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Management Summary

In this deliverable, the identification of the industrial alignment needs with industry are discussed. In the first part of the report, requirements emerging from the scenarios and business cases considered in S-Cube are matched with the research roadmap of S-Cube. This gap analysis helps identifying research topics and areas that are in need of alignment. This deliverable reports preliminary results, which will be extended and detailed in the upcoming CD-IA-2.2.4 deliverable. Then the report analyzes the contacts with industries which have been pursued so far in the project and the initiatives that have been taken. On the basis of the results of these efforts and of the comments received during the second year review, this report delineates a strategy for achieving the goals that S-Cube has set with respect with interaction with industries and proposes a plan to be implemented in the second part of the project.

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Center for Scientific and Technological Research	Italy
The French National Institute for Research in Computer Science and Control	France
Lero - The Irish Software Engineering Research Centre	Ireland
Politecnico di Milano	Italy
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The S-Cube Deliverable Series

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.

S-Cube materials are available from URL: http://www.s-cube-network.eu/

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1 Introduction

While the objective of S-Cube is to produce innovative research results in the area of service engineering taking into account requirements from industry and industrial platforms development, being a Network of Excellence, S-Cube does not involve industrial partners. This can be seen as an obstacle to the grounding of results achieved by the network on the current best practices and problems of industry and to the actual experimentation of these results on a concrete basis.

The goal of Work package IA-2.2 is to create links with industry, to present and discuss results from the research to relevant industrial players, and to benefit from industrial experience.

While in deliverable PO-IA-2.2.1 an analysis of industrial state of the art has been performed based on questionnaires, and in CD-IA-2.2.2 industrial case studies have been collected and analyzed, in the present project outcome (PO-IA-2.2.3) we describe activities performed or organized with two goals: on one end, to foster industrial interaction, and on the other end, to base research work on the case studies collected in the previous activities that represents the industrial needs.

Several integration activities in S-Cube are being performed, and there is a need to keep them aligned in order to achieve the common integration goal. In particular, Integration activities performed for Validation of research and for the development of an integrated framework need to be considered as a basis for developing a common strategy for analyzing case studies and for developing pilot cases for the project. Vice versa, validation activities need to consider real examples as they are emerging from the collected case studies, and a strategy for setting a concrete basis for validation needs to be developed.

To these aims, several activities have been started in the last period, namely:

- coordinated activities with IA-3 Integration Framework for Service-based Applications, to have a synergetic approach to integration in S-Cube from different points of view
- an analysis of the case studies with respect to the S-Cube life cycle proposed in the integration framework being developed in IA3.1 has started

As a result, a common workplan has been developed to achieve these goals, which encompasses all the integration activities. The detailed workplan for defining validation scenarios is described in PO-IA-3.2.1. Within this workplan, a goal has been to keep a reference to the cases studies in the validation scenarios. As validation scenarios emerge, they will be analyzed with respect to the already defined case studies and their detailed description will be used to extend or specialize the case studies.
The research work done in JRA 1 and JRA 2 is strictly interlinked to this deliverable PO-IA-2.3.1 and the following deliverable CD-IA-2.2.4. In particular, JRA 1 and JRA 2 will consider the case studies defined in IA-2.2.2, refine its scenarios and use those scenarios to validate workpackage specific research results such as approaches, techniques and methods. The research WPs scenarios used for the validation are fed back to IA-2.2 in order to be harmonized and aggregated, refining the case studies with details related to the use of S-Cube research results within the proposed scenarios.

In addition to the work related to development and refinement of case studies, several initiatives have been experimented to get feedback from industrial partners of research results and to gather new research requirements from them. Some initiatives are related to the presentation of the S-Cube case studies and their relationships with the project research goals to industrial partners. Other initiatives have been taken with the objective of getting feedback from industrial partners and participating in international research strategies development as a result from S-Cube. These initiatives are discussed]in detail in Section 4. The organized initiatives have highlighted difficulties to obtain information about the industrial research agenda and in establishing long lasting contacts with industry. In order to improve this situation, in the deliverable, in the appendix, we introduce a new communication strategy

that aims at promoting the research results of S-Cube, which will be the basis for interaction with industry in the following of the project.

2 Purpose of the Deliverable

The purpose of deliverable PO-IA-2.2.3 as stated in the DoW is to match industrial requirements emerging from the scenarios and business cases with the research roadmap of S-Cube. This gap analysis has the goal of revealing research topics and areas that are in need of alignment. In addition, when large gaps are identified it might be necessary to involve additional industrial or research organisations in order to cover the expertise needed. A call for additional partners has been issued in September 2009 also on the basis of this analysis.

The present deliverable will also contribute to deliverable CD-IA-2.2.4: Report on common of pilot case, in which documented pilot cases will substantially help to integrate research activities across various S-Cube work packages and domains by providing a focus on central research challenge of practical relevance. The work performed is mainly relevant to Task T-IA 2.2.2: Establishing Pilot Industrial Cases, in which the aim is to establish common pilot cases between the industrial collaborators and S-Cube beneficiaries. The aim of pilot cases is to define a practical context to be used to gather specific requirements from industrial collaborators, to exemplify how the S-CUBE results would work in practice, and to define reference cases for the entire community.

In this deliverable we illustrate how the integration activities for an alignment with European Industry Practices have been conducted. We show how the analysis of case studies against the integration framework is progressing and also the results from the gap analysis. We illustrate how the definition of the case studies is being performed by actively collaborating with Work package IA-3.2, working of validation of research. The goal is to create a base of case studies to validate advanced research. This will be performed on an industrial basis.

Finally, the deliverable illustrates the activities being performed to activate the interaction with industrial partners within the Task T-IA-2.2.3 Alignment with Industrial Research Agenda. The activities, illustrated in Section 4, were aimed at creating opportunities to meet with representatives from industries to get feedback on research results and to contribute to the development of research agendas and of new interaction opportunities with industries. The results and critical points of the activities are analyzed, and a new plan is proposed in the appendix.

2.1 Definition of terms

The DoW sometimes uses a divergent terminology for IA-2.2 and for IA-3. In the following we distinguish between:

- *Case Studies* (synonyms in DoW: use cases): Case studies are real or realistic life problems contextualized within the corresponding application domain. A case study description introduces the relevant vocabulary of the domain (glossary), the business goals and domain assumptions the considered problem is based on, the actors involved in the scenario, their relationships and dependencies, and a number of coarse-grained scenarios or situations that show how the actors interact in order to fulfil the business goals, given the domain assumptions. We aim at developing case study descriptions that are completely independent from specific technological solutions so that the case study can be flexibly used to identify, develop and evaluate different technological solutions.
- *Validation Scenarios*: Validation scenarios are always related to case studies and describe possible ways the actors in a case study behave. Typically this behaviour is defined by sequences of activities within this case study. In this way the case study and possibly one or more of its coarse-grained scenarios is refined. In general validation scenarios are collected

with one of the research activities defined in JRA 1 and JRA 2 work packages, focusing on specific research goals.

