Contract No. IST 2005-034891

Hydra

Networked Embedded System middleware for
Heterogeneous physical devices in a distributed architecture

D13.9 Report on projects connected to Hydra

Integrated Project
SO 2.5.3 Embedded systems

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1 Introduction

1.1 Purpose, context and scope of this deliverable

The Hydra dissemination strategy is to progressively increase dissemination efforts as project results are obtained, in order to assure a wide awareness of the Hydra project. The dissemination strategy is intended to optimise dissemination of project knowledge and results to universities, organisations, and companies, which share an interest in the scientific results and the applications or are potential users of Hydra middleware.

The dissemination of the results of the project will take several forms and use a variety of media. One obvious strand of dissemination of Hydra results is through clustering activities with other EU or nationally funded research projects in related areas of research, in order to initiate collaboration with other projects related to middleware web services, cognitive systems, dynamic networks, distributed security, ambient intelligence and knowledge management.

During the re-planning of the project and the reformulation of the Description of Work, it was decided to provide a comprehensive overview of the relevant projects. The present deliverable D13.9 Report of projects connected to Hydra provides this overview.

The Hydra Consortium will establish links to the relevant projects through direct contact, liaison through Commission officials and through participate in clustering events and conferences organised by the Commission.

1.2 Content of the deliverable

This document will systematically list the projects that are relevant to Hydra, including a description of each project, an identification of the features relevant to Hydra and planned actions in relation to the specific project. Both projects that are finished and ongoing are included in this deliverable.

Chapter three provides information on a total of 24 projects concerning embedded systems and middleware. Chapter four presents relevant service oriented architecture projects. A total of 8 projects are defined here. Chapter five provides information on a total of 6 relevant sensor and wireless network projects and chapter six provides information on a total of 18 relevant security projects. Chapters seven to none focuses on user domain projects. Chapter seven presents 5 relevant projects on home automation, chapter eight presents 10 health care projects and chapter nine presents 7 agriculture projects. Finally, the conclusion highlights the projects that are considered most important and relevant to Hydra.

2 Summary of projects

A large amount of current and completed projects have been identified in areas which are of relevance to Hydra, in terms of technology and application.

The following projects are considered as the most relevant projects, to which the Consortium Partners will take further action, either by further studying the approach and results of the project, by contacting the consortium with the aim of arranging events where knowledge exchange and transfer can take place, or where Consortium Partners have direct access to knowledge by virtue of their involvement in the project in question.

The summary is provided in tabular form for ease of overview.

Embedded systems and middleware projects		
Project Acronym	**Title**	**Main Features**
WASP http://www.wasp-project.org	Wirelessly accessible sensor populations	WASP is relevant to HYDRA in area of wireless sensor networks. The scope of the project includes several relevant issues in this are like communication and networking of devices (sensors), information distribution and services for linking of application with sensor networks
MORE http://www.ist-more.org/	Network-centric Middleware for GrOup communication and Resource Sharing across Heterogeneous Embedded Systems	Main focus is to design middleware that hides the complexity of the underlying heterogeneity of embedded systems through providing simplified APIs and management mechanisms for the future operators of these systems. This is highly relevant in scope of Hydra as we are going to support similar paradigms and both projects are highly complementary, also in case of use case scenarios, where first testing will be provided.
ANDRES http://andres.offis.de/	ANalysis and Design of run-time REconfigurable, heterogeneous Systems	The prime result of ANDRES is a seamless design flow, which provides the possibility of designing embedded hardware/software systems on a higher level of abstraction emphasising in particular the application of run-time re-configurable architectures.
FRESCOR http://www.frescor.org/	Framework for Real-time Embedded Systems based on COntRacts	The framework will be portable across different scheduling strategies and platforms. Because of the dynamic nature of the contracts and the independence that they provide among the different real-time components of the application, the methodology is well suited to address very dynamic systems, such as those based on re-configurable architectures.
EMMA http://www.emmaproject.eu/	Embedded Middleware in Mobility Applications	EMMA project strategic goal is to open new prospects in the field of embedded middleware for cooperating wireless objects in order to hide the complexity of the underlying infrastructure while providing open interfaces to third parties.

Embedded systems and middleware projects		
Project Acronym	**Title**	**Main Features**
AN P2 http://www.ambient-networks.org	Ambient Networks Phase 2	Project was similar to some particular HYDRA objectives. Main aim of this project was to develop various scenarios for ambient intelligent mobile devices.
MIDAS http://www.ist-midas.org	Middleware Platform for Developing and Deploying Advanced Mobile Services	Project is similar and some particular issues are relevant to middleware issues in HYDRA project.
MobiLife http://www.ist-mobilife.org/	Mobile Life	Project covers various interesting aspects such as modelling and reasoning for contextual awareness, technologies, that is relevant to HYDRA.
HIPEAC http://www.hipeac.net/	High-Performance Embedded Architectures and Compilers	HiPEAC integrates the newest knowledge in the research area of high-performance embedded processor architectures on academic and industrial level.
HYCON http://www.ist-hycon.org/	Hybrid Control: taming heterogeneity and complexity of networked embedded systems	The main importance of HYCON project is integration of the knowledge about the development and application of hybrid systems approach to design of networked embedded systems.
BETSY http://www.hitech-projects.com/euprojects/betsy	Being on time saves energy continuous multimedia experiences on networked handheld devices	Today it is not possible, even at design time, to make well-founded system trade-offs between network and terminal resource consumption, energy consumption of the terminal and timeliness of the streaming data. The BETSY project will deliver all the theory, models and design methodology to make this possible during design time and a framework implementation that makes dynamic adaptations in this trade-off possible at run-time.
DECOS https://www.decos.at/	Dependable Embedded Components and Systems	DECOS introduce the approach to cost-efficient design and development of embedded systems providing the architecture and services in a domain and platform independent manner. The main importance is the use of model-based tool-chain developed by the DECOS project.
NECST http://www.strep-necst.org/	Networked Control Systems Tolerant to faults	The NeCST project offers the solution enhancing the performance of diagnostics and fault tolerance of modular, adaptive, reconfigurable systems with autonomous components, such as wireless networks and embedded systems similar to expected possible Hydra implementations.

Embedded systems and middleware projects		
Project Acronym	**Title**	**Main Features**
ICODES http://icodes.offis.de/	Interface- and Communication-based Design of Embedded Systems	The main possible contribution of ICODES project to Hydra is the approach to design of embedded systems containing many and heterogeneous communicating components in hardware and software. Importance of approach proposed in ICODES is using high-level models describing the applications, which can be analysed, evaluated, optimized and translated into implementation.
AN http://www.ambient-networks.org/phase1web/	Ambient Networks	This project is relevant to HYDRA in area of AmI. Similar is approach to use of mobile devices, composition of networks using these devices.
ENACTIVE https://www.enactivenetwork.org/	Enactive interfaces	The ENACTIVE project proposes the reactive paradigm to design of human-machine interfaces. Reactivity of so-called sensible machines based on direct mapping from sensoric perceptions to actions without the use of symbolic knowledge can be in many cases efficient solution to elementary responses design.
AIM@SHAPE http://www.aimatshape.net/	Advanced and Innovative Models And Tools for the development of Semantic-based systems for Handling, Acquiring, and Processing Knowledge Embedded in multidimensional digital objects	The main importance of AIM@SHAPE project is the recognition of real world objects and mapping of observations of the real world to knowledge model. Knowledge acquired from real world observations can be more easily used for modelling and description of context information.
AMI http://www.amiproject.org/	Augmented Multi-party Interaction	Modelling approaches addressed by AMI project can bring the useful knowledge for design of multimodal interfaces in Hydra project, mainly in area of multi-channel signal processing, multimodal information modelling, information retrieval and content abstraction.
CHIL http://chil.server.de/servlet/is/101/	Computers In the Human Interaction Loop	One of main possible contributions of CHIL project to Hydra is the design of interfaces directly centred on observation and processing of human behaviour, activities and intentions.

Embedded systems and middleware projects		
Project Acronym	**Title**	**Main Features**
SIMILAR http://www.similar.cc/	The European research taskforce creating human-machine interfaces SIMILAR to human-human communication	SIMILAR project brings new knowledge in the area of multimodal interfaces, fusion of multimodal information, signal processing, human-machine interaction rules, which may be useful for design of multimodal human-computer interfaces in Hydra.
CORTEX http://cortex.di.fc.ul.pt/index.htm	CO-operating Real-time senTient objects: architecture and EXperimental	The CORTEX project is concerned with research other than context-aware middleware, but has proposed a middleware to deal with "Autonomous mobile physical objects that cooperate with other objects, either mobile or static, by capturing information in real-time from sensors event messages propagated in a MANET".
COGMA http://www.cogma.org/en/index_overview.html	Cooperative Gadgets for Mobile Appliances	COGMA project offers the solution very similar to Hydra design in several aspects.
CoolTown http://www.champignon.net/TimKindberg/cooltown.php	Cooltown	Cooltown project presents an idea of building the web-presence applications. In particular, this project also deals with the issues of context representation and context awareness in mobile devices.
Hydrogen Context-Framework	Hydrogen Context-Framework	Hydrogen project is relevant to HYDRA in area of context-awareness in mobile devices environments. Various aspects are addressed, networking of the devices, data storage, as well as profiling of the users.

