
 The logo for the SEQUOIA project. It features three overlapping circles in light blue, brown, and dark red. Below the circles, the word "SEQUOIA" is written in a sans-serif font, with "SE" in dark red and "QUOIA" in light blue.	<p><b>SEQUOIA PROJECT</b> <b><i>“Socio-Economic Impact Assessment for Research Projects”</i></b></p> <p>Contract n° 258346</p>
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## **WP2: SEQUOIA Self-Assessment Methodology Development**

### **Deliverable D2.2a Results of First Questionnaire and In-Depth Interviews**

 The logo for the Seventh Framework Programme. It features a stylized blue number '7' composed of horizontal lines. Below the '7', the words "SEVENTH FRAMEWORK" and "PROGRAMME" are written in a small, sans-serif font.	<p>Project funded by the European Commission “Information Society and Media Directorate - General”, Support Action</p>
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## Table of Contents

<b>1. INTRODUCTION .....</b>	<b>4</b>
<b>2. PRELIMINARY QUESTIONNAIRE-BASED SURVEY .....</b>	<b>5</b>
1.1 List of invitees .....	5
1.2 The preliminary questionnaire .....	6
1.3 Responses .....	7
1.4 Analysis of gathered data .....	8
<b>2. THE KEY INFORMANTS INTERVIEWS .....</b>	<b>13</b>
2.1 Key informants .....	13
2.2 Interview guide .....	13
2.3 Results of expert views .....	14
<b>CONCLUSIONS.....</b>	<b>16</b>
<b>ANNEX A – SECOND QUESTIONNAIRE.....</b>	<b>17</b>

## 1. INTRODUCTION

This deliverable summarises the outputs of the first phase of the Call 1 projects analysis (based on the preliminary questionnaire) and the outputs of the interviews with key experts of the Software as a Service (SaaS) and Internet of Services (IoS).

As mentioned in D.2.1, after the document inventory exercise and the achievement of a better understanding of Call 1 projects, the consortium developed 2 questionnaires: one for in-depth interviews to key experts and another for the 25 Call 1 projects. This second questionnaire was complete in terms of variables used and therefore very long (see annex A). As a consequence, given the fact that there had already been a total lack of response to an introductory mail sent by the coordinator, the consortium saw a risk in sending such a long questionnaire to the projects.

During the July 2010 project meeting, therefore, the consortium agreed on the need to postpone the use of this second questionnaire and to develop a new questionnaire, shorter and more user-friendly. This questionnaire, named “preliminary questionnaire”, was submitted online first and then, having receiving only very few answers, was sent by email while contacting each project directly also by phone.

The need to contact the projects several times and the difficulty in opening a direct channel of communication implied a slowing down of the research process. Originally the preliminary questionnaire analysis was intended to be completed before the summer, leaving time to the consortium to send the second, longer and more complete questionnaire in September and scheduling the focus group session during the Collaboration meeting of October. However, the slowing down of the activities related to the preliminary questionnaire, combined with the more complex characterisation of the projects in terms of the socio-economic relevance of their outputs (discussed in D1.1), implied the need to re-plan the submission of the second questionnaire and to split the original D2.2 in the two sub-deliverables D2.2a and D2.2b.

In this deliverable we describe the outputs of the preliminary questionnaire-based survey, together with the results of the in-depth interviews of key experts.

In the collaboration meeting held in Bruxelles on October 18<sup>th</sup> and 19<sup>th</sup> the consortium had the opportunity to meet in person some of the Call 1 projects, so that the preliminary questionnaire could be distributed again. This additional information has been included in this deliverable.

The deliverable is organized as follows: Chapter 1 reports and comments on the results of the preliminary questionnaire-based survey. Chapter 2 presents the results of key experts’ in-depth interviews. In Annex A the long questionnaire that constitutes the third instrument to be used for the analysis of Call 1 project is presented. The work here described influenced the definition of the SEQUOIA assessment method described in D2.3.

## 2. PRELIMINARY QUESTIONNAIRE-BASED SURVEY

The assumption of the preliminary questionnaire was that the questionnaire should not be seen only as a research instrument but also as an opportunity for constructive interaction between the Call 1 projects and the SEQUOIA consortium. In order to engage the projects and to have the chance of showing our research process as useful for them, we thought the questionnaire needed to be:

- 1) high-level
- 2) short
- 3) interesting and
- 4) rewarding to the respondent.

The aim of this preliminary questionnaire was, indeed, to gather some information about the 25 projects under analysis and, at the same time, allow the respondents to express their opinion and speak about the lessons they have learned during their projects.

Ultimately this approach aimed to

- indicate to the respondents that their personal experience and point of view have significant value;
- acknowledge their authority in something they have necessarily become experts during the running of their projects;
- give them a chance to 'blow their own trumpet', i.e. express opinions of wider scope and import;
- keep the engagement as light and short as possible.

### 1.1 List of invitees

The invitations were sent to 25 persons (one for each project), the contact persons as described in the projects' website and factsheet (

Figure 1). The first invitation letter asked the respondent to fill the questionnaire by using an online instrument ([www.surveygizmo.com](http://www.surveygizmo.com)).