- *Pilot cases* (in some contexts used as a synonym of case studies)*:* Pilot cases within the project will be defined as consolidated case studies, in which validation scenarios have been integrated and harmonized, to be released as reference cases to be used by the research community as a basis for analysis and comparison of methods and techniques. The aim of pilot cases is to define a practical context to be used to gather specific requirements from industrial collaborators, to exemplify how the S-CUBE results would work in practice, and to define reference cases for the entire community.

3 Alignment between Scenarios and Integration Framework

The goal of this section is to perform a systematic analysis of the scenarios collected in the integration activities to analyze their ability to provide a good coverage of research needs emerging from case studies, towards the definition of reference cases of wide applicability.

We first consider the coverage of the scenarios with respect to the Integration Frameworks defined in [3], then from this analysis we derive considerations on potential gaps.

This section is therefore divided into five parts. Each of the first three parts deals with one of the views on the framework (see [3]): “Conceptual Research Framework”, “Lifecycle” and “Runtime Architecture”. These chapters deal with the question whether there are any framework elements that are not covered by the scenarios. They comprise short descriptions and figures of the views which originate from “CD-IA-3.1.1 Integration Framework Baseline”. The fourth part concerns the other “direction”. The leading question is, if there are any scenario aspects, which are not covered by the framework? The fifth part summarizes the identified gaps.

The scenarios analyzed in this section, which will be refined and harmonized in creating common pilot cases in deliverable CD-IA-2.2.4, have been collected jointly with IA-3 for validation purposes. IA-2.2 has the goal of coherently aligning the new scenarios to the existing case studies and will extend and/or modify the case studies where necessary. A common guidelines document has been produced jointly by the two Integration Activities, listing requirements from the Industrial case studies analysis point of view (IA-2) and validation and integration framework point of view (IA-3).

As the basis for the alignment the following scenarios have been proposed and are being analyzed:

ID	Scenario	Related Case Study	Proposer
Purchase_Order_Processing_01	Purchase Order Processing	Automotive	UniDue and USTUTT
Message-wrapper-example-1	Web service message wrapper	E-Government	UniDue and USTUTT
Number-porting-example-1	Telephone number porting Web service		UniDue and USTUTT
SZTAKI_MED	Medical application in a virtualized distributed environment	E-Health	SZTAKI
SZTAKI_AUTONOMIC_CAR	Autonomic arrangement of car assembly testing services with virtualized service execution environment	Automotive	SZTAKI

Journey planning	Journey Planning Scenario	E-Government	CITY
Self-monitoring of blood glucose (SMBG)	Self-monitoring of blood glucose (SMBG)	E-Health	CITY
Auto-Crosslayer-1	Scenarios of grid-based assembly simulation in manufacturing process	Automotive	FBK
Auto-Crosslayer-4	Plan and purchase materials scenario	Automotive	FBK
Automotive_process_monitoring	Automotive process monitoring scenario	Automotive	POLIMI and USTUTT
WINERY-S-1	Collaborative Transport Chain Control	Winery	UniHH
WINERY-S-2	Handling occurrences of harmful animals scenario	Winery	UniHH
Purchase_Order_Processing_BPM	Automotive Purchase Order Processing Scenario	Automotive	Tilburg
Group_Reservation_01	Compensated Group Reservation	Automotive	UPM

Table 1: Related Scenarios

The scenarios used in this deliverable are currently in the process of being evaluated and not every scenario evaluation has concluded yet. The full discussion on the evaluation of the scenarios will be presented in CD--IA-2.2.4.

3.1 Coverage of the Research Framework

The conceptual research framework is the core element in the definition of the S-Cube Integrated Research Framework (IRF). Its aim is to organise the joint research activities within S-Cube by providing a high-level conceptual architecture for the principles and methods for engineering service-based applications, as well as for the technologies and mechanisms which are used to realize those applications.

The framework consists of six components, which are in a 1-to-1 relation with the six research work packages of the network. Moreover, the framework distinguishes between the horizontal components corresponding to the “traditional” domain layers of a service based architecture, i.e., “Service Infrastructure”, “Service Composition and Coordination”, and “Business Process Management” and the vertical components, which correspond to the cross-cutting issues addressed by the project, namely “Engineering and Design”, “Adaptation and Monitoring”, and “Quality Definition, Negotiation and Assurance”.

We note that the distinction between the vertical and horizontal components is one of the core elements of the S-Cube approach. Indeed, an element that makes the S-Cube framework unique when compared to the traditional “layered” approach is that the framework systematically addresses cross-cutting issues. The framework sets out to make explicit the knowledge of the horizontal layers that is relevant for these cross-cutting issues, and that currently is mostly hidden in languages, standards, mechanisms, and so on that are defined and investigated in isolation at the different layers. More precisely, the approach underlying the framework is that the domain layers offer (design, monitoring, adaptation, verification) capabilities that are relevant for the cross-cutting issues. The research efforts in the vertical components are responsible of defining over-arching principles and methodologies for addressing cross-cutting issues by exploiting in suitable ways the capabilities exposed by the horizontal components.

The table shows the related scenarios.

Nr	Scenario	Covered Framework Elements
1	Purchase Order Processing	• All three domain layers and the monitoring cross-cutting concern
2	Web service message wrapper	• Service Infrastructure Domain Layer
3	Telephone number porting Web service	• Service Infrastructure
4	Medical application in a virtualized distributed environment	• Service Infrastructure • Negotiation
5	Autonomic arrangement of car assembly testing services with virtualized service execution environment	• Service Infrastructure • Adaptation and Monitoring • Negotiation
6	Day in life scenario	• Engineering and Design (primarily) and Adaptation and Monitoring. Relation to the cross cutting issues: • service composition and coordination domain layer: HCI based mechanisms for selection and composition; • service infrastructure domain layer: HCI based mechanisms for service discovery, and contributions to monitoring and adaptation
7	Patient lookup scenario	• Engineering and Design (primarily), Adaptation and Monitoring. More specific the cross cutting issues: • service composition and coordination domain layer: composition heuristics (mainly task model-based); • service infrastructure domain layer: mechanisms for service discovery
8	Scenarios of grid-based assembly simulation in manufacturing process	• Cross-cutting issues (Primarily covered elements): • Adaptation and Monitoring: Preventing wrong-diagnosis, lack of effectiveness and lack of SBA compatibility in adaptation and monitoring by applying cross-layer approaches. • Horizontal components: • Business Process Management: Relevance of service infrastructure adaptation to business rules. KPI monitoring. • Service Composition and Coordination: Service replacement. Service parallelization. • Service Infrastructure: Using grid infrastructure. Load balancing. QoS monitoring.
9	Plan and purchase materials scenario	• Cross-cutting issues (Primarily covered elements): • Adaptation and Monitoring: Ensuring coordination and completeness of adaptations for an SBA by applying cross-layer approaches.

