Grant Agreement N° 215483

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Management Summary

This deliverable summarizes the activities performed by S-Cube Consortium and the results with the aim of fostering a European-wide professional learning society. In particular, it reports on the status and progress in the S-Cube Virtual Campus, Summer School on Service-Oriented Computing, The International Master in Service Engineering (IMSE) Program, IFIP Working Group on Service-Oriented Systems, EU Collaboration Working Group on Use Case Collection and the Industrial Dissemination through S-Cube Industry Workshop.

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).

Members of the S-CUBE consortium:

University of Duisburg-Essen	Germany
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
Lero - The Irish Software Engineering Research Centre	Ireland
Politecnico di Milano	Italy
MTA SZTAKI – Computer and Automation Research Institute	Hungary
Vienna University of Technology	Austria
Université Claude Bernard Lyon	France
University of Crete	Greece
Universidad Politécnica de Madrid	Spain
University of Stuttgart	Germany
University of Hamburg	Germany
Vrije Universiteit Amsterdam	Netherlands

Published S-CUBE documents

All public S-Cube deliverables are available from the S-Cube Web Portal at the following URL:
http://www.s-cube-network.eu/results/deliverables/

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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-fertilization 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

The Spread of Excellence workpackage (WP-SoE-1.2) focuses on the spread of results, research outcomes and innovation in the area of service-based systems across the wider scientific community, special subsections of the industry and user communities. Specifically, the four main target groups of S-Cube for dissemination activities are: scientists, industry, policy makers and end-user communities. Inaugurating a Europe-wide common program of education and training for researchers and industry is one of the main objectives of S-Cube. This will help to create a common culture and foster a professional learning society that will have a profound impact on the future of the field.

This deliverable summarizes the activities performed by S-Cube Consortium that will foster a European-wide professional learning society. In particular, it reports on the following activities and artifacts:

- S-Cube Virtual Campus (Section 2.1)
- Summer School on Service-Oriented Computing (SSIAE) (Section 3)
- The International Master in Service Engineering (IMSE) Program (Section 4)
- IFIP Working Group on Service-Oriented Systems (WG 2.14/6.12/8.10) (Section 5)
- EU Collaboration Working Group on Use Case Collection (Section 6)
- Appendix: contains the report prepared by TUW regarding the Virtual Campus.

However, in addition to the instruments listed above, S-Cube disseminates its results to the widest possible audience through several other means, which will also contribute directly or indirectly to help furthering a learning society. The details regarding these activities are reported in the annual series of CD-SoE-1.2.4d deliverable [1].

2 Integration of Education

2.1 Virtual Campus

The Virtual Campus, or Virtual Learning Centre,[1] is a part of the integration activity SoE-1.1 of the S-Cube Network of Excellence. The Virtual Campus aims to use a flexible combination of communication and collaboration technologies to encourage and facilitate knowledge exchange, news circulation, debate, feedback to support the interaction and dissemination in the community of Software Services and Systems. The Virtual Campus platform will enhance the cooperation and facilitate the integration of research of geographically distributed organizations of different countries and different research perspectives related to Service-oriented computing (SOC).

Besides the integration of research, the Virtual Campus aims to provide a distributed and flexible e-Learning environment supporting the co-joined master and PhD programs of S-Cube as well as to maintain the basis for further cooperation and integration especially in teaching in the SOC Community and related communities. In that respect, Virtual Campus is one of the primary long-lasting artifacts of S-Cube to be exploited to foster a European-wide professional learning society.

The Virtual Campus is described in deliverable CD-SoE-1.1.6 [3] as a continuation effort of deliverable CD-SoE-1.1.2 [4]. CD-SoE-1.1.2 presented our initial design of the Virtual Campus platform. As a requested extension of deliverable CD-SoE-1.1.6, a special report is prepared to describe our first deployed version of the VC. This report is included as an appendix in CD-SoE-1.2.4d [1].

Figure 1 lists the four domains of the Virtual Campus that where the focus of the past deliverables in the Virtual Campus. These include:

- *Public Campus*: The public campus is the open part to the campus and provides the visitor with initial information about the e-learning platform. The goal of the Public Campus is to provide all visitors, be it researchers or practitioners, from different domains with an integrated discussion and information area for S-Cube related teaching areas. Through Public Campus they are able to obtain comprehensive and up-to-date information regarding the progress in the corresponding areas; to share ideas, to cooperate, and to interact with each other by means of public forums and announcement mechanisms.
- *Internal Campus*: The idea of the Internal Campus is to provide an E-Learning platform based on a course management system for the students in S-Cube's joint Master & PhD Program. On release the module provides a fully functional campus that offers across an E-Learning Platform various courses. Students can register with the provided courses. Teaching personal is capable of offering selective material for their provided courses. Furthermore, teachers are enabled to interact with their students using the platform tools.
- *Knowledge Base*: is presented in detail in CD-SoE-1.1.6 [3]. The tasks of the knowledge base are twofold: on the one hand, it organizes and displays consolidated material produced by S-Cube and others to the S-Cube relevant areas; on the other hand, associated (additional) material is stored and presented along with the original material. The Knowledge Base is made publicly available to participating institutions and the SOC community.
- *Outreach*: this domain resulted from the Y3 review recommendations. These consider the Virtual Campus not only an e-learning platform with forum, course management, and research work management, but in addition as a means for the Outreach to interested students and researches in the projects results. The result was the Learning Packages extension and has been presented in CD-SoE-1.2.4d [1] as appendix.

[1] *The Virtual Campus: http://vc.infosys.tuwien.ac.at/*

Figure 1 Virtual Campus Domains

The requested public addition to the Virtual Campus -the Learning Packages, have been split accordingly to the six S-Cube research areas (see Table 1). Thus, each of the six S-Cube JRAs has its own cluster. Furthermore, on a second layer an elaborate structure divides a cluster into the dominant research topics of the research areas. In total, there is a collection of 12 particular research topics. These topics lead a third layer structure which gives access to the Learning Packages. The partners created a total of *42 Learning Packages* for the research areas. The number of contributions from each partner ranges between 1 and 6 Learning Packages; some were created jointly. Table 1 below details the number of Learning Packages per cluster.

Table 1: Contributions per cluster

Cluster	#Learning Packages
JRA-1.1: Engineering and Design	6
JRA-1.2: Adaptation and Monitoring	7
JRA-1.3: Quality Definition, Negotiation and Assurance	12
JRA-2.1: Business Process Management	3
JRA-2.2: Composition and Coordination	8
JRA-2.3: Service Infrastructures	6

The modules of the VC are implemented, released, and interconnected (with, e.g., single system registration). For more information, we refer the reader to CD-SoE-1.1.2 [4] and CD-SoE-1.2.4d [1].