ID. Number	Title	Website	Contact	Email	Phone	Survey
1	ADMIRE	<a href="http://www.admire-project.eu/">http://www.admire-project.eu/</a>	Rob Baxter	<a href="mailto:r.baxter@epcc.ed.ac.uk">r.baxter@epcc.ed.ac.uk</a>		
2	ALIVE	<a href="http://www.ist-alive.eu/">http://www.ist-alive.eu/</a>	Javier Vázquez Salceda	<a href="mailto:jvazquez@si.upc.edu">jvazquez@si.upc.edu</a>	+34 93 413 79 03	
3	Compas	<a href="http://www.compas-ict.eu/">http://www.compas-ict.eu/</a>	Prof. Schahram Dustdar	<a href="mailto:dustdar@infosys.tuwien.ac.at">dustdar@infosys.tuwien.ac.at</a>	+43-1-58801-18414	
4	DEPLOY	<a href="http://www.deploy-project.eu/">http://www.deploy-project.eu/</a>	Alexander Romanovsky	<a href="mailto:alexander.romanovsky@ncl.ac.uk">alexander.romanovsky@ncl.ac.uk</a>		
5	DIVA	<a href="http://www.ict-diva.eu/">http://www.ict-diva.eu/</a>	Dirk Balfanz	<a href="mailto:dirk.balfanz@cas.de">dirk.balfanz@cas.de</a>		Partial
6	FAST	<a href="http://fast-fp7project.morfeo-project.org/">http://fast-fp7project.morfeo-project.org/</a>	Dr. Javier Soriano	<a href="mailto:jsoriano@fi.upm.es">jsoriano@fi.upm.es</a>		
7	IRMOS	<a href="http://www.imosproject.eu/">http://www.imosproject.eu/</a>	Eddie Townsend	<a href="mailto:eddie_townsend@xyratex.com">eddie_townsend@xyratex.com</a>		Bounced
8	m: Ciudad	<a href="http://www.mciudad-fp7.org/">http://www.mciudad-fp7.org/</a>	Manbel Narganes	<a href="mailto:info@mciudad-fp7.org">info@mciudad-fp7.org</a>		
9	MANCOOSI	<a href="http://www.mancoosi.org/">http://www.mancoosi.org/</a>	Prof. Roberto Di Cosmo	<a href="mailto:roberto@dicosmo.org">roberto@dicosmo.org</a>		
10	MOST	<a href="http://www.most-project.eu/">http://www.most-project.eu/</a>	Krzysztof Miksa	<a href="mailto:krzysztof.miksa@comarch.com">krzysztof.miksa@comarch.com</a>		Partial
11	NEXOF-RA	<a href="http://www.nexof-ra.eu/">http://www.nexof-ra.eu/</a>	Stefano De Panfilis	<a href="mailto:stefano.depanfilis@eng.it">stefano.depanfilis@eng.it</a>		
12	OMP	<a href="http://www.openmediaplatform.eu/">http://www.openmediaplatform.eu/</a>	Colin Tattersall	<a href="mailto:colin.tattersall@incoras.com">colin.tattersall@incoras.com</a>		
13	OPEN	<a href="http://www.ict-open.eu/">http://www.ict-open.eu/</a>	Fabio Patemò	<a href="mailto:fabio.patemo@isti.cnr.it">fabio.patemo@isti.cnr.it</a>		Partial
14	Persists	<a href="http://www.ict-persist.eu/">http://www.ict-persist.eu/</a>	Kevin Doolin	<a href="mailto:kdoolin@tssg.org">kdoolin@tssg.org</a>	+353-51-302935	Complete
15	ProTest	<a href="http://www.protest-project.eu/">http://www.protest-project.eu/</a>	Prof. John Derrick	<a href="mailto:J.Derrick@dcs.shef.ac.uk">J.Derrick@dcs.shef.ac.uk</a>		
16	Q-impress	<a href="http://www.q-impress.eu/wordpress/">http://www.q-impress.eu/wordpress/</a>	Dr.-Ing. Mircea Trifu	<a href="mailto:mircea.trifu@fzi.de">mircea.trifu@fzi.de</a>	+49 721 9654 – 624	Complete
17	RESERVOIR	<a href="http://www.reservoir-fp7.eu/">http://www.reservoir-fp7.eu/</a>	Eliot Salant	<a href="mailto:salant@il.ibm.com">salant@il.ibm.com</a>		Complete
18	Romulus	<a href="http://www.ict-romulus.eu/web/romulus">http://www.ict-romulus.eu/web/romulus</a>	Carlos Iglesias	<a href="mailto:cif@gemminus.com">cif@gemminus.com</a>	(+34) 91 304 80 94	Complete
19	S-Cube	<a href="http://www.s-cube-network.eu/">http://www.s-cube-network.eu/</a>	Klaus Pohl	<a href="mailto:klaus.pohl@sse.uni-due.de">klaus.pohl@sse.uni-due.de</a>		
20	ServFace	<a href="http://www.servface.org/">http://www.servface.org/</a>	Steffen Goebel	<a href="mailto:steffen.goebel@sap.com">steffen.goebel@sap.com</a>	+49 351 4811-6124	
21	SHAPE	<a href="http://www.shape-project.eu/">http://www.shape-project.eu/</a>	Ame-Jørgen Berre	<a href="mailto:Ame.J.Berre@sintef.no">Ame.J.Berre@sintef.no</a>	+47 22067452	
22	SLA@SOI	<a href="http://sla-at-soi.eu/">http://sla-at-soi.eu/</a>	Wolfgang Theilmann	<a href="mailto:wolfgang.theilmann@sap.com">wolfgang.theilmann@sap.com</a>		
23	SmartLM	<a href="http://www.smartlm.eu/">http://www.smartlm.eu/</a>	Josep Martrat	<a href="mailto:josep.martrat@atosorigin.com">josep.martrat@atosorigin.com</a>		
24	SOA4ALL	<a href="http://www.soa4all.eu/">http://www.soa4all.eu/</a>	Eliès Prunes Soler	<a href="mailto:elies.prunes@atosresearch.eu">elies.prunes@atosresearch.eu</a>	+34 93 486 1818	
25	STREAM	<a href="http://www.streamproject.eu/">http://www.streamproject.eu/</a>	Ricardo Jimenez-Peris	<a href="mailto:rjimenez@upm.fi.es">rjimenez@upm.fi.es</a>	+34 91 336 74 52	