Service oriented Architecture Projects		
Project Acronym	**Title**	**Main Features**
MUSIC http://www.ist-music.eu/	Mobile Users in Ubiquitous Computing Environments	MUSIC is a focused initiative that will develop a comprehensive open-source software development framework that facilitates the development of self-adapting, reconfigurable software that seamlessly adapts to the highly dynamic user and execution context, and maintains a high level usefulness across context changes.
SOCRADES http://www.socrades.eu/	Service-oriented cross-layer infrastructure for distributed smart embedded systems	This project is highly relevant to Hydra. Similarity can be viewed e.g. in middleware technologies to be developed in this project. These will be based on the Service-Oriented Architecture approach, will be generic to any networking technology or transmission medium, and will provide open interfaces that enable interoperability at the semantic level to any 3rd party.

Service oriented Architecture Projects		
Project Acronym	**Title**	**Main Features**
VAN http://www.van-eu.eu	Virtual Automation Networks	Virtual Automation Networks project provides new technologies and extensions to existing IST to fulfil the requirements of industrial applications. Wireless concepts for industry - Infrastructure for the joint use of embedded devices and IT systems in industrial automation, enabling multi-stakeholder involvement for multidisciplinary and dynamic industrial environments
DIP http://dip.semanticweb.org/	Data Information, and Process Integration with Semantic Web Services	Semantic Web Service technology will allow structural and semantic definitions of documents providing completely new possibilities in knowledge management, Enterprise Application Integration, and eCommerce.
SIRENA http://www.sirena-itea.org/Sirena/Home.htm	Service Infrastructure for Real time Embedded Networked Applications	The technology, the application domains and the consortium partners are all very relevant to Hydra. SAG has been a partner in Sirena through C-LAB. In the project's context, "Schneider Electric", SIRENA's lead contractor, started a program called "Transparent Ready", that allows all their products to communicate and access each other.
OBELIX http://www.cs.vu.nl/~obelix/	Ontology-based electronic integration of complex products and value chains	Project results can be relevant to some specific HYDRA related problems such as ontology modelling.
METEOR-S http://lsdis.cs.uga.edu/projects/meteor-s/	METEOR-S Web Service Composition Framework	This project is relevant to HYDRA in the area of semantic description of web services. Project described various approaches to semantic web services description, as well as WSDL extensions, OWL and WSMO.
IRS III http://kmi.open.ac.uk/projects/irs/#irsiii	Internet Reasoning Service III	IRS project deals with the service description. However it elaborates more on WSMO and OWL-S technologies that are not considered in HYDRA project, the project should be also investigated as a similar approach.

Sensor and Wireless Network Projects		
Project Acronym	**Title**	**Main Features**

Sensor and Wireless Network Projects		
Project Acronym	**Title**	**Main Features**
WINSOC http://www.winsoc.org/	Wireless sensor Networks with Self-Organization capabilities for Critical and emergency applications	Main relevance to Hydra can be viewed in the innovative methodology for networking and interactions of sensors. The interaction occurs through a very simple mechanism that does not require complicated modulation, MAC, or routing strategies. This interaction among the sensors is the key feature, as it improves the reliability of the local decisions and, at the same time, it yields fault tolerance and scalability.
SENSE http://www.sense-ist.org/ http://www.winsoc.org/	Smart Embedded Network of Sensing Entities	The key innovative aspects are the methods by which the network perceives its environment, fuses these perceptions using local message passing to achieve local and global object recognition, and calibrates itself based on its environment.
SMEPP http://proact.tugraz.at/research/smepp/index.htm	Secure Middleware for Embedded Peer to Peer systems	The main objective of SMEPP project is to develop a new secure and generic middleware, based on a new network centric abstract model for EP2P systems. Important part of the project with the remarkable relevance to the Hydra project is its ability to provide open interfaces of middleware, especially in case of security, trust and quality-based aspects.
ANGEL http://www.ist-angel.eu/	Advanced Networked embedded platform as a Gateway to Enhance quality of Life	The project considers the mobile handset as the ad hoc gateway. The usage of a co-simulation tool, based on NS-2, SystemC and ISS, guarantees the optimised interaction between the ad hoc network and the mobile infrastructure.
SPICE http://www.ist-spice.org/index.html	Service Platform for Innovative Communication Environment	In SPICE project innovative aspects relevant to HYDRA are related to design and development of mobile devices service platform for wireless heterogeneous networks. Important fact is that project consortium consists of leading telecommunication companies.
EMBEDDED WISENTS http://www.embedded-wisents.org/	Cooperating Embedded Systems for Exploration and Control featuring Wireless Sensor Networks	Important inspirations of WiSeNts project are the needs and approaches to design and development of wireless sensor networks and their applications, especially in the form of cooperative objects.
GOLLUM http://www.ist-gollum.org/	Generic Open Link-Layer API for Unified Media Access	The main importance of GOLLUM project to Hydra is design of API aimed to improve the development of interoperable solutions using various, mainly wireless, technologies. For more, such a API can be used as the building block of the middleware and embedded systems for networked devices.

Sensor and Wireless Network Projects		
Project Acronym	**Title**	**Main Features**
E2R http://e2r.motlabs.com/front-page	End-to-End Reconfigurability	Project should be interesting for HYDRA WP5 – wireless networks.

Security projects		
Project Acronym	**Title**	**Main Features**
PRIMELIFE http://www.primelife.eu/	Privacy and identity management in Europe for life	The objectives of this project seem to fit well into HYDRA WP7 on security, especially privacy and trust issues.
SENSEI http://www.ict-sensei.org/	Integrating the physical with the digital world of the network of the future	The aim of the SENSEI project is to create an open, business driven architecture that fundamentally addresses the scalability problems for a large number of globally distributed and heterogeneous wireless sensor and actuator networks (WS&AN) devices. The objectives of this project seem to fit well into Hydra WP5 on wireless networks.
TAS3 http://tas3.eu/	Trusted Architecture for Securely Shared Services	The aim of TAS3 project is to develop and implement an architecture with trusted services to manage and process distributed personal information generated over a person's lifespan. The relevance of this project to Hydra lies in the approach to security and privacy, in particular the approach to stored health data.
TransiDoc http://www.transidoc.de/website-transidoc/index-en.html	Legally Secure Transformation of Signed Documents	Important underlying work relevant for the container design defining the methods, data structures, and organisation was done within the TransiDoc project. Each step in the coarse of the workflow can be interpreted as a transformation of a document according to the definition of the TransiDoc project. The aim is to secure each step and to embed all process relevant data for a process integrated or ex post verification.
S3MS http://www.s3ms.org/	Security of software services of mobile systems	The objective of S3MS is to create a framework and technological solution for trusted deployment and execution of communicating mobile applications in heterogeneous environments. S3MS would enable the opening of the software market of nomadic devices (from smart phones to PDA) to trusted third party applications beyond the sandbox model, without the burden of roaming trust infrastructure but without compromising security and privacy requirements.

Security projects		
Project Acronym	**Title**	**Main Features**
SERENITY http://www.serenity-project.org/	System engineering for security and dependability	Serenity project is highly relevant to HYDRA as it deals with aspects of providing the security mechanisms in AmI systems. Project will develop methods and tools for these purposes.
UbiSec&Sens http://www.ist-ubisecsens.org	Ubiquitous sensing and security in the European homeland (UBISECANDSENS)	UbiSec&Sens will provide a comprehensive architecture for medium and large scale wireless sensor networks with the full level of security that will make them trusted and secure for all applications.
SENSORIA http://www.sensoria-ist.eu/	Software Engineering for Service-Oriented Overlay Computers	The aim of Sensoria is to develop a novel comprehensive approach to the engineering of software systems for service-oriented overlay computers where foundational theories, techniques and methods are fully integrated in a pragmatic software engineering approach.
SWAMI http://swami.jrc.es/	Safeguards in a World of Ambient Intelligence	The main potential contributions of the SWAMI project to Hydra is the design of dark scenarios that enable to identify much useful security, but also technological requirements that should be focused and took into account in the middleware and SOA development phase of Hydra project.
RUNES http://www.ist-runes.org/	Reconfigurable Ubiquitous Networked Embedded Systems	Important inspiration of the RUNES project is the implementation of semantic technologies for representation of security constraints designating the behaviour and access of several components in the system. Hydra should take into account the semantic modelling of properties and roles for devices, sensors and users in the specific context of the specific application.
PRIME https://www.prime-project.eu/	Privacy and Identity Management for Europe	PRIME offers flexible solution to identity management enabling user to negotiate with service provider in order to establish required secure communication. Important element in the communication process is certificating the user using the credentials. Hydra needs such identity management also on level of devices and sensors, which should be also provided by trustful identity. In PRIME, ontologies are used to name the categories of data, instances of data, process workflows, specifications, elements of policies and obligations defined in the system using RDF. In order to allow more general and more readable modelling, Hydra needs higher-level description language, such an OWL.

