by means of tussle analysis. Robin Mason also remarked that the benefits of the players are a key factor; technical solutions can be found.

Regarding the second question on "Network Neutrality and QoS", Robin Mason replied that elasticity of demand is very important to measure. Costas Courcoubetis pointed to the problem that even if all necessary raw data was collected, it could be infeasible to extract the respective information to answer these questions. Alissa Cooper pointed to a problem on the conceptual level, namely that refined information could be understood differently by different individuals. Bob Briscoe said that BT offers IPTV service with QoS.

Next, it was discussed whether traffic should be charged on its purpose/application, i.e., if volume based charging is applied, should it be acceptable to charge differently for the same amount of traffic if it transports for example video streaming data or VoIP data. Robin Mason mentioned that the cost of dynamic pricing may be higher than the benefits of the network operator. The panel compared IP traffic to electricity; it was stressed that also for electricity costs it is not considered for which purpose the electricity is used. Bob Briscoe explained that there are major differences between the two types of networks, such as the fact that traffic in networks is subject to routing (unlike electricity), can be classified in flows etc. Nicolas le Sauze stated that, unlike electrons, bytes in the Internet have an extra value added, wherefore such a fine-grained charging model should be considered. Michael Boniface sketched a scenario where the charge for electrical power could also be calculated with respect to its purpose; in particular, he rendered a scenario where this cost differentiation is achieved with respect to voltage, allowing a device to charge faster or

slower. Alessandro Bogliolo brought the cases of Kindle and IPTV, as examples of revenue sharing among players.

Finally, following the third and final question on the relation of "CDNs and Tier-based Interconnection", Alissa Cooper stated that, unlike in Europe, there is not much of a business case for CDN federation is the USA. Bob Briscoe said that CDN is the sender of traffic, and they are compensated by OTTs; thus, the charges faced by CDNs should be transparent to the users. Michael Boniface said that it is often the case in cloud computing that an ASP pays for user access. The discussion then shifted towards charging issues, and particularly whether different charging policies should be defined for Internet access. With respect to this, Alissa Cooper posed the conceptual question how access to the Internet is/could be defined, i.e., if it can be considered as the access to a bunch of services like Facebook, YouTube, etc.?

3.6 Interviews, Feedback, and Dissemination of Athens Workshop Results

This section presents supportive methods for collecting input from the workshop participants, such as personal interviews and a feedback questionnaire (including the results). Furthermore, the dissemination strategy of the workshop's results is presented.

3.6.1 Interview Aims and Questions

As in the Oxford workshop, several participants were invited (during registration) to engage in a short interview (5-10 minutes approx. each). The aims of the interviews were to:

- **Study the dynamics of answers:** The questions asked in the Oxford workshop (expanded with some new ones) were asked again in order to sample the evolution of Future Internet community's views on socio-economic aspects over time. Thus the initial aims to "Identify gaps", "Bring the voice of the stakeholders", "Facilitate the comparability of perspectives", "Identify the relevance of the Digital Agenda" are still valid.
- **Understand the vision of technology makers:** Different research projects can have varying targets when developing their technologies and we wanted to understand whether they have a concrete plan when evaluating their results.
- **Receive feedback on SESERV coordination activities** in order to better understand SESERV's impact on the Future Internet community and to provide guidance for future SESERV workshops.

The interviewees were given the following questions in advance (handed out on a sheet at registration in the morning):

1. How do you think your project benefits a broader European drive to increase innovation?
2. What do you know about the EU Digital Agenda? How is the DA relevant for your project?
3. Who are the main stakeholders targeted by your project or affected by the solutions it provides?
4. What are the main social and economic problems that your project deals with?
5. What are the criteria for evaluating your project's research results?
6. Have you been exposed so far to any results of SESERV? If yes, to which ones? Did your project make use of such results? Please specify.

The following participants kindly gave an interview and agreed to make it publicly available via the SESERV website:

- Alessandro Bogliolio (ULOOP), http://www.seserv.org/athens-ws-1/2nd-seserv-workshop---interviews#Bogliolo

- Bob Briscoe (ETICS), http://www.seserv.org/athens-ws-1/2nd-seserv-workshop---interviews#Briscoe
- Nicola Le Sauze (ETICS), http://www.seserv.org/athens-ws-1/2nd-seserv-workshop---interviews#Sauze
- Makis Stamatelatos (UNIVERSELF), http://www.seserv.org/athens-ws-1/2nd-seserv-workshop---interviews#Sauze

3.6.2 Participants Feedback

After the workshop all participants were emailed with the request to give feedback and assist the SESERV consortium in improving future workshops. 18 participants kindly gave their responses in the online questionnaire (see Appendix A). For each of the 6 questions, a screenshot is provided followed by the distribution of the responses.

1. **Was the time allocated to keynotes, tussle analysis presentations, focus group sessions and panel discussion appropriate and satisfactory?**

   Based on the responses almost half of the participants were satisfied by the time allocated to the three sessions of the workshops. Furthermore, a significant share would like to spend more time interacting with the rest participants.

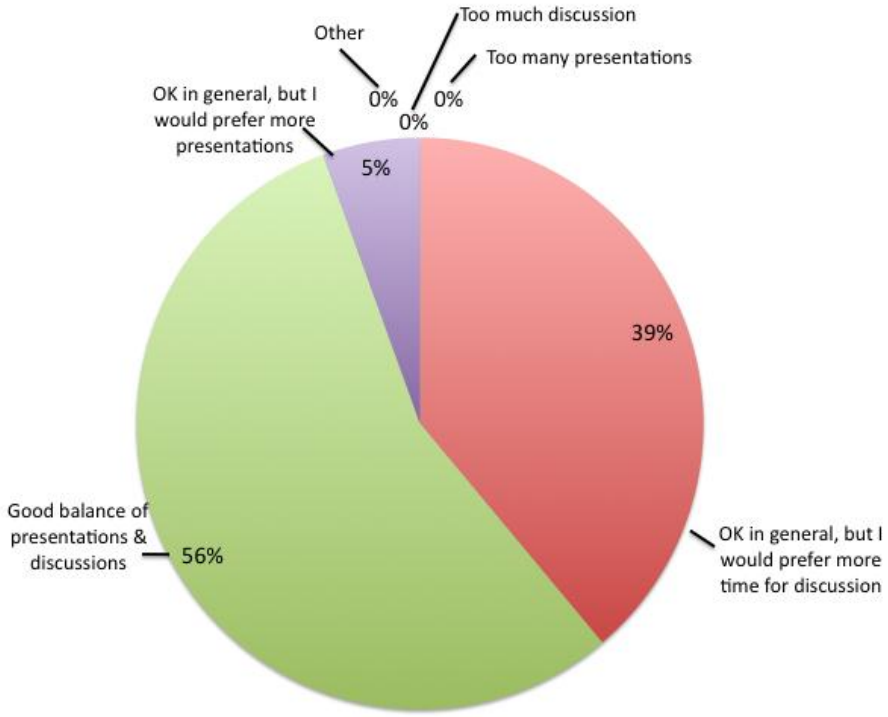


Figure 10: Responses to First Question of the Online Questionnaire

2. **Was the mix of presenters and participants broad enough and satisfactory? Whose perspectives were rather missing from the discussions/ presentations?**

   Participants suggested that all stakeholder roles, except from ISPs, could have had more representatives. As an example, half of them indicated that the perspectives of the content owners were rather missing from the workshop.

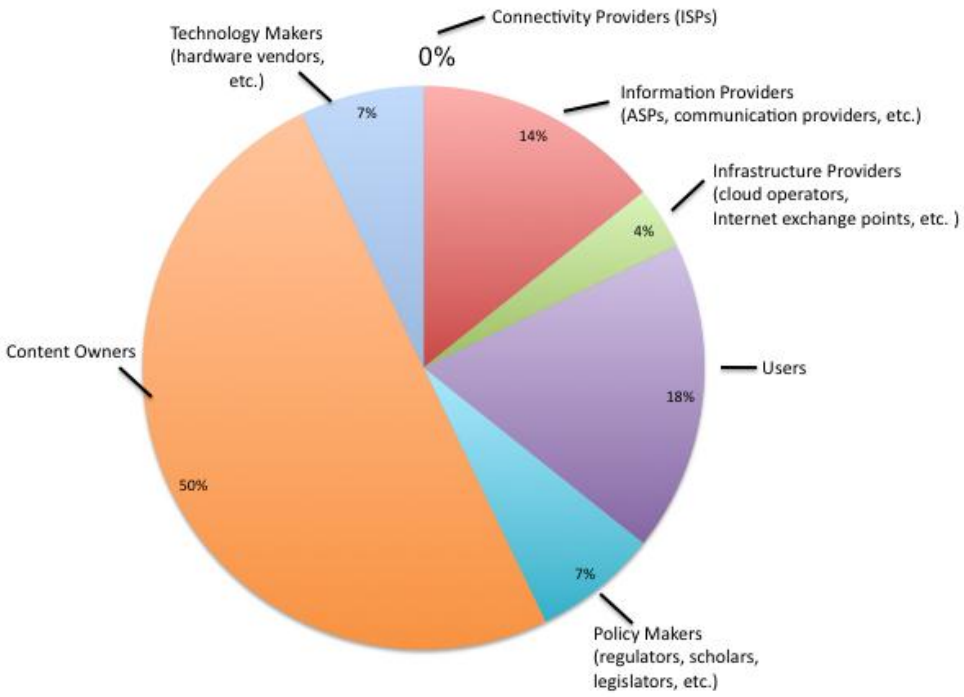


Figure 11: Responses to Second Question of the Online Questionnaire

3. Did you learn anything at the workshop that you were not aware of before?

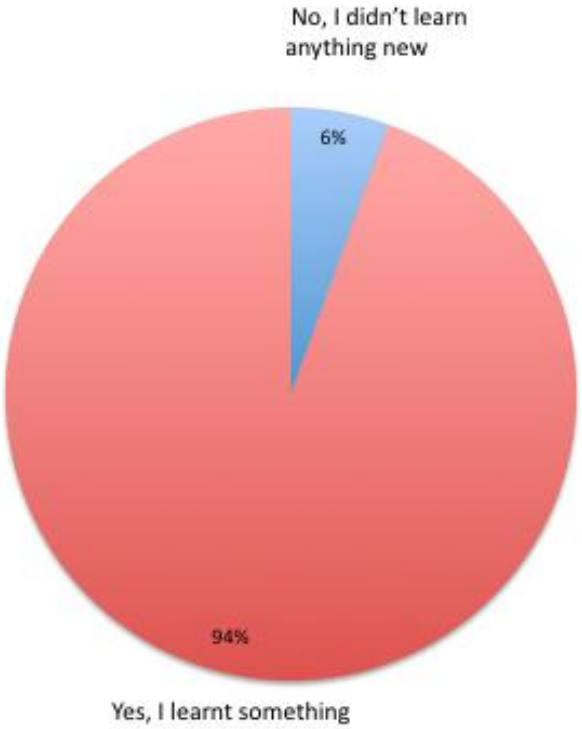


Figure 12: Responses to Third Question (Part A) of the Online Questionnaire

Based on Figure 12 and Figure 13 most participants responded that they did learn something at the workshop. It should be noticed that there was a balance in the responses given, where the most popular answer got almost 25% of votes. Furthermore, there were few participants who discovered something different than selected key-messages.

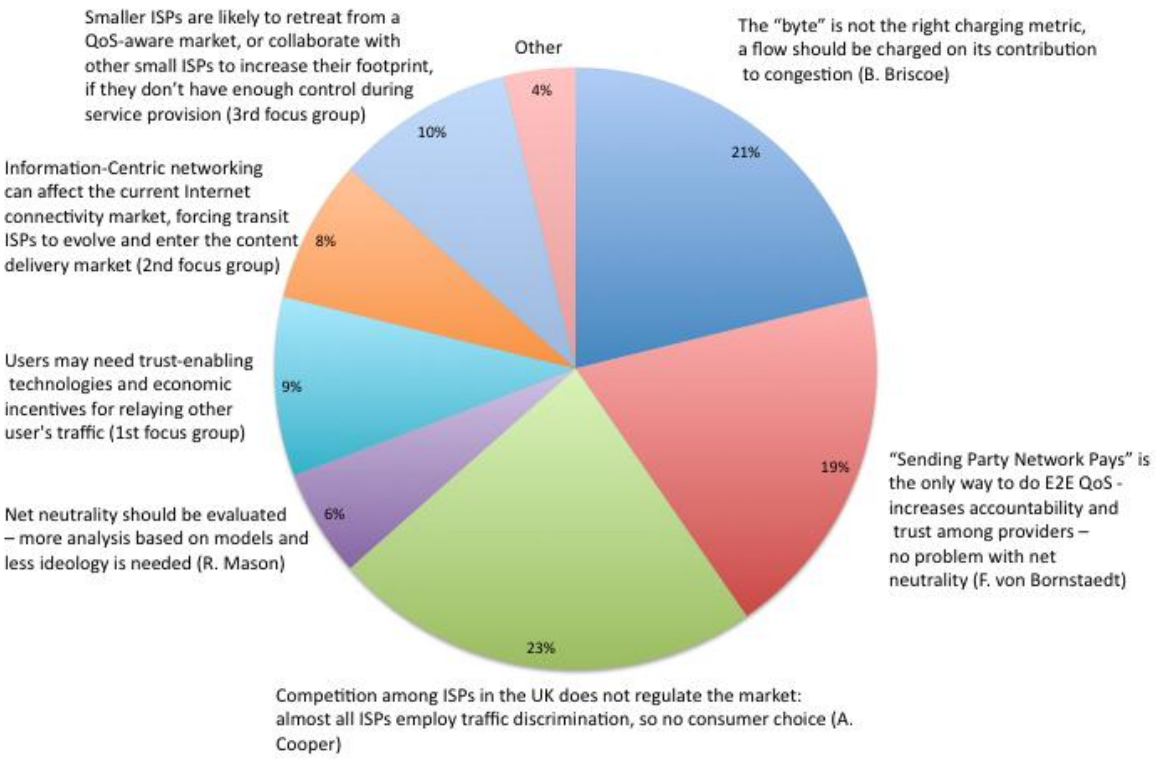


Figure 13: Responses to Third Question (Part B) of the Online Questionnaire

4. What would you like to see covered in a future event?

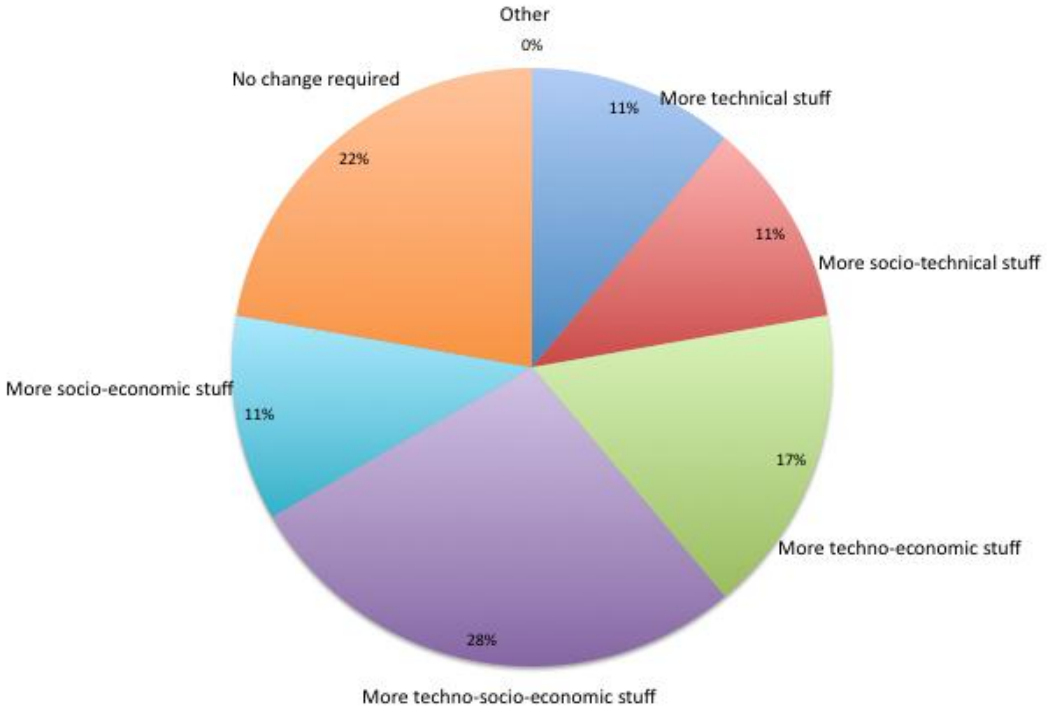


Figure 14: Responses to Fourth Question of the Online Questionnaire

Answers to this question were rather balanced. It is interesting to notice that 28% of the participants would like to understand technologies from a broad perspective, covering technical details as well as socio-economic aspects.