2.2 PhD. Theses

Table 1 shows the joint PhD (completed in Year 3).

Former S-Cube PhD student	*Institution*	*Graduation date*
Ralf Mietzner	USTUTT	7/13/2010
Vasilios Andrikopoulos	TILBURG	10/1/2010
Luca Cavallaro	POLIMI	2/17/2011
Daniel J. Dubois	POLIMI	2/17/2011
Torsten Scheibler	USTUTT	6/17/2010
Florian Skopik	TUW	6/18/2010

Table 1: Completed PhD theses

Table 2 shows the on-going PhD (will be completed after the project finishes) with complete supervision[2].

[2] *Requires two partners to take part as PhD committee members.*

S-Cube PhD student	*Institution*	*Graduation date*
Dragan Ivanovic	UPM	TBA
Qing Gu	VUA	10/6/2011
Sergio Segura	(U-Sevillia associated member)	TBA
Eric Schmieders	UniDue	TBA
Osama Sammodi	UniDue	TBA
Amir Molzam Sharifloo	UniDue	TBA
Lukasz Juszczyk	TUW	10/27/2011
Martin Treiber	TUW	March-May 2012
Harald Psaier	TUW	March-May 2012
Seyed Hossein Siadat	POLIMI	TBA
Rafiqul Haque	LERO	TBA
Stephen Lane	LERO	TBA
Maryam Razavian	VUA	Dec 2012
Damian Tamburri	VUA	TBA
Sonja Zaplata	UniHH	TBA
Benedikt Kratz	UVT	Jun 2012
François Hantry	UCBL	October 2012

Table 2: On-going PhD theses

3 Summer School on Service-Oriented Computing (SSIAE)

Summer schools and training activities constitute an important means to spread excellence across the scientific and other communities. As a foundational step, S-Cube has taken stock of joint educational themes and expertise. The outcome of this process was presented in Deliverable CD-SoE-1.2.2 (Collaboration Plan for Joint Activities with ICT SSAI&E Projects).

S-Cube has organized a series of summer school and training workshops of an international and interdisciplinary character that helped forge a new research and scientific community on Service Science Management and Engineering (SSME).

Through the participation of distinguishes experts and professionals from leading academic, research and industrial organizations in the SSAIE summer schools, the summer school promotes the exchange of ideas and helps participants — in particular young researchers and practitioners — to network and start new cooperative research projects.

Business Process in the Service Science". The second workshop was held in Palermo, Italy in June 2008 with 40 participants to facilitate exchange of ideas and help researchers, both senior and young researchers and graduate students from around the world, to understand each other's work, network and start new cooperative research projects. The topic was 'Perspectives on Services'. Funding for the summer school participants was provided by the S-Cube Network of Excellence, while Engineering Ingegneria Informatica and IBM generously supported the event by covering meeting room expenses and lunches.

The third workshop and summer school was held in Crete in June 2009. It has been widened in scope and themes to address educational requirements of other FP7 SSAI&E related projects. Time and location was chosen carefully by a local organization committee to attract high profile instructors and maximize attendance.

Continuing the series of summer schools on SSAI&E, the 2010 summer school was jointly organized by the Transformation Services Laboratory 25 of the University of Crete, the Institute of Computer Science (ICS) and the European Network of Excellence in Software Services and Systems, S-Cube. It was again held in Heraklion, Greece in June 28th to July 2nd 2010. This edition of the summer school brought together participants from countries all around the world. There were approximately 29 speakers who presented their work. The speakers included representatives from industry, such as IBM, Ericsson and BOC, and the Head of the European Commission's Software & Service Architectures and Infrastructures unit also spoke at the summer school.

The 2011[3] edition of SSAIE Summer School took place in Crete, Greece, from June 27th to July 3rd 2011. It was open to graduate students and young professionals to provide training and information in the area of Service Oriented Computing. The summer school brought together distinguished experts on software and services, graduate students, young researchers and professionals from leading academic, research and industrial organizations, altogether 81, and 30 speakers presented their work in the aforementioned areas of interest.

At the end of the 2011 summer school, participants were asked to fill in a questionnaire regarding the quality and the relevance of the presentations to each session topic, the presenters and the organization of the summer school. The results show that most of the participants were satisfied with the presentations as well as the speakers and they suggested additional speakers to attend the next summer school and future topics to be covered. Scientific topics such as Cloud computing, business strategy and composition models, Crowdsourcing, ambient intelligence, are some of the topics suggested by the participants in order to be considered for the next summer school.

[3] *http://www.summersoc.eu/summersoc2011/*

More information regarding the themes and topics and the PhD symposium in 2011 Summer School is reported in deliverable SoE-1.2.4d [1].

The 2012 Summer School

In 2012, the SSAIE Summer School[4] will open for PhD students, young researchers and professionals from leading academic, research and industrial organizations across Europe and around the world. Topics will span the entire field of SOC from conceptual foundations to industrial applications. In addition to high quality training, the Advanced School helps forge a new research and scientific community on Service-Oriented Computing (SOC). The Advanced School fosters the free exchange of ideas and helps the participants to network and start new cooperative research projects. It will take place in Crete, Greece, from July 2nd to July 7th 2012. The planned tracks are:

- Conceptual Foundations.
- Computing in the Clouds.
- People in Service Oriented Computing Systems (SOCS).
- Emerging Topics.

Based on the questionnaire results in which participants proposed additional presenters based on a topic of interest, the organization committee will take these propositions into consideration and invitations have already been sent.

[4] *http://www.summersoc.eu/*

4 The IMSE Program

Many experts see the explosive growth in services as the next major revolution in the world economy. As service economies continue to expand and powerful digital communications networks – notably the Internet– evolve rapidly, companies are transforming from regional businesses to globally integrated enterprises, shortly referred to as service networks.

In the light of these developments, there is a quickly growing need for new multi-disciplinary teaching programmes that are designed at the interface of software service systems and new globe-spanning business processes to prepare students to become the new generation of T-shaped service engineers. S-Cube has acknowledged the critical need for such a programme and proposed a new two-year Master programme in Service Engineering, named the International Master in Service Engineering (IMSE) (see Figure 2), to the EC's directorate of education and training early in 2009. Given restrictions imposed by the EC, only three S-Cube members could work on a new Masters programme; i.e. UoC, USTUTT and Tilburg (Coordinator). The remaining S-Cube partners are involved in IMSE through the associate membership of the S-Cube project in the IMSE consortium.

