Grant Agreement N° 215483

Title: *Intermediate Assessment of mobility program for researchers and students*

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Identifier: *Deliverable # PO-IA-2.1.6*

Type: *Report*

Version: *1.2*

Date: *10/05/2011*

Status: *Final*

Class: *External*

Management Summary

This deliverable updates the figures provided in Deliverable CD-IA-2.1.3 “Initial assessment of results of a separate mobility program for researchers and students” and CD-IA-2.1.4 “Mobility program determined based on the S-Cube Convergence Knowledge Model” about how the scientific subjects for mobility and the S-Cube integration framework elements have been covered by the mobility initiatives. The reference period goes from month 1 to month 36.

The research leading to these results has received funding from the European Community's Seventh Framework Programme [FP7/2007-2013] under grant agreement n° 215483 (S-Cube).

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Tilburg University	Netherlands
City University London	U.K.
Consiglio Nazionale delle Ricerche	Italy
Center for Scientific and Technological Research	Italy
The French National Institute for Research in Computer Science and Control	France
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Vision and Objectives of S-Cube

The Software Services and Systems Network (S-Cube) will establish a unified, multidisciplinary, vibrant research community which will enable Europe to lead the software-services revolution, helping shape the software-service based Internet which is the backbone of our future interactive society.

By integrating diverse research communities, S-Cube intends to achieve world-wide scientific excellence in a field that is critical for European competitiveness. S-Cube will accomplish its aims by meeting the following objectives:

- Re-aligning, re-shaping and integrating research agendas of key European players from diverse research areas and by synthesizing and integrating diversified knowledge, thereby establishing a long-lasting foundation for steering research and for achieving innovation at the highest level.
- Inaugurating a Europe-wide common program of education and training for researchers and industry thereby creating a common culture that will have a profound impact on the future of the field.
- Establishing a pro-active mobility plan to enable cross-fertilisation and thereby fostering the integration of research communities and the establishment of a common software services research culture.
- Establishing trust relationships with industry via European Technology Platforms (specifically NESSI) to achieve a catalytic effect in shaping European research, strengthening industrial competitiveness and addressing main societal challenges.
- Defining a broader research vision and perspective that will shape the software-service based Internet of the future and will accelerate economic growth and improve the living conditions of European citizens.

S-Cube will produce an integrated research community of international reputation and acclaim that will help define the future shape of the field of software services which is of critical for European competitiveness. S-Cube will provide service engineering methodologies which facilitate the development, deployment and adjustment of sophisticated hybrid service-based systems that cannot be addressed with today's limited software engineering approaches. S-Cube will further introduce an advanced training program for researchers and practitioners. Finally, S-Cube intends to bring strategic added value to European industry by using industry best-practice models and by implementing research results into pilot business cases and prototype systems.

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List of Acronyms

A&M	Adaptation and Monitoring
ASN	Agile Service Network
BPEL	Business Process Execution Language
BPM	Business Process Management
CEP	Complex Event Processing
EAI	Enterprise Application Integration
GUI	Graphical User Interface
KPI	Key Performance Indicator
PPM	Process Performance Metric
QA	Quality Assurance
QoS	Quality of Service
SC	Service Composition
SC&C	Service Composition and Coordination
SI	Service Infrastructure
SLA	Service Level Agreement
SN	Service Network
SOA	Service Oriented Architecture

1 Introduction

The S-Cube mobility program supports researchers of the network in carrying out joint research through the reimbursement of travel and living expenses at the host institution. The goal of the mobility program is to support the integration of knowledge and the alignment of research activities between different research groups and across S-Cube research domains.

In Deliverables CD-IA-2.1.3 "Initial assessment of results of a separate mobility program for researchers and students" and CD-IA-2.1.4 "Mobility program determined based on the S-Cube Convergence Knowledge Model" we have reported about the visits that have been performed during the first 18 and 30 months of the project respectively. In this deliverable we update the figures to take into account all visits occurred till month 36.

Overall, 71 mobility stays took place. For each stay the results have been collected and summarized (see Appendix B). Based on that data, we have analyzed the results using different views. The objective is to assess the results of the mobility program and use them to understand how we can proceed in the remaining year for the project to cover the identified gaps. We first analyze how the scientific subjects have been covered so far, and how the competencies of the partners have been combined. Then, we analyze how the results have contributed to research workpackages and how the integration framework baseline with its different views has been covered. We finally perform a quantitative analysis based on S-Cube KPIs and further indicators.

The structure of this deliverable is as follows. Section 2 focuses on assessing if the mobility visits performed from the beginning of the project until M36 cover the scientific subjects defined for the mobility program. Section 3 focuses on evaluating how the visits cover the areas of study of the various workpackages. Section 4 analyzes the coverage of the S-Cube integration framework. Section 5 provides some indicators to evaluate the mobility performance of the entire project and of each partner. Section 6 provides a summary of the assessment of mobility visits performed in the previous sections. Section 7 proposes a vade-mecum to be developed to support partners involved in mobility both in the identification of the best mobility opportunities and in the reporting of performed initiatives. Section 8 briefly presents additional actions aiming at improving mobility. Section 9 provides a short conclusion. Finally, Appendix A lists the mobility subjects that have been used for collecting and classifying the current data on mobility, Appendix B provides the list of the mobility stays performed so far, Appendix C provides tables that map each visit on mobility subjects, partners' competences, and S-Cube research workpackages, and Appendix D gives the outcomes, in terms of publications, of some of the accomplished research stays..

2 Scientific Subject Coverage and Synergy of Competencies

Based on the descriptions of the mobility stays provided by the visitors and summarized in Appendix B, we can assess the coverage of mobility subjects. These subjects have been defined in Deliverable CD-IA-2.1.2 and updated in Deliverable CD-IA-2.1.4. They are summarized in Tables 1 and 2.

The result of this analysis shows that the subject "Cloud and Grid Computing" is not covered. However, some partners are investigating this issue.

	Number of visits
Business Processes and Protocols (2,3)	25
Cloud and grid computing (7)	0
Adaptation (1)	17
Evolution (4)	6
Quality of Service (5,12)	8
Service Discovery (17)	4
Service Composition (16)	21
Negotiation and QoS Agreement (10)	5
Monitoring and Prediction (9)	11
Lifecycle (21)	1
Requirement Engineering (13)	7
Service Design and Modelling Methodologies (14,18)	9
Quality Assurance (11)	1

Table 1. Number of visits per each subject.

	1.1	1.2	1.3	2.1	2.2	2.3
Business Processes and Protocols (2,3)				25		
Cloud and grid computing (7)						
Adaptation (1)		17				
Evolution (4)	6					
Quality of Service (5,12)			8			
Service Discovery (17)						4
Service Composition (16)					21	
Negotiation and QoS Agreement (10)			5			
Monitoring and Prediction (9)		11				
Lifecycle (21)	1					
Requirement Engineering (13)	7					
Service Design and Modelling Methodologies (14,18)	9					
Quality Assurance (11)			1			
Total	23	28	14	25	21	4

Table 2. Number of visits per subject per main WP.

The synergy of competences between hosting and visiting partners is highlighted in Table 11 (see Appendix C). This table indicates a synergy of research at different institutions.

Table 3 synthesizes the research visits by considering the pairs sending institution (lines) and hosting institution (columns). The numbers show that the situation has improved as now all institutions except

VUA have acted as sending institutions and all except SZTAKI and VUA have acted as hosts. VUA, however, is actually involved in mobility, both as a visitor and as a guest, but it is not claiming for funding for internal reasons. SZTAKI has significantly improved its performance in the last year, but, because of its geographical decentralization, has not attracted visitors so far.