Figure 1 . List of contact persons invited to the preliminary questionnaire

## 1.2 The preliminary questionnaire

The questions contained in the preliminary questionnaire are shown below, as they look in the online application.

### **Contact information.**

*(Please notice that the information you will provide is going to be treated anonymously, and your contact details are going to be used only by the researchers in order to keep in touch with you in case more information were needed).*

Name and Surname .....

Email address .....

Telephone number .....

Full name and acronym of the project you represent .....

.....

### **Questions**

1) Please rate your project in terms of:

	Rate
Innovative aspect	★ ★ ★ ★ ★
Benefit for the users	★ ★ ★ ★ ★
Scientific aspect	★ ★ ★ ★ ★
Commercial aspect	★ ★ ★ ★ ★
Social impact	★ ★ ★ ★ ★
Economic impact	★ ★ ★ ★ ★

- 2) What in your opinion is the most **interesting aspect** of your project?
- 3) What in your opinion is the most **innovative aspect** of your project?
- 4) Who in your opinion is most likely to **benefit** from your project?
- 5) What in your opinion is the most **practical aspect** of your project? How will your project affect the everyday life of your users/beneficiaries?
- 6) What in your opinion is the most **scientifically significant** aspect of your project?
- 7) What in your opinion is the most **commercially significant aspect** of your project?
- 8) What in your opinion will be the most important **social impact** of your project?
- 9) What in your opinion will be the most important **economic impact** of your project?



Figure 2- Screenshot of the online survey

The entry page, Figure 2, contains a short letter to respondents presenting the SEQUOIA project and the questionnaire's aims. This same SEQUOIA presentation letter was also contained in the invitation letter the project coordinators received together with the request of fulfilling the online questionnaire.

### 1.3 Responses

Through the online questionnaire we were able to collect complete data about 4 projects; 3 projects answered in an incomplete way (answering only to very few questions). Generally speaking the quality of information provided was low, most of the respondents provided short answers, in some cases copying and pasting information already present in their projects' factsheets and/or websites.

The consortium considered the information gathered insufficient, so the researchers started contacting the project representatives who did not answer by email and phone. The preliminary questionnaire was open for two weeks the first time and then it was opened again in order to allow the projects to go back to it and finalize/fulfil the questions.

The feedback after the reminder emails and the telephone calls was not impressive, so the consortium decided to use the Coordination Meeting in October as an occasion for distributing the preliminary questionnaire and collecting some more information. Through these various tactics in the end we were able to collect 9 completed questionnaires.

Below is the list of the projects who answered the preliminary questionnaire:

- Reservoir
- Q-InPreSS
- Persist
- Soa4All
- IRMOS
- Nexof-RA
- Most
- Romulus
- m-Ciudad

#### 1.4 Analysis of gathered data

We asked the projects to rate their level of innovation using a 1 to 5 rank where 1 is less innovative than 5. All the projects consider themselves very innovative, with an average value of 4.4. The level of innovation turned out to be the item in which each project excels, but a good score was registered also in terms of the “benefit for the users”. With an average value of 4, we can see that the projects under analysis expect to deliver important and positive benefits for their users. In this sense, a clear definition of their users seems very important (see D2.1 for the project clusterisation in terms of users/beneficiaries categories).

We also asked the people we interviewed to rate their project in terms of scientific aspects (average value of 3.5), commercial aspects (average value of 3.5), economic impact (average value of 3.2) and social impact (average value of 2.5). In synthesis, we can say that the projects interviewed consider their experiences as very innovative, providing very important benefits for the users, having scientific and commercial relevance, and possible economic benefit. The latter aspect, however, is perceived as less relevant than the other aspects, while the social impact is seen as low.

In the table below (Table 1), we present the answers provided to the following question: “What in your opinion is the most **interesting aspect** of your project?”.