In July 2009, IMSE was selected by the European Commission to be added to the programs available under the EU's Erasmus Mundus initiative for stronger European cooperation and international ties in higher education. Being selected as Erasmus Mundus course allows the IMSE consortium to offer a number of Erasmus Mundus scholarships to top-ranked students from "third countries" and to "scholars" (academics) to teach or carry out research. For example, the EU has granted 18 scholarships for the first IMSE cohort; 10 for non-EU and 8 for EU-students.

About Us

The Erasmus Mundus IMSE program is jointly offered by three European universities with an excellent track record in service science and software service engineering. Because Tilburg, Stuttgart and Crete have created this program in close collaboration with its associated members and industry partners, this will enhance your European experience even further.

Tilburg University, The Netherlands

- Leading international research position, so you will be taught by the best academics only For example, the work of Prof. Mike Papazoglou, founder of the our European Research Institute for Service Sciences (ERISS), falls into the 1% of mostly cited papers in his research field, service science, worldwide.
- For years Tilburg University is recognized by its competitors as the best specialized university of the Netherlands.
- In 2009 Tilburg School of Management ranked 41 in the UT Dallas ranking of Business Schools and number 3 in Europe.

University of Stuttgart, Germany

- Worldwide reputation for excellence in mobile and information technology
- Situated in centre of dynamic economic region, so good starting point to start building your European business network
- Unique cooperation between technical, physical and human sciences, so strong exposure to multiple perspectives and approaches

University of Crete, Greece

- Leading multi-disciplinary research university of Greece
- Modern campus on the largest of the Greek islands with a unique geographical position between Europe, Asia and Africa
- Hosting the Summer School for service and software engineering and meeting place for both the students and lecturers, including invited scholars from IMSE associated members, such as Tsinghua University and UC Berkeley, and other top-ranked universities

For more information about each of the participating universities, please check the websites of the individual institutions.

Registration Countdown

036:23:31:14
days hours min sec
since Application deadline

Follow me on the web!

Online via skype every Tuesday from 15.00 till 16:00 CET

I'm offline

IMSE on twitter

- Please check the FAQ page on the IMSE website, new items were recently posted. Happy Reading! - 3 months ago
- Company presentation about internship possibilities at Philips is about to start for current IMSE students in Tilburg. - 3 months ago
- @SenFang29 Yes, please reply with all zeros and upload your GRE test results. This way we know you took GRE, not GMAT. - 3 months ago
- @SenFang29 Yes, it is true. We do not ask for this. Only the transcripts of your Bachelor's degree. - 3 months ago
- @SenFang29 : Sure, what is your question? - 3 months ago

Figure 2 The IMSE's web portal[5]

The IMSE programme is organized as follows. After spending a kick-off at the summer school, students spend a semester in Germany (USTUTT), followed by Greece (UoC) and the Netherlands (Tilburg). The final semester is devoted to thesis work, which includes an internship in an international company or research institute. Upon completion, students earn a joint Master degree in Service Science.

[5] *http://www.erasmusmundus-imse.eu/*

In the second year of the programme the IMSE students participate in the summer school to gain the latest insights in software services and systems, while in the second year of the programme the students defend their thesis at the summer school. In this way, the summer school becomes a place where first- and second year students meet each other to share experiences with other students from around the globe.

IMSE is delivered in close cooperation with a number of top quality research institutes and universities, such as UC Berkeley (USA), the University of New South Wales (Australia), Tsinghua University (China) and international companies like ForthNet, IBM, Software AG, Accenture and PriceWaterhouseCoopers. This not only guarantees a curriculum that incorporates the latest developments in the field of service science and service engineering, but also caters for a global marketing of the program.

The marriage between the research-oriented Network of Excellence S-Cube and the educational programme IMSE is highly synergistic. Firstly, IMSE is a perfect vehicle for sharing S-Cube's scientific insights with the upcoming generation of new software service engineers. Additionally, the combination of the S-Cube Knowledge Model and the S-Cube Virtual Campus (more details about the S-Cube Virtual Campus are presented in Section 2.1) provides the knowledge backbone of IMSE: a virtual environment where scholars, lecturers and students share lecture slides, notes, articles, white papers, contacts, etc. Last, but not least, the SSAIE Summer School (see also Section 3) becomes an essential educational component in IMSE's programme.

The IMSE third cohort has received 68 applications. In the assessment performed in February 2012, 36 applications were considered for selection. Based on this review and the assessment, the IMSE third cohort- category A has granted 8 scholarships and 3 window scholarships. The 8 scholarships have included students from Russia, India, China, Pakistan, Bangladesh, Sri Lanka and China. The other three window scholarships are specifically dedicated for (one scholarship for each):

- Western Balkans and Turkey.
- Tunisia and Egypt.
- Eastern Neighborhood.

The IMSE third cohort- category B has granted 5 scholarships. This includes students from Cyprus, Bulgaria, Greece, Spain and Germany. In total, the third IMSE cohort has granted scholarships for 11 non-Europeans and 5 for Europeans. Finally, the EACEA (The Education, Audiovisual and Culture Executive Agency) is expected to perform an eligibility check on the accepted candidates and will make a final decision in April 2012.

5 IFIP Working Group on Service-Oriented Systems

The goal of the IFIP Working Group on Service-Oriented Systems[6] -chaired by Luciano Baresi and Barbara Pernici from POLIMI and by Winfried Lamersdorf from University of Hamburg (UniHH)- is to organize and promote the exchange of information on fundamental as well as practical aspects of service-oriented systems. In doing so, the working group considers service-oriented systems from a technological perspective, but it also addresses their business aspects and economic impact. The aim also is to structure a research community that comprises both academia and industry (maybe through living labs) and become an active, permanent, and international forum on services-oriented systems.

Besides the technological underpinnings, the working group addresses the different facets of the discipline. It also tries to organize current initiatives and research, and proposes suitable and sustainable future research directions.

Given the current level of activities in service orientation, the working group aims at consolidating initiatives instead of proposing new ones: the working group becomes glue among existing activities, identifies the right synergies among existing initiatives, and acts as a catalyst among existing (sub-) communities. The working group also aims to consolidate fundamental and theoretical aspects, and to identify future research directions in the discipline. This provides with proper and shared means to conduct research in the field to whoever is interested in services-oriented computing and systems.