Security projects		
Project Acronym	**Title**	**Main Features**
UBISEC http://www.ubisec.org/	Ubiquitous Networks with a Secure Provision of Services, Access, and Content Delivery	Project deals with situation-dependent secure management, which is basically context awareness in this area. It describes various important aspects of heterogeneous networks equipped with mobile devices.
SEINIT http://www.seinit.org/	Security Expert INITiative	The main importance of the SEINIT project is the component based approach. Designing of security protocols and technologies as components allows significant flexibility and extensibility of the architecture. Basic disadvantage of SEINIT is the centralized key distribution approach. Hydra project requires more generic solution which covers mainly distributed and also centralized approaches.
DAIDALOS II http://www.ist-daidalos.org/	Designing Advanced network Interfaces for the Delivery and Administration of Location independent, Optimised personal Services	The concepts identified in this project should help the HYDRA in some particular aspects of the project. For example, virtual identities, privacy and personalization issues are highly relevant for WP7
PAW http://www.cs.ru.nl/paw/	Privacy in an Ambient World	The advantage of the proposal is the decentralization, where no central authority for controlling is necessary. But unfortunately an agent can use data in a way which it is not allowed to do and can only be held responsible after the misuse of the data and so this is not ideal for real scenarios.
OXYGEN http://oxygen.csail.mit.edu/	MIT Project Oxygen – Pervasive, human-centered computing	Oxygen project introduces various design approaches, which can be very important for Hydra. Intentional naming system provides scalable, dynamic resource discovery and message delivery. Concept of dynamic, self-configuring networks enabling the devices to locate each other as well as the people, services, and resources they want to reach, in addition, software on devices, adaptable to particular environmental changes is extremely relevant for Hydra.
E-PASTA http://www.e-pasta.org/	E-Protection of Appliances through Secure and Trusted Access	E-PASTA will specify, develop and demonstrate a trust and security platform for extended smart home environments. Such environments will allow applications such as remote control, remote security, or remote maintenance.

User domain projects – Home Automation		
Project Acronym	**Title**	**Main Features**
AMIGO http://www.hitech-projects.com/euprojects/amigo/index.htm	Ambient intelligence for the networked home environment	The objective of both projects Hydra and AMIGO is to develop and validate interoperable middleware for networked home environment and motivate people to use networked home systems with great ease and pleasure as well.
TEAHA http://www.teaha.org/	The European Application Home Alliance	Both TEAHA project and Hydra targets home control and home automation although in different way.
I'MOK http://www.im-ok.info/	Intelligent monitoring of kitchens	The I'MOK system utilises the NAFEM standard to provide step changes in food quality, safety and performance monitoring.
HOMETALK http://www.hometalk.org/	A Voice Enabled Residential Automation & Networking platform	Project HomeTalk creates a truly intelligent user-friendly residential environment in order to control appliances and automate everyday tasks. The aim of Hydra middleware is to improve home automation as well.
ISPIRE http://www.inspire-project.org	INfotainment management with SPeech interaction via REmote-microphones and telephone interfaces	The objective of the project INSPIRE was to develop "a home assistant" for facilitation the operation with home appliances and services in peoples' daily life. One of the objectives of Hydra middleware is to allow seamless access, intelligent and secure interoperability among different devices in home.

User domain projects – Healthcare		
Project Acronym	**Title**	**Main Features**
CONFIDENCE http://www.confidence-eu.org/	Ubiquitous Care System to Support Independent Living	Both Hydra and CONFIDENCE has the objective to improve the quality of life of older people and simplify their healthcare using smart sensors and innovative infrastructure. However, where Hydra is focussing on generic middleware that can facilitate the development of applications, CONFIDENCE is focusing on the application itself.
CAALYX http://caalyx.eu/	Complete Ambient Assisted Living Experiment	Hydra middleware facilitates permit communication between an electronic device and monitoring and management system developed within CAALYX.

User domain projects – Healthcare		
Project Acronym	**Title**	**Main Features**
OLDES http://www.oldes.eu/	Old people's e-services at home	The results of both Hydra and OLDES can be used to improve the quality of life of older people and simplify their healthcare. However, where Hydra is focussing on generic middleware that can facilitate the development of applications, OLDES is focusing on the application itself.
PERSONA http://www.aal-persona.org/	Perceptive Spaces Promoting Independent Aging	Ambient Assisted Living is a very relevant platform and domain for Hydra enabled applications. AAL relates to a global inclusion of all sorts of sensors in the surroundings, where Hydra can add self-discovery and self-configuration capabilities. Also security related results of Hydra would be relevant.
INHOME http://www.ist-inhome.eu/	An intelligent interactive services environment for assisted living at home	The project INHOME aims at the same application domain as Hydra. The approach of discriminating between experienced and inexperienced rather than enabled or disabled users is interesting. However, the focus on audiovisual and white goods functions in the home is rather limited.
MonAMI http://www.monami.info/	Mainstreaming on ambient intelligence	MonAMI will select bouquets of services in the areas of comfort applications, communication/information, health, safety and security. It will build, test and deploy these services and demonstrate that they can be economically brought through the future mainstream ambient intelligence technologies.
SmartHEALTH www.smarthealthip.com	Smart Integrated Biodiagnostic Systems for Healthcare	The project aims at the same application domain as Hydra, i.e. Healthcare. In it's approach, SmartHEALTH develops dedicated sensors for specific applications. It also seems as if the supporting infrastructure is dedicated to the chosen applications, whereas the Hydra architecture is more general in its middleware approach.
AAL http://www.aal169.org/	Ambient Assisted Living - Preparation of an Art. 169-initiative	Hydra middleware can be used in healthcare applications and it is one from the possibilities for supporting assisted living.
AWARENESS http://awareness.freeband.nl	Context AWARE mobile NETworks and ServiceS	The goal of the Freeband AWARENESS project is to research and design an infrastructure for context-aware and pro-active mobile applications, and validate this through prototyping with mobile health applications.

User domain projects – Healthcare		
Project Acronym	**Title**	**Main Features**
MYHEART http://www.hitech-projects.com/euprojects/myheart/home.html	MyHEART	This is a lifestyle change project which incorporates textile embedded sensors and on-body process systems. The application is very close to some of the Hydra scenarios, but the concept is build on pre-defined sensors in confined applications, which is somewhat different from Hydra's open and dynamic middleware approach.

User domain projects – Agriculture		
Project Acronym	**Title**	**Main Features**
MONIQA http://www.moniqa.org/	Towards the harmonisation of analytical methods for monitoring quality and safety in the food chain	Following the purposes of HYDRA the project MONIQA is a way to be in touch with organisation at the state of the art on matters related to food security.
NOVELQ http://www.novelq.org/Default.aspx/	Novel processing methods for the production and distribution of high-quality and safe foods	The development and demonstration of processes is related to Hydra actions in order to interact, considering the implication of the middleware implementation to novel processing of high quality and safe food.
SAFIR http://www.safir4eu.org/	Safe and High Quality Food Production using Poor Quality Waters and Improved Irrigation Systems and Management	One of the scenarios of the usage of Hydra middleware deals with the question of irrigation system and irrigation control system. Irrigation systems and its controlling systems are of great interest in the studied agriculture scenarios. Here the Hydra enabled devices could give an important contribution.
CO-EXTRA http://www.coextra.eu/	GM and non-GM supply chains: their CO-EXistence and TRAceability	Co-Extra's intentions are related to GMO's supply chains, thus disseminate Hydra activity within the ambience of ideal application of traceability instruments is to be intended as a relevant activity to reach the objective of our project. As the stakeholders are involved in the improvement of European Competitiveness Hydra's project can give its contribution as an effective mean to reach it.