Project	Most interesting aspect of the project
RESERVOIR	RESERVOIR is about cutting-edge research in the world of cloud computing and federation of clouds
IRMOS	The demonstration of a complete end-to-end toolset and infrastructure to deploy Real-time interactive applications in (cloud) Service Environments, where processing, storage and networking are delivered with guaranteed levels of service
PERSIST	Creation of a new paradigm, the personal smart space
SOA4ALL	Exploring the link between Linked Data e Services
Q-IMPRESS	Q-IMPRESS enables integrated prediction of different service QoS properties. Such predictions, made at design time, enable answering What-If questions for a service-oriented system at an early stage, based on a design model. Q-Impress also provides methods to evaluate design alternatives with respect to various QoS properties (trade-off analysis).
NEXOF-RA	The approach, method and processes to build IoS reference architectures. To integrate complementary research approaches coming from different sources (organisations, projects, individuals).
MOST	Project shows real scenarios and general guidelines for how software companies can benefit from semantic technologies in their software development.
ROMULUS	Practical Java Framework for developing Web apps
m-Ciudad	The mCiudad project tackles a completely new paradigm of communication between mobile users. A set of tools for mobile devices will allow m:Ciudad mobile users to create, provide and consume mobile services; this means that the mobile devices not only present data but provide valuable services to other users.

**Table 1: Most interesting aspects of the projects (question 2 of the preliminary questionnaire)**

Looking to the answers in a longitudinal way, we can see that five out of nine projects consider as most relevant aspects their technological dimension, three mention research-oriented aspects and two make explicit reference to the benefits they will generate for the final users. However, when moving from “most interesting aspect” of their projects to “most innovative aspect” the technological dimension becomes – as expected – more and more relevant. Almost all the projects refer to the technological dimension as the most innovative. More specifically, the following answers were provided:

- Creation of a federation of computers clouds
- Application deployment
- New and better service engineering and modelling
- Learning more reasoning based on context, preferences and user activity
- New and better software models for services, annotation Goals and reposition<sup>1</sup>
- New generation of Service Oriented Cloud Computing environment.
- A common Service Architecture Meta-Model, allowing to create models of service-oriented software systems.
- The standard capability to integrate and compare different architectural solutions
- Finding synergies between software modelling and semantic technologies, which were not so far integrated.
- Combination of Mashups and Domain Design

<sup>1</sup> Not clear what this respondent meant. “Reposition” could mean “repository”. And Goal is a programming language for agents.

- Service creation and provisioning processes have been outsourced from PCs and remote servers to mobile devices, for being managed by mobile users.

As we will see in the next sections, various kinds of innovation are recognisable in these answers as well as diverse possible economic and commercial benefits.

The preliminary questionnaire asked for most scientific relevance aspects of the projects (question n. 6); as we have seen in the previous section, projects consider their scientific relevance as quite high (average score of 3.5 out of 5), however this question ended up being too general. In fact, all projects mentioned, as scientifically relevant, different aspects of their technological development. Only one project mentioned an interdisciplinary approach. Generally, the respondents did not position themselves in scientific communities, or in ongoing theoretical debates (with the exception of one project mentioning its relationship with the OSS community).

This aspect, considered important by the projects themselves (scientific impact is rated 3.5 out of 5), will need to be further analysed through the second questionnaire. The consortium sees the potential scientific impact as relevant for two main reasons: on the one hand, if the projects' outputs are disseminated and welcomed by well-established scientific communities, this can positively influence the sustainability of the projects themselves. On the other hand, if the projects' outputs find a resonance in the universities, students and researchers can become further agents of dissemination.

### Defining the users/beneficiaries

We asked the projects to define their beneficiaries (question n. 4 of the preliminary questionnaire) and the answers are as in Table 2.

Users/beneficiaries categories	N. of projects that indicate a specific user/beneficiary as relevant
Enterprises (and SMEs)	● ● ● ● ●
Service end-users/citizens	● ● ●
Software engineers	● ●
System architects	●
Open Source community	●

**Table 2 – Users/beneficiaries identification (question N 4 of the preliminary questionnaire)**

Now, we can go a little bit deeper and describe the concrete and actual benefits that projects foresee for their users/beneficiaries. Starting by considering benefit for enterprises, the following benefits are mentioned:

- Increase competitiveness of involved players due to low-cost implementation and broader market accessibility;
- Provide management interfaces between service providers and network operators opening up new opportunities for all stakeholders;
- Lower the entry barrier for SMEs to participate in the market of real-time interactive services
- lower ICT costs.

For end-users and citizens the projects see the following:

- This will not directly affect the everyday life of users, but rather indirectly affect them
- New and better services

Finally, the projects that have software developers and software architects as their main target expect to increase their productivity.

## Innovation and economic impact

It is very interesting to notice that these projects, that perceive themselves as highly innovative, at the same time can see a clear benefit for enterprises coming out of their research. Reading the answers in a more detailed way, we have to specify that in most cases the enterprises mentioned are the one related to the ICT sector, but still it would be important to investigate how and to what extent these and Call 5 project can transfer their innovations to the entrepreneurs, thereby generating an economic benefit.

With reference to the latter “commercially significant aspects of projects under analysis” (question n. 7 of the preliminary questionnaire) we can see that project innovativeness translates on the one hand on the *creation of new or improved (considering actual market solutions) products* and *process innovation*. It is important to remember that this phase of analysis is not intended to measure the impact of Call 1 projects (not yet), but to map all the aspects of their potential impact in order to generate sensitive and complete variables and indicators. In this respect, the co-presence of potential product and process innovation is of great relevance and motivates the inclusion of both aspects in the SEQUOIA methodology. Only one project indicates the commercial dimension in an eventual future, whereas all the others seem to have a clear idea of possible market penetration. In the table below (Table 3) we listed the answers gathered, as a reference.