5. Did you feel the balance between presentation and discussion was right in the Focus Group you attended?

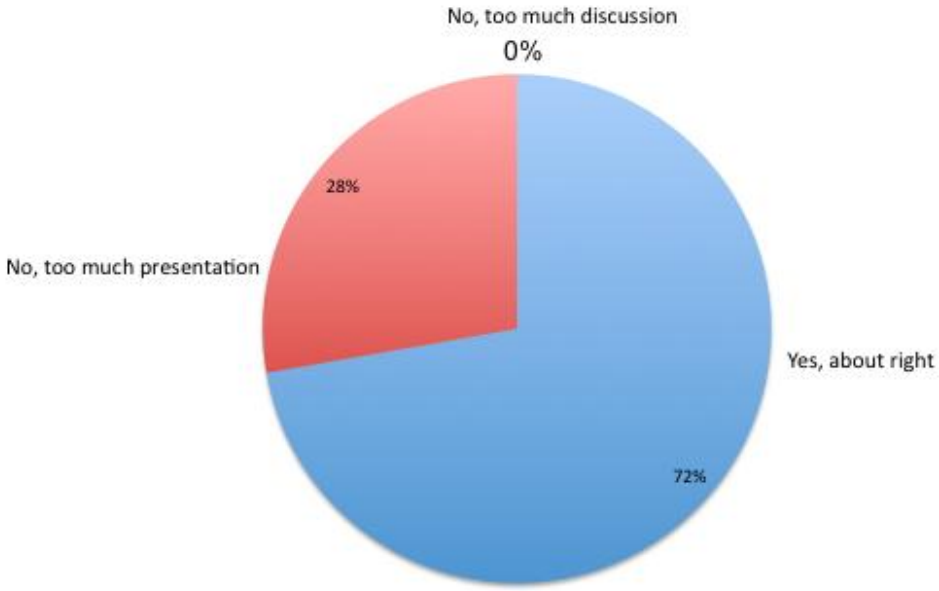


Figure 1: Responses to Fifth Question of the Online Questionnaire

A significant share of the participants found the focus groups balanced in terms of time spent in discussion and presentation. The rest participants (28%) would like to have more discussion.

6. Would you like to be informed for subsequent focus groups organized by SESERV in the months to follow (note that procedure, topics may be updated, based on your feedback)?

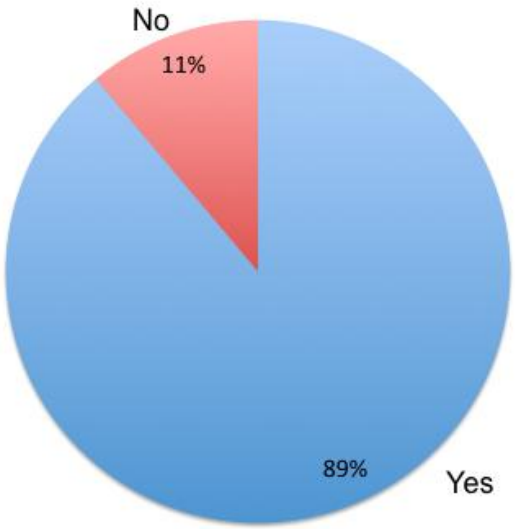


Figure 2: Responses to Sixth Question of the Online Questionnaire

Most participants found the focus groups and their objectives (understand the stakeholders' concerns to a particular technology) interesting and would like to be notified again and possibly participate in related future SESERV events.

3.6.3 Dissemination of Athens Workshop Results

Following the successful dissemination strategy of the previous workshop, the results have been disseminated via different channels and in different forms (text, videos).

1. A FIA book chapter [7] has been prepared and submitted based on interactions with members from SAIL and PURSUIT research projects and will be published on the SESERV website.
2. Preliminary workshop results have been disseminated to the 9th EC D1 concertation meeting in Brussels on February 14, 2012 (Figure 3: Example Slide for Workshop Results Dissemination at 9th EC D1 Concertation Meeting).
3. Shorter excerpts of the results of the parallel focus groups have also been published online (http://www.seserv.org/athens-ws-1/webcasts#feedback).
4. The keynote speeches, project presentations and the panel discussion were filmed and have become available online on the SESERV website (http://www.seserv.org/athens-ws-1/webcasts).
5. Additionally, the slides of the project powerpoint presentations have been published too on http://www.seserv.org/athens-ws-1/webcasts (for those presentations where presenters have given us the permission to do so).
6. The videos of the short interviews have been posted on the SESERV website and YouTube (http://www.seserv.org/athens-ws-1/2nd-seserv-workshop---interviews).
7. All the material placed on the SESERV website have also been advertised on LinkedIn.
8. The findings from the workshop were used in forming the Deliverable 2.2.

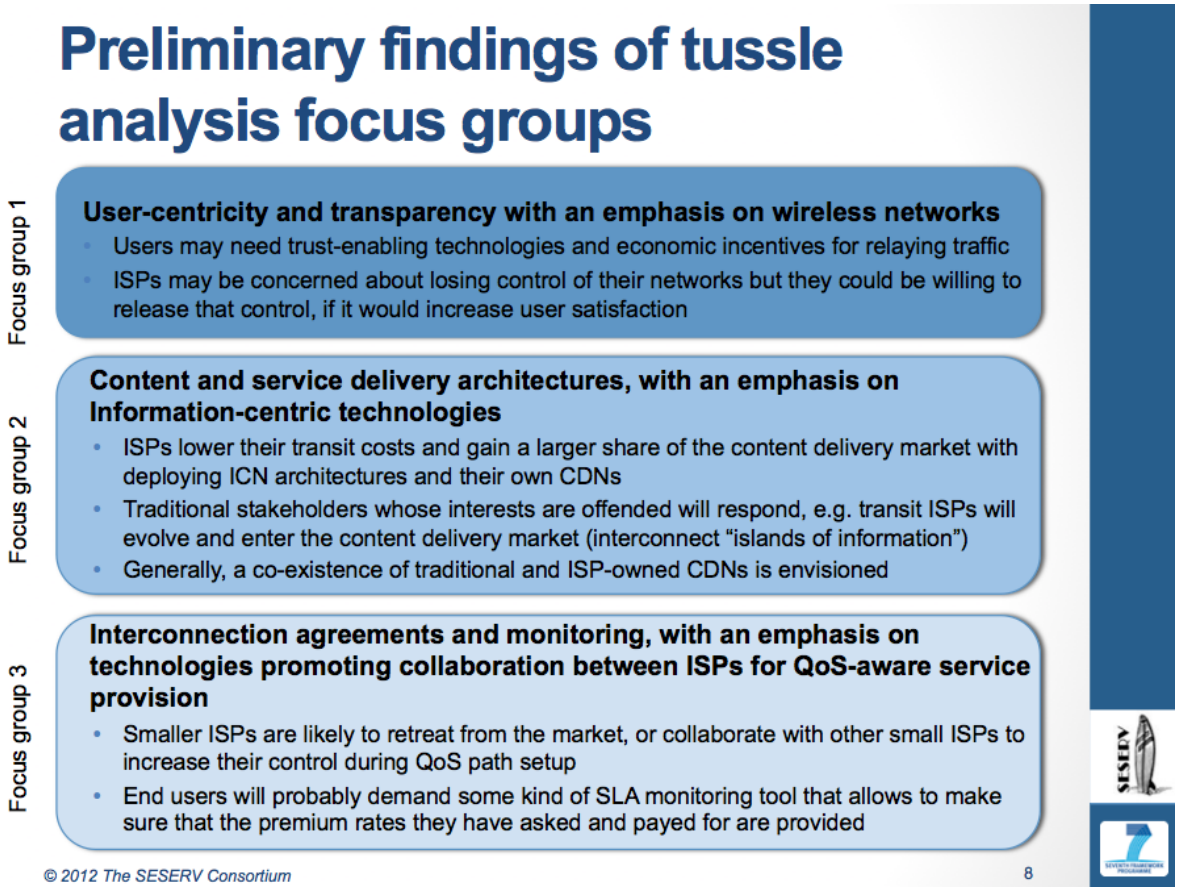


Figure 3: Example Slide for Workshop Results Dissemination at 9th EC D1 Concertation Meeting

All participants of the workshop and everybody signed up to the LinkedIn group have been notified when the material was published online.

4 Summary of the Brussels Workshop

4.1 Objectives of the Brussels Workshop

Given the timing of the third workshop, on the 20th of June, 2012, close to the end of the project and taking place recently after a focus groups meeting in May at the FIA Aalborg, it was felt that the meeting should both consolidate the work done throughout the project's duration and open the community's perspective of other open SE issues. The result would create a momentum of this discussion lasting beyond the project lifetime, strengthened on its emphasis to bring into the workshop greater representation from industry and policy to match its established interaction with researchers.

The title selected was: *Socio-Economic Certainties and Change for the Future Internet*, subtitled: *Perspectives for European ICT Industry and Horizon 2020 Research*.

The intention was not to close certain topics as 'complete' but rather to present how the understanding of the group has evolved, in areas such as network neutrality, business models for network traffic, cloud computing tussles, evolving understanding of trust models, and online privacy and personas. This would then be complemented by new horizons within the FI where the SE methodology and perspective could further advance the topic. In particular the project wanted to discuss with delegates the importance and applicability of SE disciplines in Horizon 2020. SESERV was ending, but its role as a facilitator for this discussion was aimed to ensure this interaction would continue and grow well past the project.

4.2 Planning of the Brussels Workshop

The Brussels workshop was established as a plenary conference, with networking breaks. No parallel or breakout sessions were planned, as these had been covered the month before in the FIA Aalborg. This, on one hand, increased the value to the presenters of the conference, allowing it to attract senior individuals, and on the other hand this allowed the audience to follow a single thread throughout the day, culminating in the closing panel session.

The event was pitched at a diverse audience which would include representatives from European research (both from SE and technical domains) but also importantly, industry, policy and international research. Correspondingly the agenda was not focused on presenting the SESERV project, its methodologies or results in a lengthy manner, instead catering for individuals who had not engaged previously with the project nor were involved actively in FP7 projects; SESERV's role was a facilitator to this discussion and community interaction. This was also reflected in the marketing campaign for the conference.

The speakers invited to speak had to fulfill two general criteria. Firstly they were not to be frequent speakers at European project forums. These perspectives had been consistently covered in conference venues such as the Future Internet Assembly or other project-based events. The project was searching to broaden the perspectives and interaction of the community, to add value to the SESERV-nurtured SE conversation and to offer a unique event to the audience. The second criterion was that the speaker had to have reached a certain level of prominence or seniority. This made the conference more attractive to delegates and ensured the input to the SE community was high with their substantial experience in their field. Consequently the speakers included senior

European commission delegates (Head of unit, cabinet member), a vice-president of the analyst IDC, and senior-level international researchers with scientific, business and legal backgrounds.

In line with the aforementioned issues, the event was scheduled for the day prior to the Digital Agenda conference, which a large number of SE and broad-minded technologists would attend. This was done in the hope of facilitating the attendance of these individuals. Brussels was also an ideal location for the ability to attract European Commission officers (relevant too as the conference wished to demonstrate the value of SE in Horizon 2020) and because of the ease and familiarity of travel to and from the city to delegate's home cities.

4.3 Agenda of the Brussels Workshop

As previously mentioned, the agenda followed a plenary format, with networking breaks. Below, in Table 2, the final agenda and short abstracts of the presentations that took place are provided.

Table 2: Brussels Workshop Agenda

09:30 - 09:50	workshop introduction
09:50 - 10:20	**Andrea Glorioso - Policy Officer, European Commission** The EU is creating new initiatives to ensure human rights and fundamental freedoms are respected both online and off-line. EC policy officer Andrea Glorioso presents the "No Disconnect Strategy", and how technologies of the Future Internet can be unexpected enablers of major societal movements.
10:20 - 10:50	**Stephen Minton - Vice President for the IDC Worldwide IT Markets, IDC** IDC looks at the growing market segments of the Future Internet, and how the social and economic context of its "Information Society Index" applies to its industry stakeholders. The analysis and forecast will set a context for much of the discussion throughout the day.
10:50 - 11:20	**Sara de Freitas - Director of Research, Serious Games Institute** Gaming and entertainment industries have been a strong element of computing and Internet technologies, almost from the very start. As technology has advanced, games have found application not just as entertainment but also as a means of learning, decision making, problem solving and innovation. The UK's Serious Games Institute will discuss the socioeconomic themes in this context.
11:20 - 11:40	coffee break
11:40 - 12:05 **Networks**	**Falk von Bornstaedt - Deutsche Telekom** Deutsche Telekom presents new business models that derive from the changing societal and economic drivers of ISPs, network and content providers of the Future Internet.
12:05 - 12:30 **Data Protection**	**Aleksandra Kuczerawy - Legal Researcher, KU Leuven** Data protection and the legal frameworks to support it are an urgent concern of the Future Internet's user base. Legal expert Aleksandra Kuczerawy tells us the critical areas to look out for, and how to prepare for the legal advances now developing.
12:30 - 13:15	Panel Session on Socio-Economics and Technology
13:15 - 14:15	networking lunch
14:15 - 14:40 **Trust & Security**	**Alan Hartman - Senior Researcher, IBM** Trust and Security are ongoing struggles in all facets of the Future Internet. Alan Hartman of IBM Research presents the research issues central to the study of the measurement and management of trust in a business context.
14:40 - 15:05	**Javier Salcedo - Product Director, Arsys** Cloud computing's strong entrance into the infrastructure market has seen success. As customers are introduced to an expanding choice in offerings and opportunities,

Cloud Computing	naturally the expectations to meet higher requirements and needs have arrived. Arsys, a Cloud hosting leader, shows us how Cloud offerings are rising to the socio-economic challenges.
15:05 - 15:30 **Network Neutrality**	**Vesa Terävä - Regulatory Coordination & Users Unit, European Commission DG CNEC** Introducing an added layer to the upcoming workshop roundtable, Vesa Terävä reflects on network neutrality, what factors to keep into account, and Europe's analysis and policy towards the hot topic.
15:30 - 16:15	Panel Session on Socio-Economics in Horizon 2020 Research & Industry
16:15 - 16:35	coffee break

4.3.1 The keynotes

Andrea Glorioso - Policy Officer, European Commission

The first keynote was delivered by Andrea Glorioso, EC officer and member of Neelie Kroe's cabinet. Andrea discussed the No Disconnect Strategy (NDS) which he heads. This initiative was inspired by the events of the Arab Spring. The initiative seeks to provide tools, knowledge and training of IT for foreign activists who support the ideals of Europe, such a freedom of speech, equal rights and democracy. Andrea highlighted how poor understanding of technology hampers such activists from reaching their goals, such as insufficient security practices and precautions by NGOs. He described the different instruments the NDS is putting forward in this area, including through the Future Internet Research and Experimentation (FIRE) unit.

Figure 4: Time the protester: an attention-grabbing slide from Andrea Glorioso.

Stephen Minton - Vice President for the IDC Worldwide IT Markets, IDC

The second keynote was by Stephen Minton, Vice President for the IDC Worldwide IT Markets, IDC. Stephen gave an overview of the markets for devices, cloud and networks and growth of each of these markets affected the others. The statistics he showed would underpin many of the observations and assumptions described by later speakers, as the economics of the situation underpins many of the drivers for FI development and the way technology is used and impacts users and society.

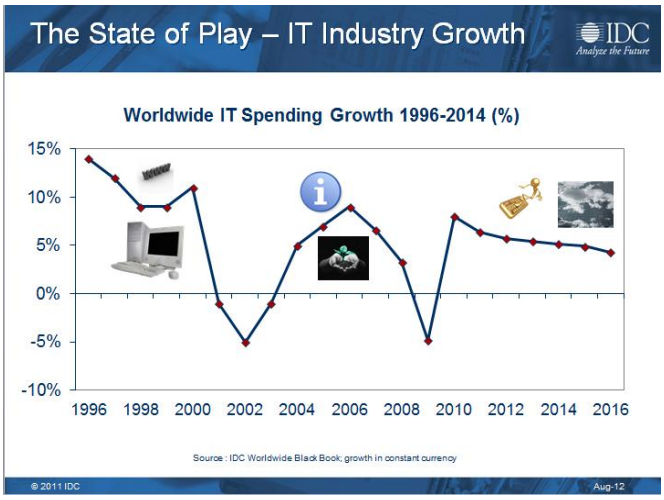


Figure 5: Worldwide spending growth as charted by IDC.

Figure 6: The changing face of the Internet: IDC commented on the way new Internet phenomena change usage.

Sara de Freitas - Director of Research, Serious Games Institute

The third keynote speaker, Sara de Freitas, from the Serious Games Institute discussed the role of serious games as an additional tool in the resolution of business problems and in training, showing how gaming technology has advanced significantly and can now be applied not just to the entertainment sector but also in many walks of life, including triage training for medical teams or disaster recovery for rescue teams. Beyond the financial and environmental benefits of serious games, research has shown the superiority of games in some circumstances. Sara discussed how new technologies are shifting the way that business, the public sector and society are able to address issues in a quick and affordable fashion. Serious games are a good example of how technology can be repurposed and how technologies of the Future Internet can be used in real life.

4.3.2 Future Internet Challenges

In this session, the Brussels workshop covered talks given by the following speakers:

- Falk von Bornstaedt - Head of IP Transit and Peering, Deutsche Telekom
- Aleksandra Kuczerawy - Legal Researcher, KU Leuven
- Alan Hartman - Senior Researcher, IBM
- Javier Salcedo - Product Director, Arsys

Figure 7: Sara de Freitas' presentation included many demonstrative stills and videos from the world of serious gaming (Part A).

Figure 8: Sara de Freitas' presentation included many demonstrative stills and videos from the world of serious gaming (Part B).