User domain projects – Agriculture		
Project Acronym	**Title**	**Main Features**
SMES-NET http://smes-net.ciaa.eu/asp/home.asp	SMEs Networking European Food Safety Stakeholders	Several regional meetings were organised within SMES-NET project. During these meetings the most stringent topics on food safety, technology, and nutritional issues and consumers expectations were identified and selected contribution were used for preparing material appointed for dissemination at EU level as well. This material could be the source of much interesting information useful for identifying users' requirements within agriculture domain.
AMI@NetFood http://www.ami-netfood.com/	Development of Long-term shared vision on AMI Technologies for a Networked agri-food sector	The effort of AMI@Netfood was to bring Ambient Intelligence in the agrifood sector. Since one from the Hydra application domains is agriculture, Hydra middleware has the possibility to show farmers, that for example using ICT in order to shorten their costs need not be difficult.
QUALITYMEAL http://www.kpk.gov.pl/qualitymeat/index.php	Survey on the research landscape in the Associated Candidate Countries for monitoring and promoting Good Quality Meat production - the whole food chain from farm to fork of Poultry and Pork Meat	One QUALITYMEAT project specific objective is to create a database of researchers and research centres working in the specific field in NMS and CC. This database will provide contacts for getting potential partners or consumers of Hydra middleware.
QUALITYLOWINPUTFOOD (QLIF) http://www.qlif.org/	Improving quality and safety and reduction of cost in the European organic and 'low input' supply chains	Relevance to Hydra project is to be seen in the reduction of the supply chain costs both for low input and organic food. The identification and traceability of products along the supply chain are matters which activities could be clustered by the two projects.
GOODFOOD http://www.goodfood-project.org/	Food Safety And Quality Monitoring With Microsystems	GoodFood project focuses on the field of European Union policies on safe food. This field is also under the HYDRa's interest.
SAFES http://www.vanhelsing.com/SaFES/SaFES.htm	Safe Food Enhancement System	One of the Hydra's goals is to improve the quality control of food production equally as it is in the SaFES project case.

3 Embedded systems and middleware projects

3.1 WASP

Wirelessly accessible sensor populations

Type of the project:	IST FP6 project, Integrated project
IST SO:	Embedded systems
Project Reference:	034963
Launch:	September 2006
Duration:	42 months
Consortium:	19 partners from 6 countries
Coordinator:	Philips Electronics Nederland B.V., Netherlands
Website:	http://www.wasp-project.org

Description

An important class of collaborating objects is represented by the myriad of wireless sensors, which will constitute the infrastructure for the ambient intelligence vision. The academic world actively investigates the technology for Wireless Sensor Networks (WSN). The industry is reluctant to use these results coming from academic research. A major cause is the magnitude of the mismatch between research at the application level and the node and network level.

The WASP project aims at narrowing this mismatch by covering the whole range from basic hardware, sensors, processor, communication, over the packaging of the nodes, the organisation of the nodes, towards the information distribution and a selection of applications. The emphasis in the project lays in the self-organisation and the services, which link the application to the sensor network. Research into the nodes themselves is needed because a strong link lies between the required flexibility and the hardware design. Research into the applications is necessary because the properties of the required service will influence the configuration of both sensor networks and application for optimum efficiency and functionality. All inherent design decisions cannot be handled in isolation as they depend on the hardware costs involved in making a sensor and the market size for sensors of a given type.

Three business areas, road transport, elderly care, and herd control, are selected for their societal significance and large range of requirements, to validate the WASP results. The general goal of the project is the provision of a complete system view for building large populations of collaborating objects. The impact on European industry and research comes from the provision of a European alternative to the WSNs originating in the US.

The WASP results will be well suited for adoption by SMEs. The consortium defines an active programme to approach the appropriate SMEs and to familiarise them with the WASP results.

Relevance to Hydra

WASP is relevant to HYDRA in area of wireless sensor networks. The scope of the project includes several relevant issues in this are like communication and networking of devices (sensors), information distribution and services for linking of application with sensor networks. Not the main interest, but important fact is that two of the tested application are in coherence with HYDRA application domains – agriculture and healthcare.

Planned actions

Project is planned to finish in year 2010. The deliverables and publications should be investigated by the HYDRA partners.

3.2   MORE

Network-centric Middleware for GrOup communication and Resource Sharing across Heterogeneous Embedded Systems

Type of the project:	EU IST FP6 project, STREP
IST SO:	Embedded systems
Project Reference:	032939
Launch:	June 2006
Duration:	36 months
Consortium:	8 partners from 5 countries
Coordinator:	PRO DV, Germany
Website:	http://www.ist-more.org/

Description

MORE is a Specific Targeted Research Project (STREP) that is going to implement new technology to facilitate communication and distributed intelligence across groups of users using different wireless standards. The project addresses the problem of how the interaction between humans and embedded systems can be efficiently supported by developing a system that can be tailored to the specific needs of diverse organizations. A clear focus of the project is to design a middleware that hides the complexity of the underlying heterogeneity of embedded systems through providing simplified APIs and management mechanisms for the future operators of these systems.

The middleware is designed with a network-centric point of view and with the following main functionalities:

- Alleviate heterogeneity of devices

- Support scalable group communication

- Allow for multi-media communication and resource sharing between humans (voice, pictures, video) and machines (in particular sensors)

- Ensure security of communications, data exchanges and protection of sensitive data

- Provide Gateway services, allowing access to embedded networks and increasing range of accessibility (e.g. connecting small scale local Bluetooth networks to large scale mobile networks like UMTS).

Two use case scenarios are envisioned for validation: Mitigation management (forestry and environment) and Medical environment (Diabetes).

Relevance to Hydra

MORE is going to implement new technology for distributed communication using different wireless standards. Main focus is to design middleware that hides the complexity of the underlying heterogeneity of embedded systems through providing simplified APIs and management mechanisms for the future operators of these systems. This is highly relevant in scope of Hydra as we are going to support similar paradigms and both projects are highly complementary, also in case of use case scenarios, where first testing will be provided.

Planned actions

The MORE middleware is very relevant for Hydra and covers the same general objectives. Since the project is still ongoing, it would be very relevant to compare results. The WP5 leader will contact the MORE consortium.

3.3   ANDRES

ANalysis and Design of run-time REconfigurable, heterogeneous Systems

Type of the project: EU IST FP6 project, STREP
IST SO: Embedded systems
Project Reference: 033511
Launch: June 2006
Duration: 36 months
Consortium: 6 partners from 5 countries
Coordinator: Offis E.V., Germany
Website: http://andres.offis.de/

Description

The high level objective of the ANDRES project is to improve the competitiveness of innovative European industries, such as the telecommunication and automotive, by reducing the design time and cost of highly integrated embedded systems. These systems are heterogeneous in nature and include up to four different domains: software, analogue hardware, static hardware, and dynamically re-configurable hardware, the latter gaining importance because of its new attractive combination of flexibility and efficiency.

Currently no methodology exists allowing to seamlessly build; that is, to model, synthesize and verify such systems, because each domain comes with its own computational models, languages and design tools. This prevents early system verification and postpones error detection to the system integration phase causing long, costly and most importantly time-consuming design reiterations. ANDRES will develop solutions to overcome this incompatibility in component design by developing an integrated design approach for heterogeneous embedded systems. This approach builds on the open-source modelling language SystemC already adopted by many European companies. Next ANDRES will close the gaps in the design flow by developing a tool for dynamically re-configurable hardware components.

Relevance to Hydra

The prime result of ANDRES is a seamless design flow, which provides the possibility of designing embedded hardware/software systems on a higher level of abstraction emphasising in particular the application of run-time re-configurable architectures.

Planned actions

Project is planned to finish in year 2010. The deliverables and publications should be investigated by the HYDRA partners.

3.4   FRESCOR

Framework for Real-time Embedded Systems based on COntRacts

Type of the project: EU IST FP6 project, STREP
IST SO: Embedded systems
Project Reference: 034026
Launch: June 2006
Duration: 36 months
Consortium: 11 partners from 7 countries
Coordinator: Universidad de Cantabria, Spain
Website: http://www.frescor.org/

Description

The main objective of the project is to develop the enabling technology and infrastructure required to effectively use the most advanced techniques developed for real-time applications with flexible scheduling requirements, in embedded systems design methodologies and tools, providing the

necessary elements to target re-configurable processing modules and re-configurable distributed architectures.

The approach to achieve this main objective is to integrate advanced flexible scheduling techniques directly into an embedded systems design methodology, covering all the levels involved in the implementation, from the OS primitives, through the middleware, up to the application level. This will be achieved by creating a contract model that specifies which are the application requirements with respect to the flexible use of the processing resources in the system, and also what are the resources that must be guaranteed if the component is to be installed into the system, and how the system can distribute any spare capacity that it has, to achieve the highest usage of the available resources.