<b><i>New or incrementally innovative products/services</i></b>	<b><i>Process innovation</i></b>
<ul style="list-style-type: none"> <li>• Infrastructure components for networks, processing (real-time O/S) and storage QoS</li> <li>• Various robust tools based on Linked Data</li> <li>• Several products: roma framework, wapity, mycocktail</li> </ul>	<ul style="list-style-type: none"> <li>• Our solution allows creation of new personalised contextaware services</li> <li>• Software companies could improve their software development process in terms of cost, time-to-market and quality.</li> <li>• Cost savings through enhanced productivity.</li> <li>• Process innovation for mobile application developers</li> </ul>

**Table 3 – Commercially significant aspects (question 7 of the preliminary questionnaire)**

In addition to the commercially relevant aspects of the projects, we also asked about macroeconomic potential impact (question n. 9 of the preliminary questionnaire) and here the answers are consistent with the previous, indicating that the projects may impact on the following economic aspects of the ICT sector:

- Creation of new business opportunities /new markets
- Enhancement of productivity
- New value chains and business models

## Social impact

Respondents found it difficult to define the possible social impacts of their projects and, as we have seen in the first section of this chapter, social impact is the item that got a lower score in the first question. However, the clear definition of project users/beneficiaries and the description of the expected benefit for them can give us an idea of the potential social impact of these projects, or – better still – of the dimensions to take in consideration for the next research step. In fact, defining social impact is a challenging issue, especially when dealing with technological projects that are at the research level and that work on process innovation or on the development of services that may have a limited impact of the mass market. This

challenge is well-known by social science researchers and well-documented in the literature. Increasingly, this issue can be problematic for project representatives: for this reason we will better specify the subcategories of social impact that can appear less intuitive than the economic ones. Two projects did not answer to this question at all, indicating that it was not applicable to their project, but one project – maybe in an involuntary way – grasped the essence of potential social impact:

“[Thanks to the project], services could be created for addressing a wide range of social needs: quality of life, health, transport and so on. Its application to support location-based social networks could be easily glimpsed”.

In this sentence we can see that, for example, social impact can be considered an *indirect impact* compared to commercial *direct impact*. By considering this point of view, perhaps, more projects would be able to answer positively to the question. Moreover, innovation processes can stimulate the creation of better services in different fields of social computing, and so on; and process innovation can result in more and better jobs by increasing the productivity and reducing service delivery costs.

In addition to this, two projects mentioned as social impact the fact that their innovation could “allow remote users to interact” and “improve collaboration among users”. The impact of SaaS and IoF on social capital and on the sharing and circulation of knowledge are two dimensions that need to be further investigated. The answers gathered through the preliminary questionnaire allow SEQUOIA researchers to be optimistic about the possibility to map – besides quantitative and monetary impacts – also intangible and more qualitative potential impacts.

## **2. THE KEY INFORMANTS INTERVIEWS**

An informed account of the current status of the ICT market in Europe is important for ensuring that the results of the projects subjected to our investigation are assessed and applied in ways that are enabling and responsive to the varied corporate, private and policy contexts of ICT production and markets. In seeking to advance this and related investigative agendas, we have sought to arrange for qualitative interviews with several key informants working in leading organizations and who provided us with their expert views.

### 2.1 Key informants

Based on their expertise and availability the consortium selected five key informants who could provide us with a broad overview of trends and near-term prospects in the ICT industry, the growing impact of ICT on the economy and society, developments and emerging applications in selected areas of ICT and insight into new policy directions.

The key informants are:

- 1) Mr Marc Bogdanowicz, Action Leader: The role of the ICT Industry in the evolving Knowledge Economy (European Commission, Directorate-General JRC, Institute for Prospective Technological Studies, Information Society Unit).
- 2) Mr Fabrizio D'Ascenzo, Professor, Department of Management and Technology (Faculty of Economics, University "La Sapienza").
- 3) Mr Constantijn van Oranje-Nassau, Senior Advisor Cabinet Kroes (European Commission, Digital Agenda).
- 4) Mrs Veronique Pevtschin, Owner Tecsin sprl, European Research Direction Team (Engineering Ingegneria Informatica SPA), NESSI Communication Director (NESSI).
- 5) Mr Graham Vickery, Head of the Information Economy Group (Directorate for Science, Technology and Industry, Organisation for Economic Co-Operation and Development - OECD) (retired as of 1 July 2010).

### 2.2 Interview guide

A formal interview request was sent out via email in July 2010. Interviews were carried out through telephone and email between July and October 2010. The interviews, where possible, were recorded in voice and written word. In order to gain a deeper understanding of the larger European ICT domain, the interviews encompassed a set of three open questions with the aim to highlight meaningful themes, practices, and relationships from the interviewees' own perspectives. The following questions were formulated:

- 1) Based on your experience, how do you perceive the current status of the ICT market in Europe?
- 2) In your opinion, what scenarios for the ICT market can you see evolve over the next 5 years?
- 3) Based on your experience, what are some of the most important issues that EU policies supporting ICT development, are facing?