A first foreseen incarnation of these activities will be the provision of qualified support to PhD-level research through the creation of dedicated workshops addressed to supervisors of PhD thesis in the field. Shared and strong foundations will also serve to strengthen the relationships with related fields (e.g., Internet of things and Cloud computing) and to base the coordination of efforts with standardization groups. Additionally, the working group will propose benchmarks and create a shared and distributed sandbox to support experimentation and provide objective instruments for the comparison of different proposals.

As part of its mission of gluing existing activities, the working group will be the one in charge of ensuring the self-sustainability of the three long lasting artifacts produced by S-Cube, namely, the *Knowledge Model*, the *use cases repository* and the *Virtual Campus*. This will be accomplished by creating in the research and practitioners community awareness of these artifacts and by encouraging their usage. Given the fact that the working group does not own specific funding, the expenses for the technical maintenance of these artifacts will be still in charge to the S-Cube partners that are currently responsible for them and that are also partners of the working group.

[6] *IFIP Working Group on Services-oriented Systems (WG 2.14/6.12/8.10): http://home.dei.polimi.it/baresi/ifip/*

6 EU Collaboration Working Groups

Among the activities performed in S-Cube, the organization of the EU Collaboration Working Group at SSAIE (Service and Software Architectures, Infrastructures and Engineering) gave the opportunity to disseminate the methodology for describing use cases developed in the project [2]. While the details on this methodology have been published in the 3rd year of the project, along with the description of the S-Cube case studies, the portal specifically developed to collect case studies from other projects, has been populated during the last year.

So far, in addition to the S-Cube case studies, the portal also includes case studies from:

- ALERT project[7]: Active support and reaL-time coordination based on Event pRocessing in FLOSS developmenT.
- PLAY project[8]: People, Things and Services.

During the last SSAIE event, also these projects expressed their interest to contribute with their case studies that there will be included shortly in the portal.

- FITTEST project[9]
- MOSAIC project[10]: Open source API and platform for multiple cloud

[7] *http://www.alert-project.eu/*
[8] *http://www.play-project.eu/*
[9] *http://www.facebook.com/FITTEST & http://cordis.europa.eu/projects/95183_en.html*
[10] *http://www.mosaic-cloud.eu/*

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[2] A. Bucchiarone, R. Kazhamiakin, V. Mazza, P. Plebani, Describing Case Studies and Classifying Research Approaches, in S. Dustdar, F. Li, "Service Engineering: European Research Results", October, 2010, Springer Wien, NewYork.

[3] S-Cube Deliverable: CD-SoE-1.1.6 - Virtual Learning Centre, 2011.

[4] S-Cube Deliverable: CD-SoE-1.1.2 - Organizational Structure for Virtual Campus, 2009.

Appendix: Virtual Campus - Summary

Grant Agreement N° 215483

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Management Summary

This deliverable will establish the virtual learning centre for open learning purposes, including e-learning facilities for use by both academic and industry trainees.

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).

Contents

1 Introduction

The Virtual Campus, or Virtual Learning Centre (the terms are used interchangably through the remainder of this report), is a part of the integration activity SoE-1.1 of the S-Cube Network of Excellence. The Virtual Campus aims to use a flexible combination of communication and collaboration technologies to encourage and facilitate knowledge exchange, news circulation, debate, feedback to support the interaction and dissemination in the community of Software Services and Systems. The Virtual Campus platform should enhance the cooperation and facilitate the integration of research of geographically distributed organizations of different countries and different research perspectives related to Service-oriented computing (SOC). Besides the integration of research, the Virtual Campus aims to provide a distributed and flexible e-Learning environment supporting the co-joined master and PhD programs of S-Cube as well as to maintain the basis for further cooperation and integration especially in teaching in the SOC Community and related communities. The current report can be seen as a requested extension of the Virtual Campus described in deliverable CD-SoE-1.1.6[1], a continuation effort of deliverable CD-SoE-1.1.2 [2]. CD-SoE-1.1.2 presented our initial design of the Virtual Campus platform. Here, we will now describe our first deployed version of this tool. Most of the design statements of CD-SoE-1.1.2 are still valid, however, in detail some deviations from the originally envisioned design have been necessary. The aim of the current report, as part of the spread of excellence activity, is to describe the implementation of the main dissemination platform of the S-Cube project in detail.

Learning Packages. Please note that the content of this report focuses on the Learning Packages extension requested after the Y3 review. According to the reviewers opinion, S-Cube as a network encouraging spread of excellence, must own a tool for the S-Cube outreach strategy, which tends towards a more information push approach. In a consortium driven activity a cluster structure shell be defined. Each cluster must provide an overview of related research challenges and will summarize the the key ideas behind the research challenges. All S-Cube partners need to identify their key results and condense these results in a digestible learning package that must be provided as input to the Learning Packages' collection. The WP leaders will coordinate and consolidate the partners' inputs into a coherent view of the topic areas. The project coordinator should provide the umbrella, with the prime research challenges addressed. The leader of the Virtual Campus activities is requested to ensure that the tooling is available and appropriate for third parties. By the end of the project the final version shall be available plus an initial assessment of the usage by third parties. A proposal of the sustainability concept of the Virtual Campus and the publically available Knowledge Model, beyond the S-Cube life time shall be provided.

1.1 Presentation of this Report

In the remainder of this report, we will outline the decisions taken to organize and structure of the work of the Learning Packages. A walktrough highlights the features of the final product. After, a section will describe the provided sustainability options. Finally, an initial usage assessment is given with the current numbers.

1.2 Relationship to Other Workpackages

The work is a requested extension to the Virtual Campus build on the ideas of the in the past deliverables of SoE-1.1 and detailed in SoE-1.1.6.

2 Learning Packages

2.1 Distribution of the Work

As suggested in the comments from the reviewers, the assembling of the Learning Packages for the Virtual Campus resulted in a joint work of the WP Leaders. As decided in the GB meetings, it was the task of the WP leaders to coordinate the production of the material for her/his clusters. S/he had to organize the process in her/his respective WP. This process included the two major steps. First, research topics where proposed and defined collectively in a WP for the related cluster. Then the actual slides and presentations for the Learning Packages were created. The result was merged by the leader of the Virtual Campus in a presentable form. The structure is detailed next and followed by a walkthrough describing the interface features.

2.2 Learning Packages Structure

The requested public addition to the Virtual Campus, the Learning Packages, have been split accordingly to the 6 S-Cube research areas. Thus, each of the 6 S-Cube JRAs has its own cluster. Furthermore, on a second layer an elaborate structure divides a cluster into the dominant research topics of the research areas. In total there is a collection of 12 particular research topics. These topics lead a third layer structure which gives access to the Learning Packages. The partners created a total of 42 Learning Packages for the research areas. The number of contributions from each partner range form between 1 and 6 Learning Packages; some were created in collaborations. The table below details the number of Learning Packages per cluster.