		• Horizontal components: • Business Process Management: SLA incompliance. Changing provider of a business activity. • Service Composition and Coordination: Dynamic service binding.
10	Automotive process monitoring scenario	• Quality Definition, Negotiation and Assurance • Service Composition & Coordination
11	Collaborative Transport Chain Control	• Service Composition & Coordination (primarily), in part also Business Process Management
12	Handling occurrences of harmful animals scenario	• Service Composition & Coordination (primarily), in part also Business Process Management
13	Order Processing scenario	• Service Composition & Coordination
14	Compensated Group Reservation	• Vertical: • Adaptation and monitoring: in case of adaptation by rebinding, use static analysis over the structure of the composition plus run-time characteristics to select the best candidate; signal problems before they appear. • Quality Definition, Negotiation, and Assurance: use data from the composition (composition structure) and infrastructure layer (run-time characteristics) to predict future behavior. Horizontal: • Service composition and coordination.

Table 2: Covered Framework Elements

Figure 1 shows the conceptual view of the Research Framework. The attached numbers indicated the elements referred by the scenarios.

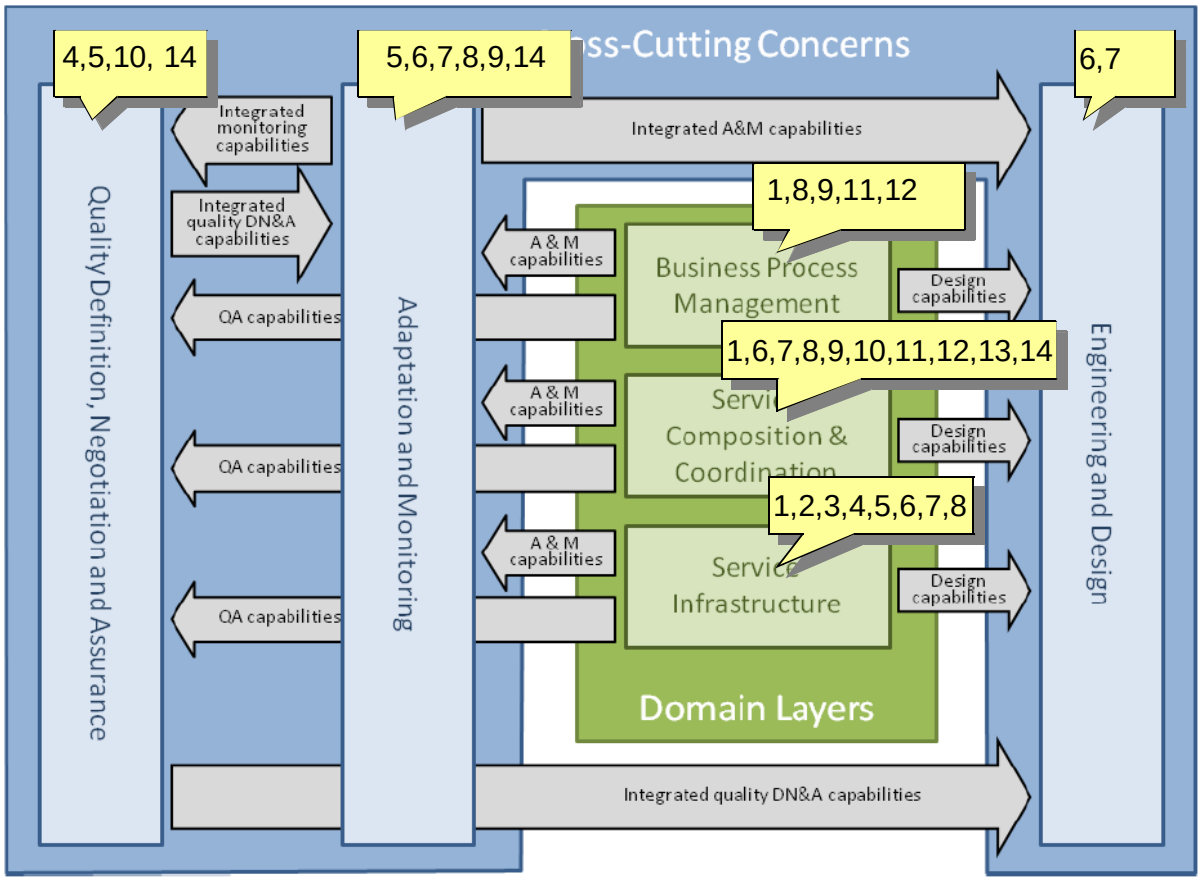

Figure 1: Conceptual Research Framework and Targets of Scenarios

3.2 Coverage of the Reference Lifecycle

The reference life-cycle (see [3]) is depicted in Figure 2 below. It is composed of two main cycles:

- the one on the right hand side corresponds to the classical application design, deployment and provisioning
- the one on the left hand side corresponds to the adaptation perspectives

One of the key aspects of service based applications is that they need to be able to accommodate and manage various changes at runtime. By adopting this two-cycle approach applications undergo the transition between the runtime operation and the analysis and design phases in order to be continuously improved and updated. But they must provide mechanisms that, during runtime, continuously and automatically a) detect new problems, changes, and needs for adaptation, b) identify possible adaptation strategies, and c) enact them. These three steps are shown in the left hand side of the figure and lead to the deployment and provisioning of the modified application. The identification of the changes in the environment and of the problems in the execution of the SBA (e.g., failures) is obtained through monitoring and run-time quality assurance (they are part of the management activities typically performed during execution). This monitoring activity triggers the iteration of the adaptation cycle, whose effect is to inject changes directly into the application being operated and managed.

The table shows the related scenarios.

Nr	Scenario	Covered Lifecycle Elements
1	Purchase Order Processing	• Operation and Management (Runtime monitoring and Post-mortem Analysis) • Identification of Adaptation Needs (Pro-active adaptation)
2	Web service message wrapper	• Operation and Management
3	Telephone number porting Web service	• Operation and Management
4	Medical application in a virtualized distributed environment	• Deployment & Provisioning (Brokering and Deployment)
5	Autonomic arrangement of car assembly testing services with virtualized service execution environment	• Enact Adaptation (self-healing)
6	Day in life scenario	• Early RE: modeling of context factors. • RE and design: context/HCI based classes of requirements (e.g. UM or TM inspired) • Deployment and provisioning: service description elements, monitoring rules
7	Patient lookup scenario	• Early RE: support requirements elicitation (TM based) • RE and design: HCI based classes of requirements • Construction and quality assurance: composition rules
8	Scenarios of grid-based assembly simulation in manufacturing process	• Early RE: Demonstrating cross-layer adaptation and monitoring needs. Identifying interdependencies of SBA layer elements. • RE and design: Designing cross-layer adaptation and monitoring model. • Construction: Realizing the model. • Operation and management: Implementing the pilot SBA (manufacturing process in automotive industry) for the scenario. Running and testing the cross-layer adaptation and monitoring engine on the scenario. • Identify adaptation need: Identification of cross-layer adaptation needs. • Identify adaptation strategy: Identification of the cross-layer adaptation strategies. • Enact adaptation: Activation of adaptation mechanisms corresponding to the cross-layer adaptation strategies.
9	Plan and purchase materials scenario	• Early RE: Demonstrating cross-layer adaptation needs. Identifying