		Hosting Institutions																
Visiting Institutions		**UniDue**	**Tilburg**	**CITY**	**CNR**	**FBK**	**INRIA**	**Lero-UL**	**SZTAKI**	**POLIMI**	**TUW**	**UCBL**	**UoC**	**UPM**	**USTUTT**	**UniHH**	**VUA**	**UPC**
	UniDue			1	1	1				1					2			
	Tilburg							1		1		2		2	3			
	CITY												1					
	CNR						1				1							
	FBK									1					1			
	INRIA			1												1		
	LERO-UL		1	2	1							1						
	SZTAKI			2	1						1				3			
	POLIMI		1	1									3		1			
	TUW		1		1									1	1			
	UCBL		2		2		1											
	UoC		1		1					1		2			2			
	UPM										3							
	USTUTT	1	1			1					1		2					
	UniHH														1			
	VUA																	
	UPC													1				
	T.U. Dortmund									1								

Table 3: Research exchanges between partners

3 Workpackage Coverage

Analyzing the reports concerning each visit, we have identified the association between visits and workpackages that is reported in Appendix C (Table 12). This association is summarized in Figure 1. On average we have about 17 visits per WP for the period M1-M30 and 21 visits per WP for the period M1-M36.

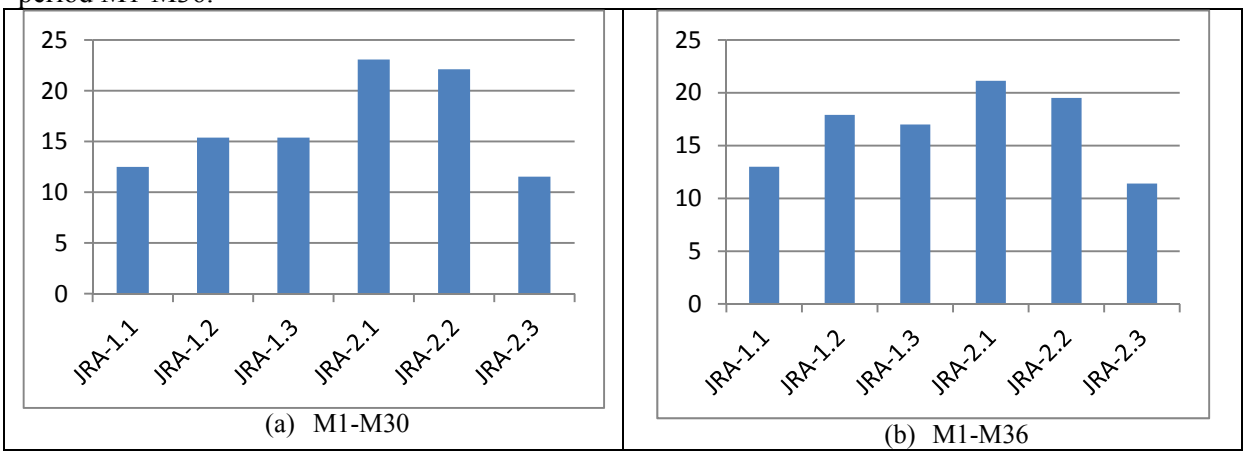

Figure 1: Percentage of research visits devoted to each workpackage

4 Integration Research Framework Coverage

The goal of this section is to perform a coverage analysis of mobility stays with respect to the S-Cube Integration Framework Baseline as defined in Deliverable CD-IA-3.1.1. The section is divided into two subsections covering the views "Reference Lifecycle" and "Runtime Architecture", respectively.

4.1 Coverage of the Reference Lifecycle View

Figure 2 shows the Reference Lifecycle and Table 4 shows how it has been covered through visits. Each visit in the table is identified by a unique ID, as defined in Table 9 (see Appendix B). Most results have addressed the "Requirements Engineering & Design" phase while "Early Requirements Engineering" and "Enact Adaptation" phases have clearly not been in the main focus. As far as the "Early Requirements Engineering" phase is concerned, this may be simply due to the fact that early requirement activities for service-based applications are not dramatically different from those undertaken when considering other kinds of applications. Therefore, the attention of the consortium to this phase has been low. As for the "Enact Adaptation" aspect, the small number of visits is due to the fact that S-Cube does not aim at building new enactment environments. Instead, it reuses the existing ones, either standard or developed by the partners in the context of other projects.

The relatively small number of visits concerned with the "Identify Adaptation Strategy" phase, instead, needs to be considered and possibly improved.

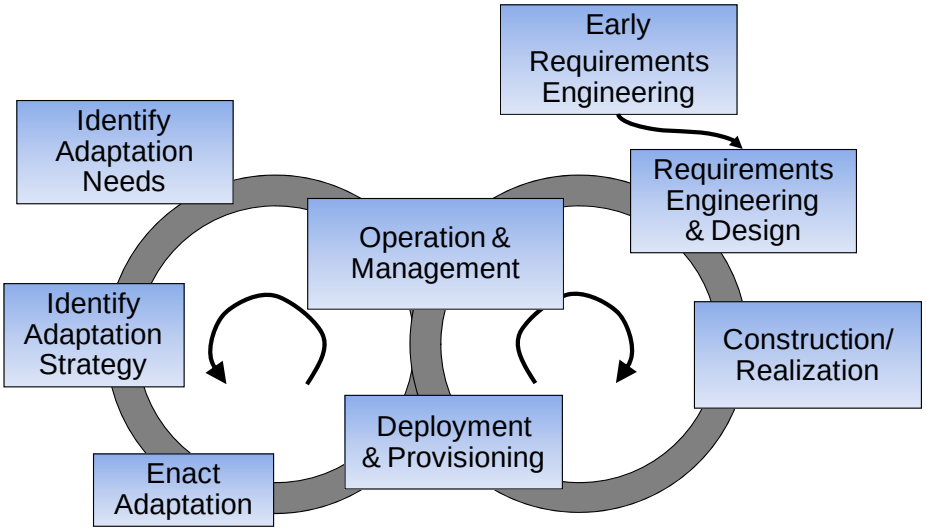

Figure 2: Reference Life Cycle View.

Lifecycle phase	**Visit ID**
Early Requirements Engineering	18, 19
Requirements Engineering & Design	1, 2, 3, 4, 5, 8, 9, 10, 11, 14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 34, 36, 37, 38, 41, 43, 44, 45, 48, 49, 50, 51, 52, 53, 55, 57, 58, 59, 62,68,67
Construction/Realization	1, 2, 5, 8, 14, 15, 17, 19, 21, 23, 24, 27, 28, 36, 38, 42, 44, 45, 48, 49, 50, 51, 52, 54, 57, 58, 61, 62
Deployment & Provisioning	2, 6, 7, 8, 17, 19, 20, 21, 33, 38, 43, 46, 48, 51
Operation & Management	2, 4, 10, 11, 12, 13, 17, 18, 19, 26, 32, 41, 48, 51, 55, 59, 67
Identify Adaptation Needs	2, 4, 6, 10, 11, 13, 16, 17, 18, 20, 29, 31, 32, 34, 35, 39, 40, 41, 43, 48, 51, 55, 64, 67
Identify Adaptation Strategy	16, 22, 29, 34, 35, 39, 40, 43, 64, 65

Enact Adaptation	7, 11, 12

Table 4. Mapping of visits to the lifecycle phases.

4.2 Coverage of the Runtime Architecture View

Figure 3 shows how the Runtime Architecture has been covered. Most of the performed work (see table 5) has addressed monitoring and adaptation engines and the service container, while the resource broker has not been addressed. This can be explained by the fact that this element is not considered to be critical by the S-Cube partners, as the focus is mainly on services and not on other kinds of web resources.