After a networking break, the conference proceeded to the technology-themed talks, reflecting the Future Internet / ICT work programme breakdown of 1.1 "future networks" (Falk von Bornstaedt, Deutsche Telekom), 1.2 "Cloud computing, software and services (Javier Salcedo, ARSYS), 1.4 "trust and security" (Alan Hartman, IBM Haifa) and a cross-theme talk on data protection and regulation (Aleksandra Kuczerawy, KU Leuvan). These talks discussed both the speaker's point of view on the selected topics, and the way that the community's perspective on SE challenges pertinent to each has evolved during and through SESERV. For example Alan Hartman described a mathematical solution to describing situations of trust, and Falk von Bornstaedt described how outages caused by recent undersea cable ruptures affected DT's stance on the network neutrality debate.

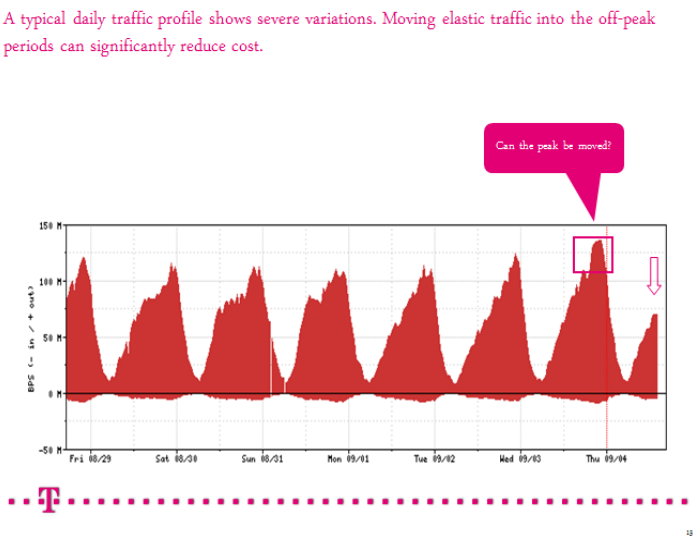


Figure 9: Falk von Bornstaedt discussed traffic patterns under normal circumstances as well as during outages.

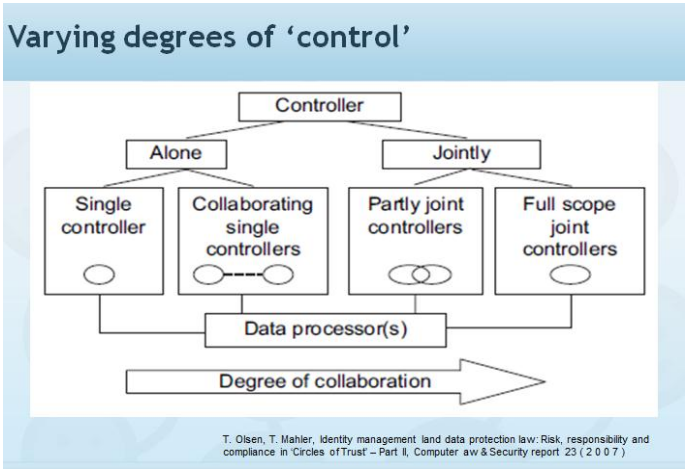


Figure 10: Aleksandra Kuczerawy described how the control of data is complicated in the increasingly common situation of joint control.

Figure 11: Alan Hartman gave an animated discussion of mathematically modeling trust.

Figure 12: Javier Salcedo's presentation included a memorable analysis of technology adoption speed and how this has accelerated manifold over recent years.

4.3.3 Concluding presentation

Vesa Terävä - Regulatory Coordination & Users Unit, European Commission DG CNEC

The Presentations concluded with a presentation delivered by Vesa Terävä, head of unit for Regulatory Coordination & Users, (DG CNEC), who discussed network neutrality and engaged delegates in a Q&A session.

The agenda was completed with a panel session of the delegates chaired by SESERV participant Brian Pickering (IT Innovation), further engaging the workshop delegates in the discussion, and concluded with a summary session from the project's scientific coordinator who highlighted several of the topics that linked the participants' diverse background together throughout the day.

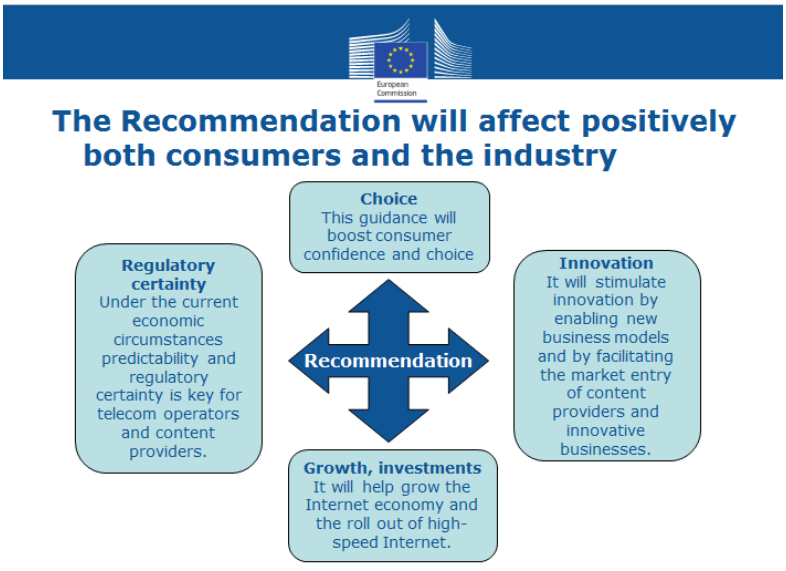


Figure 13: Vesa Terävä spoke of the positive effects of EC involvement in the net neutrality issue.

4.4 Workshop Advertisement and Participation

Advertising the build-up for the Brussels workshop leveraged several strategic, logistical, and networking tools to ensure its two primary objectives: a strong agenda and an active audience.

A workshop of this type does not focus for a high quantity of KPIs for on-site attendance, but rather key representatives that can disseminate the dialog and content to their own stakeholder networks, expanding the impact and reach of the experts involved in the discussion. This qualitative goal was first used in forming the agenda, where each draft highlighted the workshop's progression and more incentive for participation. This was particularly important to capture the interest of those not previously involved in FISE related events, and the result added the needed base for context and networking.

Online tools included LinkedIn, a multitude of mailing lists, online portals, networking messages, various announcements and a feature-rich experience in SESERV's community website. A sample of such marketing content can be found below:

Figure 14: Participating Organizations and Projects of SESERV's 3rd Workshop

Figure 14: Participating Organizations and Projects of SESERV's 3rd WorkshopFigure 14 was used on the promotional material, particular web articles which promoted the event. It showed the participation from projects and organisations.

The flyer in Figure 15 was distributed electronically to mailing lists and bulletin boards. Paper copies were also distributed at other project meetings. This version of the flyer was produced before the agenda was finalised and was aimed to be a teaser. Later a revised version with the agenda included was circulated closer to the event.

Furthermore, the online version of the agenda (see Figure 16) was updated as information became available. In addition, in the run up to the workshop, each day prominently featured a speaker profile and the anticipated contents of their presentation. This created some anticipation to the event.

Figure 17 above shows an excerpt of one of the mailing-list publicity rounds. These were sent around in the weeks prior to the event and informed potential attendees of the contents and importance of the conference.

Finally, the Prezi presentation (see Figure 18) was created after the workshop to serve both those who attended and those who were unable to. It gives an elegant and detailed overview of the day and main conclusions.

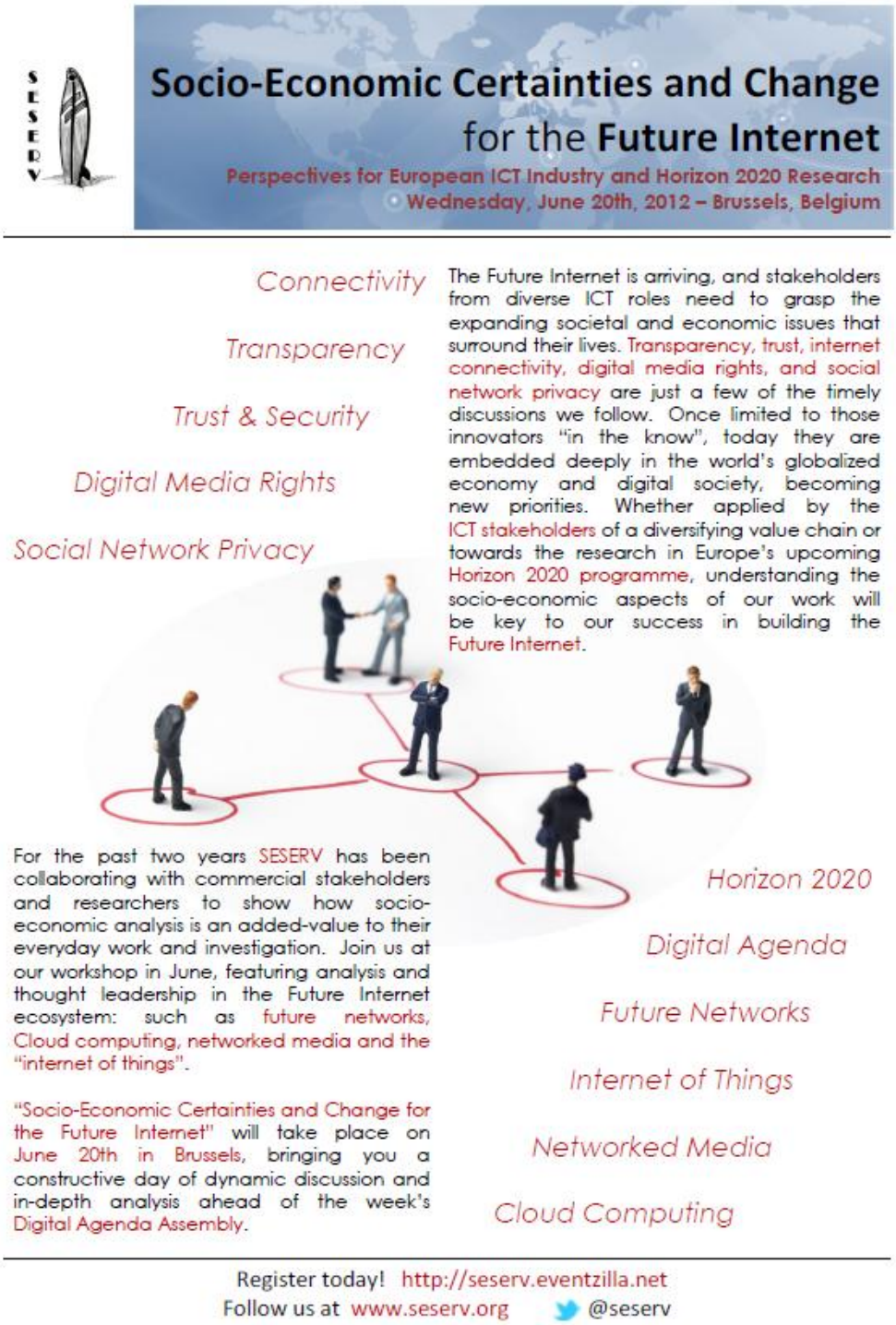


Figure 15: Flyer for SESERV's 3rd Workshop Focusing on Priority Topics and Thematic Diversity.

Figure 16: SESERV Website Featuring Full Online Experience for 3rd Workshop.

Register today! http://seserv.eventzilla.net

Why is it important to become involved?

1) Gain insight and competitiveness through the social and economic topics that affect us all:

Provider transparency, user centricity, connectivity, trust & security, data privacy, digital rights and network bandwidth conflicts.

These are just a sample of the topics that are at the forefront of the users of internet-related services and the providers that deliver them. This interactive workshop will provide a clearer outline of which actors are involved, where the conflicts and opportunities lay in these topics, and insight into the priorities in industry and public policy to facilitate them. The day will give you greater insight on how to leverage these socio-economic issues and maintain competitiveness as they take precedence.

2) Perspectives from the stakeholders that must overcome these challenges, and the leading analysts that watch this market with a close eye:

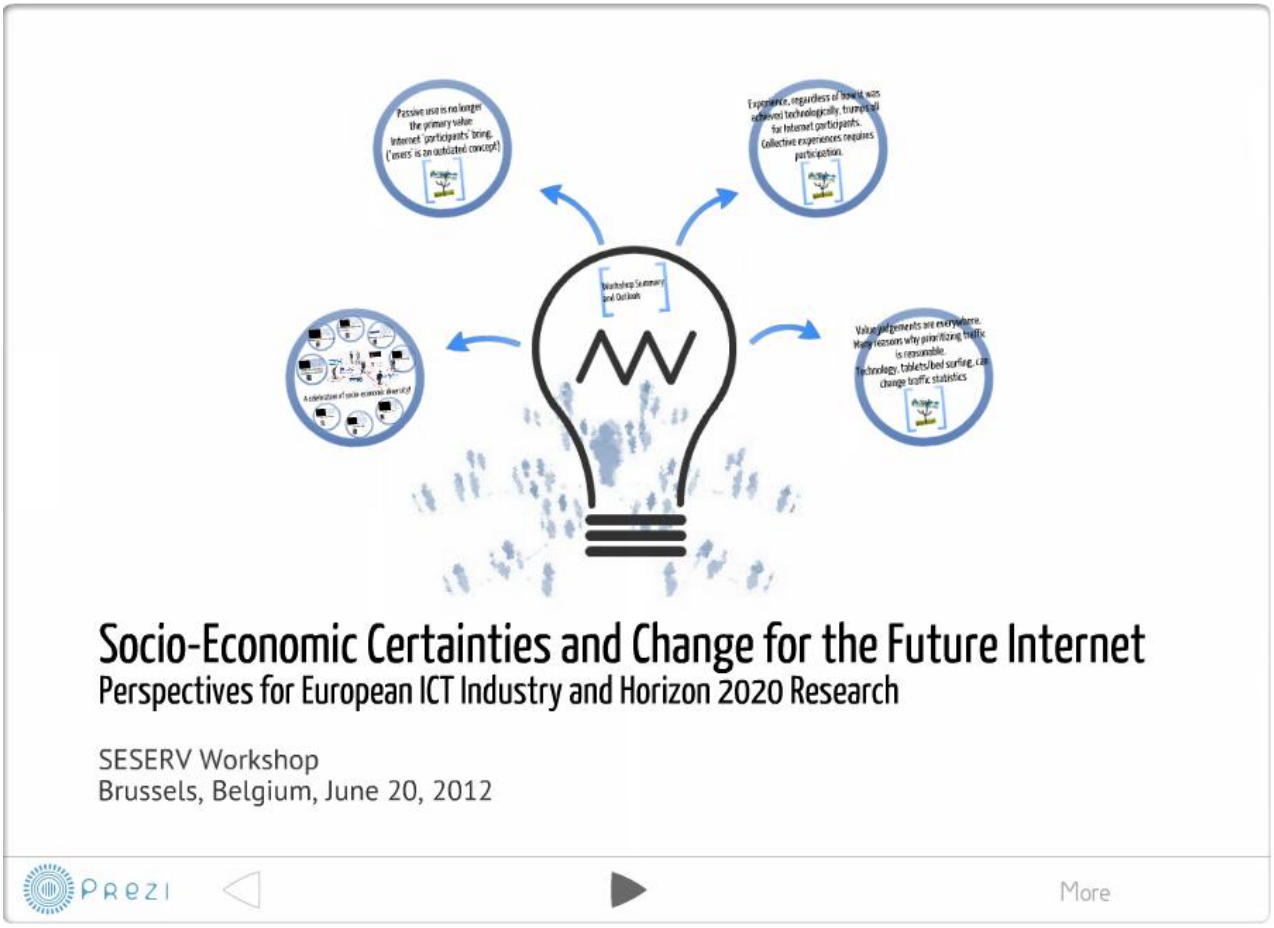
Network operators, Cloud and service providers, content developers, telecoms, analysts, legal experts, European regulators and more.

Market analyst **IDC** kicks it off with its outlook into Europe's Future Internet arena, starting an agenda that confronts these social and economic issues through the perspectives of Europe's intertwined ICT stakeholders, regulators and users. For instance, hear from **Deutsche Telekom** on Europe's bandwidth-related issues between network and content providers, **IBM** on trust & security in a crowded market of risk-prone outsourced IT, and Spanish Cloud leader **Arsys** on responsible management of large IT infrastructure services with an ever growing user base.

3) New opportunities in these social and economic topics for Europe's future research:

Horizon 2020 will bring Europe's next generation of funded research and innovation. Starting in less than a few short years, it will take into account these social and economic issues to ensure a competitive European ICT industry. An interactive roundtable will discuss what priorities can be tackled in this arena, and share potential areas of investigation that can be fostered in this timely period of transition between the FP7, the Digital Agenda and Horizon 2020. It is a networking opportunity not to be missed.

Figure 17: Marketing Distribution for 3rd workshop "Focusing on Incentives to Become Involved".