Relevance to Hydra

This contract-based methodology requires, for each resource, an underlying implementation that is capable of enforcing the reservations implied by the different active contracts. The contracts will be integrated with a component-based framework, and will provide the required level of abstraction to make the component model independent of the underlying implementation and hardware architecture. The framework will be portable across different scheduling strategies and platforms. Because of the dynamic nature of the contracts and the independence that they provide among the different real-time components of the application, the methodology is well suited to address very dynamic systems, such as those based on re-configurable architectures.

Planned actions

Project is planned to finish in year 2010. The deliverables and publications should be investigated by the HYDRA partners.

3.5   EMMA

Embedded Middleware in Mobility Applications

Type of the project:	EU IST FP6 project, STREP
IST SO:	Embedded systems
Project Reference:	034097
Launch:	May 2006
Duration:	30 months
Consortium:	7 partners from 6 countries
Coordinator:	ETRA Research and Development, S. A., Spain
Website:	http://www.emmaproject.eu/

Description

The EMMA project aims at using new embedded middleware to support the underlying logic and communications required for future cooperating wireless objects. The application domain is focused on the automotive and road transport fields. The project is committed to deliver a middleware platform and a development environment which facilitates the design and implementation of embedded software for cooperative sensing objects.

The ultimate aim that the project will focus on delivering is to hide the complexity of the underlying infrastructure whilst providing open interfaces to third parties enabling the faster, cost-efficient development of new cooperative sensing applications. This end-product will be accompanied by a publicly available specification (PAS) that will help to facilitate its wider adoption.

In order to validate the EMMA middleware a set of lab tests on a number of wireless cooperative objects (WICOS) will be performed. Furthermore the results will also be validated, in a second step, in the context of a number of applications: within an automotive subsystem, a car level and at a supra-car level (intelligent infrastructure).

This strategic goal will be achieved by means of a number of specific objectives, namely:

- Building of a middleware platform

- Including other cooperating objects as part of the definition of a cooperating object itself

- To lab test this middleware on a number of sensors

- Validating EMMA in a number of applications useful as test beds for the project embedded middleware

- To feed the project results into the relevant standards, particularly in those of the automotive industry.

Relevance to Hydra

EMMA project strategic goal is to open new prospects in the field of embedded middleware for cooperating wireless objects in order to hide the complexity of the underlying infrastructure while providing open interfaces to third parties. The application domain of transport will be taken as a pilot example. Similarity between Hydra and EMMA is high, they start in approximately same time, so the public outcomes and best practices of shorter project EMMA can be used in the IP Hydra project in the next steps, especially middleware architecture and testing on application domain of transfer.

Planned actions

This project could be of interest and their results should be investigated.

3.6   AN P2

Ambient Networks Phase 2

Type of the project:	EU IST FP6 project,
IST SO:	Mobile and Wireless Systems beyond 3G
Project Reference:	027662
Launch:	January 2006
Duration:	24 months (finished)
Consortium:	43 partners from 17 countries
Coordinator:	Ericsson AB
Website:	http://www.ambient-networks.org

Description

To achieve its strategic goals, the technical objectives over the full lifetime of the project are: to define and validate a complete and coherent solution for ambient networking, based on a range of different scenarios and business cases; to set new standards based on the Ambient Networks solution for future context-aware; multi-domain mobile networks; to ensure the commercial viability by identifying business roles and interfaces as well as deployment concepts and to consider business scenarios that allow different size and types of players to compete and cooperate; and to validate the various technical solutions developed for functional completeness and performance.

Relevance to Hydra

Project was similar to some particular HYDRA objectives. The main aim of this project was to develop various scenarios for ambient intelligent mobile devices.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.7   MIDAS

Middleware Platform for Developing and Deploying Advanced Mobile Services

Type of the project:	EU IST FP6 project
IST SO:	Mobile and wireless systems and platforms beyond 3G

Project Reference: 027055
Launch: January 2006
Duration: 30 months
Consortium: 8 partners from 6 countries
Coordinator: SINTEF ICT
Website: http://www.ist-midas.org

The project will focus in particular on making it feasible to provide mobile services in situations where the following apply: The number of users may be very large; The network may need to be set up at short notice, or for limited duration; infrastructure is limited and some users may have to use ad-hoc communications.

Today, it is technically difficult and time-consuming to provide customized services for such events. Existing approaches to service creation involve a great deal of reinvention for each new service, and there are no standard approaches to key issues such as the need to combine infrastructure-based and infrastructure-less communications. The core idea of MIDAS is to provide middleware building blocks addressing these problems, so that service developers can concentrate on providing the customised functionality required for the services being provided.

The project uses two proof-of-concept application scenarios to gather requirements and demonstrate project results. The first centres on the use of mobile devices to support emergency crews responding to an incident. Here the focus is on professional users and time-criticality: it must be possible to set up the network rapidly and at very short notice. The second scenario involves innovative services at a major sporting event. Here the focus is on different types of users (professionals, volunteers, the public), with a wider scope for commercialisation opportunities.

Relevance to Hydra

Project is similar and some particular issues are relevant to middleware issues in HYDRA project.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.8   MobiLife

Mobile Life

Type of the project: EU IST FP6 project,
IST SO: Applications and services for the mobile user and worker
Project Reference: 511607
Launch: September 2004
Duration: 27 months (finished)
Consortium: 22 partners from 9 countries
Coordinator: Nokia Corporation
Website: http://www.ist-mobilife.org/

Description

As users are participating in varying social contexts in everyday life, we need a facility to maintain such relations: To communicate. To share items and time. To manage today's complex lifestyles.

This mandated the development of group awareness support enabling the automatic and meaningful (self) organisation of communication means, view and use of shared items, adapted to the relevant context. Equally important, this required new privacy and trust models, so that such solutions could gain user acceptance. These models must also be understandable to the users. To make these services and applications real, the project investigated key application enablers and technologies deemed crucial for their implementation, keeping in mind the qualitative constraints such as the very large number of end-users and their diversity.

Technologies for maintaining a "shared cognition" amongst groups of users, such as modelling and reasoning for contextual awareness, technologies for facilitating and maintaining privacy and trust,

and technologies for creating and sharing various kinds of content and media related to everyday life belonged to key areas covered in the project. The enablers and technologies were embodied in application experience prototypes, thus providing the project further opportunities to learn interactively how they could facilitate providing sustained added value to the end-users. None of the services and applications developed in the project would ever reach the end-users, if they could not in practice be created and provided by some value network consisting of network operators, service operators, content providers, integrators, and others as may be needed. Therefore, the full service lifecycle covering service creation, packaging, configuration, provision, and support was addressed by the project, thus complementing the user-centric view with the equally decisive value network view.

In the context of the marketplace dynamics, the project also studied the relevant business models and societal issues, in particular potential legal problems and their solutions.

Relevance to Hydra

Project covers various interesting aspects such as modelling and reasoning for contextual awareness, technologies, that is relevant to HYDRA.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.9 HIPEAC

High-Performance Embedded Architectures and Compilers

Type of the project: EU IST FP6 project, Network of Excellence
IST SO: Embedded systems
Project Reference: 004408
Launch: September 2004
Duration: 48 months
Consortium: 15 partners from 11 countries
Coordinator: Universitat Politecnica de Catalunya, Spain
Website: http://www.hipeac.net/

Description

HiPEAC addresses the design and implementation of high-performance commodity computing devices in the 10+ year horizon, covering both, the processor design, the optimising compiler infrastructure, and the evaluation of upcoming applications made possible by the increased computing power of future devices. The objectives of HiPEAC are to ensure the visibility of European institutions in the high performance embedded marked, and to promote the integration of research efforts in a common direction. HiPEAC will also provide the means for easy collaboration among members, and rapid dissemination of knowledge among the community, as well as strengthening the relationships between academia and European industry. HiPEAC brings together the leading European experts in computer architecture, coordinating -for the first time- their research effort. HiPEAC will build up European strength by spreading knowledge and expertise to engineers and students, and by transferring this expertise to industry, with the goal of making Europe the worldwide leader in high-performance embedded processor architectures. The end target is to create a virtual centre of excellence in high-performance compilers and architectures for embedded processors. This centre will gather the world's largest critical mass of researchers, generate world-leading results in embedded architectures, and offer the best discussion forums on our topics of influence, becoming a focal point in the fields of computer architecture and optimising compilers at the maximum level.

Relevance to Hydra

HiPEAC integrates the newest knowledge in the research area of high-performance embedded processor architectures on academic and industrial level. This knowledge may be helpful in the phase of Hydra technical design.