Cluster	#Learning Packages
JRA-1.1: Engineering and Design	6
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JRA-1.3: Quality Definition, Negotiation and Assurance	12
JRA-2.1: Business Process Management	3
JRA-2.2: Composition and Coordination	8
JRA-2.3: Service Infrastructures	6

Table 1: Contributions per cluster

In this section a guide through the Learning Packages as integrated into the Virtual Campus is presented. The "look and feel" is in the line with the familiar S-Cube themes and integrates nicely into the other Virtual Campus Domains namely, *Public Campus*, *Internal Campus*, and *Knowledge Base* already presented in deliverable CD-SoE-1.1.6.

2.3 Learning Packages Walkthrough

Figure 1 illustrates the top-level overview of the packages. Each of S-Cube's research areas represents an individual cluster. By clicking on one of the areas the interested user is directed to a substructure at a second level which represents the selected research topics of each cluster. These were provided by each of the package leader, namely, the WP leaders.

Figure 2 represents an example of a research topic overview. The figure shows the view a user would get when s/he selects the cluster *JRA-1.2 Composition and Coordination*. At this level an *Overview* provides a summary presentation that outlines the successfully addressed research challenges in this very cluster and gives references to the knowledge model and the S-Cube's own or relevant publications. Furthermore, in the presented example the jointly selected sub-topics of particular interest for the cluster are the listed *Models and Mechanisms for Coordinated Service Compositions* and *Adaptable and QoS-Aware Service Compositions*.

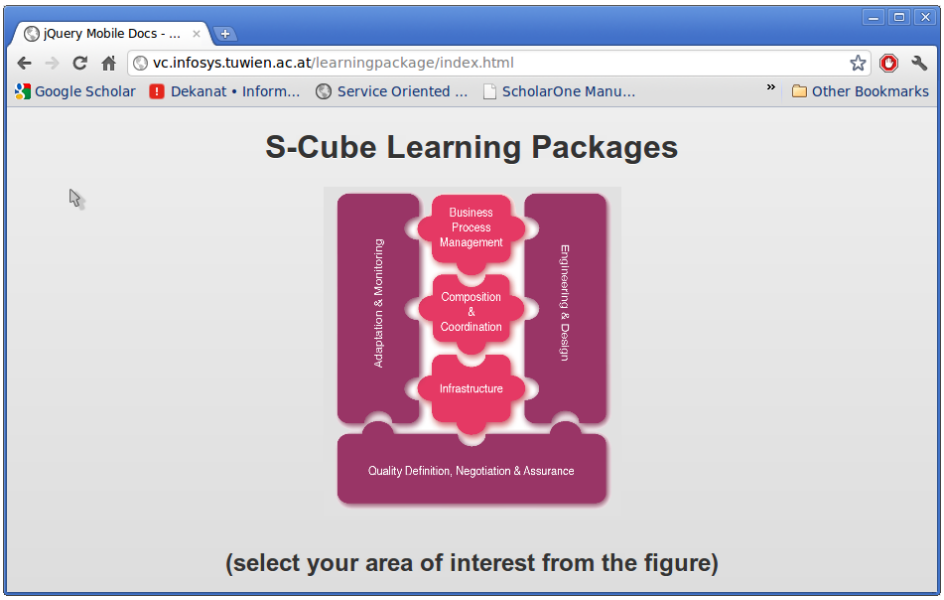

Figure 1: Cluster Overview.

Next, if one was to select the topic *Models and Mechanisms for Coordinated Service Compositions* one slides to the following level where the actual Learning Packages are accessible. These are implemented as a collapsible HTML structure that represents a container for each of the Learning Packages. This mechanism provides a more comfortable interaction with the Learning Packages.

Finally, Figure 4 provides a view on the details hidden in collapsible. First of all, the user can live access and browse the Learning Packages' slides embedded from the S-Cube *SlideShare* account (more on that later). Below, a tag cloud of the most important S-Cube related terms comprised in the presentation is attached. The collection represents and references terms of the S-Cube *Knowledge Model*. A link to the *Knowledge Model* is connected to each of the terms. Their size represents the frequency of occurrence in on the slides. As all slides are recommended to be provided without registration obligations at the bottom a download link

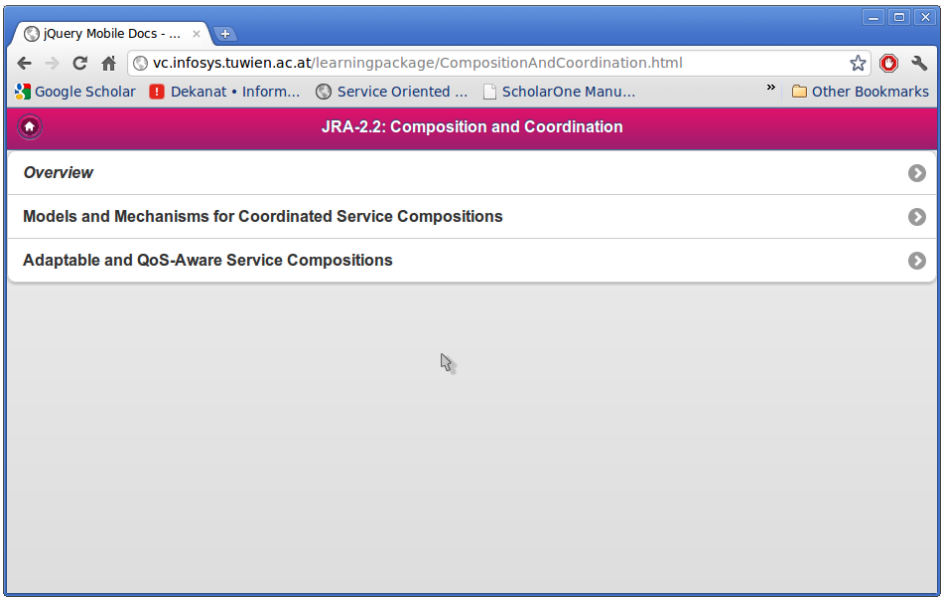

Figure 2: Selected Research Topics Overview.