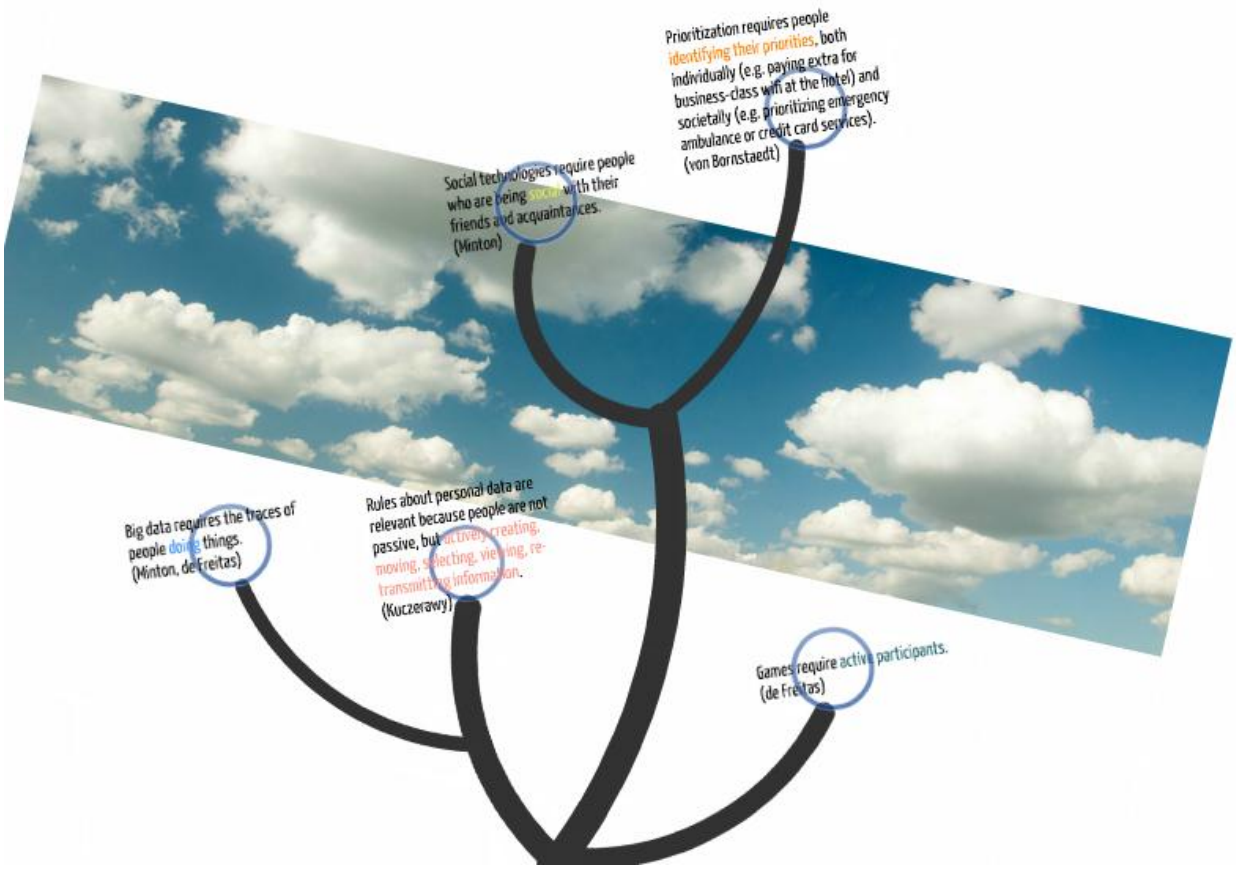


Figure 18: Intuitive “Prezi” Tool Emphasizing on SESERV’s 3rd Workshop Outcome Takeaways.

4.5 Workshop Results and Dissemination

4.5.1 Results

The workshop was considered a success. The audience was attentive and animated during the day, and participated actively in the Q&A sessions. Feedback was positive and the content delivered of high standard. The content is further discussed in D2.2 and D3.2 in the backdrop of SESERV's socio-economic studies.

Logistically the strategic placing with the Digital Agenda Assembly (DAA) did not have the full intended effect, although it did bring in a few key international experts. The late announcement of the DAA program revealed changes from its 2011 iteration, where the venue and on-site participation was smaller in size and invite-only. Although the DAA and SESERV's workshop shared much in common in FI themes, on an organizational level it was not possible for a formal collaboration. However, this strategic decision still brought added-value, particularly in our non-European attendance, with industry reps attending from India, Israel and the United States.

Positively, the project's momentum and following by FISE researchers gained from the previously two successful workshop and follow-up focus groups gave SESERV a brand advantage for our target audience. This was coupled with a speaker selection that focused on new hands-on perspectives and profiles that would engage our researcher community, as well as grow the post-workshop impact by acting as a catalyst to ensure that these stakeholders and their dialog continue the momentum and link their own networks in the fostered discussion.

There were 49 registrants to the event (see Table 3, Figure 19), with all material published the following week for our online followers and attendees' contacts. This was in line with organization expectations, where SESERV concentrated on an on-site representational attendance that would ensure a branching effect and impact in terms of the perspectives and networking relationships shared.

Table 3: Brussels Workshop Participation

Delegate type	#	%
Policy	8	16%
Technologist (research)	17	35%
Technologist (industry)	5	10%
Sociologist / economist	17	35%
Unknown background	2	4%
Total	49	100%

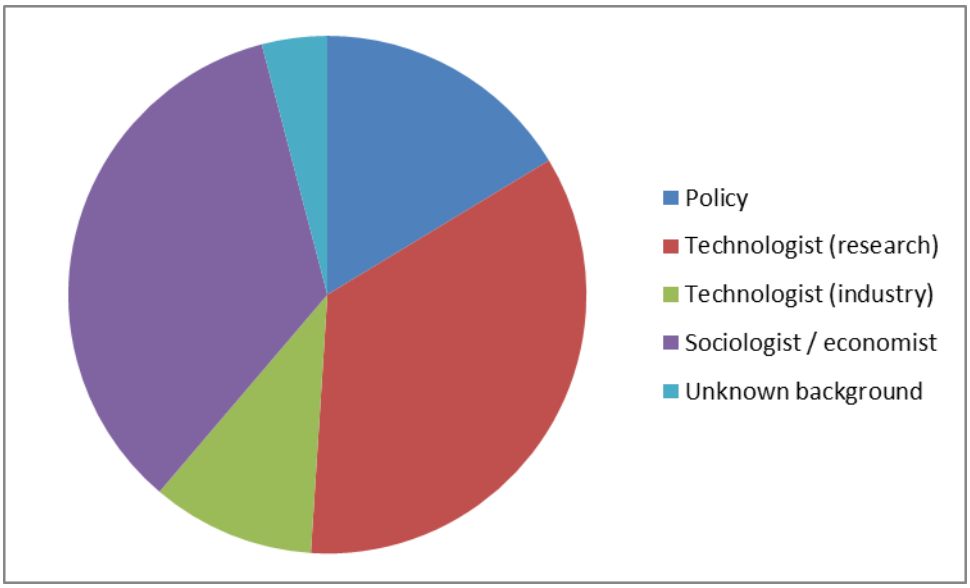


Figure 19: Composition of Registrants to the Brussels Workshop.

Content-wise, the workshop gave its attendance and the SESERV project a diversified dialog on FI-related priority topics: network neutrality, data privacy, data protection, and trust & security to name a few.

While the agenda section above gives a high-level look at what was covered, the analysis of how this fits within SESERV's economic and societal analysis is woven into the deliverables of WP2 and WP3, respectively. Nonetheless, a short summary of the main conclusions is provided here:

1. The concept of "users" is outdated: passive use is no longer the primary value of the Internet. Instead we should be phrasing Internet value in what "participants" bring.

- Big data requires the traces of people doing things (Minton, de Freitas)
- Rules about personal data are relevant because people are not passive, but actively creating, selecting, viewing, moving, and re-transmitting information (Kuczerawy)
- Trust is based on perceptions of active participants (Hartman)
- Social technologies require people who are being social with their friends and acquaintances (Minton)
- Prioritization requires people identifying their priorities, both individually (e.g. paying extra for business-class WiFi at the hotel) and societally (e.g. prioritizing emergency ambulance or credit card financial services) (von Bornstaedt).
- Concrete circumstances can alter our perception of what is "fair" and "just" in terms of prioritising Internet traffic. (von Bornstaedt). The example given was when deep sea anchors tore underwater cables severely crippling Internet traffic. Under these circumstances it seems just to prioritise e.g. credit card transactions which are required by stranded travellers over movie downloads, partly because of unequal inconvenience caused and partly because of unequal numbers of those affected (for 1 video download, many thousand transactions could occur). These sorts of circumstances offer a new perspective to net neutrality.
- Games require active participants (de Freitas)

2. *Experience, regardless of how it was achieved technologically, trumps all for Internet participants*

- Clouds are becoming invisible, because people on the Internet want their information available, but don't particularly care about the means for doing do, as long as it is understandable and convenient (Minton, Salcedo)
- The migration to smartphones occurred once the experience was such that the affordability and applications made the devices attractive to mainstream adopters (Minton)
- As technology improves and becomes ubiquitous, more people are becoming early (or instant) adopters of new tech (Salcedo)
- Services such as Netflix have ballooned to 30% of traffic in some countries because of tapping into the desire for on-demand, quality entertainment (von Bornstaedt)
- Internet participants want to choose which content and services they access and run (i.e. net neutrality) (Terävä)

3. Time to prioritize network traffic?

- Interesting contentions and differentiations, e.g. movie vs. credit card transactions (von Bornstaedt) (see above)
- Turning information into value through big data analytics (Minton)
- Content providers will move to another provider for 2 milliseconds (von Bornstaedt)
- Applications don't have the same value and demand; one must manage elastic and inelastic tasks (von Bordstaedt)
- Video is driving up internet traffic, and a high rise in traffic is in the future, beyond HD (von Bornstaedt)

4.5.2 Participants Feedback

Feedback from participants was positive, both to the topics and quality of the speakers, and compliments were received on the venue location and workshop organization. Formal questionnaires were not circulated because this was the final SESERV event and because as intended (see above) the audience was composed of many participants outside of the European research field. Instead of a feedback questionnaire, post-workshop contact is focused on keeping those new perspectives involved in the discussion after SESERV's end. Examples of this engagement has been done through the LinkedIn group, subscriptions to the FISE mailing list and leveraging the SESERV website to include external content

4.5.3 Dissemination of Workshop Results

The workshop results have been disseminated through the website, including copies of all presentations and proceedings. A Prezi presentation of the day's events was created and circulated, and transcripts and slides for each presenter made available through the website. The publication of this information was accompanied by a news announcement to subscribers, twitter and the mailing lists, as would be expected.

Much of the content of the day has been built upon by WP2 and WP3, and their additional analysis and cross reference with the literature in the relevant fields is made available through dissemination of their relevant documents, with timely release at the end of August, for availability when stakeholders will return in September to focus on these FI topics.

5 Summary of the FISE Workshop in FI Week in Poznan

5.1 Motivation and Objectives of the FISE Workshop

The Internet has become the backdrop for daily life. The benefits and disruptions caused by the Internet are rarely out of the headlines as society contends with the impact of technological advances and its innovative users. Connections between people, content, sensors and devices are delivering greater efficiency in economic processes, creating opportunities for new business models and value chains and supporting new forms of participation and value exchange within real and online communities. But with connections now faster and more meaningful than ever, the risks and rewards for all players have become increasingly significant. The playground of the 90's Internet has become a battleground for survival, dominance and ideology. Understanding the complexity and dynamics of the Internet ecosystem has never been more important. For researchers and engineers wanting successful and durable technologies in a Future Internet, awareness how technology disrupts a FI ecosystem is essential.

The purpose of this workshop was to share analysis, discuss and debate how disruptive technologies will influence the FI business ecosystem. The motivation was that many FI projects are assessing the FI Business Ecosystem and the dynamics of stakeholders in relation to technological results (e.g. SESERV, SEQUOIA, UNIVERSELF, ETICS, FI-PPP, FI3P, etc.). The workshop was an opportunity to explore techniques for analysing FI ecosystems, how impact is achieved and what are the emerging considering for design and experimentation. The objective of the workshop was a shared understanding of FI business ecosystem, the stakeholders and a comparison of methodology used to understand both baseline and future scenarios.

The outcomes have been incorporated into a joint paper for distribution to the Future Internet community.

5.2 Planning of the FISE Workshop

The FISE workshop titled "How Disruptive Technologies Influence the FI Business Ecosystem" was organized as a full day event on October 27th, 2011 in Poznan, Poland, co-located with the Future Internet Week. A detailed agenda is provided in Section 5.3.

The FISE workshop was ***co-organized*** by the SESERV (http://www.seserv.org), SEQUOIA (www.sequoiaproject.eu) and UNIVERSELF (www.univerself-project.eu) projects. The organizing committee comprised of:

- Michael Boniface (mjb@it-innovation.soton.ac.uk),
- Makis Stamatelatos (makiss@di.uoa.gr),
- Simon Delaere (simon.delaere@vub.ac.be),
- Vânia Gonçalves (vania.goncalves@vub.ac.be), and
- Antonella Passani (a.passani@t-6.it).

The workshop was divided into two main sessions each contributing an understanding of the FI business ecosystem. The morning session focused on trends shaping the FI ecosystem and in the afternoon session methodologies for assessing impact of technology within the ecosystem have been explored.

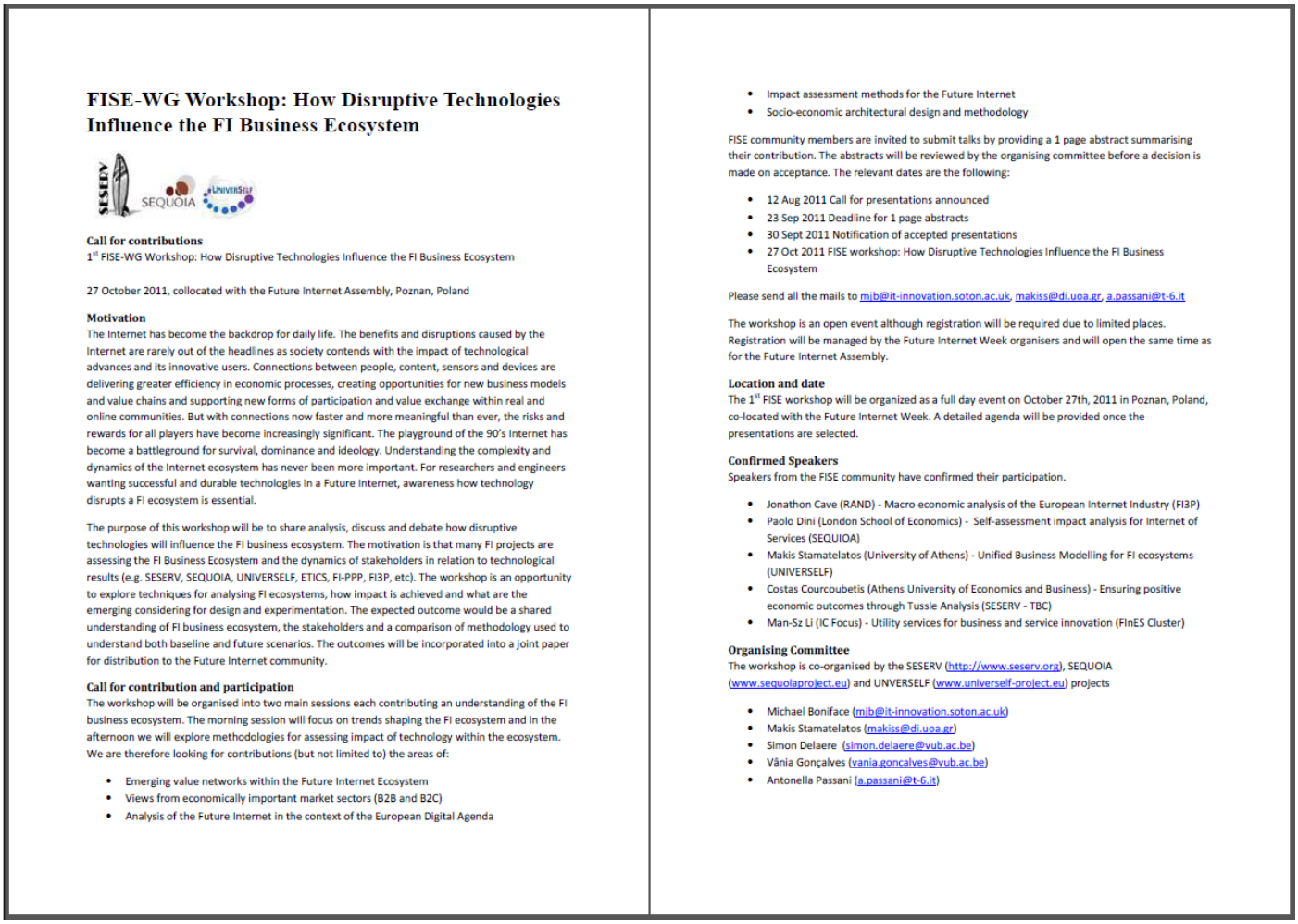
Therefore, on August 12th, 2012 the call for presentations (see Figure 20) was announced which invited FISE community members to submit talks by providing a 1-page abstract summarizing their contribution on the following (but not limited to) areas:

- Emerging value networks within the Future Internet Ecosystem
- Views from economically important market sectors (B2B and B2C)

- Analysis of the Future Internet in the context of the European Digital Agenda
- Impact assessment methods for the Future Internet
- Socio-economic architectural design and methodology

The deadline for the abstract submission was September 23rd, 2011. Then, the abstracts have been reviewed by the organising committee before a decision was made on acceptance. The notification on acceptance has been sent on September 30th, 2011.