		interdependencies of SBA layer elements. • RE and design: Designing cross-layer model. • Construction: Realizing the model. • Operation and management: Implementing the pilot SBA (manufacturing process in automotive industry) to test the cross-layer model. • Identify adaptation need: Identification of cross-layer adaptation needs. • Identify adaptation strategy: Identification of the cross-layer adaptation strategies. • Enact adaptation: Activation of adaptation mechanisms corresponding to the cross-layer adaptation strategies.
10	Automotive process monitoring scenario	• RE & design (how to define a KPI)
11	Collaborative Transport Chain Control	• Operation & Management
12	Handling occurrences of harmful animals scenario	• Operation & Management
13	Order Processing scenario	• RE & Design
14	Compensated Group Reservation	• Identify adaptation needs (ahead of time). • Identify adaptation strategy (up to some point: the best candidate service for rebinding is identified) • RE & D, by predicting run-time characteristics based on design-time characteristics.

Table 3: Covered Lifecycle Elements

Figure 2 shows the reference Lifecycle. The attached numbers indicated the elements covered by the scenarios.

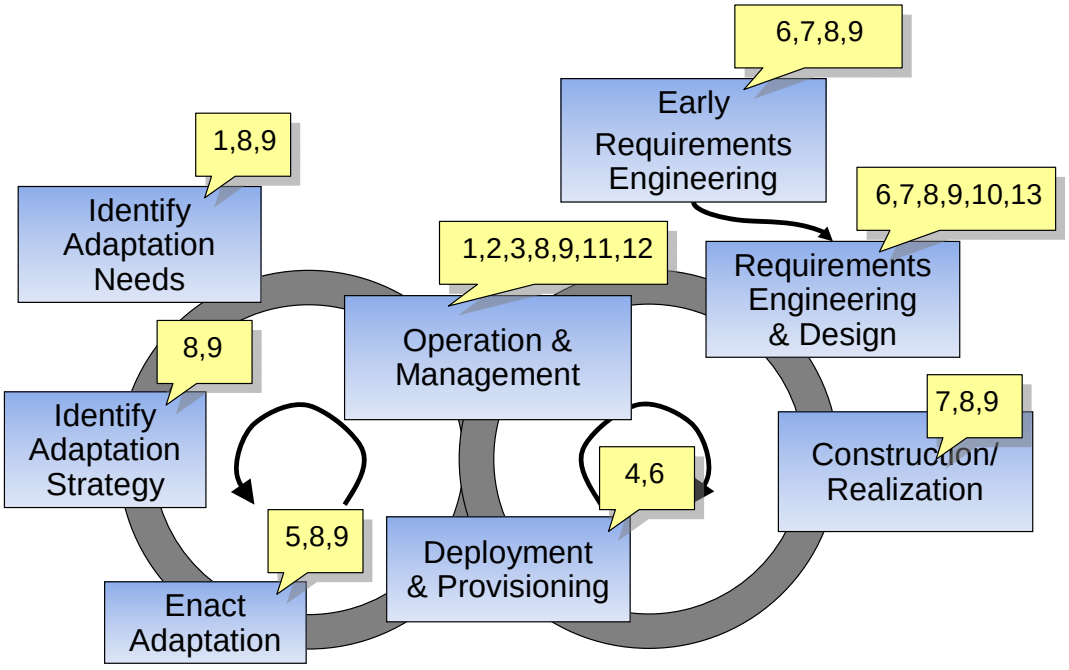

Figure 2: Reference Life Cycle and Parts Targeted by Scenarios

3.3 Coverage of the runtime architecture

The proposed run-time architecture assumes that all the run-time mechanisms and components are realized as services and are exposed on the same communication back-bone. By adopting a service-oriented architecture, we guarantee that the run-time mechanisms realized in the project can be integrated and exploited in a synergistic way, at least at the conceptual level.

We distinguish between core services and application-specific services. The core services are middleware services that the run-time architecture provides to all SBA in order to support the different aspects of the SBA execution.

The communication backbone supports the communication among any kind of services, regardless of whether they are core services or application-specific services. In particular, in the case of service containers, the communication backbone allows accessing both the core service and the application-specific services deployed within the container.

The table shows the related scenarios.

Nr	Scenario	Covered Architecture Elements
1	Purchase Order Processing	• Monitoring Engine
2	Web service message wrapper	• Communication Backbone
3	Telephone number porting Web service	• Discovery and Registry Infrastructure

4	Medical application in a virtualized distributed environment	• Negotiation engine • Resource broker • Resources
5	Autonomic arrangement of car assembly testing services with virtualized service execution environment	• Monitoring engine • Adaptation engine • Negotiation engine • Resource broker • Resources
6	Day in life scenario	• Service container, human service interface, resource broker, monitoring engine, adaptation engine
7	Patient lookup scenario	• Service container, human service interface, resource broker, monitoring engine, adaptation engine
8	Scenarios of grid-based assembly simulation in manufacturing process	• Monitoring Engine • Adaptation Engine • Resources • Resource Broker
9	Plan and purchase materials scenario	• Adaptation Engine • Negotiation Engine • Discovery and Registry Infrastructure
10	Automotive process monitoring scenario	• Monitoring engine
11	Collaborative Transport Chain Control	• Service Container: Service Composition
12	Handling occurrences of harmful animals scenario	• Service Container: Service Composition
13	Order Processing scenario	• Service Container: Service Composition
14	Compensated Group Reservation	• Monitoring Engine • Adaptation Engine • Discovery and Registry Infrastructure

Table 4: Covered Architecture Elements

Figure 3 shows the Runtime Architecture. The attached numbers indicated the elements referred by the scenarios.