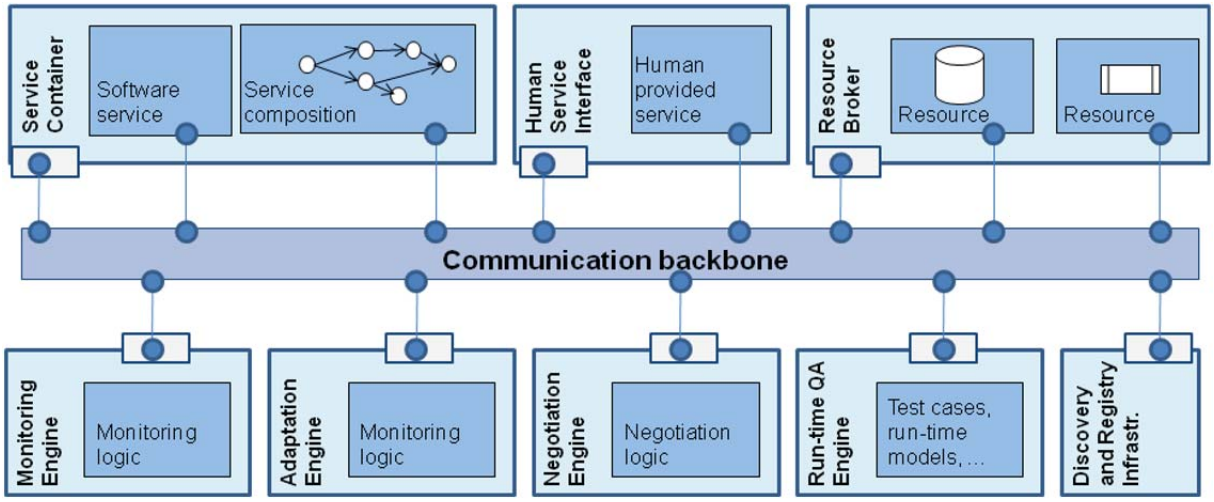

Figure 3: Runtime Architecture View.

Runtime Architecture elements	**Visit ID**
Service container	2, 4, 11, 20, 27, 28, 31, 32, 36, 38, 40, 42, 44, 57, 56, 62, 65, 67
Human service interface	28, 41, 49, 60
Resource broker	
Monitoring engine	2, 17, 18, 28, 31, 34, 39, 56, 59, 57, 62, 64, 65
Adaptation engine	11, 12, 16, 18, 22, 24, 29, 31, 32, 34, 39, 40, 43, 64, 65, 67
Negotiation engine	7
Runtime QA Engine	11, 18, 24, 30, 33, 40, 46, 47, 48, 63
Discovery and registry infrastructure	6, 17, 20, 37, 67

Table 5. Mapping of visits on the lifecycle phases.

5 Key Performance Indicators (KPIs)

In this section we analyze the mobility program based on a set of performance indicators. In particular we have included in our analysis the KPIs specified in the DoW as part of the S-Cube Key Objective (Obj-4) "Bonding of Research Staff". Table 6 shows the performance indicators measured on the whole consortium.

Metric	M1-M12	M13-M24	M25-M36	Overall
Number of research visits (KPI)	16	19	36	71
Number of participating researchers (as visitors) (KPI)	13	16	29	58
Number of participating S-Cube beneficiaries as visitors (KPI)	7	12	13 (+2)	16
Number of participating S-Cube beneficiaries as hosts	8	8	12	14
Average Duration per visit (in days)	10.5	8.12	7.72	8.78
Number of co-authored publications resulting from mobility (KPI)				27

Table 6: Performance Indicators

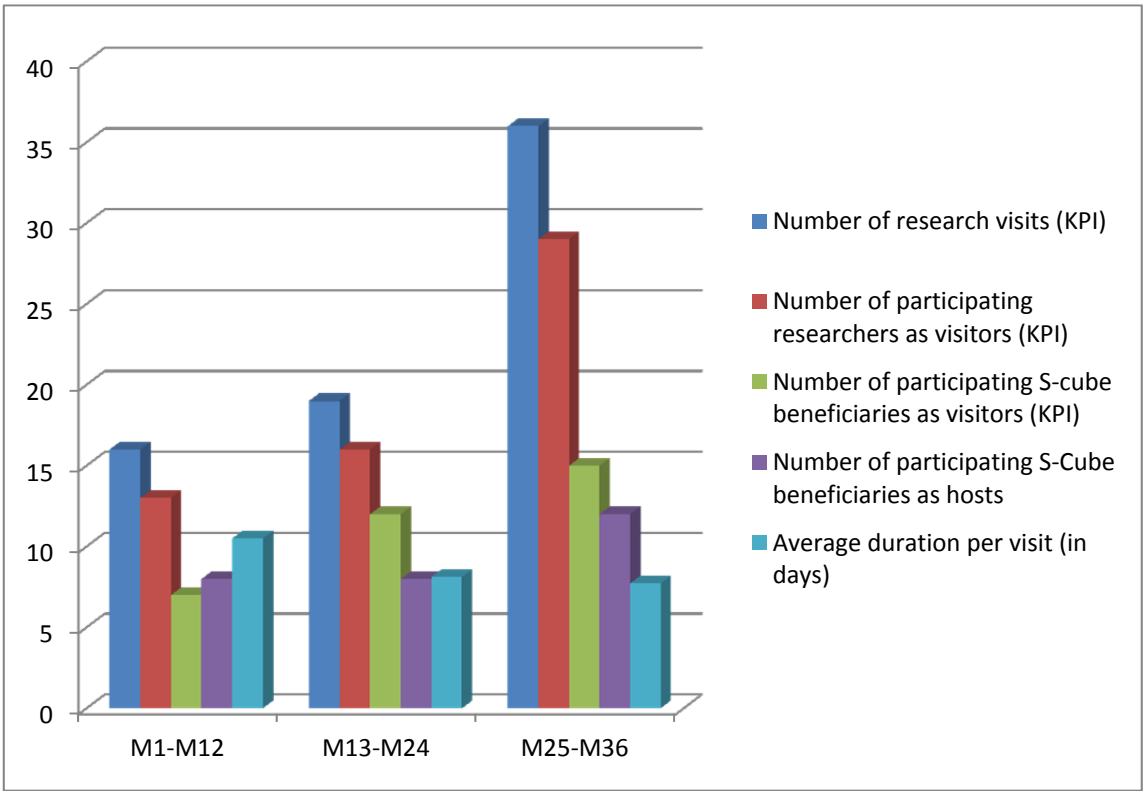

Figure 4: Variations of KPIs for the three years of the project

Table 6 and Figure 4 show that the number of mobility stays has significantly increased each year, even though they seem to have generated a slightly smaller number of publications. So far, the mobility stays have generated 27 joint publications (see Appendix D) and many others are in the publication queue.

As already shown in Section 2, all the partners have participated to the mobility program.

Concerning the volume of visits, the performance indicator on the DoW specifies that: "…each partner will have on the average two researchers visiting other institutes for a cumulative period extending on the average for up to four weeks (in total for both researchers) per annum…". Table 7 shows the corresponding data for each partner and whether it meets the targets in year 3.

Metric	Y3	Target
Cumulative duration of stays since the beginning of the project	588	
Average of visiting researchers per partner	~3.3	2
Cumulative period on the average per annum	~2.5	Up to 4

Table 7 shows the average volume of visits for each partner at year 3

For more details, Figure 5 shows the situation from the point of view of visiting institutions during two periods: M1-18 and M19-36. As it can be seen, there is a significant improvement for the mobility regarding, the number of visit between partners during the second period comparing the to the first one More than 95% of visits have been achieved in the second period comparing to the first one, the total duration visits increases about 47% in the second period, the total days visit per partner increases about 48%, the days/visit decreases due to the fact that the researchers know each other now, they start to work during short visit and continue working through skype and other devices.