Planned actions

Project is planned to finish soon (September 2008). The deliverables and publications should be investigated by the HYDRA partners.

3.10 HYCON

Hybrid Control: taming heterogeneity and complexity of networked embedded systems

Type of the project:	EU IST FP6 project, Network of Excellence
IST SO:	Embedded systems
Project Reference:	511368
Launch:	September 2004
Duration:	48 months
Consortium:	27 partners from 11 countries
Coordinator:	FIST - France Innovation Scientifique et Transfert France
Website:	http://www.ist-hycon.org/

Description

The objective of the NoE HYCON is establishing a durable community of leading researchers and practitioners who develop and apply the hybrid systems approach to the design of networked embedded control systems as found, e.g., in industrial production, transportation systems, generation and distribution of energy, communication systems. Hybrid systems provide a scientific paradigm to systematically address the analysis, modelling, simulation, synthesis, and optimisation of digital controllers for physical plants that communicate directly or via networks with other computerized systems and with human users and supervisors. Malfunction of the control system can lead to drastic performance degradation, severe damage to humans and the environment and cause significant economic losses. The interaction of digital controllers, communication systems and physical plants originates complex dynamic behaviours that cannot be understood intuitively. At present, the development of such systems is based on extensive testing and frequent iterations without guarantee of performance or even safety. HYCON aims at a major advancement of the methodology for the design of such systems and their application in power management, industrial controls, automotive control and communication networks. The long-lasting result will be a European Institute of Hybrid Systems (EIHS), designed to become a worldwide focal point for hybrid systems research. They share an integrating approach based on the concept of a dynamical system, which provides the basis for understanding and mastering the complexity and heterogeneity issues arising in the design of large distributed networked embedded control systems. The network will contribute significantly to bridge the gap between traditional control engineering and embedded system design.

Relevance to Hydra

The main importance of HYCON project is integration of the knowledge about the development and application of hybrid systems approach to design of networked embedded systems. This knowledge may be helpful in the phase of Hydra technical design.

Planned actions

Project is planned to finish soon (September 2008). The deliverables and publications should be investigated by the HYDRA partners.

3.11 BETSY

Being on time saves energy continuous multimedia experiences on networked handheld devices

Type of the project:	IST FP6 project, STREP
IST SO:	Embedded systems
Project Reference:	004042
Launch:	September 2004
Duration:	30 months (finished)
Consortium:	8 partners from 6 countries
Coordinator:	NXP Semiconductors Netherlands B.V., Netherlands
Website:	http://www.hitech-projects.com/euprojects/betsy

Description

Wireless multimedia streaming on hand-held, mobile or otherwise battery operated devices will be a major technology underlying the next generation information and entertainment appliances. On one hand our own home slowly becomes a networked environment, in which devices can talk to each other. But wireless multimedia streaming will also become possible when we are on the move, as so-called hot-spots, places in city centres, bus stations, airports, hospitals etc, where our own devices can connect into a local networking area where services and content can be provided, will give the possibility to retrieve the content we want and have a reasonable amount of bandwidth available.

Today it is not possible, even at design time, to make well-founded system trade-offs between network and terminal resource consumption, energy consumption of the terminal and timeliness of the streaming data. The BETSY project will deliver all the theory, models and design methodology to make this possible during design time and a framework implementation that makes dynamic adaptations in this trade-off possible at run-time. The latter part is necessary, as fixed system design is not possible anymore in the changing environment we look at. BETSY proposes to combine the research results of several domains, such as networking, device resource management, real-time processing and stream processing, to achieve a holistic view on the dependencies between bandwidth, delay, schedules, and the power and energy consumption for this specific application domain, because the traditional, isolated view of the issues does not yield satisfying results.

The results will lead to reduced product cost by eliminating pessimistic and large safety margins or improved system performance with equal resource demands. It will also lead to automatic adaptation of devices and applications to the resource and energy limits of the surrounding environment, which is an important step towards Ambient Intelligence.

Relevance to Hydra

This project is relevant to HYDRA in area of AmI and adaptive networking of mobile devices like handhelds or smart phones.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.12 DECOS

Dependable Embedded Components and Systems

Type of the project:	EU IST FP6 project, Integrated project
IST SO:	Embedded systems
Project Reference:	511764
Launch:	August 2004
Duration:	36 months (finished)
Consortium:	18 partners from 10 countries
Coordinator:	ARC, Austria
Website:	https://www.decos.at/

Description

Dependable embedded real-time systems are an enabling technology for the information society. Their economic impact reaches far beyond their immediate market size, since the success of many industrial products depends on the provision of reliable control systems. As the rapidly growing functional and non-functional system requirements cause an enormous increase in system complexity, it is necessary to move into component-based design: to provide pre-validated hardware and software components and an appropriate integration methodology for the design of next generation dependable embedded real-time systems. The major objective of the project DECOS is to perform research in and to develop a set of generic hardware and software components within the framework of the Time-Triggered Architecture.

DECOS is an integrative project that will develop the basic enabling technology to move from a federated distributed architecture to an integrated distributed architecture in order to reduce development, production and maintenance cost and increase the dependability of embedded applications in many application domains. DECOS plans to develop technology invariant software interfaces and encapsulated virtual networks with predictable temporal properties such that application software can be transferred to a new hardware and communication base with minimal effort (legacy re-use). The DECOS methodology and the tools will be evaluated by building three applications in the automotive, aerospace and control domain, respectively. The components and tools developed within DECOS will cover: cluster design, middleware and code generators, validation and certification as well as systems-on-a-chip (SoCs) for high dependability applications.

Relevance to Hydra

DECOS introduce the approach to cost-efficient design and development of embedded systems providing the architecture and services in a domain and platform independent manner. The main importance is the use of model-based tool-chain developed by the DECOS project.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.13 NECST

Networked Control Systems Tolerant to faults

Type of the project:	EU IST FP6 project, STREP
IST SO:	Embedded systems
Project Reference:	004303
Launch:	August 2004
Duration:	36 months (finished)
Consortium:	7 partners from 5 countries
Coordinator:	University Henri Poincare, France
Website:	http://www.strep-necst.org/

Description

The aim of the NeCST (Networked Control System Tolerant to faults) is to explore research opportunities in the direction of distributed control system in order to enhance the performances of diagnostics and fault tolerant control systems. This will lead to improving the intensive use of NeCST technologies for the reactivity, autonomy and monitoring of large scale systems. The systems under consideration in the framework of this project can be considered as a distributed network of nodes operating under highly decentralised control, but unified in accomplishing complex system-wide goals. One of the key factors in designing such a complex system is that both the physical subsystem and the control part have to be designed together in an integrated way. Systems developed in this project will be modular, adaptive, able to operate in autonomy and possibly reconfigurable. The implementation of these concepts is achieved by using the technologies of

wireless networks, embedded systems, nomad components, electronics tags, etc. Finally, the main contribution of the NeCST project in the embedded systems area is to propose different means enabling to improve the embedded component safety. For this, algorithms and procedures will be developed in order to be able to early detect anomalies (variances or irregularities in the embedded networks and in the embedded equipments) and to switch to fault tolerant control strategy and/or providing predictive and real-time maintenance.

Relevance to Hydra

The NeCST project offers the solution enhancing the performance of diagnostics and fault tolerance of modular, adaptive, reconfigurable systems with autonomous components, such as wireless networks and embedded systems similar to expected possible Hydra implementations.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.14 ICODES

Interface- and Communication-based Design of Embedded Systems

Type of the project:	EU IST FP6 project, STREP
IST SO:	Embedded systems
Project Reference:	004452
Launch:	August 2004
Duration:	36 months (finished)
Consortium:	7 partners from 3 countries
Coordinator:	Bosch, Germany
Website:	http://icodes.offis.de/

Description

The ICODES project will produce research results and prototypes of Electronic System Design Automation tools, which will enable the European electronic system industry to reduce their design time and cost of the next generation of embedded intelligent devices. These devices will enable new powerful services as well as innovative products. In particular ICODES main target is to provide a design technology for embedded systems containing many and heterogeneous communicating components in hardware and software. A methodology to model, evaluate and implement embedded hardware/software systems from the specification at Electronic System Level (ESL) to a standard industrial backend design flow will be developed. It will enable a holistic view on the design as a whole. Techniques like communication based design and object-orientation will be integrated into a seamless design flow for embedded systems. It will support analysis and optimisation of the systems communication properties. The design methodology will be implemented by a suite of ESL tools based on the SystemC language. The tool set will include analysis, evaluation, optimisation and synthesis tools supporting interactive design decisions as well as the automatic translation and optimisation of high-level models into an implementation. In order to ensure a wide applicability of the methodology and a successful path to commercial exploitation, the project is industry driven.