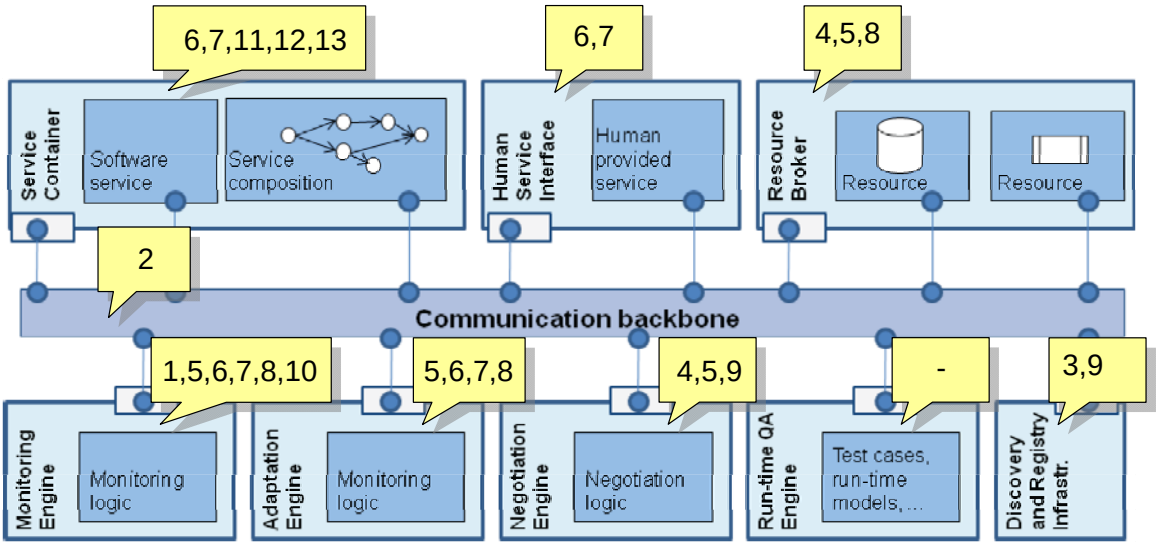

Figure 3: Runtime Architecture

3.4 Summary identified gaps

A first analysis of the coverage shows, that the research framework is well covered. You can see this in the three figures presented in this chapter.

Nevertheless there are some model elements which are covered less. The following elements are covered by three or less scenarios:

- Research Framework
  - Engineering and design
- Reference Lifecycle
  - Identify Adaptation Strategy
  - Enact Adaptation
  - Deployment & Provisioning
  - Construction/Realization
- Runtime Architecture
  - Human Service Interface
  - Communication Bone
  - Negotiation Engine
  - Run-time QA Engine
  - Discovery and Registry Infrastructure

The analysis of validation scenarios within the JRA 1 and JRA 2 work packages has contributed to identify some of the research gaps which have been identified as a basis for selecting new partners in the project.

A summary table is provided below in Table 5.

Integration Framework	Module	Identified research gap
Conceptual framework	Engineering and Design	Life-cycle issues in service-based systems engineering and adaptation
Reference Life Cycle	Deployment and provisioning	Self-* service and Grid infrastructures
Reference Life Cycle	Identify adaptation strategy	Monitoring and adaptation in specific domains and infrastructures
Reference Life Cycle	Run-time QA Engine	Run-time quality assurance and quality prediction for service-based systems
Run Time Architecture	Human service interface	HCI and context issues in service-based systems engineering and adaptation
Run Time Architecture	Communication backbone	Not a focus in the project

Table 5: Gaps for new associate members call

3.5 Analysis of the integration framework

In general, the integration frameworks proposed in [3] have provided a consistent basis for analyzing the validation scenarios and the requirements they pose to case studies. Some specific points have emerged, which will be taken into consideration for next integration deliverables, such as an explicit integration of security issues.

4 Towards a validation of the alignment with industry

This section reports on internal and external initiatives which have been taken to perform an analysis of case studies and which are aimed at getting industry feedback and input. Since the initial phases of the project, the project has periodically met with the Industrial Advisory Board (IAB) which was created for the project.

The internal initiatives in the project are therefore related to the meetings with the Industrial Advisory Board (IAB) where the case studies and the research agenda defined in S-Cube have been presented. The key recommendations from the participants are discussed in Section 4.1.

Based on these recommendations we moved according to four directions:

- Intensifying relationships with NESSI and NEXOF-RA (e.g., by contributing to the NEXOF-RA open construction process and including NEXOF-RA definitions in the S-Cube Knowledge Model).
- Defining a methodology for the description of case studies considering elements that are relevant for industries
- Extending and intensifying the contacts with industries (e.g., exploiting internship opportunities offered by IAB member IBM)
- Looking for case studies closer to the industrial research agenda

To achieve these directions, we organized or participated in a number of external initiatives. At the time of writing this deliverable these initiatives are the participation as a coordinator to the UE SSAI&E working group on use cases (see Section 4.2.1) and the organization of an application workshop at ICSOC (see Section 4.2.2). Moreover, in the context of IFIP, a new Joint Working Group on Digital Services is being prepared for proposal to IFIP boards, aiming at the involvement of industries as well as of academics (Section 4.2.4 introduces the aims and the scope of this initiative). Finally, S-Cube participated to NESSI meetings and at the end of year 2 organized a session during the NESSI Project Summit, planned on the 13th of April 2010 in Valencia (see Section 4.2.3 about NESSI and NEXOF initiatives). Within the first year of the project, interaction with industries had also been performed proposing questionnaires to collect relevant information from industry. In the following, we provide detail on the performed activities and we comment on the achieved results.

Taking these efforts into account, based on the perception of the current situation of the relationship among S-Cube and the industry, as requested during year 2 review and anticipated in the introduction, in Appendix B we propose a re-organization of the relationship with industries, coordinated with SOE1.2 (Community outreach).

4.1 Internal initiatives: Key recommendations from Industrial Advisory Board meetings

The Industrial Advisory Board for S-Cube has been established in the beginning of the project and it is composed of the following members:

Yaron Wolfsthal, IBM
Wolfgang Gerteis, SAP
Pascal Bisson, Thales

Marquart Franz, Siemens
Stefano de Panfilis, Engineering Ingegneria Informatica
Frederic Gittler, HP

The project meets the IAB regularly, usually in connection with Project General Meetings.In the following, a summary report is given on the feedback received during all the IAB meetings held within the project, then we discuss external initiatives taken by the project and discuss them.

1st Industrial Advisory Board Meeting (June 1st, 2008 in Palermo)

Participants: Frederic Gittler (HP); Pascal Bison (Thales); Franz Kudorfer (Siemens), Stefano De Panfilis (Engineering)

Key Recommendations:

a) The IAB emphasizes the S-Cube should be recognized as the core of the service community; this is important for industry as focal point of research
b) S-Cube should illustrate its results using exemplar use-cases elicited from industry.
c) S-Cube should participate in the NEXOF-RA architectural board (currently 15-18 people)
d) Suggestion: S-Cube defines its knowledge map based on the NEXOF-RA glossary to ensure that the glossary and the knowledge map are coherent (which is important for the research and industry "community")
e) Call for contribution of NEXOF-RA (in July) S-Cube partners are encouraged to participate (on their own expense, i.e. outside the S-Cube budget).