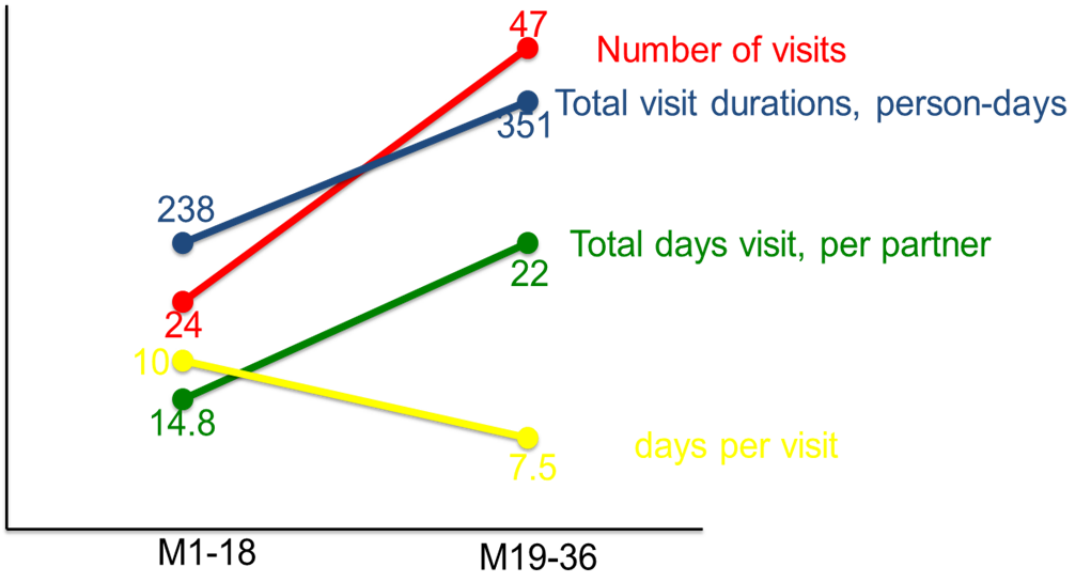

Figure 5. The situation from the point of view of visiting institutions during two periods: M1-18 and M19-36.

6 Summary of assessment

Table 9 summarizes our main findings and proposed intended actions to address the problematic situations.

Analyzed Aspect	Main Results and Identified gaps	Recommended actions
Scientific Subject Coverage	The following scientific subjects has not yet been covered: Cloud and Grid computing.	Encourage mobility on this uncovered subject. Some partners have already started investigating this issue.
Synergy of Competencies	Synergy of competencies has been clearly shown: In most cases there is a combination of competencies in a complementary way.	None
Workpackage Coverage	The workpackages are equally covered.	Additional effort, in terms of joint research through visits is required for workpackages JRA-1.1 and JRA-2.3.
Integration Framework Coverage	The integration framework is in general well covered. Some model elements are covered less in relation to the others, in particular: Reference Lifecycle: - Early Requirements Engineering - Identify Adaptation Strategy - Enact Adaptation Runtime Architecture - Resource Broker	The lack of coverage of the listed elements is generally not critical. The early requirement engineering phase and the resource broker component are not among the main focuses of the project. The phase "Identify Adaptation Strategy", instead, would require more care as it is part of the core focuses of the project. We will encourage the occurrence of more visits focusing on this aspect.
Indicator Evaluation	Considering the trend, there is an increase in the volume of mobility visits during the period M18-36 compared to the first period. As shown on Figure 4, the number of visits increases each year.	All partners should participate. The volume should be increased.

Table 7: Summary of Assessment Results

7 Definition of a vade-mecum for visitors and visiting organizations

The redefinition of subjects, as well as the explicit definition of the mappings between WPs and subjects, aims at offering to the institutions interested in visiting other institutions the information useful to correlate in the best way their mobility initiative to the S-Cube objectives. Another important tool to simplify mobility and to encourage its development consists in developing a vade-mecum for visitors and visiting organizations, that packages all needed pieces of information in the proper format and makes them available on the S-Cube portal under the mobility area. This vade-mecum should contain the information to be checked before organizing a visit and the process to be followed during and after the visit.

General information to be checked before organizing a visit

The aim of this information is to make all S-Cube partners aware about the possibilities offered by the mobility program as well as about the situation of partners and workpackages with respect to mobility. In particular, this section of the vade mecum will contain the practical guidelines published in Deliverable CD-IA-2.1.1 as well as the following data:

- Subject list (Table 10) and mapping on workpackages (Table 11)
- List of competences per partner (see Deliverable CD-IA-2.1.2)
- Coverage of subjects and WPs (Table 2 and 13)
- Visit performance of each partner (Tables 12 and 14)

Process to be followed during or after the visit

Information about this process is already partially available on the S-Cube portal, but it is encapsulated in a number of different pdf files. Thus, it is not immediately visible. Moreover, the process lacks an explicit definition of the information needed for assessing the result of mobility. This results in the fact that collecting all data and building the synthetic metrics provided in this report has been a cumbersome activity. To overcome this problem, we will explicitly require visitors to follow the steps listed below:

- Introduce information about visits even if they are not directly paid by the S-Cube mobility program. Of course, we will make sure that these visits are clearly distinguishable from the others. This process has already started.
- Select the subject of visit and indicate the WPs the visit is contributing to, by specifying the rationale for this choice.
- Indicate the deliverable the visit is contributing to.
- Indicate if the visit is a follow up of a previous visit (either performed by the same visitor or by another researcher from the hosting organization).
- Indicate the status of joint publications resulting from the visit. This part is supposed to be updated when new data are reported in the partner's quarterly report.

  All the information mentioned above is made available in the final reports the visitors should provide after completing their research stays.

8 Other actions to encourage mobility

Other actions to encourage mobility will be the following:

1. We will specifically focus on increasing the number of mobility initiatives impacting on JRA-2.3 and on the vertical workpackages (JRA-1.1, JRA-1.2, and JRA-1.3).
2. Cross-workpackages contributions will be encouraged, for instance, by allowing for longer staying in these cases.

3. The production of concrete outcomes out of each mobility initiative will be encouraged by explicitly asking all researchers to indicate these outcomes in their quarterly reports. This is done for visits from Month 24 to Month 36.
4. Associate partners will be actively involved in collaborations with the other S-Cube members, taking into account their specific competences and the way these complement the ones already existing in S-Cube.
5. Even if mobility funding cannot be used for refunding the "additional personnel" as established in the DoW, from Month 36 the mobility performance indicators will consider visits performed by these researchers as well.
6. Information about the best performing partners in terms of mobility will be periodically distributed to all partners. A presentation of the updated situation of mobility will be given at each global meeting to ensure partners' awareness.

9 Conclusions

This deliverable reports about the status of mobility at Month 36 and provides an evaluation of the current situation. The introduction in the S-Cube project of Associate Members will help covering the existing gaps. In particular, we expect an improvement for what concerns the subjects on Cloud and grid computing as partners with specific skills in these areas are now part of the NoE.

Please note that based on the analysis of the collected data, one notes that the number of research stays and outcome in terms of publications increase each year.

As a concluding remark, we highlight the fact that the current report does not provide a complete overview of all mobility initiatives as it reports only on those initiatives that have been funded by the mobility program. Other initiatives self-funded by the partners are not reported here. An updated version of this deliverable will report on this.

Appendix A

The following table lists the scientific subjects for mobility as described in CD-IA-2.1.4 (revision of the subjects defined in deliverable CD-IA-2.1.2).