Relevance to Hydra

The main possible contribution of ICODES project to Hydra is the approach to design of embedded systems containing many and heterogeneous communicating components in hardware and software. Importance of approach proposed in ICODES is using high-level models describing the applications, which can be analysed, evaluated, optimized and translated into implementation.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.15 AN – Ambient Networks

Type of the project: EU IST FP6 project
IST SO: Mobile and Wireless Systems Beyond 3G
Launch: January 2004
Duration: 24 months (finished)
Consortium: 35 partners from 15 countries
Coordinator: Ericsson AB
Website: http://www.ambient-networks.org/phase1web/

Description

The Ambient Networks project will create the network solutions for mobile and wireless systems beyond 3G. It will enable scalable and affordable wireless networking while providing rich and easy to use communication services for all. It is geared towards increasing competition and cooperation in an environment populated by a multitude of user devices, wireless technologies, network operators and business actors.

Ambient Networks offers a fundamentally new vision based on the dynamic composition of networks to avoid adding to the growing patchwork of extensions to existing architectures. This will provide access to any network, including mobile personal networks, through instant establishment of inter-network agreements.

The project adopts the design paradigm of horizontally structured mobile systems that offer common control functions to a wide range of different applications and air interface technologies. Such a radical change requires the definition of new interfaces and a multitude of standards in key areas of future media- and context-aware, multi-domain mobile networks.

The project's results comprise a complete, coherent wireless network solution; an architecture for self-configuring network components that reduces deployment and operational costs and a complete protocol suite for network composition evolved from IPv6. The results will facilitate incremental market introduction of new services, and will stimulate sustainable growth in the European mobile communications sector.

Relevance to Hydra

This project is relevant to HYDRA in area of AmI. Similar is approach to use of mobile devices, composition of networks using these devices.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.16 ENACTIVE

Enactive interfaces

Type of the project: EU IST FP6 project, Network of Excellence
IST SO: Multimodal interfaces
Project Reference: 002114
Launch: 2004
Duration: 48 months (finished)
Consortium: 24 partners from 10 countries
Coordinator: Scuola Superiore Sant'anna Pisa, Italy
Website: https://www.enactivenetwork.org/

Description

Enaction is a form of interaction realized in the form of sensory-motor responses and acquired by the act of "doing". It is a form of cognition inherently tied to actions, capable of directly conveying a non-symbolic form of knowledge. The objective of the ENACTIVE Network of Excellence is to join excellent researchers to define and develop reliable solutions for enactive interaction and overcome the two main bottlenecks of present Interface Technologies:

- The need of increasing of artificial systems reactivity to reach the same level of human action-perception abilities in complex tasks;
- The link of physical sensory-motor events (enactive experiences) with the symbolic information and knowledge technologies.

The ultimate Network vision is to design a new kind of computerized machines, called Sensible Machines, adapted to our sensory-motor intelligence. Beside Thinking Machines, considered as machines based on language technologies that can perform reasoning, and beside Communicating Machines, intended as machines based on wireless communications and network technologies that allow humans to communicate between themselves, the Sensible Machine plays the role of a third complementary means. It will be a generic interface between the human senses and the external universe, that completes our computerized environments with the aim of rendering them more efficient and human oriented.

Relevance to Hydra

The ENACTIVE project proposes the reactive paradigm to design of human-machine interfaces. Reactivity of so-called sensible machines based on direct mapping from sensoric perceptions to actions without the use of symbolic knowledge can be in many cases efficient solution to elementary responses design.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.17 AIM@SHAPE

Advanced and Innovative Models And Tools for the development of Semantic-based systems for Handling, Acquiring, and Processing Knowledge Embedded in multidimensional digital objects

Type of the project:	EU IST FP6 project, Network of Excellence
IST SO:	Semantic-based knowledge systems
Project Reference:	506766
Launch:	January 2004
Duration:	48 months (finished)
Consortium:	13 partners from 8 countries
Coordinator:	C.N.R. - Istituto di Matematica Applicata e Tecnologie Informatiche - Dept. of Genova, Italy
Website:	http://www.aimatshape.net/

Description

The Mission of AIM@SHAPE is to foster the development of new methodologies for modelling and processing the knowledge related to digital shapes. This knowledge is concerned with the geometry (the spatial extent of the object), the structure (object features and part-whole decomposition), attributes (colours, textures), semantics (meaning, purpose), and has interaction with time (morphing, animation). This objective will be achieved by growing a new multi-disciplinary research field, which deeply integrates Computer Graphics and Vision with Knowledge Technologies and builds on using knowledge formalisation mechanisms (metadata and ontologies) for linking semantics to shape or shape parts. The innovation sought by AIM@SHAPE is to move towards digital representations of shapes which are able to model not only the visual appearance of objects but also their meaning or functionality in a given knowledge domain.

The goal of AIM@SHAPE is to integrate research on digital shapes modelling and processing with Knowledge Technologies and Semantic Web tools.

The AIM@SHAPE consortium of 13 excellent research institutions in foundational and applied fields of shape modelling will pursue lasting integration both at the foundational level, by initiating a new Theory of Digital Shapes, and at the component level, by developing a Digital Shape Workbench as a common platform for shape models and software tools. Integrating activities will include the design of a common shape ontology and a program for human capital mobility and training. Spreading of excellence activities will include an international forum, an industrial users' group and regular conferences.

Relevance to Hydra

The main importance of AIM@SHAPE project is the recognition of real world objects and mapping of observations of the real world to knowledge model. Knowledge acquired from real world observations can be more easily used for modelling and description of context information.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.18 AMI

Augmented Multi-party Interaction

Type of the project:	EU IST FP6 project, Integrated Project
IST SO:	Multimodal interfaces
Project Reference:	506811
Launch:	January 2004
Duration:	48 months (finished)
Consortium:	16 partners from 8 countries
Coordinator:	IDIAP Research Institute, Switzerland
Website:	http://www.amiproject.org/

Description

AMI is concerned with new multimodal technologies to support human interaction, in the context of instrumented meeting rooms and remote meeting assistants. The project aims to enhance the value of multimodal meeting recordings and to make human interaction more effective in real time. These goals are being achieved by developing new tools for computer supported cooperative work and by designing new ways to search and browse meetings as part of an integrated multimodal group communication, captured from a wide range of devices.

This Integrated Project addresses a wide range of critical multi-disciplinary activities and applications, including: multimodal input interfaces (primarily speech and visual input); integration of modalities and coordination among modalities, e.g. (asynchronous) multi-channel processing; meeting dynamics and human-human interaction modelling; content abstraction, including multimodal information indexing, summarising, and retrieval; technology transfer; and training activities, including an international exchange programme.

Relevance to Hydra

Modelling approaches addressed by AMI project can bring the useful knowledge for design of multimodal interfaces in Hydra project, mainly in area of multi-channel signal processing, multimodal information modelling, information retrieval and content abstraction.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.19 CHIL

Computers In the Human Interaction Loop

Type of the project: EU IST FP6 project, Integrated Project
IST SO: Multimodal interfaces
Project Reference: 506909
Launch: January 2004
Duration: 44 months (finished)
Consortium: 15 partners from 10 countries
Coordinator: Universität Karlsruhe and Fraunhofer Institute IITB, Germany
Website: http://chil.server.de/servlet/is/101/

Description

The objective of this project is to explore and create environments in which computers serve humans which focus on interacting with other humans as opposed to having to attend to and being preoccupied by the machines themselves. Instead of computers operating in an isolated manner, and humans [thrust] in the loop [of computers] CHIL puts Computers in the Human Interaction Loop (CHIL). CHIL designs Technologies and Computer Services that model humans and the state of their activities and intentions. A complete perceptual context enables a family of CHIL computing services that provide helpful assistance implicitly, requiring a minimum of human attention or interruptions.

To achieve this overall vision, a broad set of key scientific issues is proposed:

- Multimodal Perceptual User Interfaces that observe, recognize, fuse, and interpret all available cues and clues to explain human-human activities and intentions.

- A suite of Services that instantiate CHIL Computing based on perceptual context awareness and understanding of human activity.

- A supportive infrastructure that supports CHIL Services including autonomic computing, self-healing and self-maintaining software, flexible architecture, and a networked infrastructure integrating numerous devices intermittently and dynamically.