4.1.1 2nd Industrial Advisory Board Meeting (September 17th 2008 in Crete)

Participants: Frederic Gittler (HP), Pascal Bison (Thales)

Key Recommendations:

a) S-Cube should continue to drive research and clarify research results using scenarios. This will not only be important for internal discussion but also facilitate the investigations on how expected/tangible results could be turned into real and industrial innovation. The "Channel to go from Research to Industrialization " is key to IAB.
b) S-Cube should strengthen its relationship with NEXOF-RA, e.g. to foster the establishing of a common terminology based on the NEXOF-RA glossary as well as on the S-Cube knowledge map. Another topic for closer cooperation is obviously the definition of the NEXOF-RA reference model and reference architecture.
c) S-Cube should define a template for the scenario (use case) description, clearly stating scope and expected content, in order to support the IAB members (and other industrial partners) for acting as translators and/or facilitators when collecting the requested information (industrial best practices, scenarios and business cases). The IAB members will support S-Cube in the collection of relevant scenarios and use-cases.

3rd Industrial Advisory Board Meeting (March 11th 2009 in Lyon)

Participants: Stefano De Panfilis (Engineering), Frederic Gittler (HP), Yaron Wolfsthal (IBM) , Franz Kudorfer (Siemens)

Key Recommendations:

a) When crossing various administrative domains various aspects may change and have to be considered (Among the others: Security, Quality, Trust aspect Building resilience).
b) Important aspects are also service governance and service management from an infrastructure perspective (Energy consumption, Load balancing, Threshold management in order to sustain the QoS to be provided)

c) Concerning QoS, it is important to understand how users can express their QoS requirements in an intuitive but effective way
d) It is interesting to investigate novel aspects such as the use of services in the internet of things setting
e) IBM internships (on Service quality, Service management)
f) Participation to working groups within NESSI/NEXOF (Architecture board: technical authority for the project, approval of deliverables, steering of work)

4.1.2 4th Industrial Advisory Board Meeting (September 30th 2009 in Madrid)

Participants: Frederic Glitter (HP), Stefano De Panfilis (Engineering), Yaron Wolfstahl (IBM), Wolfgang Gerteis (SAP), Pascal Bison (Thales)

Key Recommendations:

a) Role of industries as associate members
    a. Associate memberships should also be possible for industry;
    b. Associate members should be used as spread of excellence opportunity, i.e. the IAB suggested to appoint a large number of members;
    c. IAB members should not become associate members since they could than be in conflict (giving advise vs. participating in the project)
b) Progress on definition of application domains/case studies/scenarios
    a. The IAB suggests improving the definition of the scenarios together with industry, e.g., via a close cooperation with the members of the IAB.
    b. IAB also suggests defining clear interactions pattern with industry with respect to the scenarios/use cases.
    c. IAB suggests to team up with industry to co develop the detail scenarios (visit industry to co-develop scenarios, e.g. with student interim-ships with IBM).
    d. S-Cube partners should make use of existing exchange program with industry, i.e. send students or post docs for some periods of time to industry, e.g. to co-develop scenarios illustrating visions
    e. IAB members ask to clarify the role the scenarios should play in S-Cube. Are they defined with the aim to, for example,
        i. drive the development of concepts,
        ii. continuous validation of research as you go along to develop solutions for the visions, validation of the developed S-Cube results with "industry" (validation of applicability), as illustration of what is envisioned

4.1.3 5th Industrial Advisory Board Meeting (March 3rd 2010 in Pisa)

Participants: Yaron Wolfsthal (IBM), Pascal Bison (Thales)

Key Recommendations:

a) Concerning case studies:
    a. Only those case studies should be promoted as industrial case studies that are real industrial ones (e.g., “IBM” case study).
    b. Case studies should be presented in a more concrete way; e.g., take only one use case (domain) and present an “end-to-end” scenario / walk-through.
b) Concerning industry collaborations:
    a. Connections with industry via students should be investigated. IBM repeats the invitation for an internship opportunity at IBM that revolves around service quality.
    b. Thales extends an invitation to internal consultation meetings at Thales allowing people to present S-Cube’s case studies and results and thereby get feedback from industry.
c) Concerning alignment of research agendas:

   a. The S-Cube research vision and roadmap should be matched against NESSI's Strategic Research Agenda. The S-Cube vision white paper and the Integrated Research Framework might provide input to such an activity.
   b. S-Cube should more strongly contribute to activities wrt. the definition of research agendas, including NESSI SRA activities and the NESSI Working Groups. It is considered important that S-Cube drives the consolidation of those working groups (NESSI WGs (service / software engineering) with the SSAIE working group).

d) Concerning the Validation of the Integrated Research Framework (IRF) in industry
   a. Investigate the opportunity to get feedback to the IRF (e.g., conceptual run-time architecture) from the NESSI WGs revolving around service architecture.
   b. Compared to other projects, it appears that S-Cube is too much focusing on structure and numbers and only little on real results. The "validation" results are presented in a very verbose form and could be presented with a much stronger focus; e.g., provide more facts and key statements, include an overview of the KPIs achieved vs. the KPIs planned.
   c. The different types of validation should be more clearly differentiated (e.g., external vs. internal validation). Also, it would be important to clarify the difference between the IRF validation and the validation of traditional software products (which is significantly different and thus could lead to misunderstandings).
   d. Industry should not only restricted to a role of evaluating the results but should also be involved in producing the results, i.e., during the actual research activities.

e) Observations
   a. Observation that one of the obstacles is that the services are also a new concept for industry and thus expression the research challenges is more difficult.
   b. It appears that S-Cube is not connected to industry hot topics; e.g., instead of cloud computing S-Cube speaks about "utility computing"

4.2 External initiatives

Starting for the above proposals, S-Cube members have been discussing on how to implement them and several initiatives have been taken.
Suggestions about the technical contents of the project have been considered within the Joint Research Activities in the project.
We report here on the external initiatives, started from comments of IAB, from interactions with the European Commission, and originated autonomously from joint activities activities of the partners to increase interaction with industry Collaboration meetings.

4.2.1 SSAI&E working group on use cases

S-Cube is actively seeking collaboration with industry towards the creating of a collection of case studies. To this aim, S-Cube participated in June 11-12, 2009 as the leader of the SSAI&E working group on use cases, in a collaboration meeting held in Brussels for collecting use cases from results of FP6 & FP7 Projects. This working group has a key role in coordinating the use-case-related activities for all the research projects in the SSAI&E area. During this meeting templates and structure for organizing the use case collections have been discussed. S-Cube presented the methodology developed within S-Cube for collecting the case studies and which has been applied to collect the case studies described in IA-2.2.2 in various application domains, derived from NEXOF partners, a joint effort of 360Fresh and IBM, and from a wine producer SME.

A comparison of the different case studies has been illustrated and will be a basis of a chapter of a book on Service Engineering which is being published on the basis of the results of the collaboration meeting [5].