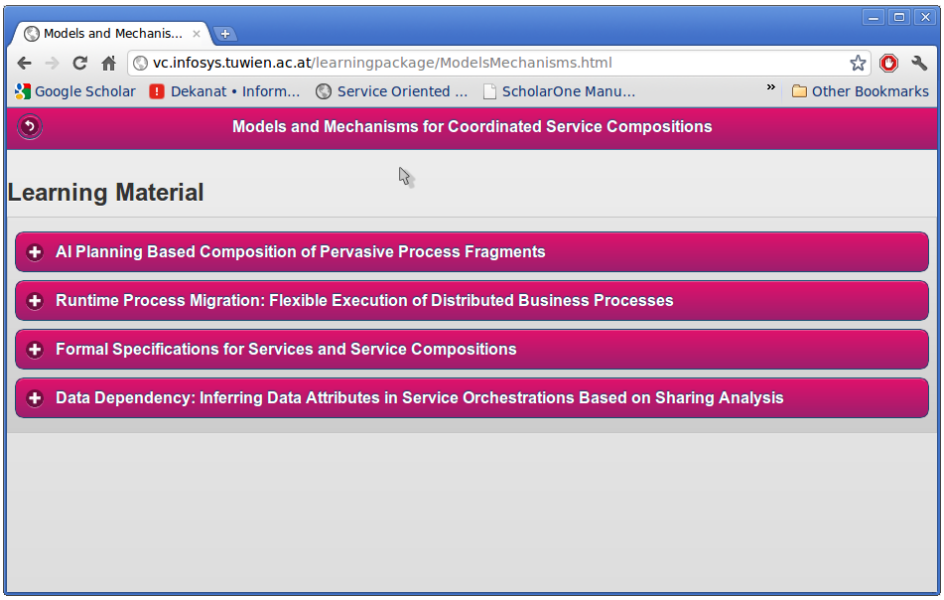

Figure 3: Selected Learning Packages Overview.

to each slide set is available. For questions and comments the interested reader finds the contributing partners listed on the title slide.

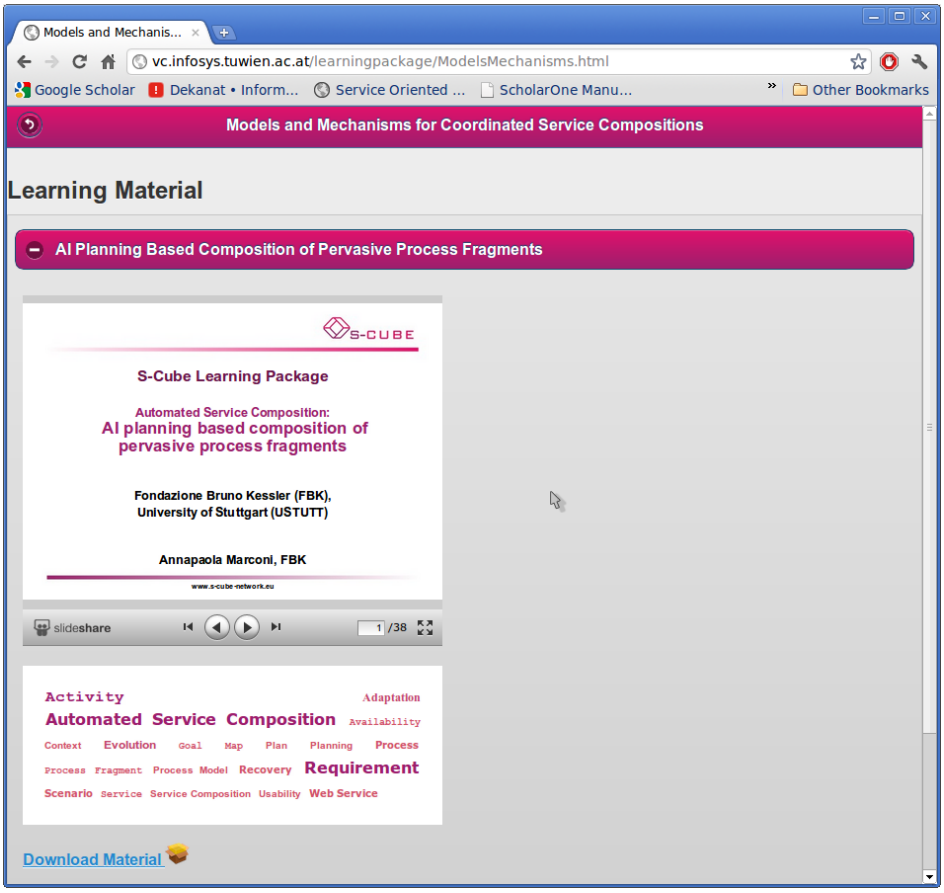

Figure 4: Learning Packages details.

3 Sustainability Concepts

The requested proposal of a sustainability concept beyond the S-Cube life time was realized as follows. The leader of the Virtual Campus proposed and followed two variants presented below in detail that had the common consent of the partners.

3.1 SlideShare

SlideShare [1] is the world's largest community for sharing presentations. According to their numbers there is 60 million visitors monthly and 130 million pageviews. It is amongst the most visited 200 websites in the world. Besides presentations, SlideShare also supports documents, PDFs, videos and webinars. SlideShare features a vibrant professional and educational community that regularly comments, favorites and downloads content. SlideShare content spreads through blogs and social networks such as LinkedIn, Facebook and Twitter. Individuals and organizations upload documents to SlideShare to share ideas, conduct research, connect with others, and generate leads for their businesses. Anyone can view presentations and documents on topics that interest them, download them and reuse or remix for their own work.

