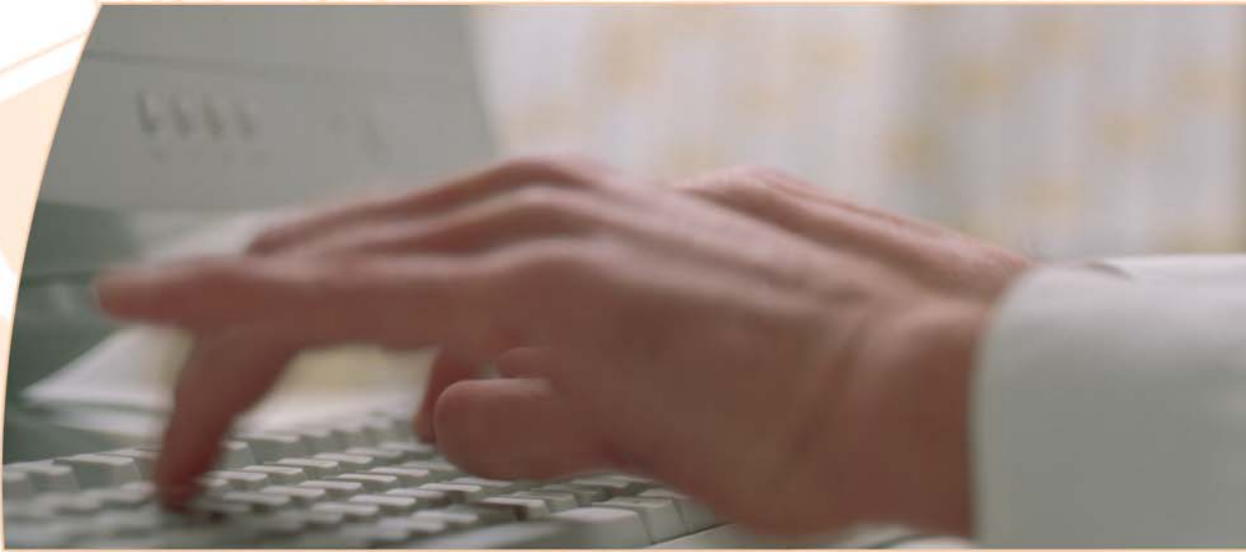


www.asg-platform.org

"Next Generation Service Delivery"

Adaptive Services Grid

European Integrated Project



Negotiate
Execute
Compose
Discover
Integrate



Sixth Framework Programme
Information Society Technologies
Open development platforms
for software and services

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VISION AND PROJECT GOALS

"It's all about services"

- **The vision of the Integrated Project Adaptive Services Grid is to provide the next level of service provision and delivery by developing concepts, languages and tools for an open architecture for adaptive service discovery, creation, composition and enactment. Furthermore, the platform will stimulate business use by adding functionalities and procedures in order to respect quality of service parameter defined by users.**

In the interconnected world of the Web, users are able to take advantage of services on a broad range of functionality such as searching, ordering, making reservations or retrieving any kind of information. In the future services will provide far more functionality to users in using a wide range of different service components and by applying complex processes in the form of service-oriented applications. Such service applications will have their runtime environments within a worldwide network and be powerful through dynamic performance capabilities in which many flexible service components

The ASG open service platform-generic and domain-specific

The main goal of ASG is to develop an open service platform that consists of a set of concepts, languages and tools that are generic and therefore domain-independent in a way, where it can adapt to different kinds of application realms, business needs or service scenarios. In order to provide a broad range of solutions, tailoring towards a specific application area primarily requires the definition or provision of a domain-specific ontology that describes the concepts and their relationships in that particular domain. Once provisioning has been taken care of, the platform will be able to access

Adaptive Behaviour

Through use of the ASG platform, every service will be accessed and handled in an adaptive way. This means that the platform is able to adapt to runtime changes in the service environment such as the deletion or failure of a service or the registration or creation of new services. In the end the platform

attempts to reach a defined user goal as long as the service landscape allows it. For example, in case of a service failure the platform attempts to substitute or re-build this service automatically by using semantically equivalent services that are available in the current service landscape. This type of automation is inherent in almost every feature of the platform from service discovery to invocation and represents a distinct advantage over traditional manual construction methods carried out at design time.

Reliability in the sense of fulfilment of a requested service is also addressed. The use of Grid technology in the underlying infrastructure ensures efficient resource usage and provides high performance with respect to Quality of Service parameters. Finally, ASG attempts to overcome unforeseen problems or situations in the service landscape and the service delivery lifecycle by developing automated, adaptive and dynamic techniques and applying them to service-related technologies.

More User-centric Services

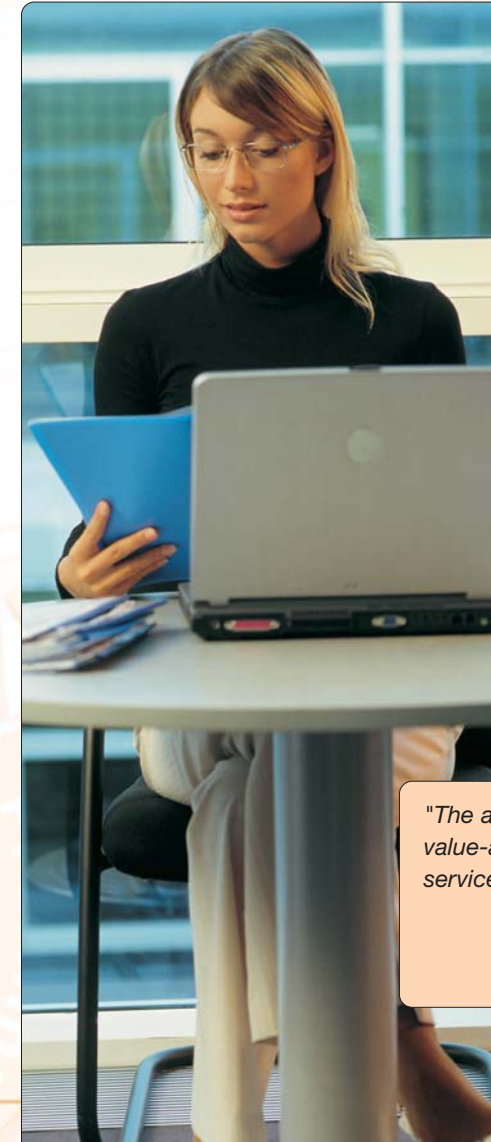
The philosophy of ASG is to be as user-centred as possible. This means that ASG will develop and provide technologies that ease service consumption and service provision in addition to providing much richer functionality by services being more capable and valuable as compared to traditional services today. Additionally, this user-centred philosophy involves putting more control in the hands of the user, for example in terms of consuming a service. The best way in which this can be achieved is to allow the user to specify preferences and constraints, which will have an impact upon the quality of a service that needs to be fulfilled when a user goal is reached. The user is therefore able to choose levels of quality from a wide range of service-related aspects such as maximal cost or response time.