These questions were supported by motivational and exemplary questions such as 'Could you describe it to me?', 'Who are the key players?', and 'What do you consider to be positive developments?'.

### 2.3 Results of expert views

The overall outlook for the current ICT production and markets in Europe seems to be in good shape. In general the ICT market is growing faster than GDP growth indicating that the ICT market has recovered earlier than the general economy. The IT and software services can be said to be growing more rapidly, along with some content, some manufacturing doing reasonably well, e.g. communications infrastructure equipment (Ericsson, NSN, Alcatel-Lucent), and very dynamic offshore assembly such as in the Czech and Slovak Republics, and Hungary. European telecommunication service providers, however, are growing rather slowly, and hope that mobile Internet services will compensate for declining fixed revenues.

The ICT market, however, is rather complex as it involves large IT players such as SAP that focus on elaborating solutions that are further adapted to the customer needs, and large IT players that are evolving towards a service model that provides customers with a complete outsourcing approach (e.g. from hosting to functionalities). Furthermore, telecommunication operators are increasingly involved beyond merely the infrastructure in developing services, or at least front-end to services, that ensure maximum usage of the deployed infrastructure. In addition, small ICT players provide an essential innovation force, but require that the telco operators and the larger IT players deliver the adequate service infrastructure.

In fact, the European market is quite fragmented:

“I think in sector-by-sector there are differences, for instance in healthcare, highly fragmented, a lot of SMEs, some actually very advanced software providers in the EU, but as healthcare markets and also the public procurement systems tend to be on the one hand quite conservative, on the other also fragmented, we don't see any big players there, and this kind of filters down to technologies like RFID. There are a few SAP kind of the big ones are using these technologies and are trying to develop product suites for them in these different use markets, but on the whole it's a patchwork of small, small companies.” (van Oranje, 28 July 2010).

The key players in the current market are considered to be the global US corporations Google, Apple, while in the European context the following firms per sector are mentioned: Ericsson and Nokia for their communications network and equipment supply; Philips and Siemens for their general electronic and equipment supply; ST Micro, Infineon and ASML as important semiconductors; SAP for its software; Capgemini for its services; Vivendi and Ubisoft for their games; and various telcos in all large European countries. There is an important concern shared by all experts that draws attention to the relative strong position of established European firms, yet that it is hard for new firms to move from start-up to established. Moreover,

“Europe is growing along with everybody else, but the most rapidly growing new market and product areas are coming increasingly from outside of Europe (currently US firms), and there is increasing competition from Indian IT services firms [e.g. Infosys, Wipro, TCS], Chinese firms [e.g. ZTE, Huawei].” (Vickery, 30 October, 2010).

In this context,

“Within such a global perspective, the role and opportunities of an [European ICT] industry are rather secondary, but they still do participate. The capacity of the ICT industry (and collaterals) to answer at the world-scale issues will be determining. ‘Think global’ is more important than ever. ‘Act local’ has lost (provisionally?) a lot of its potential.” (Bogdanowicz, 29 July 2010).

So, not only fragmentation of the European market is a drawback for the industry in general, but newly created firms seem unable to reach international scale and/or capture significant market share in new areas. In particular, Internet-related applications and exploitation have

not been particularly dynamic on the supply-side, which may point to a more general problem for the European ICT market in the global context. Other pitfalls include the risk of moving to cloud computing without supporting the legislative environment, the effective localization of data storage; in these contexts, this means the lack of understanding of security and privacy risks.

The ICT market is likely to develop further on one of its main drivers, that is, communication. However, data processing (e.g. sensors, machine-to-machine communication) will also grow in importance. The generalised digitalisation of data and content favours the emergence of new behaviours, new lifestyles, new services, new risks, and so on, such as urban communication, autonomous driver, smart environments, virtual pleasures, data-mining and probabilistic science results. It is the question however how many European companies will take a sustainable lead in these developments.

Against this backdrop, the EC hopes to stimulate more innovative research and to bring in more public procurement money. And, although there is a European Investment Fund, the problem right now seems to be that it does not have a profit objective which is not very attractive for investors. The EC has no answer yet for related, rather difficult questions such as 'How do you create entrepreneurs?', 'How do you create risk-seeking within the boundaries of the individual responsibility that the entrepreneur has?', and 'How do you support a booming venture capital market?'. It does not come as a surprise therefore that the EC has a strong interest in convening parties that otherwise would not be convening, or better, in public-private partnerships such as the energy market and healthcare providers.

The most important issues that EU ICT policies are facing include the improvement of start-ups and the growth of new firms; support for growth and employment; support for R&D; "support the elaboration of a services infrastructure that is open, resilient, secure supporting ICT providers in terms of deployment and users in terms of access [while] also support[ing] the definition of the supporting business model(s)" (Pevtschin, 25 October 2010); yet, "avoid assuming that policy can do anything very much to directly promote innovation" (Vickery, 30 October 2010). Lastly, the Commission tends to understand ICT as a solution to many things, yet

"[It is] not the solution but an enabler to societal issues where mostly we're talking about productivity gains through technology where we have the old story, [of] more people greying and less people providing the services, so per capita we just have to push up our productivity to be able to support the kind of life that we want, and to enable that technology is...is inevitable. But it's not the solution. [...] We do this without questioning the outcome of that. And it's probably also a development that we can't stop and we don't really want to stop, but we do need to become more aware, especially because we are policy makers, but the impact is on individuals, on society, on human relations, on business models and sectors and all those kinds of things, and we are not too far developed, and I think we can't procure all that research. I think we should start to develop thinking about these kinds of impacts that are maybe more qualitative." (van Oranje, 28 July 2010).