[1] SlideShare - present yourself: `http://www.slideshare.net/`

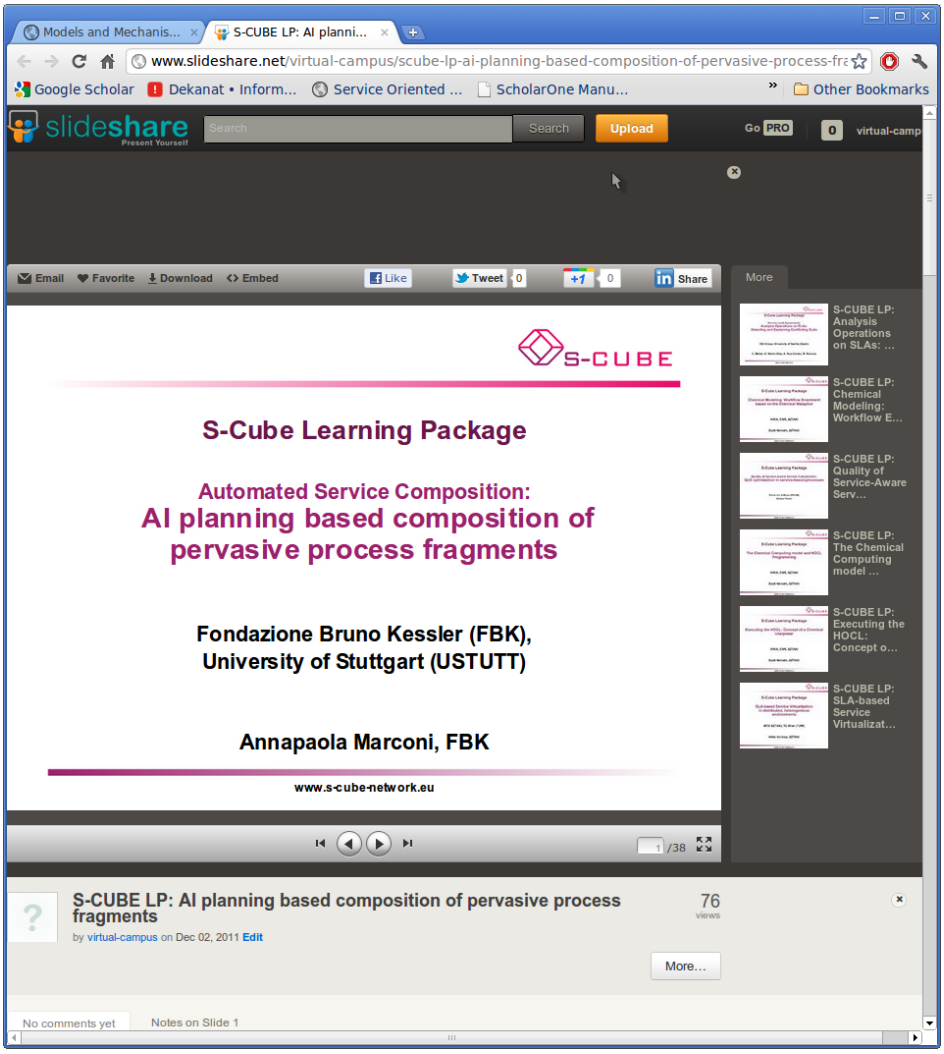

Figure 5: SlideShare example.

To sum-up, the following are the most interesting features of SlideShare for sustainability :

- The presentations can be uploaded for public use.
- The presentations can be downloaded and reused.
- The material can be embedded into blogs, websites, etc.
- They can be shared with social networks such as Twitter, Facebook, LinkedIn.
- The slides can be tagged for easy search.
- The slides can be commented by users.
- They are indexed by internet search engines and show up in search results.

Figure 5 illustrates an example of how the slides are hosted at SlideShare. Above the presentation are recent methods to share, embed, and download the Learning Packages. Below the common control buttons. The convenient tagging mechanism allows to categorize the material and related material is available in the list on the right hand side of the slide.

3.2 iTunes U

Anyone who creates and distributes a course on iTunes U, will join a large and growing community of schools and institutions that are sharing their content with students and lifelong learners all over the world. iTunes U includes Stanford, Yale, Oxford, and UC Berkeley, along with other distinguished institutions such as MoMA, New York Public Library, and more. Students can use iTunes on their computer or the iTunes U app on their iPad, iPhone, or iPod touch to browse and download over 500,000 free lectures, videos, books, and other resources on thousands of subjects. The iTunes Learning Packages integration is currently in the process of being published.

To sum-up, the following are the most interesting features of iTunes for sustainability :

- Share presentations in many different formats (Video and slide presentations).
- Tag, keyword enhanced presentations.
- Provided by iTunes Store and presentable on all compatible devices.
- Share privately or publicly.
- Popular with many Universities.

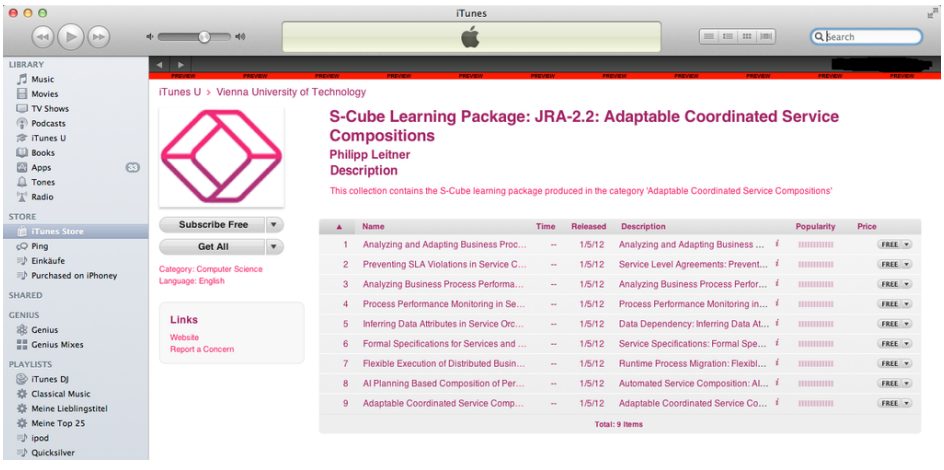

Figure 6: iTunesU preview.

4 First Usage Assessment

In this section we provide the most recent statistics including KPIs relevant to th Virtual Campus. First, we give a general overview of the access statistics related to the whole of the Virtual Campus. Then we detail the numbers related to the Learning Packages only as available by SlideShare.

Table 2 outlines some important KPIs of the Virtual Campus compiled recently on 23th of Jan 2012.

KPIs	Value
Total Hits	838.448
Visitor Hits	564.413
Avg. Hits per Day	1.013
Avg. Hits per Visitor	27,18
Total Page Views	198.247
Avg. Page Views per Day	239
Avg. Page Views per Visitor	9,55
Total Visitors	20.764
Avg. Visitors per Day	25
Total Unique IPs	5.139

Table 2: Data as of 23th Jan.

Next, two figures Figure 7 and Figure 8 demonstrate the access log of activities since activating the Virtual Campus. Note, the flat curve until official launch after the Y3 review. Figure 8 illustrates the access with focus on the hours of day.