- **The ASG Consortium has 22 partners ranging from major European academic and industrial research institutes, to small and medium-sized companies from a total of 6 European countries and Australia.**

ASG is part of the Sixth Framework Programme Information Society Technology with the strategic objective "Open development platforms for software and services" and was launched in September 2004 with a lifetime of two years.

"Over the last few years, the service-oriented paradigm has gained massive interest from industry and also from academia. SOA is predicted to have a massive impact on how we build software systems, and current developments in software industry affirm this. What makes SOA attractive is the loose coupling of individual services to larger applications, and this is exactly where ASG comes into the picture. We are providing a platform which allows seamless integration of heterogeneous external services, on-demand creation of service compositions and reliable service provision."

Dr. Dominik Kuroпка, Hasso Plattner Institute, Germany (ASG Scientific Coordinator)



"The adaptive capabilities of ASG enable the simple and low-cost creation and provision of new types of value-added services and service-oriented applications that are not possible in the current generation of service platforms."

Prof. Dr. Ryszard Kowalczyk, Swinburne University of Technology, Australia
(Work Component Leader "Adaptive Process Management" and Member of the ASG Scientific Board)

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are available. Reliability, easy service creation and composition as well as service maintenance take on a new meaning when a service is created not only from one source, but also from a network of service providers. The Integrated project Adaptive Services Grid tackles such challenges by developing an open platform for adaptive and flexible service discovery, creation, composition and enactment. Positioned in the field of service-oriented architectures (SOA), ASG attempts to raise SOA technology to a new level, by incorporating and carrying out research on a number of concepts and techniques drawn from the latest technologies such as semantic web services, grid technology, agent-based negotiation or model-driven service creation.

and handle all services that rely on that ontology. Service providers will be encouraged to use already existing ontologies or to provide new ones in order to integrate their services. ASG will thereby provide support in the development of ontologies and the integration of services. Several business-oriented usage scenarios and a prototype will allow the adaptability of the platform towards specific application scenarios to be formally proved and demonstrated.

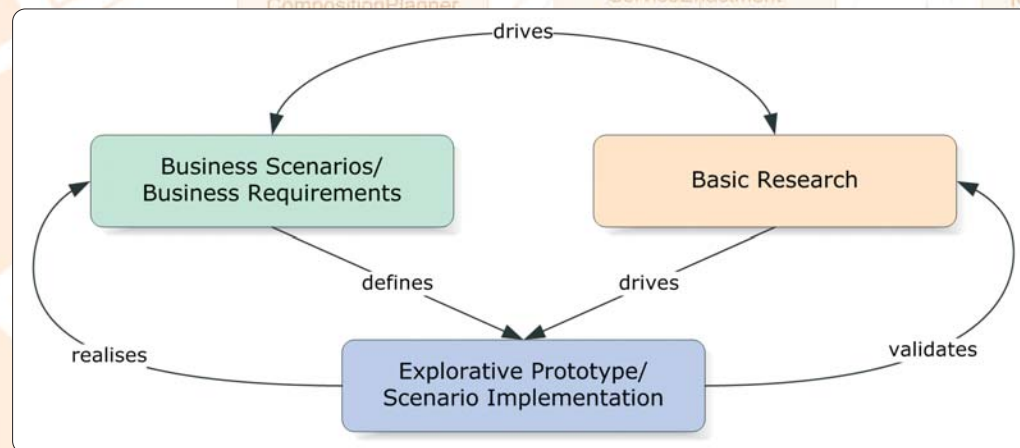
DEVELOPING USAGE SCENARIOS FOR BUSINESS

ASG's explorative research methodology

In order to ensure business exploitation of ASG outcomes and results, ASG adopts an approach where research is tightly interweaved with business-oriented usage scenarios and prototype development. As the ASG project has quite a range of industrial partners it is crucial for them that results of the project can directly be transferred into real-world business scenarios. Therefore, research efforts from the ASG research work components are strongly related to business requirements defined by the industrial partners. Iteratively integrating recent findings, concepts and techniques into a running explorative prototype enables the ASG project on one hand to validate and refine research results and on the other to provide industrial partners with concrete solutions. The explorative research methodology of ASG takes advantage in the "Attraction Booking Scenario" which was selected for demonstration purposes by the platform prototype.

Usage Scenarios

Alongside the participation of major European research institutes, the ASG project has the distinction of a strong involvement of industry-based partners ranging from big companies to small and medium-sized enterprises. The ASG project thus aims to have great impact on relevant industry and businesses, and will exploit and demonstrate its



technical developments in a variety of application areas. Although the ASG platform intends to cover a wide range of application possibilities, the targeted industry domains are exemplary in the domains of telecommunications, telematics and enhanced enterprise IT. Additionally, the field of E-Government will also be targeted. As demonstration of potential application of the ASG platform is of vital importance, several candidates of usage scenarios will be

developed. These scenarios will serve as a base to open the door for business and industrial exploitation. In order to achieve this the project has a dedicated Work Component "Usability and Demonstration" which concentrates on the design and development of such scenarios.