Scientific Subject ID	***Scientific Subjects Titles***	***Common & Complementary Competencies***
1	Business Processes and protocols	Business Process Management, Distributed Business Processes, Business Processes & Protocols, E-Business, Business Process Analysis, Monitoring & Auditing, Business Protocol Languages, Multi-Party Business Protocols, Adaptation in Business Protocols, Service Networks, Business Transactions
2	Cloud and grid computing	Grid Scheduling, Grid Workflow, Grid Brokering, Load Balancing & Scheduling, Knowledge Sharing Networks
3	Adaptation	Self-Adaptation, Dynamic Adaptation of Parallel Programs, Engineering Adaptive Component-Based Systems, Adaptive Web Services, Adaptation in Business Protocols, Adaptation of Service

		Compositions, Engineering Adaptive Service-Based Systems, Self-Organising Systems, Self-Healing, Flexible & Self-Healing Web Services
4	Evolution	Service Evolution, Software Architecture Evolution, Dependable Evolvable Pervasive Service Engineering
5	Quality of Service	Quality Assurance, Quality of Service, Quality of Service in Component-Based Systems, Web Service Orchestration & QoS Optimisation, Monitoring QoS Metrics of Web Services , Data & Information Related Quality, Data-Related Quality
6	Service Discovery	Semantically-Enriched Service Discovery Mechanisms, Web Service Retrieval, Service Registries, Context-Aware Invocation of Web Services, Dynamic Binding & Invocation of Web Services, Discovery of Human-Based Services
7	Service Composition	Model-Driven Service Composition, Service Composition, Web Service Orchestration & QoS Optimisation, Service Choreography & Orchestration, Service Networks
8	Negotiation and QoS Agreement	Service Level Agreement (SLA) Negotiation, Quality Assurance Negotiation & QoS Agreement, Estimation of the Quality of Service Providers
9	Monitoring and Prediction	Monitoring, Service-Oriented Monitoring, Monitoring Design Principles & Monitoring Framework, Business Process Analysis, Monitoring & Auditing, Monitoring of QoS Metrics of Web Services, Monitoring of Key Performance Indicators, Prediction of KPIs
10	Lifecycle	Software Processes, Software Architecture, Software Engineering, Software Quality Assurance, Software Product-Line Engineering & Variability Management
11	Requirement Engineering	Requirements Engineering, Requirements & Model-Based

		Testing, User-Centred Requirements Engineering, User-Centred Requirements Engineering, User Centric Services
12	Service Design and Modelling Methodologies	Service-Centric Systems Engineering, Service Design & Modelling Methodologies, Model-Driven Service Composition, Model-Driven Engineering, Interaction Design & Research, Personalisation
13	Quality Assurance	Software Quality Assurance, Testing, Analysis, Monitoring, Prediction

Table 10. Revised mobility subjects.

	1.1	1.2	1.3	2.1	2.2	2.3
Business Processes and Protocols (2,3)				X		
Cloud and grid computing (7)						X
Adaptation (1)	x	X				
Evolution (4)	X					
Quality of Service (5,12)			X	x	x	x
Service Discovery (17)						X
Service Composition (16)	x				X	
Negotiation and QoS Agreement (10)			X	x	x	x
Monitoring and Prediction (9)		X		x	x	x
Lifecycle (21)	X					
Requirement Engineering (13)	X					
Service Design and Modelling Methodologies (14,18)	X				x	
Quality Assurance (11)			X			

Table 8. Mapping between subjects and WPs.

Appendix B

This section lists all mobility. Only visits with the start date lying within the first 30 months of the project are analyzed. The stays are sorted based on the start date of the stay.

No.	Researcher	Location	Destination	Start date	End date	Duration
1	Georgios Koutras	UOC	Tilburg	06.04.2008	19.04.2008	14
2	Branimir Wetzstein	USTUTT	TUW	07.05.2008	21.05.2008	15
3	Michele Mancioppi	Tilburg	UPM	09.05.2008	20.05.2008	12
4.a, b	Vasilios Andrikopoulos	Tilburg	UCBL	11.05.2008 11.06.2008	18.05.2008 25.06.2008	8 11
5. a, b	Olha Danylevych	USTUTT	UOC	14.05.2008 20.09.2008	28.05.2008 26.09.2008	15 7
6	F. M. Nardini & Gabriele Tolomei	CNR	TUW	09.06.2008	27.06.2008	19
7	Pierluigi Plebani	POLIMI	UOC	06.09.2008	20.09.2008	15

8	Ralph Mietzner[1]	USTUTT	UniDue	29.09.2008	02.10.2008	4
9	Michele Mancioppi	Tilburg	UPM	06.10.2008	16.10.2008	11
10	Andreas Gehlert[2]	UniDue	CITY	15.10.2008	17.10.2008	3
11	Andreas Gehlert & J. Hielscher[3]	UniDue	USTUTT	13.11.2008	14.11.2008	2
12	Luca Cavallaro	POLIMI	USTUTT	07.12.2008	16.12.2008	10
13	Martin Treiber	TUW	Tilburg	16.01.2009	30.01.2009	15
14	Olha Danylevych	USTUTT	Tilburg	07.02.2009	13.02.2009	7
15	Andreas Gehlert	UniDue	USTUTT	02.03.2009	06.03.2009	5
16	Raman Kazhamiakin	FBK	USTUTT	26.05.2009	30.05.2009	5
17	Konstantinos Zachos	CITY	UOC	03.06.2009	16.06.2009	14
18	Andreas Gehlert	UniDue	FBK	07.06.2009	10.06.2009	4
19	Stephen Lane	Lero-UL	CITY	15.06.2009	28.06.2009	14
20	Vanessa Le Roy	INRIA	CITY	15.06.2009	04.09.2009	14
21	François Hantry[4]	UCBL	INRIA	06.07.2009	07.07.2009	2
22	Cinzia Cappiello	POLIMI	CITY	20.07.2009	31.07.2009	12
23	Daniel Dubois	POLIMI	UoC	04.11;2009	14.11.2009	11
24	Voskakis Emmanouil	UoC	POLIMI	09.12.2009	13.12.2009	5
25	Vasilios Andrikopoulos	Tilburg	POLIMI	12.12.2009	18.12.2009	7
26	Deepak Dhungana	Lero	CITY	10.01.2010	23.01.2010	14
27	Michele Mancioppi	Tilburg	USTUTT	15.02.2010	28.02.2010	14
28	Dragan Ivanovic	UPM	TUW	20.02.2010	27.02.2010	8
29	Antonio Bucchiarone	FBK	POLIMI	23.02.2010	26.02.2010	4
30	Sandor Acs	SZTAKI	TUW	21.02.2010	26.02.2010	6
31	Branimir Wetzstein	USTUTT	FBK	21.02.2010	27.02.2010	7
32	Vasilios Andrikopoulos	Tilburg	USTUTT	24.02.2010	01.03.2010	6
33	Atilla Kertész	SZTAKI	CNR	01.03.2010	05.03.2010	5
34	Osama Sammodi	UniDue	CNR	01.03.2010	11.03.2010	11
35	George Baryannis	UoC	CNR	02.03.2010	05.03.2010	4
36	François Hantry	UCBL	Tilburg	14.03.2010	18.03.2010	5
37	Kreshnik Musaraj	UCBL	CNR	18.03.2010	29.03.2010	12
38	Stephen Lane	Lero	CNR	02.03.2009	05.03.2009	4
39	Erwan Daubert	INRIA	UniHH	07.03.2010	19.03.2010	13
40	Philipp Leitner	TUW	USTUTT	08.03.2010	19.03.2010	12
41	Philipp Leitner	TUW	CNR	02.03.2010	05.03.2010	4
42	Kristof Hamann	UniHH	USTUTT	14.03.2010	19.03.2010	6
43	Maurizio Giordano	CNR	INRIA	10.05.2010	15.05.2010	6

[1] The research stay of Ralph Mietzner at UniDue was less than one week as it served the purpose of discussing a very specific issue, namely the combination of previous research of UniDue on variability in software with previous research of USTUTT on variability in software as a service applications. The research stay served as an initial kickoff for further distributed collaboration on that specific issue resulting in a paper at PESOS [1].
[1] Mietzner, Ralph; Metzger, Andreas; Leymann, Frank; Pohl, Klaus: Variability Modeling to Support Customization and Deployment of Multi-Tenant-Aware Software as a Service Applications. In: Proceedings of ICSE 2009 Workshop - Principles of Engineering Service Oriented Systems (PESOS).

[2] The visit to CITY became necessary in order to discuss first ideas of a prospective collaboration between UniDue and CITY (namely wrt. context). In addition, the goal of this first meeting was to agree upon, set up and start writing the joint deliverable PO-JRA-1.1.3.

[3] The research visit at Suttgart was intended to integrate the ideas of three existing papers. This clear focus allowed us to efficiently work on a structure and on the main contents of the envisioned paper, which was later on finalized offline.