Based on the interviews with the key informants we can conclude that the ICT industry is not only considered to be a key sector in its own right, but also by boosting economic growth and increasing economic productivity and efficiency. In many ways, the ICT industry is in good shape today. In many countries, the Internet is now a mainstream feature of present lifestyles; global communication infrastructures underpin international trade and finance; the work floor is underpinned by constant connectivity, while ICT and ICT-related employment represent a significant share of total employment, and highlighting areas such as green ICT, "smart" applications and cloud computing that promise new ICT employment. There are strong concerns, however, for new market entrants to compete with the old order that have (relatively) sustainable business models, stable cash-flows and deep pockets. From a policy stance, it is important to recognize that the rapidly internationalization of (all) industrial (and

non-industrial) activities may result in a macro economic misbalance such as between mass production (in an Asian context) and massive consumption (in Western context). Therefore, it is desirable to nurture the emergence of globally-acting firms while catching and implementing the opportunities that emerge from large societal challenges. New initiatives are therefore desirable that not only look for ways to increase productivity in the context of ICT, but also to consider how to bring about a shift in mind-sets while developing a stronger focus on the more qualitative impacts such as on society in general, and individuals in particular.

## **CONCLUSIONS**

In this deliverable we reported and commented the outputs of two fundamental data gathering activities: preliminary questionnaire and interview to key experts. Both the activities were fundamental for finalizing the second questionnaire here presented in Annex A, and that is going to be circulated using the online tool surveygizmo.

Even if we received answers only from 9 projects out of 25 we think that this is enough to proceed with the definition of SEQUOIA self-assessment main variables that the reader will find in D2.3. The second questionnaire attached is a step towards this objective.



## ANNEX A – SECOND QUESTIONNAIRE

### PART A - General Information

1. Respondent:
  - a. Contact person name and surname (to be filled in by the interviewer)  
.....
  - b. Email address (to be filled in by the interviewer)  
.....
  - c. Telephone number (to be filled in by the interviewer)  
.....
2. Full name and/or acronym of the project you represent?
3. In what stage is the project at the moment?
  - a. Research
  - b. Development,
  - c. Implementation, test
  - d. Communication and networking, transfer to final users
  - e. Other (please specify)
4. What is the “problem” this project is expected to solve (or help to solve)?  
.....
5. Give a short description of the activities performed by the project (about 500 characters)
  - a. Research activities. Please add description:  
.....  
.....  
.....
  - b. Development activities. Please add description:  
.....  
.....  
.....
  - c. Implementation, test. Please add description:  
.....  
.....  
.....
  - d. Communication and networking activities: Please add description:  
.....  
.....  
.....
  - e. Other. Please add description:  
.....  
.....  
.....
6. Do you know any other initiative or best practice whose objectives or technical solutions are similar to yours?  
.....  
.....  
.....
7. At your best knowledge, what are the main improvements (advantages) of your initiative with respect the others you listed in the previous question?

.....  
 .....  
 .....

8. Please list your potential users' categories and attribute to each of them a grade of relevance (where 5 is very relevant and 1 is almost irrelevant)

User category: .....1 2 3 4 5  
 User category: .....1 2 3 4 5  
 User category: .....1 2 3 4 5  
 User category: .....1 2 3 4 5  
 User category: .....1 2 3 4 5  
 User category: .....1 2 3 4 5

9. Please attribute to each users' categories the main activities they will be able to perform by using your innovation

User category: .....Main activities.....  
 User category: .....Main activities.....  
 User category: .....Main activities.....  
 User category: .....Main activities.....  
 User category: .....Main activities.....  
 User category: .....Main activities.....

10. Envisaged number of users for each typologies of users, in number or percentage (where 100= total number of users)

User category: .....N. of users or percentage.....  
 User category: .....N. of users or percentage.....  
 User category: .....N. of users or percentage.....  
 User category: .....N. of users or percentage.....  
 User category: .....N. of users or percentage.....  
 User category: .....N. of users or percentage.....

11. What are the skills required from the costumer side? What you users need to be able to do and/or have (in term of hardware) in order to benefit from your innovation?

.....  
 .....

## Part B - Technological Information

1. Which of the following benefits, if any, will you project realize (more than one answer allowed)?

- Reduced transaction time
- Increased quality of customer service
- Lower business costs
- Keeping pace with competitors
- Able to target customers individually
- Others (please specify).....

2. Which are the market leaders in your field of activity and is your approach interoperable with them?

.....

3. Which standard are you conforming too?

.....