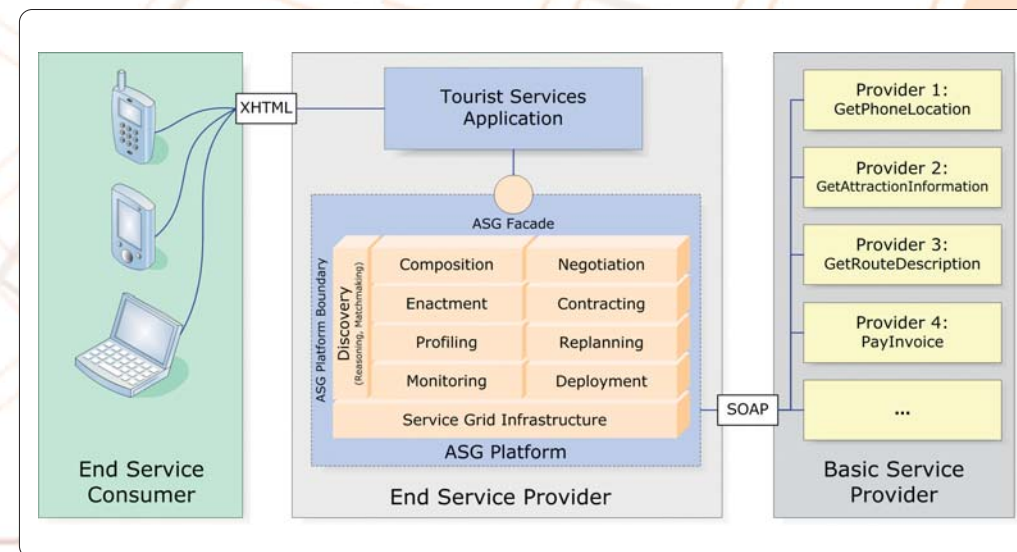
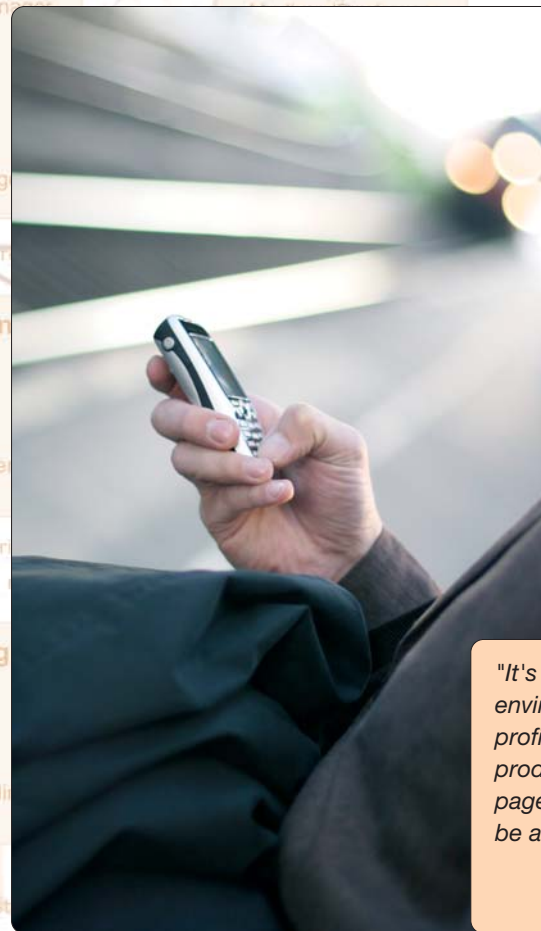
The primary scenarios that are currently under development are:

- Telematics Scenario (including "Attraction Booking Scenario")
- Management of Services in Dynamic Supply Chains
- Application and Service Monitoring in Telecom and IT Enterprises
- Service-oriented E-Government applications for Finnish authorities

A proof-of-concept prototype will demonstrate the technical developments of the particular work components based on one of the scenarios.

Demonstration Scenario "Attraction Booking Service"

In order to prove the feasibility and applicability of the concepts and technologies developed within ASG and to demonstrate their technical advancements, the project has selected one usage scenario that will be implemented by the platform prototype. This scenario, designed by the industrial partners of the telecommunications industry, presents



a location-based mobile service called the "Attraction booking service". This service can be regarded as a part of a larger service platform providing different kinds of tourist services for a mobile end user. The goal of the attraction booking service is to provide customers with information about attractions in the proximity of the customer's current location. Additionally the customer is able to perform certain actions based on this information, for example retrieve event details, book, pay, or get

route descriptions. The customer uses a mobile device, such as a PDA or mobile phone, to obtain this information. A sample situation where this service might be useful is where a tourist visits a foreign city and wants to book a cultural event for the evening.

"It is very important to have strong industrial partners who are really making sure together with the researchers that the research and the platform development will be of practical and even of commercial use after the project."

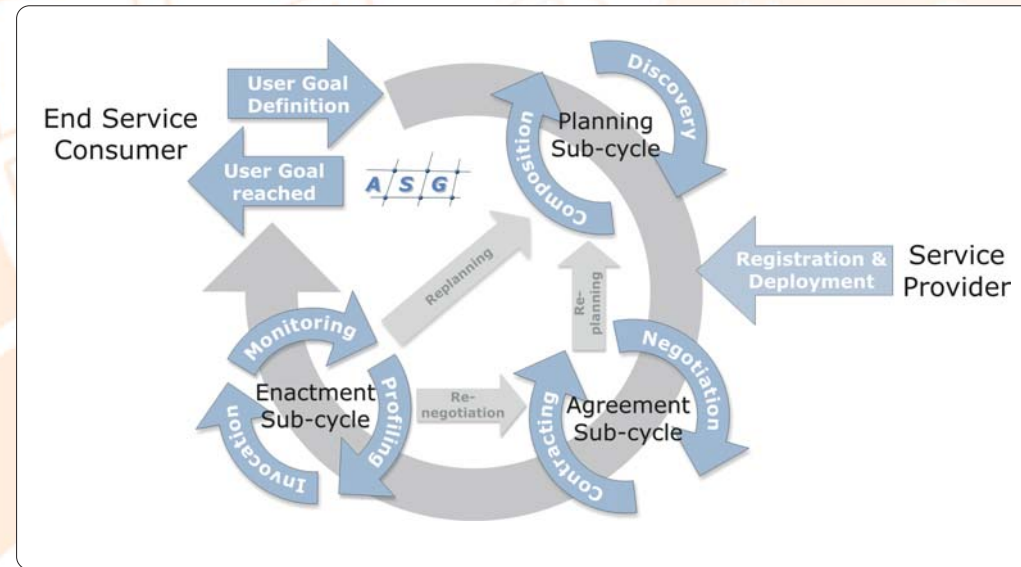
Prof. Dr. Mathias Weske,
Hasso Plattner Institute, Germany
(Work Component "Service Discovery & Composition")

"It's not one specific kind of application which will benefit from ASG development. All dynamic environments, where services have to be composed based on dynamic service components, will profit from ASG. Companies are getting lean, they do their business best. But in order to provide a good product to the customer, they have to enrich their product by additional information. Almost all Web pages of air carriers (airlines) have turned into travel Web pages. You can book your flight, but will also be able to book the rental car, the hotel and much more."

Dr. Josef Noll,
Telenor R&D, Norway (Work Component Leader "Usability and Demonstration")

ASG's SERVICE DELIVERY LIFECYCLE

■ The ASG platform will perform and support a service delivery lifecycle that enables provision and consumption of complex services based on new computing and web technologies. The main enabling concept is that ASG will use semantical information about services to fulfil user requests. A service in ASG is thus not only syntactically (the technical interface to invoke a service) described but also semantically. These semantics are represented by semantic service specifications, which include functional and non-functional properties and rely on ontologies from various industrial domains. ASG components can make use of this information for what a service does in addition to how it does it.