4.2.2 Workshop: Industrial experience for service-oriented computing (IE4SOC)

A workshop has been held at the ICSOC-Servicewave Conference as an application workshop to interact with industries and get feedback on the S-Cube approach and validate research directions. Starting from the research work of S-Cube on analyzing case studies and gaps in current solutions of current research towards the establishment of adaptive and flexible service-based applications, and with the goal of involving industries in the discussion of experiences in using services in real cases, the workshop has the aim of collecting case studies and perceived gaps in current platforms from industries and from currently running industrial and research projects. The aim of this workshop was to broaden the scope of this gap analysis by collecting industrial scenarios and case studies and by analyzing the industrial needs for research in the next 5-10 years.

The industries have been involved with the presentation of their experiences and their gap analysis with respect to platforms and solutions being adopted and developed.

The goal of the workshop was also to establish a discussion forum to analyze and compare the characteristics of presented case studies and solutions.

The workshop proposal is enclosed in the appendix (Appendix A).

A web page has been created within the S-Cube web site to invite industry contributions to the workshop:

http://www.s-cube-network.eu/contact/subpages/ie4soc

The proceedings have been published in [4]. The outcome of the workshop is described in deliverable IA-2.2.4.

4.2.3 Interaction with NESSI and NEXOF

The NESSI Strategic Research Agenda (SRA) is the tool of choice to detail the vision of the NESSI European Technology Platforms (ETP) and to translate its vision into concrete actions, which guide the NESSI project during its entire life. The SRA is developed, shaped, maintained, coordinated and communicated by the SRA Committee (headed by Stefano de Panfilis, Engineering) by consolidating inputs from different NESSI partners and working groups. In the second year of the S-Cube project, Klaus Pohl, Marco Pistore, Manuel Carro, Andreas Gehlert and Kyriakos Kritikos provided inputs to the SRA Volume 3 on behalf of the S-Cube project. Furthermore, Andreas Gehlert participated on behalf of the S-Cube project in telephone conferences and in one physical meeting devoted to collect, shape and summarise future research topics.
Following the indications of the IAB, S-Cube partners participated in NEXOF-RA working groups contributing ideas for strategic documents (e.g., on QoS and SLA).

S-Cube has organized a session during the NESSI Project Summit on April, 13 in Valencia, colocated with the Future Internet Assembly and the conference "The European Framework Programmes: From Economic Recovery to Sustainability".

In detail, the session “Service Engineering for the Future Internet of Services“ included the following three presentations:

- Vision, research areas and major outcomes of S-Cube
- Service engineering research in S-Cube and links with industrial use cases
- Collaboration opportunities, presentation of industrial call

The other collaboration with NESSI has already been reported in deliverable CD-SoE-1.2.4b Report on dissemination of network results and collaboration.

S-Cube partners have had a relevant role both in NESSI (with UniDue having a seat in its board, and UniDue and UPM members of its steering committee) and in NEXOF, with several S-Cube partners (UniDue, UPM, Lero) being members of its consortium. The University of Duisburg-Essen (coordinator and member of S-Cube) is a member of the Networked European Software & Services Initiative (NESSI) since 2009. Prof. Dr. Klaus Pohl is a member of the NESSI board and acts as vice chair of the NESSI steering committee. In particular, he is one of the initiators of the ServiceWave conference series, which is jointly organized by ETPs, FP projects and S-Cube. In addition to a scientific track, ServiceWave features an industrial track providing the exchange of developments in industry and academia.

4.2.4 Proposal for a new joint IFIP Working group on Digital Services

S-Cube has taken the lead in proposing a new IFIP joint TC2 and TC8 Working Group on Services. In the following the goals of this international working group and planned activities to generate a proposal for IFIP boards approval are illustrated.

Aims and scope

Service orientation provides means to access both software as a service (software systems) and service as software (business services based on ICT) in a way that allows services to be provided to other systems and users on the basis of specified and agreed interfaces and conditions of use.

Service orientation poses research challenges for many communities. The aim of the working group is to study the theoretical foundations and methodologies to support the software service life cycle, including service discovery, development, deployment, adaptation, monitoring, validation, verification, management and evolution in the areas of software-intensive systems, information systems, and business process management.

The Working Group is proposed as a joint TC2 Software: Theory and Practice and TC8 Information Systems Working Group within IFIP (International Federation for Information Processing).

Connections with other TC (e.g., TC6, TC10, TC12) will be established based on cooperation on specific topics. The main focus of the working group will be to research and support the software services life cycle.

The aim of the working group is to start an international discussion forum on software services, defining concepts, reference material, and future research directions, with an active participation of involved researchers both from academia and industry.

Members list

Members from S-Cube EU research network http://www.s-cube-network.eu/
Members from industry
Members from IFIP TC8 Information Systems
Members from IFIP TC2 Software: Theory and Practice

Prof. Winfried Lamerdorf within S-Cube proposed to extend this activity also to IFIP TC11 (TC on Networking).

Initial event

An initial Business meeting for the proposed working group has been planned and organized during August 2009-March 2010, to be held within the Tools 2010 Federated Conference Malaga, in June

2010. Participants have been invited from academia and industry. Interaction with industry will also be performed via e-mail.

Working group initial proposers

The initial working group proposers have been Prof. Barbara Pernici, Politecnico di Milano, barbara.pernici@polimi.it, IFIP TC8 chair and Prof. Klaus Pohl, S-Cube EU research network coordinator, University of Duisburg-Essen, Klaus.Pohl@sse.uni-due.de
Currently, this activity is lead by Prof. Luciano Baresi from POLIMI, who will chair the IFIP Digital Services Malaga meeting.

4.3 Discussion of results of external activities

Despite the spent effort, the only partially successful initiative is the interaction with the European Commission: collected topics for research agendas is being provided to the European Commission as inputs to the next European Framework Programme and the case study description that had the attention from the EC as a common way for describing case studies in the upcoming founded projects. Unfortunately the level of interest raised in the industry did not seem to be on a par with that found in the commission.

About the other initiatives:

- No useful information about the industry agenda and needs had been collected from interactions with industrial partners. Collecting information through questionnaires has proven difficult for a variety of reasons, including also IPR issues.
- The call for associate members specifically opened for industries, and also advertised during the NESSI forum previously mentioned, attracted only four applications from industries and none of them was judged has having a sufficient quality.
- the IE4SOC workshop had only 9 industries participating over 24 total participants where two of them (IBM and Engineering) are already involved in S-Cube through the IAB and one is outside Europe (Indonesia).

These facts lead the consortium to the conclusion that the current approach, although seemingly promising at the beginning, does not actually deliver what is required from it. Therefore a new approach was devised and is presented in Appendix B.