The workshop was an open event although registration was required due to limited places. Registration has been managed by the Future Internet Week organisers and was open the same time as for the Future Internet Assembly.



FISE-WG Workshop: How Disruptive Technologies Influence the FI Business Ecosystem

Call for contributions
1st FISE-WG Workshop: How Disruptive Technologies Influence the FI Business Ecosystem

27 October 2011, collocated with the Future Internet Assembly, Poznan, Poland

Motivation
The Internet has become the backdrop for daily life. The benefits and disruptions caused by the Internet are rarely out of the headlines as society contends with the impact of technological advances and its innovative users. Connections between people, content, sensors and devices are delivering greater efficiency in economic processes, creating opportunities for new business models and value chains and supporting new forms of participation and value exchange within real and online communities. But with connections now faster and more meaningful than ever, the risks and rewards for all players have become increasingly significant. The playground of the 90's Internet has become a battleground for survival, dominance and ideology. Understanding the complexity and dynamics of the Internet ecosystem has never been more important. For researchers and engineers wanting successful and durable technologies in a Future Internet, awareness how technology disrupts a FI ecosystem is essential.

The purpose of this workshop will be to share analysis, discuss and debate how disruptive technologies will influence the FI business ecosystem. The motivation is that many FI projects are assessing the FI Business Ecosystem and the dynamics of stakeholders in relation to technological results (e.g. SESERV, SEQUOIA, UNIVERSELF, ETICS, FI-PPP, FI3P, etc). The workshop is an opportunity to explore techniques for analysing FI ecosystems, how impact is achieved and what are the emerging considering for design and experimentation. The expected outcome would be a shared understanding of FI business ecosystem, the stakeholders and a comparison of methodology used to understand both baseline and future scenarios. The outcomes will be incorporated into a joint paper for distribution to the Future Internet community.

Call for contribution and participation
The workshop will be organised into two main sessions each contributing an understanding of the FI business ecosystem. The morning session will focus on trends shaping the FI ecosystem and in the afternoon we will explore methodologies for assessing impact of technology within the ecosystem. We are therefore looking for contributions (but not limited to) the areas of:

- Emerging value networks within the Future Internet Ecosystem
- Views from economically important market sectors (B2B and B2C)
- Analysis of the Future Internet in the context of the European Digital Agenda
- Impact assessment methods for the Future Internet
- Socio-economic architectural design and methodology

FISE community members are invited to submit talks by providing a 1 page abstract summarising their contribution. The abstracts will be reviewed by the organising committee before a decision is made on acceptance. The relevant dates are the following:

- 12 Aug 2011 Call for presentations announced
- 23 Sep 2011 Deadline for 1 page abstracts
- 30 Sept 2011 Notification of accepted presentations
- 27 Oct 2011 FISE workshop: How Disruptive Technologies Influence the FI Business Ecosystem

Please send all the mails to mjb@it-innovation.soton.ac.uk, makiss@di.uoa.gr, a.passani@t-6.it

The workshop is an open event although registration will be required due to limited places. Registration will be managed by the Future Internet Week organisers and will open the same time as for the Future Internet Assembly.

Location and date
The 1st FISE workshop will be organized as a full day event on October 27th, 2011 in Poznan, Poland, co-located with the Future Internet Week. A detailed agenda will be provided once the presentations are selected.

Confirmed Speakers
Speakers from the FISE community have confirmed their participation.

- Jonathon Cave (RAND) - Macro economic analysis of the European Internet Industry (FI3P)
- Paolo Dini (London School of Economics) - Self-assessment impact analysis for Internet of Services (SEQUIOA)
- Makis Stamatelatos (University of Athens) - Unified Business Modelling for FI ecosystems (UNIVERSELF)
- Costas Courcoubetis (Athens University of Economics and Business) - Ensuring positive economic outcomes through Tussle Analysis (SESERV - TBC)
- Man-Sz Li (IC Focus) - Utility services for business and service innovation (FInES Cluster)

Organising Committee
The workshop is co-organised by the SESERV (http://www.seserv.org), SEQUOIA (www.sequoiaproject.eu) and UNVERSELF (www.univerself-project.eu) projects

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Figure 20: FISE Working Group's Workshop Call for Contribution and Participation.

5.3 Agenda

As already described in Section 5.2, the FISE workshop was organized into two main sessions, a morning one and an afternoon one, which comprised of two sub-sessions each. Every session included both presentations and debate.

The 1st morning session titled “Contribution Session” was a scene setter. The workshop focused on the Internet as an “industry” is in its infancy and the contribution to economic growth, productivity, jobs and standards of living is only just being understood. This session aimed at exploring the structure and size of the European Internet industry and the emerging characteristics of the Future Internet ecosystem. The 2nd morning session was titled “Transformation Session”. This session focused on transformational effect of the Internet on businesses and individuals. We

examine trends within the traditional Internet industry, how infrastructure innovation is driving productivity/value creation in traditional industries and new value systems.

After the lunch break, the “Methodology Session” followed. This session focused on the methodologies used by Challenge 1 projects to understand the dynamics of the FI ecosystem, how impacts can be achieved and how such approaches can assist researchers and engineers building the Future Internet. Finally, the “Outcome Session” drew together the conclusions from contribution, transformation and methodology to identify the key questions ahead and the next steps for the FISE-WG. In Table 4, the full FISE workshop agenda is provided, while abstracts and hyperlinks to related presentations are provided in Appendix C.

Table 4: FISE Poznan Workshop Agenda

9.30 – 9.45	**Welcome**
	Welcome to the FISE-WG and the objectives of this workshop.
9.45 – 11.00	**The “Contribution” Session**
	• The Impacts of the PPP on the Economic Contributions of the Future Internet (Jonathan Cave - Rand) • The Future Internet Ecosystem (Michael Boniface - IT Innovation Centre)
11.00 – 11.30	**Coffee and Cookies**
11.30 – 13.00	**The “Transformation” Session**
	• Emerging value networks within the Future Internet Ecosystem - Hanne-Stine Hallingby (Telenor Digital Services) • Targeting business value innovation in open paradigms in FI Ecosystems - Man-Sz Li (IC Focus), Co-Chair DG INFSO FInES Cluster, Lead FIA Enterprise activity • Viral Innovation Process Challenging Public Support for Innovation - Jari-Pekka Kaleva (European Games Developer Federation) • Out-of-Equilibrium Techno-Socio-Economic Systems – Paolo Dini (London School of Economics)
13.00 – 14.00	**Lunch**
14.00 – 16.00	**The “Methodology” Session**
	• Unified Business Modeling for FI ecosystems (Simon Delaere, Vânia Gonçalves - IBBT, Makis Stamatelatos University of Athens) • The SEQUOIA Methodology: How to assess the socio-economic impacts of SaaS and IoS projects (Antonella Passani - T6) • Assessing economic outcomes using tussle analysis (Costas Kalogiros - Athens University of Economics and Business) • The Contributions of Complexity Theory and “Internet Science” to Future Internet Modelling and Policy Evaluation (Cave - Warwick) • The Future Internet PPP approach to socio-economic priorities (Dr. Petra Turkama, Aalto University)
16.00 – 16.30	**Coffee and Cookies**
16.30 – 17.30	**The “Outlook” Session**

5.4 Workshop Marketing and Participation

The FISE Poznan Workshop has been advertised by means of various online tools including LinkedIn, a Wiki page, the SESERV's community website and the website of the Future Internet Assembly with which the FISE workshop was co-located. A sample of such marketing content can be found below:

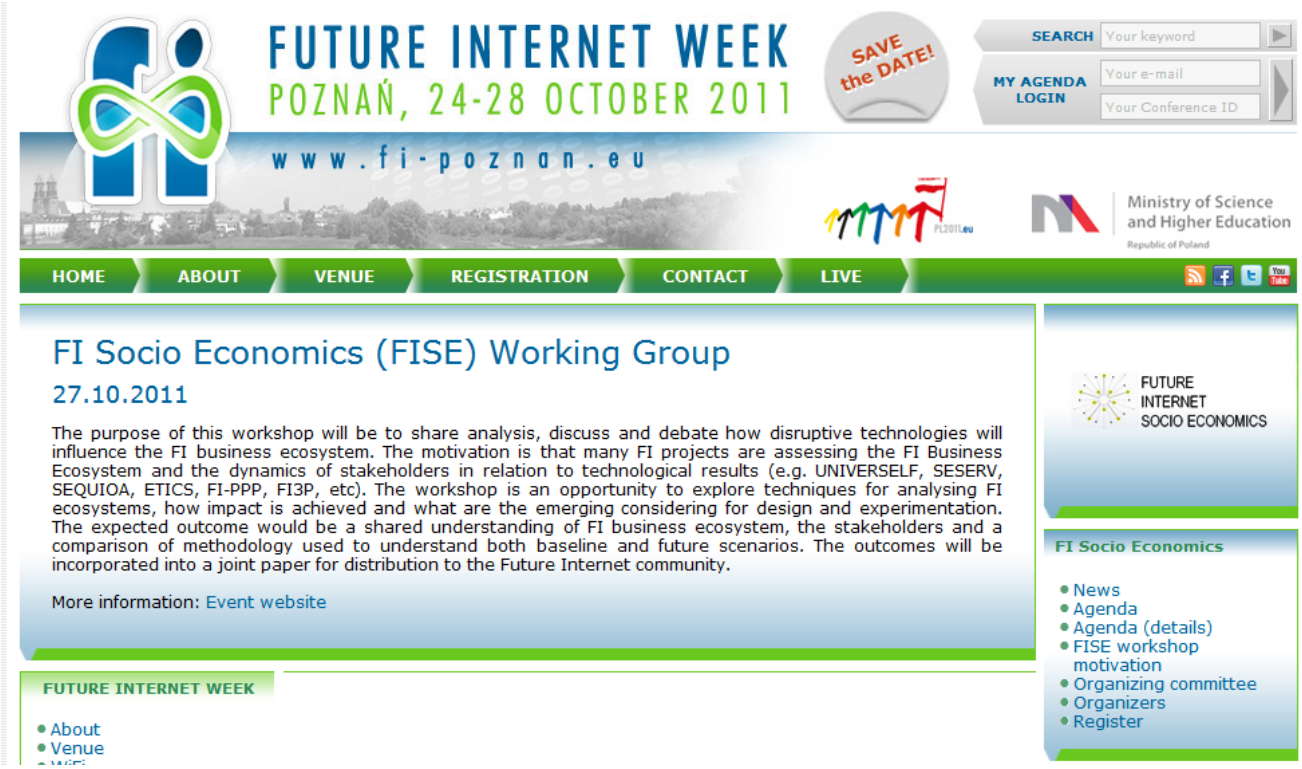


Figure 21: Future Internet Week's Website Featuring FISE Working Group

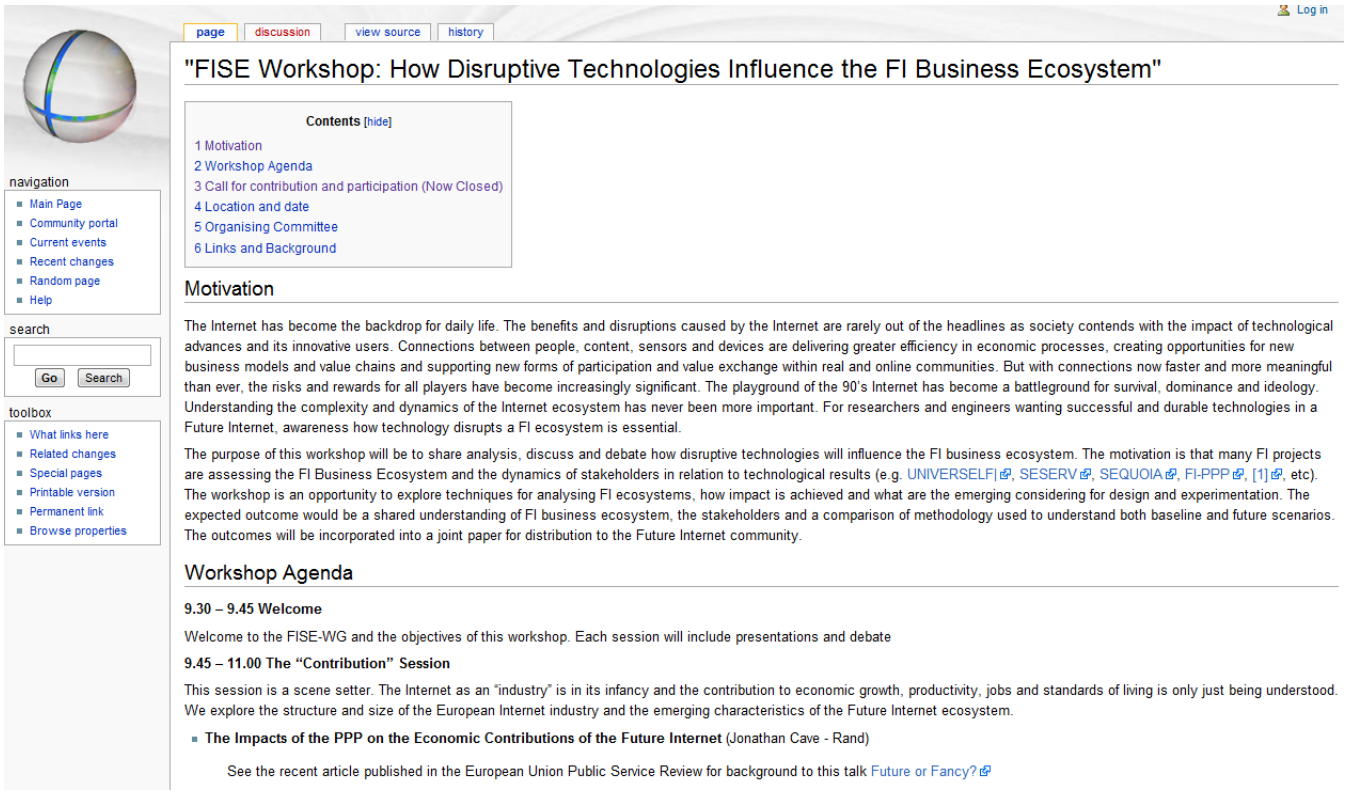
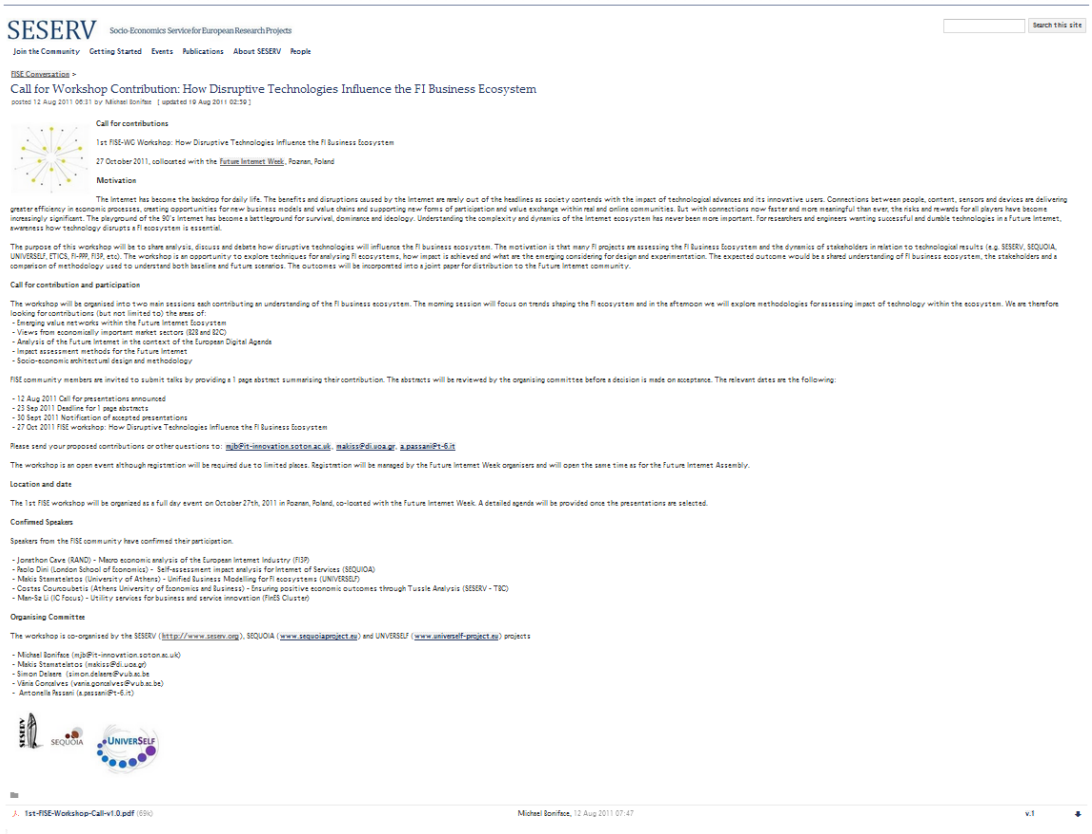


Figure 22: FISE Workshop Wiki Page



SESERV Socio-Economics Service for European Research Projects

Join the Community Getting Started Events Publications About SESERV People

FISE Conversation >

Call for Workshop Contribution: How Disruptive Technologies Influence the FI Business Ecosystem

posted 12 Aug 2011 06:31 by Nikneet Bonifac [updated 19 Aug 2011 02:39]

Call for contributions

1st FISE-WG Workshop: How Disruptive Technologies Influence the FI Business Ecosystem

27 October 2011, collocated with the Future Internet Week, Poznan, Poland

Motivation

The Internet has become the backdrop for daily life. The benefits and disruptions caused by the Internet are rarely out of the headlines as society contends with the impact of technological advances and its innovative users. Connections between people, content, sensors and devices are delivering greater efficiency in economic processes, creating opportunities for new business models and value chains and supporting new forms of participation and value exchange within real and online communities. But with connections now faster and more meaningful than ever, the risks and rewards for all players have become increasingly significant. The playground of the 90's Internet has become a battleground for survival, dominance and ideology. Understanding the complexity and dynamics of the Internet ecosystem has never been more important. For researchers and engineers wanting successful and durable technologies in a future Internet, awareness how technology disrupts a FI ecosystem is essential.