Planning Sub-cycle

ASG distinguishes between two types of Services: basic and composed services. A service composition can be thereby regarded as a combined set of services that yield another service reflecting more complex workflows or service processes. In the planning sub-cycle, the ASG platform analyses the current service landscape by discovering and com-

posing the best services to build such a process that achieves the user's goal. To accomplish this, ASG uses the semantic information provided by service specifications and is therefore able to discover and compose services automatically at runtime. By contrast, current state-of-the-art services have to be composed manually at design time due to the lack of semantic information in their service specifications. The service composition makes use of ASG's ability to react to changes in the service landscape as services are unavailable or new services were registered. Therefore, the platform can generate new or update existing service compositions (Replanning) whenever the usage of newly available services is needed.

"Quality of service, which covers a broad range of non-functional aspects of services such as cost, response time, duration, performance, availability and many others, is a very important requirement of both business and individual users. By incorporating quality of service in the composition and provision processes, ASG enables user-centric delivery of new and enhanced services where the users have more choice and the increased control over service quality they receive. The quality-assured provision of services in ASG also benefits the service providers who can offer more differentiated and user-tailored services. Those services can be dynamically assembled with little effort and executed adaptively in response to the changing user's needs, business requirements and service environments."

Prof. Dr. Ryszard Kowalczyk, Swinburne University of Technology
(Work Component Leader "Adaptive Process Management" and Member of the ASG Scientific Board)

Agreement Sub-cycle

ASG is able to negotiate with service providers to find the best solution for user preferences (Quality of Service parameters) provided together with a user's request. To make this possible ASG separates between the specification of the semantics of a service and the actual binding to the service implementation (the technical interface). A service composition therefore contains only semantic specifications of those services of which it is made up. The service implementations are selected by automated negotiation of contracts with candidate providers and results in service level agreements (SLA's) in order to fulfil the Quality of Service parameters of the service composition. Therefore, the selected service implementations adapt to the dynamic negotiation results as well as to the user specific needs. The agreement part of the ASG platform is thus conducted with the use of agent technologies.

during execution such as reliability or throughput of a service and summarises these values in the form of a profile for future negotiation tasks.

Registration & Deployment

ASG follows an approach that provides openness for the widest possible range of service providers and service developers that want to register their services in the ASG platform or intend to create or develop new ASG compliant services. A tool chain based on model-driven approach will support the creation and generation of new ASG services with the help of pre-existing service specification models. This, in turn, will allow easier integration and enrichment of external services with semantic metadata in order to make them ASG compliant. In this way, every standardized web service can be registered in the platform and deployed within its grid-based infrastructure.

Enactment Sub-cycle

During the enactment of a planned service composition, every individual negotiated service implementation is invoked using the ASG Grid service infrastructure that further provides access to service implementations in an adaptive manner using dynamic Grid resource selection. The ASG monitoring handles possible errors and failures, when for example a service is not available or a service level agreement is broken. In such cases, the platform attempts to re-negotiate other service implementations that fit into the same semantic specification as for the broken service. If this is not sufficient, it triggers a re-planning of the service composition based on the current execution status and the user's goal. Therefore, it adapts to the current state of the enactment to re-plan only the part of the service composition that has failed. In addition, the ASG profiling tracks various service properties



THE TECHNOLOGIES

- **ASG takes advantage of the latest research issues within areas such as Web Services, the Semantic Web, Grid technologies, as well as Agent-based Negotiation or Model-driven service creation. One aim of the integrated project is to unite these by utilizing and evaluating their main concepts and methods for further development and extension.**



Service-Oriented Architectures (SOA)

The main technological paradigm in which ASG is positioned is Service-oriented Architectures (SOA) where services are the primary focus as compared to data, objects or applications. This paradigm is based on web service technology is currently proliferating due to internet technologies and established, well-known standards such as SOAP, WSDL and UDDI. SOA technology attempts to provide interoperability in heterogeneous environments by connecting and integrating applications across enterprise and technology boundaries. This is possible because services are able to hide the underlying functional complexity and technology platform. That's why SOA platforms primarily intend to improve the alignment of business processes with IT-infrastructure. In contrast to state-of-the-art SOA, there are still a number of challenges which remain to be addressed. These challenges are mainly about latent automation possibilities that simplify processes and tasks related to services such as building service applications faster, finding appropriate services more easily, simplifying service specification and creation or enabling easier negotiation of contracts for consuming a commercial service. In addition, in terms of the composition of services that yield another service (also called service orchestration), the programmer has currently to do this manually at design time. The challenge here is to automate this process at runtime. This is one of the areas where ASG plays a major role, largely through developing concepts, languages and tools for an open service platform that attempts to overcome current SOA weaknesses such as dynamic service composition or automatic service negotiation.

"The real challenge for industry, after years of consolidation, is to find answers on how to provide dynamic and flexible services, adaptive to the needs of the customers. So far most of the composed services are put together manually, and every change to that service introduces high costs. We believe, and will demonstrate that in ASG, that porting the Web services to semantic Web services is the way to go, and provide a dynamic service arena."

Dr. Josef Noll, Telenor R&D, Norway
(Work Component Leader "Usability and Demonstration")

Semantic Web

The semantic web is widely proclaimed to be the next generation of the internet, that is an extension of the current web in which information is given a well defined meaning. The Internet is currently a huge information space that is interpretable mostly by humans or manual intervention. In order to make this data also interpretable by machines semantic metadata needs to be added in a machine process able way in order to enable reasoning about this semantic information by software programs. This could, in turn, shift the internet into a web of applications and services where machine-to-machine and human-to-machine communication would be more effective. Ontologies are a core enabling concept for the semantic web that define the vocabulary of a particular domain in order to communicate in the same "language". An ontology describes a shared conceptualisation of a specific domain by describing its concepts and the relationships between them. ASG explores and uses semantic web technologies for further development to enrich existing web services with semantic metadata or to create new semantically rich services. By using such concepts ASG will be able to discover or compose services on an automatic and flexible way. ASG will also give support in the development and specification of domain-specific ontologies.