[4] The research stay lasts two days because it was mainly concerned with the presentation of an overview of concepts of model driven engineering and verification tools and discussion on related tools. Two days were sufficient to perform the analysis of existing approaches since the material was already prepared.

44	Martin Treiber	TUW	UPM	16.05.2010	29.05.2010	14
45	Mariana Karmazi	UoC	USTUTT	23.05.2010	28.05.2010	6
46	Andras Micsik	SZTAKI	USTUTT	24.05.2010	27.05.2010	4
47	Laszlo Kovacs	SZTAKI	USTUTT	24.05.2010	27.05.2010	4
48	Attila Kertesz	SZTAKI	USTUTT	24.05.2010	27.05.2010	4
49	Noel Carroll	LERO	Tilburg	31.05.2010	11.06.2010	12
50	Noel Carroll	Lero	UCBL/Paris	08.06.2010	11.06.2010	4
51	Manolis Voskakis	UoC	UCBL/Paris	08.06.2010	13.06.2010	6
52	Mariana Karmazi	UoC	UCBL/Paris	08.06.2010	13.06.2010	6
53	A.K.M. Rafiqul Haque	Tilburg	Lero	19.06.2010	10.07.2010	22
54	Olha Danylevych	USTUTT	UoC	21.06.2010	05.07.2010	15
55	Vasilios Andrikopoulos	Tilburg	UCBL/Paris	28.06.2010	09.07.2010	12
56	Marc Oriol Hilari	UPC	POLIMI	04.07.2010	09.07.2010	6
57	Dragan Ivanovic	UPM	TUW	20.07.2010	23.07.2010	4
58	Michele Mancioppi	Tilburg	USTUTT	03.08.2010	24.08.2010	22
59	François Hantry	UCBL	CNR	16.09.2010	19.09.2010	4
60	Voskakis Emmanouil	UoC	UCBL/Paris	08.06.2010	13.06.2010	6
61	Mariana Karmazi	UoC	USTUTT	10.07.2010	18.07.2010	9
62	Dragan Ivanovic	UPM	TUW	02.10.2010	11.10.2010	9
63	Thomas Röblitz	T.U. Dortmund	POLIMI	13.10.2010	15.10.2010	3
64	Eric Schmieders	UniDue	POLIMI	14.10.2010	15.10.2010	2
65	Andras Micsik	SZTAKI	CITY	02.11.2010	05.11.2010	4
66	Attila Kertész	SZTAKI	CITY	02.11.2010	09.11.2010	8
67	Pierluigi Plebani	POLIMI	Tilburg	14.11.2010	17.11.2010	4
68	Salima Benbernou	UCBL (Paris)	Tilburg	07.10.2010	08.10.2010	2
69	Ali Imran Jehangiri	T.U. Dortmund	POLIMI	13.10.2010	15.10.2010	3

Table 9: List of Mobility Stays

Appendix C

The following table (Table 10) gives, for each performed visit (in the rows), the covered scientific subjects for mobility, as specified in the previous Deliverable CD-IA-2.1.2. The table column numbers refer to the list of scientific subjects (Appendix A). Visits from 1 to 22 are those that occurred in the first 18 months of the project and already reported in CD-IA-2.1.3.

Id	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
1	X												
2	X				X		X		X				
3	X												
4.a				X								X	
4.b				X								X	
5.a	X						X					X	
5.b	X						X					X	
6	X					X	X					X	
7						X		X					
8										X	X	X	
9	X												
10			X						X	X			
11			X				X			X			
12			X				X						
13									X				
14	X						X						
15	X									X	X		
16	X		X		X		X		X			X	
17	X				X		X		X				
18											X	X	
19	X				X		X		X				
20	X		X			X	X						
21	X												
22	X					X							
23	X		X									X	
24	X		X									X	
25							X						
26				X	X								
27							X						
28							X		X				
29			X						X		X		
30									X				
31					X								X

32			X	X									
33			X	X									
34	X								X				
35			X										
36	X												
37	X												
38			X										
39	X		X						X				
40			X				X	X					
41	X												
42	X							X					
43			X										
44							X						
45	X						X						
46								X					
47							X						
48							X						
49	X						X						
50	X												
51	X						X						
52	X						X						
53	X						X						
54							X						
55				X									
56					X				X				
57					X		X		X				
58	X												
59	X												
60	X				X		X						
61							X						
62					X								
63								X					
64			X										
65			X		X								
66			X		X			X					
67				X		X					X		
68				X				X					
69								X					

Table 10: Research Topics of Visits – Scientific Subjects for Mobility

Table 16 shows which of the competencies that partners have declared in the Knowledge Model (glossary, see CD-IA-2.1.2) have been exploited during the visits. For example, for the mobility

initiative number 1, titled Service Systems and Business Process Management, UoC's expertise in service networks has been combined with Tilburg's competency in business processes and service composition. Note that only the partner competencies relevant for the topic have been listed here. The table clearly indicates a synergy of research at different institutions.

Id	Research topic	Partner 1	Competencies of partner 1	Partner 2	Competencies of partner 2
1	Service Systems and Business Process Management	UoC	Service networks	Tilburg	Business processes, service composition
2	Monitoring and Analysis of Influential Factors of Business Process Performance	USTUTT	Performance indicators Monitoring Process analysis	TUW	KPI Monitoring
3	Business Protocol Soundness	Tilburg	Business Process Languages Process execution	UPM	Business protocols Compatibility
4 a, b	Controlled Evolution of Services	Tilburg	Service choreography Service evolution	UCBL	Business protocol languages
5 a, b	Service Networks on top of the BPM layering stack	USTUTT	Business processes Modeling Performance indicators	UoC	Level of services Service specification
6	Internet of Services (IoS): bring human inside the workflow of software services	CNR	Grid workflow	TUW	Service Discovery, Service Architectures
7	Semantic based negotiation	POLIMI	Service negotiation	UoC	Ontologies for services Semantics
8	Configuration and deployment of SaaS applications using techniques from software product lines	USTUTT	Enterprise application integration ESB	UniDue	SBA
9	Replaceability and conformance analysis for business protocols	Tilburg	Formal specification Service analysis	UPM	Business protocols Compatibility
10	Exploiting codified human interaction (HCI) and context knowledge for engineering, monitoring and adapting service-based applications	UniDue	Requirements analysis	CITY	Human computer interaction Requirement analysis engineering
11	Integrating requirements engineering, online testing and adaptation of workflows	UniDue	Requirements analysis/engineering Testing	USTUTT	Integration Adaptation mechanisms

12	Comparison between *SCENE* and BPEL'n'Aspects	POLIMI	Design for adaptation	USTUTT	Business processes
13	Calculating Service Fitness in Service Networks	TUW	KPI monitoring	Tilburg	QoS monitoring
14	Service Networks and Service Compositions	USTUTT	Service choreography Modeling Performance indicators	Tilburg	Service choreography Service specification Evolution
15	The interface between requirements engineering and workflows	UniDue	Requirement engineering	USTUTT	Workflow
16	Adaptation of SBAs based on process quality factor analysis	FBK	(Self) Adaptation SBA analysis	USTUTT	KPI BP analysis
17	Enhancing Service Network Analysis and Service Selection using Requirements-based Service Discovery	CITY	Service discovery	UoC	Quality of service Service discovery
18	The role of assumptions in the engineering and adaptation processes of service-based applications.	UniDue	Adaptation requirements Adaptation strategies	FBK	Adaptation mechanisms Business process modeling
19	Primary Research on Software Process for SBA Development	LERO	"Industrial expertise"	CITY	User-centered requirements engineering
20	Replacement policies for dynamic Adaptation of SBAs	INRIA	Adaptation requirements Adaptation mechanisms	CITY	Service composition
21	Paradigm of model management, refinement, consistency, model checker	UCBL	Business Process Languages	INRIA	Verification
22	Designing Adaptive Service-based Applications using Service Granularity	POLIMI	Adaptation requirements Design for adaptation	CITY	User-centered requirement engineering Requirements analysis
23	Service Networks on top of BPM Layering stack	POLIMI	Business processes	UoC	Model-driven engineering
24	Service Networks on top of BPM Layering stack	UoC	Model-driven engineering	POLIMI	Business processes
25	QoS contract evolution	Tilburg	Contracts, evolution approaches	POLIMI	Formal specifications