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FISE community members are invited to submit talks by providing a 1 page abstract summarising their contribution. The abstracts will be reviewed by the organising committee before a decision is made on acceptance. The relevant dates are the following:

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- 27 Oct 2011 FISE workshop: How Disruptive Technologies Influence the FI Business Ecosystem

Please send your proposed contributions or other questions to: mjbPit-innovation.soton.ac.uk, makiss@di.uoa.gr, a.passani@t-6.it

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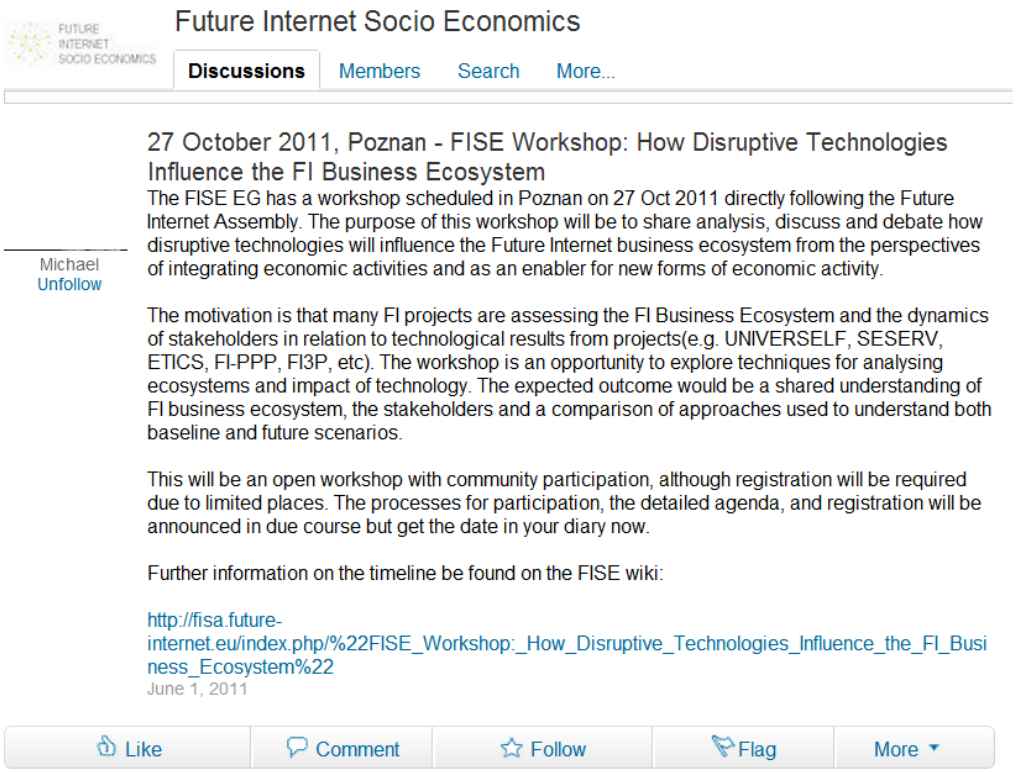
- Antonella Passani (a.passani@t-6.it)

1st-FISE-Workshop-Call-v1.0.pdf (69k) Michael Boniface, 12 Aug 2011 07:47 v.1

Figure 23: SESERV's Website Advertising FISE Workshop



FUTURE INTERNET SOCIO ECONOMICS

Future Internet Socio Economics

Discussions Members Search More...

27 October 2011, Poznan - FISE Workshop: How Disruptive Technologies Influence the FI Business Ecosystem

The FISE EG has a workshop scheduled in Poznan on 27 Oct 2011 directly following the Future Internet Assembly. The purpose of this workshop will be to share analysis, discuss and debate how disruptive technologies will influence the Future Internet business ecosystem from the perspectives of integrating economic activities and as an enabler for new forms of economic activity.

Michael
Unfollow

The motivation is that many FI projects are assessing the FI Business Ecosystem and the dynamics of stakeholders in relation to technological results from projects(e.g. UNIVERSELF, SESERV, ETICS, FI-PPP, FI3P, etc). The workshop is an opportunity to explore techniques for analysing ecosystems and impact of technology. The expected outcome would be a shared understanding of FI business ecosystem, the stakeholders and a comparison of approaches used to understand both baseline and future scenarios.

This will be an open workshop with community participation, although registration will be required due to limited places. The processes for participation, the detailed agenda, and registration will be announced in due course but get the date in your diary now.

Further information on the timeline be found on the FISE wiki:

http://fisa.future-internet.eu/index.php/%22FISE_Workshop:_How_Disruptive_Technologies_Influence_the_FI_Business_Ecosystem%22

June 1, 2011

Like Comment Follow Flag More

Figure 24: LinkedIn Discussion on FISE Workshop

The total number of participants of the FISE workshop including keynote speakers and organizing committee is 49.

5.5 Workshop Results and Dissemination

5.5.1 Results

The FISE workshop "Value Creation, Value Flows and Liability over Virtual Resources" collocated with FIA Poznan was motivated by the need to bring together those that are studying the dynamics of possible Future Internet ecosystems and the role of disruptive technologies in impacting stakeholders. Below a number of key messages to remember and lessons learned from the FISE Workshop.

5.5.1.1 The Impacts of the PPP on the Economic Contributions of the Future Internet - Jonathan Cave

FI-PPP was supposed to be a traditional impact assessment of the FI-PPP defining the status-ante and trying to understand if the impact and contributions happened or would have happened anyway. FI-PPP is a macro-economic study to measure the difference in measures such as GDP and Job growth. Jonathon highlighted that FI-PPP did not pose a simple question. For example, a telcos such as BT has a lot of business activities related to the Internet. A key challenge for FI3P was to define the scope of the European Internet Industry. What's important is that impact contributions and values need to look at real outcomes, i.e. the capacity and capability are what is important; if stuff gets monitised good but it's not the real thing.

FI-PPP have defined a core Internet industry that's related to the standard OSI structure. B2C is mature and B2B less so. When FI3P did the sums they found substantial contributions, although the contributions were not evenly spread. Additionally, they observed that there are significant differences between countries, e.g. replacement expenditures, start-up of new players. Telcos have a dominant position in Europe and have an interesting role as the enablers of value creation through their fairly localised and anchored copper and fibre assets. They do have a role to play but cannot have as much influence as much of the new activity is and will happen in the web ecosystem. What is observed is downward spending trends in semiconductors, telco equipment, software, but Internet spending hardly even paused. Part of the puzzle is whether Europe needs the FI-PPP due to the difficulty in adopting in Core Platform capabilities. Furthermore, although Europe has venture capital, this is not spent in Europe. Finally, Europe significantly lacks business model innovation.

However, the basic market structure is expected to change. At the moment, we are seeing attempts by incumbents to protect their position. Their response is to try and take control of the other related sectors. Many of the challenges are due to the need to deal with disruptive technologies; e.g.:

- the Cloud weakens dependence on key European players' hardware,
- Large players need to seize control of the platform but some of the services need to be kept free,
- A lot of European firms are developing apps and SME's are providing sources of innovation, although SME's are facing barriers such as debt overhang on failure,
- There's opportunity for alternative social models of production embedded in local communities and close to social connections,
- Innovative communities may not want to become corporate,
- Job security has disappeared, and job quality has reduced while people are working more.

The FI-PPP examined three scenarios: a Realistic scenario (powerful internet, mixed adoption, no specific winner), a Positive scenario (demand leads the recovery, we have nice competitive economy), and a Slow Motion one (recovery not strong, consumers stop spending, investment weak and fragmented, telcos weak).

Considering the impact of the PPP we are not talking about a trial amount of money. 270Billion Euros for the slow motion scenarios, that's real GDP of 37Billion by 2025 impact of PPP. What's clear is that the fate of the FI-PPP is dependent on the recovery. There does appear the need for follow on activities for a change in the business environment.

In conclusion, failure is important, old models and roles die hard and there's tendency towards the Darwinian hive. When you are faced in the disruptive technology it is not the technology but how it disrupts you. The policy makers are listening to the incumbents and ignore the market. An alternative may have been to invest in rivals to firms and use the money to create competition. This may realign the power structure. Longer term we must stop training people for the past jobs that have gone away, the key is the education that goes with the skills.

5.5.1.2 Emerging value networks within the Future Internet Ecosystem - Hanne-Stine Hallingby

ISPs have a dilemma. Levels of investment are increasing but revenues are reducing. Hanne wanted to establish a larger research network to understand the topics. Her study chose to investigate autonomous system numbers (ASNs) in Norway. An ASN is a collection of connected Internet Protocol (IP) routing prefixes under the control of one or more network operators that presents a common, clearly defined routing policy to the Internet. Studying the ASNs and routing of ISP's traffic can provide insight into the relationships and power distribution in the Internet

Enterprises (IT industries), many of which are SMEs, are providing services are over the Internet. Many are connected and take a large share of the transit market. For instance, Telenor do not have many transit customers but are an access oriented network operator to the consumer market. Companies such as BKK and Ventelo are large actors in the market and allies. Before looking at the data none of us knew of Phonera and how important actor they were; i.e. the company is growing very fast and poors traffic into Telenor's network. We also observed clusters attracted to specific internet resources such as specific domains, websites and ISSPs.

The key for telcos as Telenor is to attract domains, websites, Internet Society Service Providers (ISSPs) without ASNs and the access market (e.g. Phonera) and the large gaming actors. They are looking at the consolidation of actors into these four archetypes and asking the questions: What is the Internet? Has the Internet consolidated more than we originally thought? What's clear is that different actors have different value networks, cost models and revenue streams. What troubles Telenor is how the mechanisms of the internet differentiate. From a research point of view, they do not know if these mechanisms arrived by accident or by strategy. Recognising that this is a way of seeing the Internet, will this role continue? are these mechanisms transitory?

5.5.1.3 Targeting business value innovation in open paradigms in FI Ecosystems - Man-Sz Li

Reporting on the Business value innovation work done by the FInES cluster, 1000 person years of work are performed by 1000 researchers. What values are going to be created and distributed? Research is attracting the attention of primary incumbents but new actors are needed to be taken into account. FinES aims at supporting this field from the socio-economic space, and has proposed a value proposal for enterprise interoperability. The issue though is how to keep enterprises open whilst churning the value propositions. There's always a tendency to close at certain points in the business lifecycle. The process of opening and closing is a creative one. Examples of open platforms include Android and Linux, although no examples of open service platforms.

5.5.1.4 Viral Innovation Process Challenging Public Support for Innovation - Jari-Pekka Kaleva

The European games industry is a huge success, and includes 600 studios, 17000 employees, very smart start-ups and game providers. Viral innovation is a huge success in the games industry. Games have always been an innovation driver. 1990's increased sales by Intel, 2000 decade or consoles, and 2010 decade of online games. Content seems to be decade before the age.

In the games industry ecosystem, technology follows the business models, ground breaking innovations are transformed to technology, services, content and business models. Now innovation is viral and driven by what happens in small entities. The old innovation process (pre-production, implementation, marketing) very much like a film it's all changed now. The viral innovation process includes conception (closed beta), community building (open beta), implementation (commercialisation). Feedback from the users is key, and allows for exploring new business models and features, while the product is never finalised.

Additionally, small developers, e.g. from Finland, are competing with game developers from San Francisco, on a global stage. Thus, it is possible for small entities in markets. Furthermore, a global perspective needs to be taken into account, for instance a popular game in Indonesia can change the Swedish payment methods.

5.5.1.5 The Future Internet PPP approach to socio-economic priorities – Petra Turkama

There are barriers for implementing technology. Institutional theory and understanding of cultural barriers can help us overcome them. Value networks that change are not a threat, they are good for renewal. For instance, the role of the user is increasing and needs to be taken into account effectively. The role of service provider is getting stronger and stronger with revenues expected go there rather than the infrastructure actors. The role of the public purchaser, or the user can be that of the IT manager of a big city which can have a significant long term impact to the citizens. Therefore, there is the need to understand what is the impact of this buying decision on society, what is the role of broadcasters, how is that changing, who will pay the change.

Science, Technology and Society (STS) studies how social, political, and cultural values affect scientific research and technological innovation. For instance what will be a scientist in the future, how new emerging fields will be regulated (e.g., nano-technology). Following the question what Europe can do, the answer is that it is important to address the values of stakeholders.

5.5.1.6 Unified Business Modeling for FI ecosystems – Simon Delaere, Vânia Gonçalves, Makis Stamatelatos

Unified business model is a technique to explore business models for cognitive radio comms that's now being applied to the Future Internet. UNIVERSELF is researching how to consolidate autonomic management methods under the name UMF (unified management framework). This is a one year process and we're half way through. Business modelling is based on roles clear view on the value and the semantics assigned to the different roles trying to avoid overlapping between roles. There's discrete role (enhance revenue) and embedded role (reduce operating costs). The second level is to assign the roles to business players. Modelling part is based on roles, enables modularity of approach easier to incorporate and encapsulate ideas into different scenarios. UBM applies Mactor Analysis (MULTI-ACTOR Analysis Method) to provide a better view whether a role are in favour or opposing the different value propositions in the ecosystem. The goal is to optimise the roles to minimise conflicts in the network. The business scenarios where take from stores. For example, there's a Network and Service Governance Scenario which includes fixed network operator and various content providers. If there is a conflict between roles we need to consider if we need it to assign to a single business entity.

5.5.1.7 The SEQUOIA Methodology: How to assess the socio-economic impacts of SaaS and IoS projects – Antonella Passani

SEQUOIA presented the "How to Guide" for socio-economic self-assessment. SEQUOIA is supporting several projects from Call 1 and Call 5 in the Software as a Service (SaaS) space to understand the difference each of the projects will make. The 5 steps towards self-assessment were presented mapping each project to areas of impact.

The methodology is not only an EXANT methodology but also a good monitoring system. The big issue of EU projects is whether to wait 3 years after the project's end to perform the assessment of them or during their duration. It is interesting though to see the impacts in the long run.

5.5.1.8 Assessing economic outcomes using tussle analysis - Costas Kalogiros

Costas introduced the tussle analysis methodology as developed within the SESERV project, which tries to understand what the effect of technology is, not only on stakeholders, but also on other technologies. The approach is related to complexity theory.

The application of this methodology to a case study on the architecture of the ETICS project has been presented (which has also recently been published as a white paper). ETICS is developing technologies and economic mechanisms to give incentives to multiple providers to cooperate to provide inter-domain QoS, not always about technology issues, but also business ones. For example, in peering links network operators don't pay for the traffic. What happens then is that peering links are usually very congested. The mechanisms developed by the inter-connected providers need to promote collaboration that is mutually beneficial.

Tussle analysis helps stakeholders foresee how tussles evolve over time. The methodology comprises of the following steps: describe the functionality, identify all major stakeholders and their interests, identify candidate tussles, and whether stakeholders are happy with the outcome. What this gives is a view on the evolutionary struggle not only between functionalities but other behaviours as well (e.g., business models).

5.5.1.9 The Contributions of Complexity Theory and "Internet Science" to Future Internet Modelling and Policy Evaluation – Jonathan Cave

Networks are usually considered based on notation borrowed from graph theory (i.e. nodes and links). However, sometimes the tools miss things that may be important. The links between people are important; transactions are linked by the people that are participating. Therefore, Facebook is a great survey tool. So far, people think about groups in Facebook rather than the structure in side, but what matters is the latter. How human networks influence different parties and how opinions and beliefs are communicated.

We know apriori that little particles do not know about the system they are part of. We believe in a scale free property, little things look like the big things, equilibrium theory, structural similarity, micro model to macro model. This means that when we govern such a world we must be careful how we judge that things are right or wrong. We see people buy what we think as stupid things but that's their choice. Individuals arbitrate their own interests. In the economy, businesses must fail otherwise the economy will fail. We are hearing about prudential regulation (stopping banks failing) but saving them stops the flow of money.