Grid Technology

The term Grid technology is most typically interpreted as sharing computer power and data storage over the internet in order to use resources co-operatively. Powerful Grids are used across corporate and organisational boundaries by incorporating and sharing resources of all parties into a virtual organisation. The usage of grid technology in the underlying ASG infrastructure allows high scalability, reliability and will provide high performance for task fulfilment. User-specified Quality of Service parameters can be therefore respected. ASG uses

Model-Driven Development

Model-driven development (MDD) is about using models to automate software development. In this sense, MDD can ease the task of creating and developing services, service adapters or wrappers to bridge the gap between implementation technologies or, in the case of services, semantic service description languages. ASG will provide a model-driven based tool chain in combination with service models for flexible creation of new services or the adaptation and integration of already existing external services in order to make them ASG compliant. This opens the door for external service providers that want to have their services provided via the ASG platform. Once the services are registered, ASG uses them to fulfil user request as any other deployed or referenced service.

the Grid paradigm in the sense of service grids, where services are deployed and executed in the Grid infrastructure. It therefore adopts the Grid idea in that the actual binding of a resource for the execution of a service is delayed until execution time. This facilitates a flexible and adaptive approach for efficient resource usage.

Agent Technology

Agent technology, originally a part of the field of artificial intelligence, allows software programs to act more intelligently by taking over tasks that are too tedious, complex or protracted to be carried out by a human. These software programs, also called agents, act on behalf of a user and the preferences that they specify. In the context of semantic web technologies agents could reason about semantic specifications of services with regard to relevant domain ontologies. In ASG, Agent technology is used to automate the task of negotiating service level agreements, which define a contract between a service consumer and a service provider. The ASG platform holds a mediating position where this task is hidden to the end-user.



EVENTS

ASG Events

One of the most important instruments to present and demonstrate ASG's research and development outcomes are events that facilitate direct contact to interested parties and feedback on research work. ASG will carry out various kinds of events in order to provide specific topics related to target groups. The main types of ASG events are industry workshops, scientific conference tracks, and demonstration and training events. While industry workshops will mainly focus on business-oriented topics in order to present business-related benefits and exploitation possibilities of ASG technologies, scientific conference tracks will orient on outstanding research issues of ASG work done so far. Demonstration events are more practical e.g. by demonstrating ASG technologies via the platform prototype. Finally, training events will concentrate on increasing skills of developers, programmers or researchers in using and understanding ASG related technologies.

- ASG PhD-Session at 8th International Conference on Business Information Systems (BIS 2005) in Poznan, Poland
- Business Session for representatives of the telecommunication industry in conjunction with an ASG Multi-component Workshop in Warsaw, Poland
- 2nd International Conference on Grid Services Management and Engineering (GSEM 2005) hosted by Net.Objectdays 2005 in Erfurt, Germany
- ASG PhD-Session at Net.Objectdays 2005 in Erfurt, Germany
- ASG Session at Semantics 2005 in Vienna, Austria



The actual list of upcoming and held events is available at: www.asg-platform.org. Please look at the event page about restrictions, fees and event-related details. If you are interested in one of the events open to the public then you are able to reduce your costs by max. 30% from the overall event fee by using this coupon.

ASG Event Coupon

Only for events carried out by the European integrated project Adaptive Services Grid (ASG).

Event (Name of event on which you intend to use this coupon)

Date of Event Location

Name First Name

Affiliation

Address:

ZIP/Location

Phone/Fax

Date - Signature

"The new FP6-instrument integrated project guarantees best conditions to disseminate research results directly to the potential user groups by distributing the generated knowledge via a whole set of activities, such as R&D Exchange, Training and Demonstration actions. The impact of these activities mainly depends on the offered public dissemination events. Workshops, conferences or sessions will motivate the discussion between scientists to refine project issues or to adjust the goals from the scientific point of view. Business sessions, exhibitions or demonstrations provide the environment for proving advantages of the concepts, methods and tools developed within ASG and give a feedback on the essential business requirements of the project."

Holger Krause,
transIT GmbH, Germany (ASG Dissemination Coordinator)

PARTNER COMPETENCIES



ASTEC Sp. z o.o., Poland

ASTEC is a Polish firm located in Zielona Góra that offers outsourcing-based IT services to medium and large companies. Our primary goal is to realise projects mainly for European customers using the object oriented programming. We provide complete project delivery starting from analysing the customer's requirements, through working out the specifications, across design, implementation and quality assurance to installation, staff training and maintenance. Since 1993 ASTEC Advanced Software Technologies (since 2001 ASTEC Sp. z o.o.) has been carrying out projects for the textile industry, power plants (automatic control), public services, geographic information systems (GIS), car industry (measuring systems), insurance companies, universities, patent offices, mobile phone providers and others. Within ASG project ASTEC supports the service creation and integration of external services activities with industrial expertise with Java implementation work. ASTEC is involved in the C-3 component and focused on developing of Model Driven Architecture compliant tool prototypes: GUI for binding semantic information and platform independent service modeling aspects, the transformer between platform independent and platform specific models and the platform specific model to code generator.

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DaimlerChrysler AG, Germany

DaimlerChrysler Research and Technology is the hub of activity when it comes to the securing of DaimlerChrysler's technological future. It stands for innovation and sustained research. Transferring research results into DaimlerChrysler business units is one of the most important tasks of the Research and Technology division. Activities are concentrated on fields around the automobile and manufacturing technologies. Core competencies of the research departments participating in ASG comprise data management, domain engineering concepts, and multi-media systems. More information under www.daimlerchrysler.com. Our main areas of activities in ASG focus on service creation and the services grid infrastructure, including mobile

access. In service creation our focus is on domain engineering with configuration and composition support of services. In services grid infrastructure we examine aspects like communication and security of web-services, monitoring, QoS, and questions of performance.

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Fachhochschule Furtwangen, Germany

Fachhochschule Furtwangen (FHF) was founded in 1971. Today the Fachhochschule Furtwangen offers a broad selection of different subject areas: Bachelor (16) and master programs (9) in the areas computer sciences, technology, business and engineering with business studies. With the 26 Steinbeis technology transfer centres founded by Fachhochschule professors, the FHF is one of the most active universities in co-operating with industry and business. Additionally the institute for applied research, founded in 1987, with its focus areas of micro-systems technology, surface technology as well as environmental technology and management is an attractive partner for the industry. Professor Dr. Ulf Schreier is professor for applied computer science with focus on software architectures, specifically the design of business information systems. Prof. Schreier is also director at the faculty of information systems.

In the Adaptive Service Grid project FHF is concerned with service creation. Here, FHF is primarily addressing web services security and generative software development techniques.