4. For your project is “interoperability” a goal, a crucial issue?  
Yes No  
(if yes, move to the following questions, otherwise skip to question n. 5)
5. With what other technologies or infrastructures will you project interoperate and how?  
.....
6. How will you (formally) evaluate interoperability?  
.....
7. How would you assess your project in terms of the following categories (please attribute a score from 1 to 5 where 1 is lower than 5):
- Security....
  - Privacy.....
  - Accessibility.....
  - Reliability.....
  - Mobility (i.e. computing structure that is available at any given time and at any location).....
8. Which of the following factors, if any, is limiting or preventing your project (or did in the past)?
- Security concerns
  - Privacy concerns
  - Customers’ or suppliers’ computer systems are incompatible with yours
  - Insufficient level of customer demand
  - Uncertainty concerning legal/regulatory framework
  - Cost of development and/or maintenance is too high
  - Lack of skilled employees to develop, maintain or use the technology required
  - Others (please specify).....
9. Please list the top 5 computer languages and software programming frameworks you are using.
- I. ....
- II. ....
- III. ....
- IV. ....
- V. ....
10. Which is the copyright/license approach your project is using? Why? (perhaps also labour regulation? And, product/market regulation?)

### Part C - Economic Impact General Information

1. Will your project increment the economic efficiency, cost reduction, optimisation of resource usage of its users?  
No      to a certain extent      yes      extremely  
If "Yes" or "extremely" can you briefly describe How?  
.....
2. Will your project increase the effectiveness of the service object of the project?  
No      to a certain extent      yes      extremely  
If "Yes" or "extremely" can you briefly describe How?  
.....
3. Will your project improve the internal processes in the institution / company / SME or administrative after the application of the project?

No to a certain extent yes extremely  
If "Yes" or "extremely" can you briefly describe How?

.....

4. Will your project reduce the timeline in providing the service/application output of the project or the service/application it will support?

No to a certain extent yes extremely  
If "Yes" or "extremely" can you briefly describe How?

.....

#### Part D – Social and scientific impact

- 1 Which is the synergy between the project and the current policies in this sector?

.....

- 2 Can the project improve the users' social capital? If yes, how and to what extent?  
You can use the following items as point of references.

- Improve the way in which users communicate and collaborate one each-other
- Support the network creation/collaboration of enterprises in the sector
- Support network creation/collaboration of citizens
- Other

- 3 Will your project improve the citizen/user knowledge or know-how? after the application of the project?

No to a certain extent yes extremely  
If "Yes" or "extremely" can you briefly describe How?

.....

- 4 Will your project substantially improve the working condition of its users? after the application of the project?

No to a certain extent yes extremely  
If "Yes" or "extremely" can you briefly describe How?

.....

5. Will you project improve the everyday life (outside the work) of its final users? after the application of the project?

No to a certain extent yes extremely  
If "Yes" or "extremely" can you briefly describe How?

.....

6. Have you performed any of the following activities?

N. of knowledge exchange initiatives (with other universities and research centres)	
N. of new collaboration links established thanks to the participation in the project (in terms of exchange of information, exchange of resources, joint teaching courses, etc)	
N. of scientific conference and seminars in which your project have been presented	
N. of new teaching materials and modules (e-learning tools, online courses, summer schools, seminars, etc)	

7. Will your project have an impact on the employment rate of your territory? If yes, how and to what extent?

8. With reference to project partners, please use the table below that assist in the description of the internal impact of the project on your organisation employment rate?

N. of PhD scholarships sponsored by the project	
N. of post-doctoral scholarships sponsored by the project	
N. of new contracts and work-collaboration generated by agreement with enterprises and third parties	
N. of spin-offs	
Other.....	

9. N. of scientific publications (peer-reviewed articles, deliverables, books)  
Please add as many rows as necessary.

Topic	Peer-reviewed articles	Non-peer reviewed articles	Book chapters) (or	Deliverables	Others

10. To what extent and how did the project contribute to the formulation and implementation of international research conventions and/or international agreements?

11. How many new training modules will you develop, if any?

## Part E – Socio-Economic Indicators and sustainability

1. What was the total costs of the project?

2. How much did you spent for :

- a. human resource.....
- b. subcontracting.....
- c. travel.....
- d. Communication and dissemination.....

3. What is the number of employees closely related to the project during the following three periods (if known write the number of employees next to each time frame)

- a. Development.....
- b. implementation.....
- c. routine exercise after the end of the project? .....

4. Have you drafted a Business Plan?

Yes No

5. (If the project has a commercial dimension) Do you know the currently trends in the market(s) of your project output(s)?

- a. number of people/users/companies, potentially interested in the project functionalities or services.....

- b. the global market value? .....
  - c. Potential market share achievable .....
  - d. Main competitors.....
- 6. With reference to sustainability, please indicate:
  - a. Private investment attracted by the project (in Euros) (Beside the starting funding)
  - b. Public investment attracted by the project (in Euros) (Beside the starting funding)
  - c. N. of new commercial collaborations arising from the project
  - d. N. of new partnership agreements with other universities, research centres, enterprises or public bodies
  - e. N. of new projects proposals arose thanks to the participation in the project
  - f. N. of new product, services and patents and their possible economic value
- 7. Do you use self-assessment methodologies in order to evaluate the socio-economic impact of your project? If yes, can you please share with us eventual evaluation outputs?