5.5.1.10 Overall Outcome

A disruptive technology is an innovation that creates a new value network that eventually goes on to disrupt existing value networks. Typically these are innovations in marketing and it is the business model that goes on to make the impact rather than advancement in technology itself. Disruptive technologies are often difficult for incumbent companies to adopt because often the innovation conflicts with existing business models, addresses a small market segment with low profit opportunities and redirects investment from activities aimed at sustaining current activities. This is the general dilemma for Europe where a large number of incumbent firms (e.g. Telcos) are continuing to attempt to sustain their market position in the face of significant disruptive innovations from US and Asia.

In fact, few potentially disruptive technologies from Europe achieve their desired impact here in Europe. We only have to look at the story of Grid computing. In early 2000, Europe was a world leader in the area, with ideas and proof-of-concepts that even preceded Amazon, but there was a failure to transform the advantage into a commercial reality in ways that cloud computing has

achieved. In fact cloud computing succeeded where Grid computing failed by directly addressing socio-economic concerns. Machine abstraction (lower level than with Grid computing) was designed to simplify integration with applications and reduce the complexity of federation between providers and consumers. Cloud computing made computational outsourcing easy for consumers and also provided measures to ensure providers could maximise utilisation of resources. Cloud computing did not attempt to solve all challenges (unlike Grids) but clouds did ruthlessly focus on simplicity and cost effectiveness principles, and as such addressed the needs of the low-end market and scaled market share quickly. There's no doubt European firms do have great ideas (e.g. Skype, Playfish) but they are generally scaled and monetised elsewhere in an investment environment fitting for disruptive innovation.

5.5.2 Dissemination

The FISE workshop results have been disseminated through the SESERV website, and the FI-Poznan website, including copies of all presentations and proceedings. The outcomes of the FISE workshop have been used as input to SESERV deliverables D2.2 and D3.2, as well as for the organization of the agenda and topics of future events such as the Athens Workshop, the Brussels workshop, the FIA Aalborg sessions, etc.

6 Conclusions

The 2nd SESERV scientific workshop in Athens succeeded in attracting representatives from a broad set of stakeholders, including members from research projects, industry, regulatory bodies, policy officials, as well as academics. Out of the 53 registrations that were received eventually 50 individuals did show up and participated in sessions. Based on 18 responses to an online questionnaire, the workshop broadened the participants understanding of the Future Internet landscape and engaged with them for future SESERV initiatives. The following initial set of key messages was identified during the workshop:

- The "byte" is not the right charging metric – A flow should be charged on its contribution to congestion (B. Briscoe)
- "Sending Party Network Pays" is the only way to do E2E QoS - increases accountability and trust among providers – no problem with net neutrality (F. von Bornstaedt)
- *Competition among ISPs in the UK does not regulate the market: almost all ISPs employ traffic discrimination, so no consumer choice (A. Cooper)*
- Net neutrality should be evaluated – more analysis based on models and less ideology is needed (R. Mason)
- Users may need trust-enabling technologies and economic incentives for relaying other users' traffic (1st focus group)
- Information-Centric networking can affect the current Internet connectivity market, forcing transit ISPs to evolve and enter the content delivery market (2nd focus group)
- Smaller ISPs are likely to retreat from a QoS-aware market, or collaborate with other small ISPs to increase their footprint, if they don't have enough control during service provision (3rd focus group)

The data collected during the workshop about key economic challenges and stakeholders' concerns for candidate solutions from Future Internet projects have been analyzed by SESERV members and have been further documented in deliverables D2.2 and D3.2. Furthermore, the lessons from this workshop shaped the activities of SESERV going forward, regarding the planning of the third workshop and other FIA sessions.

The 3rd and final SESERV workshop in Brussels followed the approach of a plenary conference or seminar, with keynote speakers drawn from both new socioeconomic ground and familiar technological ones. The audience was informed of progress and development in the key themes which SESERV has addressed and given new areas in which SE issues are emerging.

A sample of re-occurring themes and speaker takeaways from the workshop's diverse program:

4. Users' is an outmoded concept, when passive use is no longer the primary value Internet 'participants' bring

- Big data requires the traces of people doing things (Minton, de Freitas)
- Rules about personal data are relevant because people are not passive, but actively creating, selecting, viewing, moving, and re-transmitting information (Kuczerawy)
- Trust is based on perceptions of active participants (Hartman)
- Social technologies require people who are being social with their friends and acquaintances (Minton)
- Prioritization requires people identifying their priorities, both individually (e.g. paying extra for business-class wifi at the hotel) and societally (e.g. prioritizing emergency ambulance or credit card financial services) (von Bornstaedt)

- Games require active participants (de Freitas)

5. *Experience, regardless of how it was achieved technologically, trumps all for Internet participants*

- Clouds are becoming invisible, because people on the Internet want their information available, but don't particularly care about the means for doing do, as long as it is understandable and convenient (Minton, Salcedo)
- The migration to smartphones occurred once the experience was such that the affordances and applications made the devices attractive to mainstream adopters (Minton)
- As technology improves and becomes ubiquitous, more people are becoming early (or instant) adopters of new tech (Salcedo)
- Services such as Netflix have ballooned to 30% of traffic in some countries because of tapping into the desire for on-demand, quality entertainment (von Bornstaedt)
- Internet participants want to choose which content and services they access and run (i.e. net neutrality) (Terävä)

6. *Time to prioritize network traffic?*

- Interesting contentions and differentiations, e.g. movie vs. credit card transactions (von Bornstaedt)
- Turning information into value through big data analytics. (Minton)
- Content providers will move to another provider for 2 milliseconds. (von Bornstaedt)
- Applications don't have the same value and demand; one must manage elastic and inelastic tasks (von Bordstaedt)
- Video is driving up internet traffic, and a high rise in traffic is in the future, beyond HD. (von Bornstaedt)

Finally, the FISE workshop in Poznan also organized on the basis of keynote presentations and moderated discussion/debate following afterwards. Major outcome of the FISE workshop is that although disruptive innovations in virtualised infrastructures have reduced Total Cost of Ownership (TCO), enabled faster time-to-market for new application and services, and improved business continuity/disaster recovery, such innovations are often difficult for incumbent companies to adopt because often there are innovation conflicts with existing business models, they address a small market segment with low profit opportunities, and redirect investment from activities aimed at sustaining current activities.

Lessons learnt include that on the one hand the companies, e.g. telcos, network providers, should look out of the box to try and get new business models and innovations, as well as that they should increase the collaboration between the business and the research community. On the other, the software industry should not be afraid to fail, since innovation and failure is part of the game but this must be matched with the responsibility to learn, and research should challenge the trends proposed by industry. Finally, a great challenge that FI ecosystems will have to face is how to translate social information into the enterprise.

The content of the presentations was circulated through slideshare and through published transcripts of the talks. Awareness of their availability was promoted through appropriate channels. The content and feedback from the attendees is consolidated in deliverables D2.2 and D3.2. Liaison with the communities is continued through the FISE working group, the website and the LinkedIn group.

7 References

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8 Abbreviations

ANP	Access Network Provider
ASN	Autonomous System Numbers
ASP	Access Service Provider
CDN	Content Distribution Network
CSA	Coordination and Support Action
CP	Content Provider
DAA	Digital Agenda Assembly
EC	European Commission
EU	European Union
FI	Future Internet
FI3P	FI-PPP
FIA	Future Internet Assembly
FISE	Future Internet Socio-Economics
FI-PPP	Future Internet Public Private Partenership
IC	Interconnectivity Provider
IoT	Internet of Things
IP	Internet Protocol
IPTV	IP Television
ISP	Internet Service Provider
QoS	Quality of Service
SaaS	Software as a Service
SE	Socioeconomic(s)
SME	Small Medium Enterprise
STREP	Specific Targeted Research Project
TCO	Total Cost of Ownership
Telco	Telecom operator
VoIP	Voice over IP

9 Acknowledgements

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The authors would like to thank:

- All partners of the SESERV consortium for their valuable comments and interaction with them
- Invited speakers who agreed to share their knowledge with the workshop participants.
- Presenters and participants in focus groups.
- PhD students Alexandros Kostopoulos and Michalis Kanakakis (AUEB) for helping out with the organization of the Athens workshop event and in particular the video recording.

Appendix A Feedback Questionnaire

As reported in Section 3.6.2, after the workshop all participants were emailed with the request to give feedback through an online questionnaire so as to assist the SESERV consortium in improving future workshops. 18 of them kindly provided their responses.online questionnaire. The six questions that constitute the online questionaire are depicted below (a screenshot is provided for each one of them):

1. **Was the time allocated to keynotes, tussle analysis presentations, focus group sessions and panel discussion appropriate and satisfactory?**

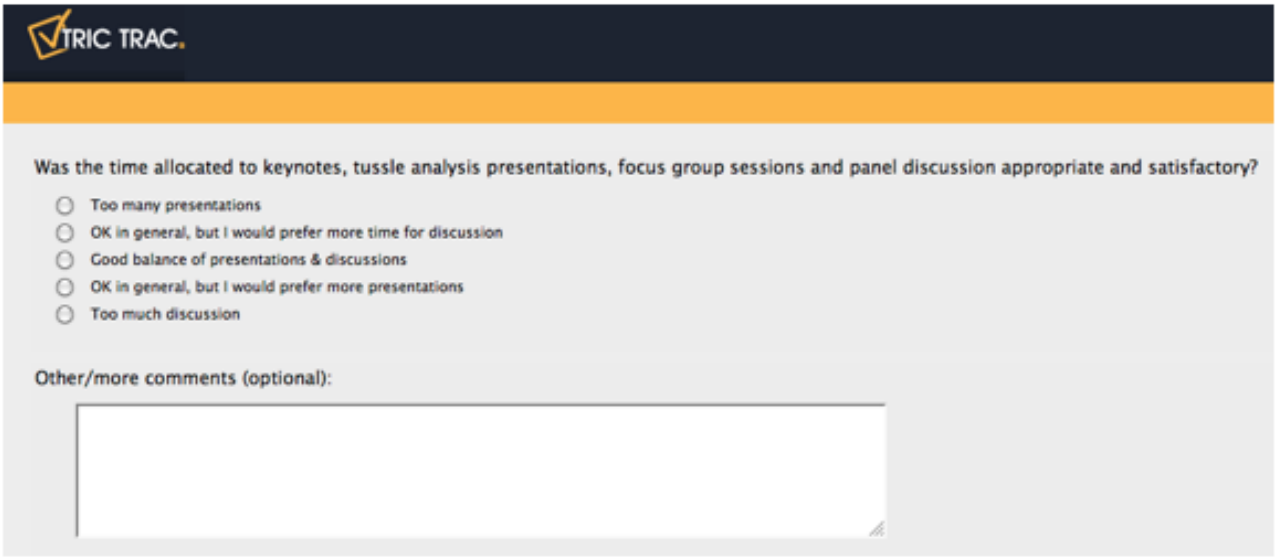

Figure 25: First Question of the Online Questionnaire

2. **Was the mix of presenters and participants broad enough and satisfactory? Whose perspectives were rather missing from the discussions/ presentations?**

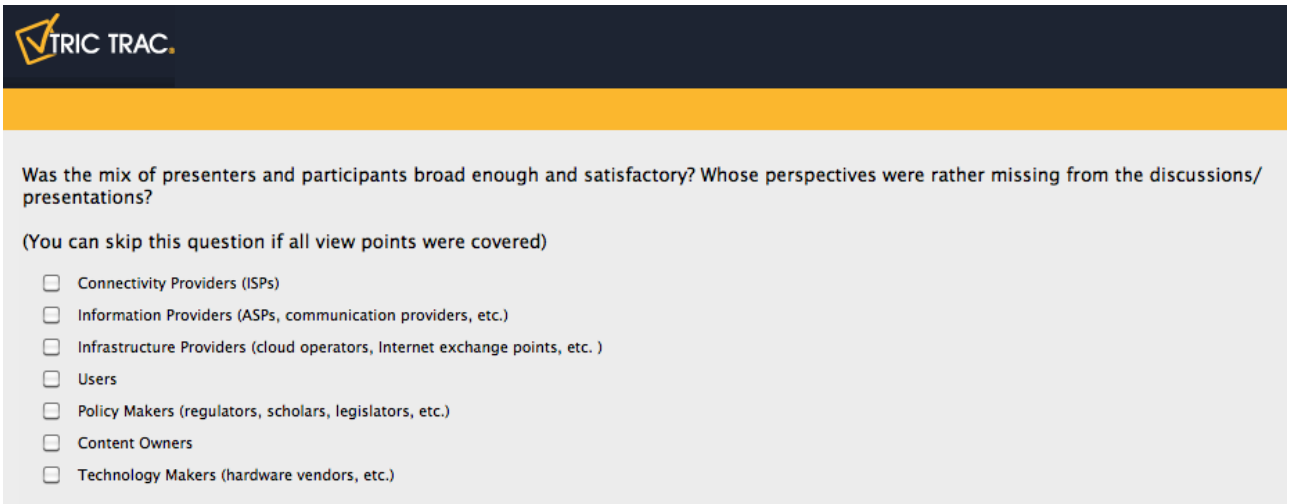

Figure 26: Second Question of the Online Questionnaire

3. Did you learn anything at the workshop that you were not aware of before?

Figure 27: Third Question (part A) of the Online Questionnaire

4. I learnt that:

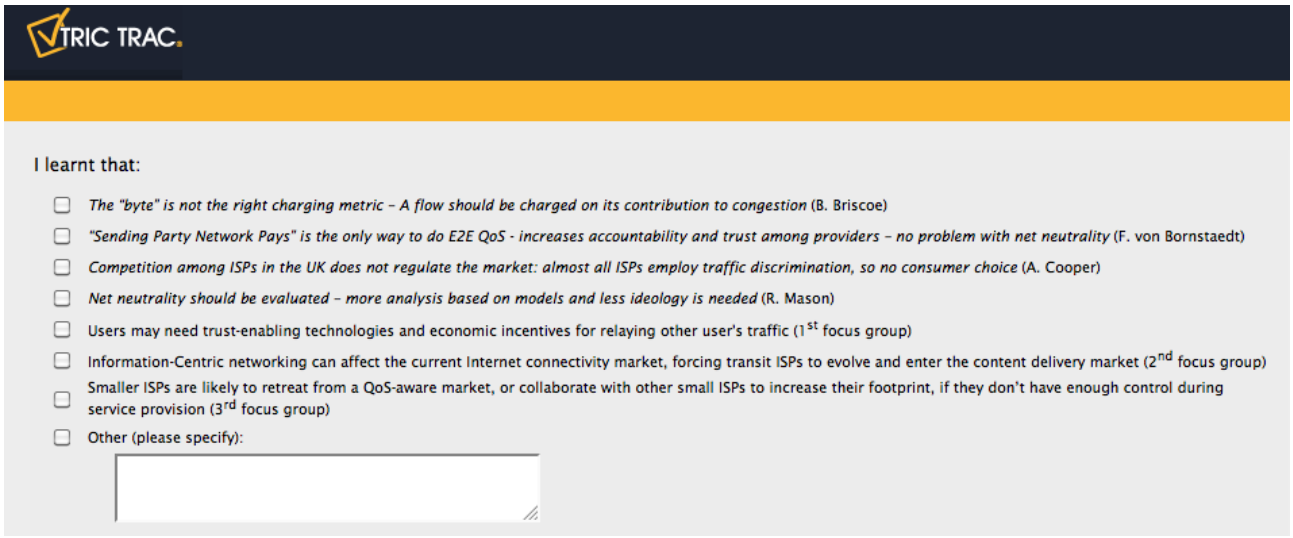

Figure 28: Third Question (part B) of the Online Questionnaire

5. What would you like to see covered in a future event?

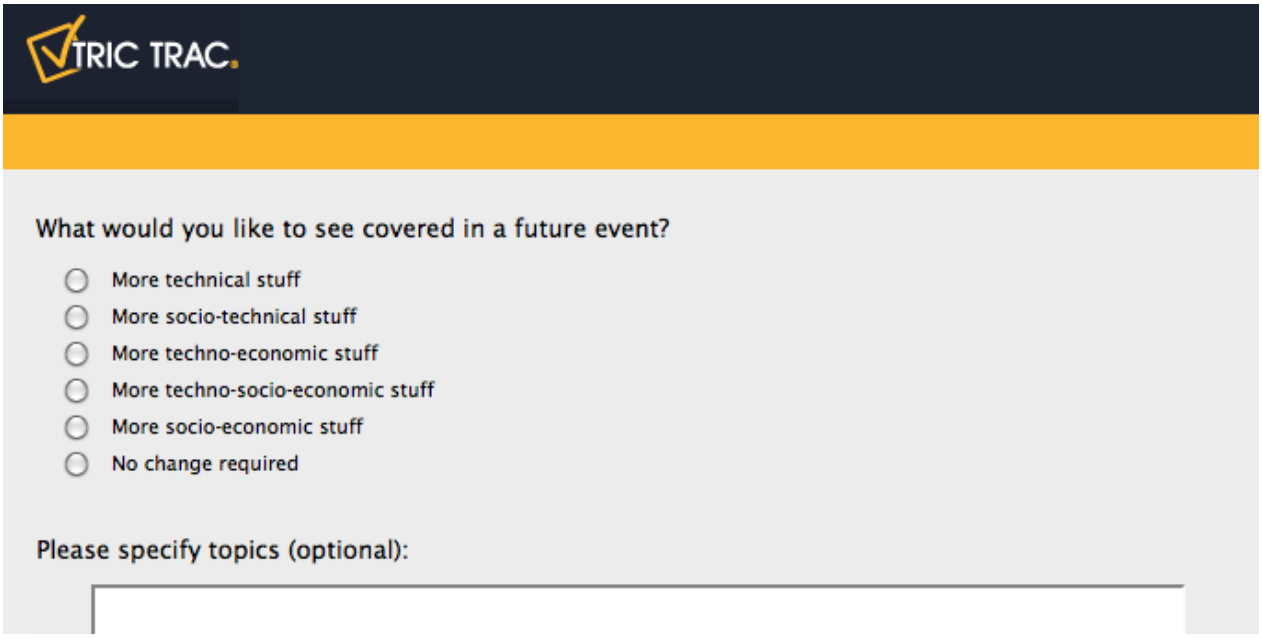

Figure 29: Fourth Question of the Online Questionnaire

6. **Did you feel the balance between presentation and discussion was right in the Focus Group you attended?**