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Fraunhofer IESE, Germany

Fraunhofer IESE currently employs more than 120 employees in research and development in the areas of software development approaches, software quality engineering and software process engineering, software architectures and software product lines, continuing improvement and Learning Software Organizations, IT security, technology-based learning, and experimentation. In cooperation with our sister institute in the U.S., the Fraunhofer Center Maryland, we are developing new technologies, methods, processes, and tools that provide an engineering-style basis for software development. We thus offer methodological instruments that make it possible to plan the design of development processes and to make software-based products ready for the market in a more efficient manner. Fraunhofer IESE contributes to the ASG project mainly with its competence in systematic method development and the transfer of research results in the industrial practice. IESE coordinates the development of the ASG platform and develops, based on the IESE methods PuLSE (Product Line Software Engineering) and KobrA (Component-based application development), an ASG application development method. Using this ASG method, service providers will be guided and supported in developing services and applications for the ASG platform. Additionally, Fraunhofer IESE contributes to the dissemination of ASG with its web-based training approaches.

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Hasso Plattner Institute - Business Process Technology, Germany

The Business Process Technology research group is part of the Hasso Plattner Institute for IT-Systems Engineering at the University of Potsdam, Germany. Its core competencies are process technology in general and the application of processes in the context of service oriented architectures in particular. This includes concepts and methodologies for process modeling, analysis and flexible enactment. Further research topics are architectures for process-enabled software systems and process-aware software product lines. In the context of services the main expertise is in the areas of semantic-enabled automated service composition, late service binding and case-based recomposition of services. The head of the Business Process Technology research group is also the scientific coordinator of ASG and, as thus, responsible for scientific progress in ASG. Our main areas in ASG are the development of a service composition sub-system, system architecture and infrastructure, and adaptive process management.

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Hasso Plattner Institute - Operating Systems and Middleware

The 'Operating Systems and Middleware Group' at 'Hasso-Plattner-Institute (HPI) for Software Systems Engineering' focuses in research and teaching on paradigms, design patterns and implementation techniques for enhancing middleware technology for predictable computing. Our mission 'Extending the Reach of Middleware' emphasizes two distinct research objectives, namely research on approaches for wide-area distributed computing on one hand side, as well as the question of how far middleware technology can be pushed into the domain of small devices on the other side. Investigating new middleware technologies and embedded COTS operating system techniques, online replacement of analytically redundant components has been identified as a new, promising paradigm for dependable control systems. In the grid computing area, we are investigating the interconnection of middleware and platform-specific system features to improve overall system predictability in heterogeneous scenarios. The ASG C-5 work component for the "Services Grid Infrastructure" (SGI) is lead by the Operating Systems and Middleware research group. SGI

PARTNER COMPETENCIES

addresses the questions of platform-independent heterogeneous service execution and monitoring, as well as load balancing, job allocation and SLA- fulfillment. The group is also responsible for the installation and maintenance of the ASG testbed, which is used for collaborative work and as foundation for experimental evaluation of the ASG development results and use-case scenarios.

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Marketplanet (Otwarty Rynek Elektroniczny S.A.), Poland

Marketplanet is a consulting company, operating on European market since 2001. Our area of specialization is to re-establish a proper position of purchasing process in a business activity. Our offer covers a wide spectrum of services and state-of-the-art technology tools, supporting all aspects and stages of procurement related activities. We provide a complex set of services, customized to fit individual needs and expectations of the customers. Starting from consulting and organizing an efficient and unified purchasing system in a company, thru training, development and deployment services, up to the outsourcing of underlying software solutions. Marketplanet is also an owner and operator of an electronic trade platform (e-marketplace) that offers companies connectivity and catalogue management services and provides comprehensive solutions that streamline and automate transactions between buyers and their suppliers. Marketplanet's consultants, have gained not only profound theoretical knowledge but also unique practical know-how and experience working for main Polish and international companies. Marketplanet is involved in the Usability and Demonstration component (C-7). We wanted to develop and design advanced telecom scenarios and work out exploitation plans and show how ASG would provide new advanced services in the specific application domains.

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National University of Galway, Ireland

The Digital Enterprise Research Institute (DERI) is a Science Foundation Ireland (SFI) Centre for Science and Engineering Technology (CSET) located at the National University of Ireland, Galway. DERI Galway was established in June 2003 and has a sister institute - DERI Innsbruck - located at the Leopold-Franzens University in Austria. DERI's mission is to make the Semantic Web a reality. DERI aims to develop the underlying technological platforms, middleware components, and domain specific solutions to support the full realisation of Internet mediated business, science, government, and society. DERI Galway is mainly contributing in two work components C-1 and C-2 in Adaptive Service Grid (ASG) project. We are leading work component C-2 with three main objectives i.e. Design and implementation of distributed service registry, service composition algorithm and match-making mechanism.

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NIWA Web Solutions, Austria

NIWA WEB Solutions (NIWA) is an innovative IT service provider located in Vienna, specialised in working on the cutting edge between R&D and applied technologies/application programming. NIWA is a spin-off from the Vienna University of Technology and its key personnel have participated in EU founded projects. Being a member of KnowledgeWeb, NIWA is active in Semantic Web R&D on European project level. NIWA brings to the project its long experience in developing advanced IT services for the telecommunication sector, its expertise in Semantic Web Services and its know-how in technical project management as offered to Austria's top telecommunication companies. Beside the participation in various EU founded projects (DIP, ASG) NIWA succeeded in several national research calls too. The latest national research project is focused on the development of a Semantic Mediation framework for the integration of legacy data-sources. The service portfolio includes consultancy services and development of IT-solutions. Recently NIWA launched a multi-national domain trading platform. In ASG NIWA will contribute to the work component business models and applications. NIWA will develop and design advanced telecom scenarios and work out exploitation plans. As a SME in Austria, the major driver of participation in ASG is to provide realistic use cases and to harvest achievements of research in early stage technologies. NIWA is particularly interested in real world adoption of technologies that enable automated service integration.

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Polska Telefonia Cyfrowa, Poland

Polska Telefonia Cyfrowa (PTC) is the Polish largest mobile telecommunications provider and one of the largest in Central and Eastern Europe. PTC began offering its services in 1996 and since then has grown into one of the top ten Polish companies. The PTC network covers more than 96 percent of Polish territory inhabited by more than 99.5 percent of the country's population. PTC has brought new mobile standards to Poland. It pioneered the mobile video transmission and introduced MMS commercially. PTC has launched innovative products to secure its continued leadership, including cooperation with media, m-banking, m-commerce partners, etc. Among those projects, PTC has begun the deve-

lopment of third generation voice and non-voice services and applications. In the ASG project PTC is concerned with service monitoring in enterprise IT usage scenario. We believe that ASG can introduce a new approach to service monitoring that may result in faster implementation of new products and improving customer perceived quality.