26	Service engineering – reuse - contextual information	Lero-UL	Service engineering	CITY	Context-based information
27	Fragmentation and business Process transaction	Tilburg	Process transactions	USTUTT	fragmentation
28	Modeling dynamic behavior and provision of service composition	UPM	Modeling dynamic behavior and verification	TUW	Service composition
29	Context modeling of adaptable SBA – service engineering and design service adaptation and monitoring	FBK-IRST	Monitoring – adaptation	POLIMI	Service engineering
30	SLA-based resource virtualization	SZTAKI	virtualization	TUW	Quality assurance
31	Adaptation of service based applications – KPIs	USTUTT	KPI	FBK	Adaptation
32	Evolution and adaptation of services	Tilburg	Evolution and adaptation	USTUTT	Evolution and adaptation
33	Deployment and management and self-* service execution	SZTAKI	Deployment of services	CNR	Service management
34	Quality prediction to support proactive adaptation	UniDue	Quality of service	CNR	Adaptation
35	Monitoring and adaptation	UoC	Monitoring and adaptation	CNR	Monitoring and adaptation
36	BPM transactions – business rules and SLA	UCBL	Formal specifications	Tilburg	Business rules
37	Mining business protocols	UCBL	Mining protocols	CNR	Mining techniques
38	Configuration management process for service-based applications – quality assurance	Lero-UL	Software process aspects	CNR	Service specific expertise
39	Adaptation and monitoring	INRIA	Generic adaptation framework	UniHH	Monitoring
40	Aspect-based adaptation	TUW	Predictions on SLA	USTUTT	Aspect-based adaptation of services
41	SLA Violation	TUW	Predictions on SLA	CNR	Process mining
42	Business transactions	UniHH	Business transactions	USTUTT	Business transaction models
43	Non-conventional computing models for	CNR	Workflow formalization – based on chemical computation models	INRIA	Higher order programming languages

	service adaptation				Non-conventional programming languages
44	Dynamic service composition model	TUW	Dynamic system models	UPM	Behavior analysis
45	Service networks	UoC	QoS, Service discovery	USTUTT	Workflows
46	Deployment and management of service and self-*in service execution	SZTAKI	Deployment, service execution	USTUTT	Workflows
47	Deployment and management of service and self-*in service execution	SZTAKI	Deployment, service execution	USTUTT	Workflows
48	QoS monitoring	SZTAKI	QoS monitoring, ontological modeling	USTUTT	Monitoring, workflow
49	Service Networks and social networks analysis	LERO	Service-oriented business model	Tilburg	Business process management
50	Business Process Management	LERO	Service networks	UCBL (Paris)	Business transaction languages, performance analytics
51	Service networks – simulation, system dynamics, BP management and performance analysis	UoC	Business process management	UCBL (Paris)	Business process management
52	Service Networks metamodel	UoC	Simulation of SNs	UCBL (Paris)	Transactions, simulation
53	Business Transactional Process Fragments	Tilburg	Business processes and transactions	LERO	Service-oriented business model
54	Service Networks – meta models	USTUTT	Service networks	UoC	modeling
55	Service evolution while preserving interoperability	Tilburg	Service evolution	UCBL (Paris)	interoperability
56	Quality of Service for service composition	UPC	QoS monitoring	POLIMI	QoS monitoring
57	Quality of Service for service composition	UPM	Service Composition	TUW	QoS
58	Process fragments (syntactic structure)	Tilburg	BP management and transactions	USTUTT	Process fragments design and specification
59	Formal model for business aware transaction management	UCBL	Logic-based approach for transactions	CNR	SLA, business rules
60	Service Networks on top of the BPM layering stack (Performance analytics	UoC	Simulation, performance measures	UCBLM (Paris)	Formal issues

	of service networks: A systems dynamics approach)				
61	Service networks	UoC	Service network's metamodel for constructing service network models	USTUTT	Service networks metamodeling
62	Dynamic modeling of quality of service: testbeds	UPM	Modeling, service composition	TUW	QoS
63	SLA-based Resource Management of Virtual Plateforms	T.U. Dortmund	Monitoring, adaptation strategies, elearning	POLIMI	Discussions with several partners: INRIA, FBK, USTUTT, POLIMI, ..
64	Evaluation of existing model checkers in the context of proactive adaptation	UniDue	Proactive adaptation capabilities	POLIMI	Model checking,
65	Quality prediction and quality based adaptation	SZTAKI	Contexts with web services and HCI aspects of web services access	CITY	Conxt-based information, HCI
66	Discussion about possible cross WP between JRA-1.2 and JRA-2.3	SZTAKI	Contexts with web services and HCI aspects of web services access	CITY	HCI approaches (CITY) + Discussion with other partners of S-Cube
67	Evolution, service discovery	POLIMI	Service retrieval	Tilburg	Service evolution
68	Service evolution and contract	UCBL (Paris)	Modeling of contracts	Tilburg	Evolution of services
69	SLA-based Resource Management of Virtual Plateforms	T.U. Dortmund	Monitoring, adaptation strategies, elearning	POLIMI	Discussions with several partners: INRIA, FBK, USTUTT, POLIMI, ..

Table 11: Research subjects of the visits – competencies of the partners

Table 12 shows, for each performed visit, the covered research topic and the related workpackages in whose deliverables the results will be described. This information has been derived, where possible, from the field "Related to S-Cube WPs/Deliverables" in the mobility stay descriptions. For example, the research stay number 2 regarding "Monitoring and Analysis of Influential Factors of Business Process Performance" is concerned with the workpackages JRA-2.2 and JRA-1.2 and its results have been or will be described in corresponding deliverables in these workpackages.

Id	Research Topic	JRA-1.1	JRA-1.2	JRA-1.3	JRA-2.1	JRA-2.2	JRA-2.3
1	Service Systems and Business Process Management				X		
2	Monitoring and Analysis of Influential Factors of Business Process Performance		X			X	
3	Business Protocol Soundness				X	X	
4a, b	Controlled Evolution of Services	X	X				

5a, b	Service Networks on top of the BPM layering stack				X	X	
6	Internet of Services (IoS): bring human inside the workflow of software services				X	X	X
7	Semantic based negotiation			X			
8	Configuration and deployment of SaaS applications using techniques from software product lines	X					
9	Replaceability and conformance analysis for business protocols				X	X	
10	Exploiting codified human interaction (HCI) and context knowledge for engineering, monitoring and adapting service-based applications	X					
11	Integrating requirements engineering, online testing and adaptation of workflows	X		X		X	
12	Comparison between *SCENE* and BPEL'n'Aspects		X		X	X	
13	Calculating Service Fitness in Service Networks			X	X	X	
14	Service Networks and Service Compositions				X	X	
15	The interface between requirements engineering and workflows	X				X	
16	Adaptation of SBAs based on process quality factor analysis		X			X	
17	Enhancing Service Network Analysis and Service Selection using Requirements-based Service Discovery		X	X			
18	The role of assumptions in the engineering and adaptation processes of service-based applications.	X	X				
19	Primary Research on Software Process for SBA Development	X		X			
20	Replacement policies for dynamic Adaptation of SBAs	X	X				
21	Paradigm of model management, refinement, consistency, model checker			X	X	X	
22	Designing Adaptive Service-based Applications using Service Granularity	X					
23	Service Networks on top of BPM Layering stack				X		
24	Service Networks on top of BPM Layering stack				X		
25	QoS contract evolution			X			
26	Service engineering – reuse - contextual information	X					
27	Fragmentation and business Process				X		