5 Summary and future work

This deliverable discussed the alignment with the industrial needs by comparing the IRF (that represents the S-Cube research agenda) and the industrial case studies (that represent the industrial needs). Moreover, the deliverable identified the current coverage of the research done in S-Cube and the area that still needs to be covered. The present project outcome will be further developed in IA-2.2.4, in which a detailed analysis of case studies and scenarios will be performed with the goal of identifying solutions proposed by S-Cube to problems derived from the case studies.

Validation from industry is required towards the following goals: building a collection of reference case studies to be used as pilot cases in the project and made available to a broader community, developing research which is aimed at solving problems based on industrial case studies, and identifying research gaps in the research integration framework. To this aim, several initiatives had been organized but with a very limited impact. For this reason, in Appendix B we define a recovery strategy to build an effective relationship with the industry.

6 References

[1] The S-Cube Team: “PO-IA-3.2.1 – Initial definition of validation scenarios “, 2009

[2] POLIMI, Tilburg, City, FBK, and UniDue, "CD-IA-2.2.2 Collection of industrial best practices, scenarios and business cases," S-Cube Project, Deliverable 2009.

[3] The S-Cube Team: “PO-IA-3.1.1 - Integration Framework Baseline”, 2009

[4] Barbara Pernici, Andreas Gehlert, Marco Pistore, Pierluigi Plebani, George Spanoudakis, City University London, UKICSOC-ServiceWave 2009 - Industrial Application Workshop, Proc. of the IE4SOC Workshop, Stockholm, Nov. 2009

[5] A. Bucchiarone, R. Kazhamiakin, V. Mazza, and P. Plebani, Describing case studies and classifying research approaches, to be published on Book on “Service Engineering. European Research Results”, Springer

Appendix A IE4SOC Workshop Proposal

"Industrial experience for service-oriented computing" (IE4SOC)

http://www.s-cube-network.eu/contact/subpages/ie4soc

- Application workshop at ICSOC09 -

Organized by
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Motivation

Service-oriented applications are being developed in a variety of application domains. While research focuses on theoretical aspects in themes such as Service Engineering, Service Compositions, Service Management, SOA at runtime, Quality of Service, and Grid Services, solid experiences about the utility of the proposed approaches in industry are still missing. The aim of this workshop is, therefore, to identify the most promising research directions that can have an impact on the service industry for the purpose of aligning academic and industrial research agendas. The evaluation of different proposed approaches and benchmarks and complete case studies is needed to be able to assess which are the most promising research directions that can have an impact on the industrial development of this field.

Objectives

Starting from the research work of the EU Network of Excellence S-Cube on analyzing case studies and the gaps in current solutions of current research towards the establishment of adaptive and flexible service-based applications, and with the goal of involving industries in the discussion of experiences in using services in real cases, the workshop has the aim of collecting case studies and perceived gaps in current platforms from industries and from currently running industrial and research projects. The aim of this workshop is to broaden the scope of this gap analysis by collecting industrial scenarios and case studies and by analysing the industrial needs for research in the next 5-10 years. A systematic basis for analyzing the available material can be set and a contribution can be made towards establishing benchmarks for assessing technologies and new research approaches
The industries will be involved with the presentation of their experiences and of their gap analysis with respect to platforms and solutions being adopted and developed.
The goal of the workshop is also to establish a discussion forum to analyze and compare the characteristics of presented case studies and solutions.

Topics

Big industrial players and SMEs are encouraged to submit short papers describing relevant case studies and scenarios in the following open list of application domains:

- pervasive systems
- automotive systems
- product design and distribution
- e-health
- e-government
- telecommunication
- other related application domains

Besides the description of the case study or scenario the paper should include an analysis of future research needs.

Submissions and Evaluation

A call for short papers will be issued. Sought papers will cover industrial applications of service-oriented computing, with a special focus on advanced developments and gap analysis for existing applications and service oriented computing technologies. Papers should be no longer than 6 pages (in Springer LNCS style) and submitted as a PDF file. Workshop Proceedings will be published in a volume.

Format and Program

The program will be based on the presentation of the selected case studies and will include a discussion session to compare the characteristics of the presented case studies and analyze possible gaps and requirements emerging for advanced service-based systems, technologies for such systems, and evolving service management.

Appendix B Plan for disseminating research results to the industries in Years 3 and 4

The participation to the organized IE4SOC workshop and all the attempts to involve Industrial partners (IAB except) highlighted difficulties to get information on the industrial research agenda on Service Based Applications. In addition, for the last Call for Associate Partners, specifically opened for including companies in the project, few applications were received from industries and none of that with a sufficient quality level.

On this basis, in the remaining two years of the project we will 'reverse the arrow' of the communication with industries: instead of trying to get information from them, we will mainly focus on disseminating the research result of S-Cube that could have a direct impact from them, in collaboration with SoE1.2, as described below. On this new direction, several possibilities can be exploited: organizing venues, or face-to-face meetings with industries that could be interested to Service Based Applications. Regardless of the kind of communication, preparing suitable and well-addressed material becomes crucial for having an effective and fruitful communication.

According to this situation, we define three main steps to be performed in order to improve the dissemination of the research results:

1. Identifying the research results from JRA that could have impact to the industries. These results should be more related to tools instead of models. Specific techniques and prototypes of tools represent the best items (ongoing)
2. Preparing promotional materials. Brochure, presentation, Elevator speech (or pitch), demo are the most suitable elements that the industries could really appreciate (in collaboration with SoE 1.2) (first set ready in September, to be continued for the rest of the project)
3. Disseminating the materials:
    a. Meeting with industries. Specific meeting, or better virtual meetings, should be organized by exploiting the existing contacts with industries, and by collecting new contacts during related international events (to be started in October, by all partners, a detailed plan will be reported in IA-2.2.6).
    b. Publishing material on Virtual Campus (in collaboration with SoE 1.1) . The aim on Virtual Campus will be extended to include not only materials for teaching but also for disseminating information to industries (first set In September, to be continuously updated).

The internal activities with the IAB meetings will be continues, as well as activities within the EU Concertation working groups and EU initiatives and the proposal for IFIP working group are planned continue.

According to this new strategy, the CD-IA-2.2.6 deliverable will include the information on the new dissemination plan. More specifically:

CD-IA-2.2.6: Report on industrial dissemination of S-Cube research results [Month 48]. Based on the dissemination material defined in SoE 1.2, events, conferences, and (virtual) face-to-face meetings will be organized to present significant S-Cube result to industries. This deliverable will document the result of this dissemination. To asses progress with respect to the alignment with industry suitable performance indicators from section B.1.3.1.10 are used.

This plan for industry outreach will be first experimented interacting with the IAB industries,. Acivities will start after the communication material has been prepared. Refinements of the plan with detailed and additional activities will be ongoing throughout the project.

With the new strategy, we aim at really building a significant relationship with industry by increasing the numbers of contacts. In particular, the goal is to increase the KPI in B.1.3.1.10 “Numbers of collaboration with industries” intended as the numbers of industries where S-Cube results had been presented.