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Rodan Systems SA, Poland

Rodan Systems SA is one of Poland's most innovative IT companies. It was established in the early 1990s and today is one of the major producers of web based content, knowledge and workflow management systems. Rodan Systems specializes in the development and implementation of application software based on its proprietary OfficeObjects® platform tool. The OfficeObjects® product line consists of OfficeObjects® DocMan that is dedicated to document management, OfficeObjects® Archive that provide services of electronic multimedia archive, and OfficeObjects® Workflow that is responsible for business processes management. OfficeObjects® Portal, the most recent product, extensively enhanced within the ICONS project, provides for consistent access to all organisation's data and applications regardless of geographical and temporal limitations in the web browser environment. The systems offered by the company meet current needs of information management, organise multimedia information repositories, allow integration of traditional legacy systems with advanced solutions and directly support realisation as well as monitoring of business processes. Within ASG project Rodan Systems is in charge of developing software supporting adaptive process management.

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The Poznan University of Economics, Poland

The Poznan University of Economics (PUE) is, according to all major rankings, the second best business university in Poland. The core curriculum of The Poznan University of Economics provides a solid foundation in the humanities and sciences and offers introductory and in-depth courses in virtually every aspect of business life. PUE specialises in educating economists, managers and specialists in quality management in all sectors of the economy. The Department of Management Information Systems at PUE focuses on widely understood information and knowledge representation, processing and management. The Department of Management Information Systems at PUE offers education in broadly understood business information processing, providing students with a wide business background and the professional skills they will need to succeed in their professional lives. Within ASG project the Poznan University of Economics is responsible for developing dynamic service profiling system, developing of the Web Service description language and also taking active part in dissemination activities.

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SIEMENS

Siemens AG, Germany
Siemens is one of the world's largest electrical engineering and electronics companies.

Siemens Corporate Technology (CT) contributes to the increase of competitiveness and to the securing of the technological future of Siemens by research, development and consulting in strategic important technologies in close cooperation with the Siemens Business Groups and Regional Units. Siemens provides the Chief Architect and is involved in the setup of the ASG platform reference architecture, in the Service Creation and Registration. In Service Creation, Siemens provides Domain Specific Language (DSL)-tools and know-how in order to allow model-driven approach to generation of services from platform independent models (PIM). Siemens also works on the distribution aspect of (semantic) service registration and lookup.

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SWINBURNE UNIVERSITY OF TECHNOLOGY, AUSTRALIA

Swinburne University of Technology in Melbourne, Australia is a large multi-sectoral and multi-campus institution with a stated mission to be a pre-eminent entrepreneurial and research intensive university from the Asia-Pacific region. Its academic programs cover the education and training needs of over 40,000 students ranging from apprentices through to doctoral students. The Faculty of Information and Communication Technologies is responsible for teaching and research in a broad range of disciplines in ICT including Software Engineering, Intelligent Systems, Telecommunications, Computer Science and Information Systems. It has strong research programs in Service-Oriented Computing that boast the largest concentration of R&D expertise and activities in that area in Australia. It conducts research in close collaboration with industry and research partners nationally and internationally, which is supported by a wide range of research grants, strategic partnership arrangements and industrial R&D projects.

In the Adaptive Services Grid (ASG) project, Swinburne University of Technology is a member of the Scientific Board, leads C-4 work component on Adaptive Process Management, and directly contributes to its work with

PARTNER COMPETENCIES

developing the adaptive service agreement negotiation and re-negotiation, and mediated workflow re-planning mechanisms for ASG.

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TELEKOMUNIKACJA POLSKA, POLAND

Telekomunikacja Polska (TP - Telecom Poland) is the largest public network operator in Poland with about 28000 employees. TP builds a strong Capital Group, so we can offer a wider pallet of services and better meet the requirements of the customers. TP provides diverse enhanced services of voice and data transmission, radio-communications and Internet access for over 11 million customers and mobile phone services for nearly 9 million subscribers (PTK Centertel). As a national operator, TP co-operates with international telecommunication organisations, such as ITU-T, ITU-R. Nowadays France Telecom owns 47.5% of TP. The Research and Development Centre (TP R&D) is a branch of TP with about 400 employees. TP R&D provides the following services for TP: co-ordination of research and development projects, information databases, performs hardware and software system development, pre-installation testing and quality measurement, network planning and designing, development and testing of new services.

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Telenor

Telenor ASA, Norway
Telenor is the leading telecommunications company in Norway, and also has substantial

international operations and investments, particularly in the areas of mobile phone, fixed line digital telephony, personal computer and Internet and Internet protocol-based communications services, satellite services and pay television services. Telenor R&D is Norway's largest research establishment within ICT (Information and Communication Technology). Its research has a long-term horizon and comprises future communication networks and services together with applications in various market arenas. The R&D results help the Telenor Group stay at the forefront of its chosen areas. Telenor R&D collaborates extensively with leading research establishments nationally and internationally. Telenor leads the Usability and Demonstration work component of ASG and contributes with scenarios in the area of intelligent transport systems (ITS). We believe that ITS are a very good examples on the future service area: Services will be global and dynamic, and the customer will need help in finding the appropriate service for him. Current ASG activities are on the evaluation of technology for semantic description of dynamic Web services, on the perspective when these types of services can reach the market and what kind of business is involved in this dynamic service world.

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transIT GmbH, Germany

TransIT is an umbrella organisation linking people and organisations in the fields of science and commerce concerned with the transfer of information and communication technologies in Thuringia, Germany, and beyond. TransIT's primary task is to promote effective value-oriented transfer of technology, both in the generation and management of projects with the objective of improving the competitiveness of these, especially for small and medium-sized companies. TransIT's software department develops solutions for a variety of target groups and domains ranging from portal solutions to management software with ERP integration. With an extensive experience in the dissemination of high topical knowledge and innovative technologies, transIT works in close cooperation with partners and specialists from academia and industry to plan and implement events, network of interests or clusters. Some of the most important events

that have been carried are the CIM (Computer Integrated Manufacture) conference and the well-known international conference Net.ObjectDays. Due to its competencies and infrastructures, transIT has been successful with a number of projects. On a European level, these include the FP3-ESSI-Application Experiment: Methods and Tools for Quality Assurance of the Software Engineering Process of a small software producer (METQUASEP) and the FP6-Integrated Project Adaptive Services Grid (ASG), in which transIT is involved as leader of the work component Dissemination and as member of the Project Board.