	transaction						
28	Modeling dynamic behavior and provision of service composition					X	
29	Context modeling of adaptable SBA – service engineering and design service adaptation and monitoring	X	X				
30	SLA-based resource virtualization			X			X
31	Adaptation of service based applications – KPIs		X				
32	Evolution and adaptation of services	X				X	
33	Deployment and management and self-* service execution						X
34	Quality prediction to support proactive adaptation			X			
35	Monitoring and adaptation		X			X	
36	BPM transactions –business rules and SLA			X	X	X	
37	Mining business protocols				X		
38	Configuration management process for service-based applications – quality assurance			X			
39	Adaptation and monitoring		X				X
40	Aspect-based adaptation		X				
41	SLA Violation			X			
42	Business transactions				X		
43	Non-conventional computing models for service adaptation						X
44	Dynamic service composition model						X
45	Service networks				X	X	X
46	Deployment and management of service and self-*in service execution		X	X			X
47	Deployment and management of service and self-*in service execution		X	X			X
48	QoS monitoring		X			X	X
49	Service Networks and social networks analysis				X		
50	Business Process Management				X		
51	Service networks – simulation, system dynamics, BP management and performance analysis				X	X	
52	Service Networks metamodel				X		
53	Business Transactional Process Fragments				X		
54	Service Networks – meta models				X		
55	Service evolution while preserving interoperability	X	X				
56	Quality of Service for service composition			X		X	X

57	Quality of Service for service composition			X		X	X
58	Process fragments (syntactic structure)					X	
59	Formal model for business aware transaction management				X		
60	Service Networks on top of the BPM layering stack (Performance analytics of service networks: A systems dynamics approach)				X	X	
61	Service networks				X	X	
62	Dynamic modeling of quality of service: testbeds			X			
63	SLA-based Resource Management of Virtual Plateforms		X	X			
64	Evaluation of existing model checkers in the context of proactive adaptation		X				
65	Quality prediction and quality based adaptation		X	X			
66	Discussion about possible cross WP between JRA-1.2 and JRA-2.3	X	X				X
67	Evolution, service discovery	X					X
68	Service evolution and contract	X	X	X	X		
69	SLA-based Resource Management of Virtual Plateforms		X	X			

Table 12: Research subject of visits – S-Cube workpackages

Appendix D

This appendix summarizes the outcomes of the research stays per subject (as defined in Deliverable CD-IA-2.1.2).

	Scientific Subject for Mobility	**Visits devoted to the subjects**	**Addressed Challenge**	**Outcomes**
1	Adaptation	TUW→USTUTT	Aspect-based adaptation and monitoring	Publication: [1]
		SZTAKI→USTUTT	Chemical programming approaches for multi-level adaptation and cross-cutting issues of service infrastructure and service composition.	
		CNR(Naples) →INRIA	An approach to dynamic adaptation in order to accommodate the continuous evolution of SBA environments.	Implementation and experimentation of the chemical-based workflow instantiation process [7]
		FBK→USTUTT	Run-time adaptation in a proactive way to avoid KPIs violations.	Publication: [9] Others in progress
		FBK→POLIMI	Context-based adaptation	Publication: [10]
		UniDue→POLIMI	Evaluating exiting model checkers in the context of an adaptation approach Comparison of various approaches on various part of the adaptation process.	Comparison of the monitoring phase using different frameworks. Comparison of complete adaptation systems
		INRIA→UniHH		
		UniDue→UniMunster	Design of techniques that can be utilized to adapt	Investigation of strategies to cleanly integrate adaptation approaches

			applications proactively	
2	Business Processes	LERO→Tilburg	Service Design and Modelling Methodologies	Publication: [27]
		POLIMI→UoC	Identification of patterns in existing service networks and exploit them to reorganize the network by adding the capability to rapidly react to dynamic environment conditions and to changes in business requirements.	Publication: [6]
		UniHH→USTUTT	Design of a common meta model for Business Transactions	A paper dealing with the concept of business transaction which is planned to be integrated in the Deliverable CD-JRA-2.1.5. Publication under progress.
		UCBL→Tilburg	Formal underpinnings of a business aware transaction management language for design time , execution , runtime-monitoring, analysis and reuse time	Publication: [26]
3	Business Protocols	Tilburg→UPM	Study formalisms for the definition of business protocols with time constraints, and analyze their soundness.	Publication: [11]
		Tilburg→USTUTT	The refinement of the classification of fragmentation of service compositions.	Submitted publication: [12]
4	Evolution	POLIMI→Tilburg	Combining service retrieval and service compatibility	[2] (submitted)
		Tilburg→UCBL	An approach to	Publication: [18, 20,

			contract-based evolution in SBA	21]
		Tilburg→POLIMI	Design of an approach to QoS contracts	Publication: [19]
		Tilburg→USTUTT	Adapting a service composition to new requirements or changes to the composition context	Potential connections with service composition and the impact of change of the service composition to the service context were investigated.
5	Information Quality			
6	Interaction			
7	Grid Computing	SZTAKI→CNR	Formal Models for QoS-Aware Service Compositions, and Deployment and execution management	Discussion on how model checking can be applicable in models for service management in the future
		POLIMI→IBM Haïfa	Impact of optimization approaches for dynamic placement of virtual servers in cloud environment	Theoretical and experimental frameworks built. Publications planned
8	Model-Driven Engineering			
9	Monitoring	SZTAKI→CITY	Methodologies of monitoring and adaptation approaches in distributed systems such as Grids and Clouds	Preparation of Deliverables JRA-1.2 and JRA-2.3
		UPC→POLIMI	Monitoring for quality of service	Initial model for QoS monitoring
		USTUTT→TUW	Implemented an integrated KPI monitoring and analysis approach	Publications: [22, 23]
		City→UoC	The develop a process model for KPI-driven service discovery to enhance SN analysis and service selection.	Publication: [24]

		UPM→USTUTT	Static analysis (in principle, using dependency analysis) of business process implementations to help discard spurious / collateral events which are not related to the main effect under study.	Experiments in progress
10	Negotiation & QoS Agreement	SZTAKI→TUW	SLA-based Resource Virtualization architecture extended with autonomic operation and enhanced SLA propagation and assurance	[3, 5] (publications) [4] (research report)
11	Quality Assurance	UNiDue→CNR TU_Dortmund→POLIMI	Design of an approach to support proactive adaptation decisions by augmenting monitoring with online testing to predict failures with confidence Iinvestigating of a multi-layer eLearning system at TU Dortmund.	Publication: [25] Monitoring data gathered
12	Quality of Service	UPM→TUW	Prediction and analysis of QoS for service orchestration	Publication: [8] Journal publication: in progress
13	Requirements Engineering			
14	Service Architectures	Lero-UL →VUA	How to use Service Oriented Architecture (SOA) to address the challenges faced by Global Software Development (GSD).	Publications: in progress
15	Security			
16	Service Composition	UoC→CNR	Service compositions using a variety of composition models	A novel approach for the automatic creation of specifications of services and service compositions more suitable for

				verification.
		Tilburg→USTUTT	The investigation of fragments and change operators for service choreographies.	Technical report: [13]
		USTUTT→UoC	Design of mechanisms to transform Service Value Networks into executable runtime artifacts	Publications: [14, 15, 16]
		USTUTT→Tilburg	Classification of fragmentation approaches of service compositions	Submitted publication: [17]
		USTUTT→UoC	Comparison of the perspectives of the institutions on Service Networks. Refinement of the Service Network Modeling Notation.	A paper will be submitted to EOMAS2011
17	Service Discovery	POLIMI→Tilburg	Combining service retrieval and service compatibility	[2] (submitted)
18	Service Design & Modelling Methodologies			
19	Service-Oriented Computing			
20	Service Oriented Software Engineering			
21	Software Engineering Life-Cycle	Lero-UL → VUA	To establish whether there is a value in researching the Global Software Process as a Service	Publication: in progress
22	User-Centred Requirements Engineering			

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