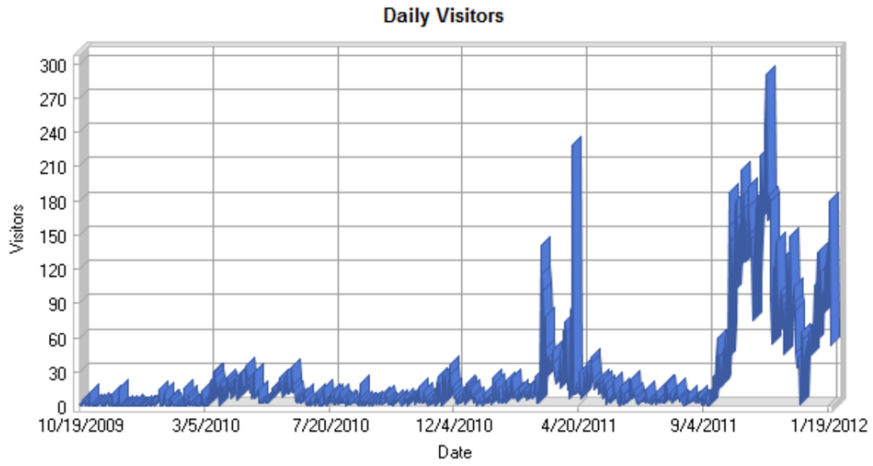

Figure 7: Activity per date.

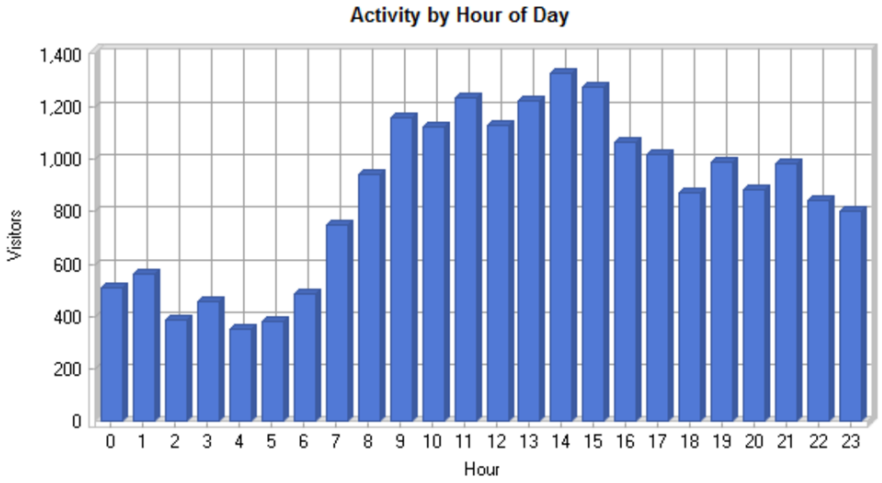

Figure 8: Activity by hour of day.

Finally, Table 4 are the collected statistics from SlideShare. The rows represent the number of slides, the number of views, and the number of downloads.

KPIs	value
Avg. Number of Slides	38,9
Avg. Number of Views	45,9
Avg. Number of Downloads	1,4

Table 3: Data as of 23th Jan.

5 Summary

This report presents the current status of the Virtual Campus platform. Thereby, the focus is on reporting the progress of the requested add-on, the Learning Packages. The Learning Packages are a on-line tool for the outreach strategy, which tends towards a more information push approach. The current collection of Learning Packages comprises clusters related to each of the WPs and their representative research topics. Screenshots of the UI give an impression of the fully developed platform. A final chapter outlines the efforts for sustainability concept that will provide the Learning Packages beyond the S-Cube life time. A first usage assessment is provided.

References

[1] O. Danylevych, "CD-SoE-1.1.6: Virtual Campus," Tech. Rep., 2011.

[2] ——, "CD-SoE-1.1.2: Organizational Structure for Virtual Campus," Tech. Rep., 2009.

A Appendix

The following table provides a detailed overview of the Learning Packages statistics per contributed slides. As one can see, there is a substantial amount of views; downloads are still only very view.

Title	#slides	#views	#dls
Analysis Operations on SLAs: Detecting and Explaining Conflicting SLAs	78	34	
Chemical Modeling: Workflow Enactment based on the Chemical Metaphor	52	13	
Quality of Service-Aware Service Composition: QoS optimization in service-based processes	63	24	
The Chemical Computing model and HOCL Programming	26	24	
Executing the HOCL: Concept of a Chemical Interpreter	35	23	
SLA-based Service Virtualization in distributed	35	29	
Service Discovery and Task Models	37	33	1
Impact of SBA design on Global Software Development	49	24	
Techniques for design for adaptation	42	73	
Self-healing in Mixed Service-oriented Systems	34	44	
Analyzing and Adapting Business Processes based on Ecologically-aware Indicators	29	47	
Preventing SLA Violations in Service Compositions Using Aspect-Based Fragment Substitution	31	48	
Analyzing Business Process Performance Using KPI Dependency Analysis	36	60	
Process Performance Monitoring in Service Compositions	32	56	
Service Level Agreement based Service infrastructures in the context of multi layered adaptation	34	129	
Runtime Prediction of SLA Violations Based on Service Event Logs	40	85	
Proactive SLA Negotiation	21	127	
A Soft-Constraint Based Approach to QoS-Aware Service Selection	35	171	
Variability Modeling and QoS Analysis of Web Services Orchestrations	32	20	
Run-time Verification for Preventive Adaptation	43	28	2
Online Testing for Proactive Adaptation	35	29	
Using Data Properties in Quality Prediction	40	20	
Dynamic Privacy Model for Web Service	51	96	
Proactive SLA Negotiation	21	107	
Quality of Service Models for Service Oriented Architectures	54	107	
Service Identification	25	46	
SOA Migration: Study of Theory and Practice	39	36	
Service Adaptation: A Maintenance Process ?	24	31	
Dynamic Adaptation: Dynamic Adaptation with the Chemical Model	35	129	
Data Dependency: Inferring Data Attributes in Service Orchestrations Based on Sharing Analysis	58	60	
Formal Specifications for Services and Service Compositions	45	82	
Runtime Process Migration: Flexible Execution of Distributed Business Processes	32	92	
AI planning based composition of pervasive process fragments	38	80	
Business Transaction Modeling	74	78	
Performance Analysis and Strategic Interactions in Service Networks	53	85	1
Service Network Analysis & Prediction Tool (SNAPT)	44	85	
Service Versioning	30	153	1
Multi-layer Monitoring and Adaptation of Service Based Applications	34	175	
Context-aware Adaptation of Business Processes	34	160	2
Service Level Agreement based Service infrastructures in the context of multi layered adaptation	35	22	
Monitoring Adaptation of Service-based Applications	41	179	
Mining Lifecycle Event Logs for Enhancing SBAs	26	182	
Indentify User Tasks from Past Usage Logs	20	260	

Table 4: SlideShare contributions access data as of 23th Jan.