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University of Innsbruck, Austria

University of Innsbruck (UIBK) has an extensive experience with Semantic Web (SW), Semantic Web Services (SWS) and Grid technology. From UIBK, two research groups are involved in ASG: Digital Enterprise Research Institute (DERI) and Distributed and Parallel System group (DPS). Although only existing for a short period of time,

DERI Innsbruck has gained a noteworthy reputation in SW and SWS communities in Europe and beyond, being involved in many EU projects. DERI is mainly developing SWS technologies. Central activities are: providing a conceptual model - WSMO (Web Service Modeling Ontology) and formal languages - WSML (Web Service Modeling Language) for SWS. The DPS group has long experience on implementing tools to simplify the development of parallel and distributed applications. DPS has wide experience in supporting the specification and invocation of Grid applications. Currently, DPS is developing ASKALON which is a tool set for cluster and Grid computing which among others includes scheduling, resource brokerage, and fault management. UIBK is actively involved in three ASG work components. DERI Innsbruck leads C-1 work component. The focus of C-1 is to provide a conceptual model and a language for semantically rich descriptions of user request and service descriptions. Furthermore, interfaces and tools for access and interoperability are provided. UIBK is also involved in C-2 and C-3 components. As part of C-2, DERI addresses the realization of Discovery task in ASG. Besides, DERI, another group from UIBK, DPS is actively involved in Service creation task.

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University of Jyväskylä, Finland

The University of Jyväskylä is one of the largest and most popular multidisciplinary universities in Finland. The number of degree students is 15,000 in seven faculties and a staff of approximately 2,500. The key elements of the scientific profile of the university are technology, man and nature. Related to the focus areas of the ASG project, University of Jyväskylä has been strongly involved in research on mobile computing environments, location-based services and mobile commerce as well as on agent technologies and semantic web. In the ASG project the University of Jyväskylä is mainly involved in the Service Discovery and Composition and Usability and Demonstration work components. In the latter we are responsible especially for e-Government related scenario development. The ASG related research is done by Information Technology Research Institute (ITRI) which is a part of the Faculty of Information Technology at the University of Jyväskylä. ITRI oversees project based, tailored research and development operations. All projects are publicly or privately funded.

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UNIVERSITÄT LEIPZIG

Faculty of Economics and Management
Information Systems Institute

University of Leipzig, Germany

Founded at the beginning of the 15th century, the University of Leipzig (UL) is the second oldest and one of the largest and most reputable universities in Germany covering a wide range of scientific disciplines. With a strong focus on most recent business information systems, the Information Systems Institute at UL is one of the leading innovative departments at the Faculty of Economics and Management. The institute is specialized in areas of service-oriented environments and service grids, enterprise application integration and content management, semantic web technologies and XML databases, and software system families. Professor Dr. Bogdan Franczyk is Full professor and director of the institute and one of the founders of the Adaptive Services Grid project. Together with a team of recognized researchers, Prof. Franczyk is strongly involved in scientific events, international conferences and workshops and actively fosters a tight cooperation with scientific institutions and industrial partners world wide. In the Adaptive Services Grid project the University of Leipzig is concerned with service creation and adaptive service management. In service creation UL is focused on creation and registration of new services and integration of external services into the ASG platform. In adaptive service management UL is concentrating on the development of an extensible service level agreement language and the management of service level agreements during their entire lifecycle in ASG.

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University of Koblenz-Landau, Germany

The working group 'ISWeb Information Systems and Semantic Web' at the University of Koblenz-Landau performs research related to management of data, knowledge and services by Semantic Web technology. Topics currently under investigation range from foundations such as semantic annotation and ontology engineering to integration of the Semantic Web into information systems and ontology-based management and self-organization of complex dynamic systems. The major application scenarios range from Peer-to-Peer and Semantic Grid-based systems, over Semantic Multimedia and to Personal Information Management by Semantic Desktop. Within ASG the ISWeb research group participates in two tasks. The experience with Semantic Web and Peer-to-Peer systems is brought into the development of the distributed ASG Web Service Registry. The Peer-to-Peer registry ensures scalability and high quality access to discover Web Services based on semantic descriptions. In service engineering, ISWeb applies its expertise on semantic middleware for semi-automatically describing new Web Services such that functional and non-functional semantic descriptions are derived in order to contribute to the Web Service discovery process.

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University of Potsdam, Germany

Potsdam is famous for its unique cultural landscape that is part of UNESCO's World Cultural Heritage. At the same time Potsdam has a high-grade scientific environment which is unparalleled in Germany. The city offers the highest density of academic and scientific facilities in Germany and is a city to work in, to live in and to love. Research has a long tradition in Potsdam and received new impetus when the University was founded in 1991 after the reunification of Germany. The University of Potsdam offers excellent conditions for the implementation of the ASG project because it has a longstanding record of success in national and international research projects, including projects within the 5th and 6th European Framework Programme. As Administrative Coordinator of the ASG project, the University of Potsdam is in an unusual and also fascinating position. Scientific and administrative coordination are typically combined in one hand. This is different in ASG, and consequently this separation poses a great challenge as well as an opportunity to define general administrative tasks and management structures for integrated projects within the European Framework Programmes. For this reason a special taskforce has been established that consists of a professional team under the special guidance of Dr. Regina Gerber, the longtime and experienced International Research Co-operation Officer. This taskforce is prepared to secure the efficient and expedient implementation and coordination of the administrative, legal and financial framework in ASG.

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Erik Lillevold, Norway

Erik Lillevold is a of the former Senior Research Scientist at Telenor R&D with more and 30 years of experience in different fields within Computer and Communication Science. From 1971 - 1986 he was a research scientist at NDRE (Norwegian Defense Research Establishment) working with different kind of computer communication project. NDRE had close relation to US DoD. Therefore he become early involved in the DARPANET (later Internet) project (1974) ending with a stay as International Fellow at SRI, Menlo Park, California (1981). Lillevold was later on involved in ISO and CCITT standardization of the MHS (Message Handling System) developed by CCITT and specified in the X.400 Recommendations. As a Telenor employee he participated in the foundation of the ASG consortium and contributed to the Project Proposal. He has also actively participated in the ASG project in the C-7 work component, and since start-up in August 2004 he has worked in C-7 and will continue to do that throughout the duration of the project. Among experiences he has that are of relevance of the ASG project are Web Services and Agent Technology, in addition to telecom systems and services in general. Particularly he has participated in several international projects like the EU YOUNGSTER project and standardization bodies like 3GPP and its work on the Open Service Architecture (OSA).

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Registration
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