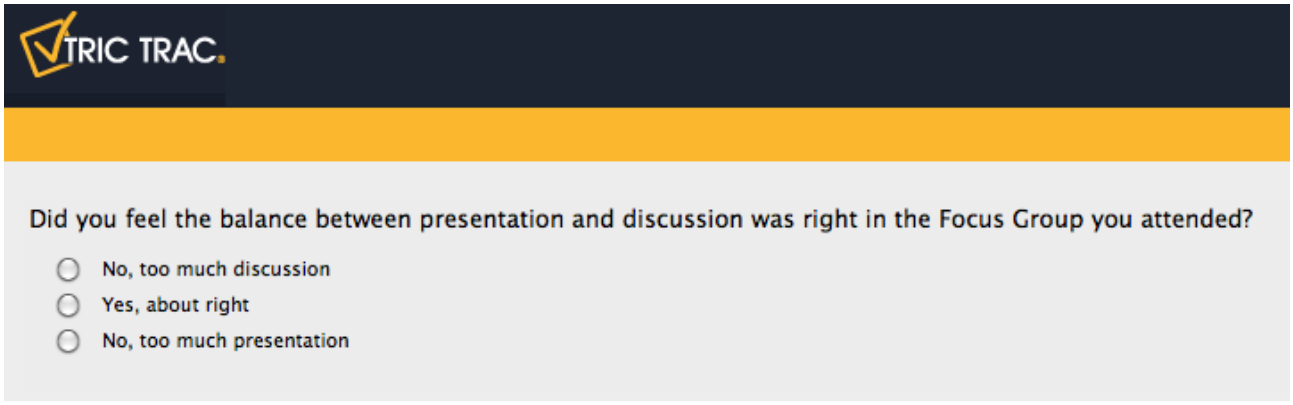

Figure 30: Fifth Question of the Online Questionnaire

7. **Would you like to be informed for subsequent focus groups organized by SESERV in the months to follow (note that procedure, topics may be updated, based on your feedback)?**

Figure 31: Sixth Question of the Online Questionnaire

Appendix B Invited Speakers' Profiles

Invited Speakers' profiles from both workshops

- Dr. F. von BORNSTAEDT holds diplomas in economics from the universities of Bonn and Paris, with a Ph.D. in economics from Cologne university. Following his studies, he was appointed project leader at the German National Research Center in Computer Science. He joined the Deutsche Telekom Group in 1991. He is currently Vice President, Product Management IP/Data, in the international carriers' division, International Carrier Sales & Solutions (ICSS). Having joined ICSS in 2001, Falk is now responsible for IP/ Data product management and the IP peering team. Prior to joining ICSS, Falk held various positions within the Deutsche Telekom Group, including responsibility for the Multimedia Division where he was responsible for the international IP product portfolio from 1996. This involved setting up the Global Intranet and IP MPLS VPN product lines. He also initiated the GRX project, an extranet for mobile operators. Before this, Falk was Assistant to the CEO of Deutsche Telekom for international affairs and worked in the controlling unit at Deutsche Telekom headquarters.
- Dr. B. BRISCOE is BT's Chief Researcher in Network Infrastructure and a member of BT's Network Strategy team. He joined BT in 1980 attaining a degree in engineering from the University of Cambridge in 1984, specialising in economics and industrial sociology. Through part-time study, in 2009 he attained a Computer Science PhD from UCL. The thesis concerned freedom with accountability on the Internet. His published research, standards contributions and patent filings are in the fields of Internet architecture, loosely coupled distributed systems, scalable network QoS, group security & charging solutions, managing fixed and wireless network loading using pricing, denial of service resistance, the economic structure of communications markets and lately slaying myths about network economics. More information: http://bobbriscoe.net/.
- Ms. A. COOPER is the Chief Computer Scientist at the Center for Democracy and Technology (CDT), a non-profit public policy organization headquarted in Washington, DC. She is the co-chair the Geographic Location/Privacy working group (Geopriv) and serve on the Internet Architecture Board (IAB) within the Internet Engineering Task Force (IETF). and also a member of the Technical Working Group of the Broadband Internet Technical Advisory Group (BITAG). More information: http://www.alissacooper.com
- Mr. N. LE SAUZE is senior researcher at Alcatel Lucent Bell Labs France and project coordinator of the FP7 researh project ETICS, https://www.ict-etics.eu
- Prof. R. MASON has joined the University of Exeter Business School as Professor of Economics in 2009, having previously been the Eric Roll Professor of Economics and Head of Economics at the University of Southampton. He gained his PhD from the University of Cambridge. He is a fellow of the CEPR and a Reporting Panel Member and a Specialist Member on the Communications Act Panel of the Competition Commission. His academic research concentrates on how firms respond strategically to uncertainty; and, more broadly, the incentives faced by economic agents in situations when they have imperfect information about their environment. While his research is theoretical in nature, it is motivated by the applied problems that he encounters while advising regulators and companies. In particular, much of his work is based on situations he has encountered when thinking about the communications and media industries. He has acted as advisor to a number of regulators, in both the UK and internationally, to the Prime Minister of Mauritius on competition policy, and a number of private-sector companies.
- Mr. Alessandro Bogliolo received the Laurea degree in Electrical Engineering and the Ph.D. degree in Electrical Engineering and Computer Science from the University of Bologna, Bologna, Italy, in 1992 and 1998, respectively. From 1992 to 1999 he was with the Department of Electronics and Computer Science (DEIS), University of Bologna. In 1995 and 1996 he was

with the Computer Systems Laboratory (CSL), Stanford University, Stanford, CA. From 1999 to 2002 he was Assistant Professor with the Department of Engineering (DI), University of Ferrara, Ferrara, Italy. In 2002 he joined the University of Urbino, Italy, as Associate Professor. From 2002 to 2010 he was Director of the Information Science and Technology Institute of the Univrsity of Urbino. Since 2010 he's the coordinator of the Information Science and Technology Division of the Department of Mathematics, Physics and Informatics. His research interests include: routing protocols, wireless sensor networks, Internet access networks, computer architectures, and bioinformatics

- Mr. Andrea GLORIOSO works as a policy officer in the European Commission, Directorate-General for Information Society and Media (as of 1 July 2012: Directorate-General for Communication Networks, Content and Technology). His main area of work concerns the global governance of the Internet, Internet policies and regulation and human rights/fundamental freedoms on the Internet. Mr Glorioso holds a MA in Political Science/Sociology, a PGD in ICT law and a LLM in Intellectual Property Law.
- Mr. Stephen MINTON is a Vice President and analyst at IDC covering global ICT markets. He manages IDC's industry-standard Worldwide Black Book research, which tracks ICT spending in 54 countries. In this role, he co-ordinates IDC's global IT spending research and analysis, helping IT organisations around the world with their planning, resource allocation and competitive analysis initiatives. Additionally, he is responsible for the IDC Information Society Index, which benchmarks countries according to IT and Internet socio-economic impact and penetration.
- Ms. Sara de FREITAS is Director of Research and Professor of Virtual Environments at Coventry University with responsibility for applied research, teaching and learning and business development. Sara was responsible for setting up the Serious Games Institute, a hybrid model of research, business and study, the first institute of its kind. The institute is now part of a successful multi-million pound turnover SGI Group including a spin out company Serious Games International with a purely commercial brief, the SGI Research Division and the SGI Business Projects group. In addition, the Institute offers education and training, with a newly established Masters Programme and Doctoral School. The SGI brings together industrial partners and academic experts from across four faculties: arts and design, health and life science, business and the environment and computing and engineering. Sara leads a cross-university applied research group of 50 academics and is a member of the Coventry University Research Committee.
- Ms. Aleksandra KUCZERAWY is a legal researcher in the Interdisciplinary Research Center for Law and ICT (ICRI) at the Katholieke Universiteit Leuven. She joined ICRI in November 2007. She was a part of the study team conducting the independent study on indicators for media pluralism in the European member states, commissioned by the European Commission (DG INFSO). She also conducted research in the area of Spatial Data Infrustructures (SDI) while working on access and licensing protocols in the eContentplus OneGeology Europe project. Currently she conducts research in the field of privacy and identity management in new technologies. She works on the European Project PrimeLife (Privacy and Identity Management in Europe for Life). Lately she has expanded her research field to legal aspects of User Generated Content (UGC) in the European Project SocIoS (Exploiting Social Networks for Building the Future Internet of Services) where she is working on privacy aspects as well as liability of Internet Intermediaries. Moreover, Aleksandra is an assistent editor of the International Ecyclopeadia of Law (IEL) - Cyber Law.
- Dr. Alan HARTMAN is currently a senior researcher at the IBM Israel Haifa Research Laboratory in the department of Privacy and Security. His work is focused on long term privacy preservation in the context of the ENSURE project. After a post-doctoral fellowship at the University of Waterloo in Canada, Alan joined the IBM Haifa Research Lab in 1983. Since then,

his research has focused on storage technologies, mathematical optimization, hardware and software verification, model based software, systems, and services engineering, and privacy. He spent 2.5 years at the IBM India research lab in Bangalore serving as the Services Science, Management, and Engineering (SSME) focal point for the IBM India Research Laboratory. He has also held positions at the IBM Israel Laboratory as the manager of the algorithms and optimization team, and the model-driven engineering technologies group. He has held visiting positions in the Mathematics Department at the University of Toronto and at Telstra Research Labs. He has also coordinated and managed several European Commission research projects (AGEDIS, MODELWARE, MODELPLEX, COCKPIT). Alan has a Ph.D. in mathematics from the University of Newcastle in Australia, an M.Sc. in mathematics from the Technion – Israel Institute of Technology, and a B.Sc. in mathematics from Monash University in Australia. He has published over 60 research papers and holds several patents.

- Mr. Javier SALCEDO has a Telecommunications Engineering degree in the Saragosse University. He started working for Accenture in 2004, participating in a worldwide process standardization project for BT Global Services. He joined Arsys in 2006 and has taken different roles in the IT Service Management, Dedicated and Managed Hosting and Presales areas. He's currently Product Director taking responsibility over the overall portfolio, including cloud computing services, managed hosting and web hosting.
- Mr. Vesa TERAVA joined the European Commission and DG Information Society and Media in 2002. Mr Terävä is currently Head of Unit B2 "Regulatory Coordination & Users Unit" in DG Communication Networks, Content and Technology. From 2003 until May 2009 Mr Terävä worked at Unit B5 "Procedures related to national regulatory measures" dealing with the electronic communications consultation procedures provided in EU telecoms rules. He was appointed as "Head of Sector" of the Unit in 2006 and "Deputy Head of Unit" in 2008. Prior to joining the Commission he worked at the Permanent Representation of Finland to the EU and at the Ministry of Transport and Communications in Finland.

Appendix C Contributions' Abstracts of the FISE Poznan Workshop

The Impacts of the PPP on the Economic Contributions of the Future Internet (Jonathan Cave - Rand)

See the recent article published in the European Union Public Service Review for background to the talk “Future or Fancy”?[6]

The Future Internet Ecosystem (Michael Boniface - IT Innovation Centre)

The SESERV project has engaged a broad range of technologists, social scientists and policy makers in discussion about the future of the Internet. This talk will bring together the collective thoughts and opinions of those people considering the potential added value of the Future Internet technologies and socio-economic barriers to adoption. More details are available on http://www.slideshare.net/ictseserv/how-disruptive-technologies-influence-the-fi-ecosystem.

Emerging value networks within the Future Internet Ecosystem - Hanne-Stine Hallingby (Telenor Digital Services)

Telenor ASA is pursuing research on the future Internet in many ways. The project Internet value network aims to reveal more about revenue streams, value creation and power relationships between actors in the core Internet. Our research questions are: • How are values, profit and power really created in the Internet Economy? • What impact does the real Internet have on various stakeholders? More details are available on http://fisa.future-internet.eu/images/1/1a/Telenor-20110923_Abstract_FISE_Oct_2011%2C_Hallingby.pdf.

Targeting business value innovation in open paradigms in FI Ecosystems - Man-Sz Li (IC Focus), Co-Chair DG INFSO FInES Cluster, Lead FIA Enterprise activity

There are no future facts. Technologies, disruptive or otherwise, may not necessarily lead us to where we want to be. The ongoing global crisis calls into questions, amongst others, the capacity and capability of existing techno-socio-economic systems to absorb exogenous shocks and implement endogenous reforms. In this rapidly changing context, a new way of envisioning, doing and evaluating business is essential. This presentation outlines the research direction and available insights from the work of FInES, which – as one domain of the overall FI research field – specifically targets business value innovation in open paradigms and its embedment in future enterprise systems. More details are available on http://fisa.future-internet.eu/images/f/fb/FINES-Open-Ecosystems.pdf.

Viral Innovation Process Challenging Public Support for Innovation - Jari-Pekka Kaleva (European Games Developer Federation)

During the last decade, games became an important part of daily life for the majority of Europeans. Recent studies show that in many European countries not only younger generations play games but also almost half of the elders1. Thus video games have a bigger and bigger impact on the everyday life2. This impact is not limited to consumer behavior; they have a significant impact also on the business and innovation models of the Digital Era. In many ways, they are the forerunners of the innovative content, services and business models of a rising immaterial economy3. Consequently they are preparing the way for the other sectors where the digital revolution has not started yet. More details are available on http://fisa.future-internet.eu/images/0/0a/EDGF-FISE_Abstract.pdf.

6 https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxzZXNlcnZ0ZXN0MXxneDoxOGJhZTgzYWU3NGZlZGNh

Out-of-Equilibrium Techno-Socio-Economic Systems – Paolo Dini (London School of Economics)

The geographical and virtual communities at the periphery of the future internet are unable to take part fully in the online economy. Their fuller engagement can be achieved through two strategies: first, by learning from community currencies how to develop import substitution mechanisms that, at the expense of a less efficient global market equilibrium, give a better chance for growth to the periphery; and, second, by 'moving the goal posts' and developing a wider definition of 'economy' based on economic anthropology which includes the social dimension as a domain of value on the same footing as the market. Furthermore, community currencies provide a better quantification system and institutional framework for such a value domain than national currency, thereby opening the possibility to develop a strategy for socio-economic development in the future internet based on the social construction of economic identity through a system of parallel or complementary online currencies as an integral part of the billing and rating services at the core of the intelligent network management and business support services layer.

Unified Business Modeling for FI ecosystems (Simon Delaere, Vânia Gonçalves - IBBT, Makis Stamatelatos University of Athens)

Design, deployment and operations of future networks are expected to tackle a diverse range of business and technical challenges allowing for the emergence of disruptive business models and new industrial ecosystems. Autonomic networks will help operators to shift from their traditional static pipe-centric approach (and related OAM/OSS/BSS architecture) to a service-enabler and/or service-centric approach allowing the emergence of diverse disruptive business models, applications and new industrial structures. More details are available on http://fisa.future-internet.eu/images/4/47/Univerself-FIA_Poznan-FISE_workshop.pdf.

The SEQUOIA Methodology: How to assess the socio-economic impacts of SaaS and IoS projects (Antonella Passani - T6)

The SEQUOIA Project has developed a methodology for socio-economic impact self-assessment and is applying it to several SaaS and IoS research projects. In this presentation I will present the main components of the methodology, with the support of a dedicated How-To Guide. The aim of the SEQUOIA methodology is to support the research projects in describing and possibly quantifying the benefits produced by their activities and their outputs. Clearly, each project has a certain degree of complexity that needs to be taken into account and reflected by the methodology without making the methodology itself too complex. The FISE workshop represents a good opportunity to begin to transfer the SEQUOIA methodology to the participating audience, but also to explore open issues related, for example, to the difficulties of mapping social impacts that may occur several years after the end of an FP7 project. More details are available on http://www.sequoiaproject.eu/index.php/documents/doc_download/46-deliverable-61.

Assessing economic outcomes using tussle analysis (Costas Kalogiros - Athens University of Economics and Business)

Tussle analysis helps better understand the interrelations between Future Internet technologies and socio-economics. Its purpose is to study how such stakeholders interact by exploiting Future Internet technologies to advance their economic interests and influence economic outcomes. The presentation will motivate and introduce a generic methodology for tussle analysis by using several case studies and discuss its complexity. More details are available on http://aod-portal.u5.platon.pionier.net.pl/DocsService/ShowDocument.ashx?id=465.

The Future Internet PPP approach to socio-economic priorities (Dr. Petra Turkama, Aalto University)

Details are available on http://documentservice.tv.pionier.net.pl/ShowDocument.ashx?id=466.