Relevance to Hydra

One of main possible contributions of CHIL project to Hydra is the design of interfaces directly centred on observation and processing of human behaviour, activities and intentions. The services proposed in CHIL projects are designed to provide the continual support for context modelling by recognition and interpretation of human behaviour.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.20 SIMILAR

The European research taskforce creating human-machine interfaces SIMILAR to human-human communication

Type of the project: EU IST FP6 project, Network of Excellence
IST SO: Multimodal interfaces
Project Reference: 507609
Launch: Dec 2003
Duration: 48 months (finished)
Consortium: 34 partners from 16 countries
Coordinator: Universite Catholique de Louvain, Belgium
Website: http://www.similar.cc/

Description

SIMILAR will create an integrated task force on multimodal interfaces that respond efficiently to speech, gestures, vision, haptics and direct brain connections by merging into a single research group excellent European laboratories in Human-Computer Interaction (HCI) and Signal Processing.

- SIMILAR will develop a common theoretical framework for fusion and fission of multimodal information using the most advanced Signal Processing tools constrained by Human Computer Interaction rules;

- SIMILAR will develop a network of usability test facilities and establish an assessment methodology;

- SIMILAR will develop a common distributed software platform available for researchers and the public at large through www.openinterface.org;

- SIMILAR will establish a scientific foundation which will manage an International Journal, Special Sessions in existing conferences, organise summer schools, interact with key European industrial partners and promote new research activities at the European level;

- SIMILAR will address a series of great challenges in the field of edutainment, interfaces for disabled people and interfaces for medical applications. Natural immersive interfaces for education purposes and interfaces for environments where the user is unable to use his hands and a keyboard (like Surgical Operation Rooms, or cars) will be dealt with a stronger focus.

Relevance to Hydra

SIMILAR project brings new knowledge in the area of multimodal interfaces, fusion of multimodal information, signal processing, human-machine interaction rules, which may be useful for design of multimodal human-computer interfaces in Hydra.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.21 CORTEX

CO-operating Real-time senTient objects: architecture and EXperimental evaluation

Type of the project:	IST Programme RTD Research Project
Project Reference:	26031
Launch:	April 2001
Duration:	24 months (finished)
Consortium:	4 partners from 4 countries
Coordinator:	Departamento de Informática, Universidade de Lisboa, Portugal
Website:	http://cortex.di.fc.ul.pt/index.htm

The CORTEX project is concerned with research other than context-aware middleware, but has proposed a middleware to deal with "Autonomous mobile physical objects that cooperate with other objects, either mobile or static, by capturing information in real-time from sensors event messages propagated in a MANET".

The middleware is based on sentient objects. A sentient object senses and views the behaviour of neighbouring objects, reasons about them, and manipulates physical objects accordingly. Sentient objects dynamically discover each other, and share context information.

To support sentient objects, CORTEX provides a middleware based on component frameworks, each of which provides a service to the sentient objects: Publish-Subscribe, Group Communication, Context, and QoS management.

Publish-Subscribe is used for discovery, while the other component frameworks support communication, context retrieval and inference, and arbitration of resource allocation.

The resulting middleware is configured at deployment time and can be reconfigured at run-time through a reflective API to adapt to changes in the environment.

Relevance to Hydra

This project is relevant to HYDRA in the area of context awareness and design/development of context-aware middleware for networking of mobile physical devices. CORTEX similarly to HYDRA provides middleware based on component frameworks with particular services for e.g. QoS management, context management, and communication.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.22 COGMA

Cooperative Gadgets for Mobile Appliances

Coordinator: Nagoya University, Information Technology Center project, Japan
Website: http://www.cogma.org/en/index_overview.html

Description

In this project, a middleware named COGMA for mobile appliances was developed. It enables the easy development of cooperative applications among various kinds of appliances in mobile environment. The middleware is designed for:

- Working not only on embedded device but also on note PC,

- Dynamic reconfiguration of sensor or control devices, and cope with sudden power-on/off,

- Cooperation of different kind of functional devices.

By virtue of dynamic code mobility based on mobile agent technology, on middleware enables the on-demand code installation. The middleware also has a logical network configuration tool. By using this tool, user can control/monitor the embedded device via GUI-terminal. COGMA system can utilize several kinds of network links such as TCP/IP, and serial. On these links, the system can construct an ad-hoc network. Each device has information about its function. Devices on the same network exchange information about them to cooperate with each other. In this project, we develop a SmartMeeting application. In this application, LCD projector, Note PC, and Light are controlled through SmartMeeting codget. By using this application, usability and feasibility of the middleware is exemplified.

Relevance to Hydra

COGMA project offers the solution very similar to Hydra design in several aspects.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.23 CoolTown

Website: http://www.champignon.net/TimKindberg/cooltown.php

The Cooltown project is intended to support wireless, mobile devices to interact with a web-enabled environment. The basic principle is that devices, people, and things have a webpresence identified by a URL, which provides a "rich" interface to the entity. Users interact with the web-enabled environment using PDAs to interact with the available web-services. As such, Cooltown expects

wireless Internet access when users interact with the system. URLs are passed between devices in local device to device interaction. E.g. a projector might receive a presentation by receiving a URL to the file.

Context in the system is closely tied to the physical environment. For example, an infrared beacon at the entrance of a room will emit a URL which points to the page of the room. When a PDA loads this page, the PDA acts as an interface to the room, thus changing behaviour based on location context. Other types of context might be used by web-applications by providing web applications with other context like time or activity. The main principle in the collection of context is that it is provided by web-clients. Depending on which sensors the clients have, web interfaces can adapt to the context they provide. Types of context about the physical world include: where, when, who, what, and how.

The context is integrated with a model of the physical world, consisting of places, people and things, and relationships between them. Relationships include: Contains, isContainedIn, isNextTo, and isCarriedBy, and the list is extensible. Relationships are directional, so like hyperlinks they can be navigated in one direction, making them suitable for presenting as web pages. Relationships have properties, and can be subtypes of other relationships. The state of the model is updated automatically by sensing mechanisms ranging from infrared beacons to GPS.

The main modules in the architecture are: Web Presence Manager, Description, Directory, Discovery modules, Autobiographer, Observer, and Control.

Besides these modules, CoolTown offers tools to build web-presence services (applications).

Relevance to Hydra

CoolTown project presents an idea of building the web-presence applications. In particular, this project also deals with the issues of context representation and context awareness in mobile devices.

Planned Action

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

3.24 Hydrogen Context-Framework

In the Hydrogen project at Johannes Kepler University Linz, issues related to building context-aware systems using mobile devices in particular (e.g. limitations of network connections, limited computing power, and characteristics of mobile users) are addressed. The Adapter Layer is responsible to get information from sensors about the physical context, possibly enriches this information with logical context information and delivers it to the Management Layer. This layer permits a sensor's concurrent use by different applications. The ContextServer embedded in the Management Layer provides simple methods for the application for retrieving or subscribing to a context. Applications, which use the context provided by the underneath layers, are part of the Application Layer

Relevance to Hydra

Hydrogen project is relevant to HYDRA in area of context-awareness in mobile devices environments. Various aspects are addressed, networking of the devices, data storage, as well as profiling of the users.

Planned Action

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

4 Service oriented Architecture projects

4.1   MUSIC

Mobile Users in Ubiquitous Computing Environments

Type of the project:	IST FP6 project, Integrated project
IST SO:	Software and Services
Project Reference:	035166
Launch:	October 2006
Duration:	42 months
Consortium:	15 partners from 10 countries
Coordinator:	SINTEF – Stiftelsen For Industriell Og Teknisk Forskning, Norway
Website:	http://www.ist-music.eu/

Description

MUSIC is a focused initiative that will develop a comprehensive open-source software development framework that facilitates the development of self-adapting, reconfigurable software that seamlessly adapts to the highly dynamic user and execution context, and maintains a high level usefulness across context changes. Context-aware applications are capable of exploiting knowledge of external operating conditions, and they are self-adaptive if they adapt at runtime to varying contexts, like changing user needs and operating environments.

MUSIC will provide a design methodology and distributed system architecture for the design and implementation of self-adapting applications in ubiquitous computing environments. This will be complemented with enhanced modelling languages for the specification of context dependencies and adaptation capabilities, supported by model specification, validation and simulation tools. This platform will be used to develop trial services, based on a set of challenging application scenarios with real market potential, having a central role: as sources of requirements, to assess technical adequacy of the results, and to promote the results.

MUSIC thus invites the user to take for granted a high level of service usability, reliability and responsiveness. The user will be released from the complex configuration and administration that are imposed on users by many applications today. Thus, MUSIC is not only about the immediate technical objectives of self-configuration of context-aware applications, but it represents a noteworthy response to the vision of autonomic computing as articulated by major industrial players.

MUSIC includes major industrial players in the mobile market, several SMEs (one IST prize winner) specialising in mobile services, organisations with expertise in the domains of the trial services, Universities, and research institutions.

Relevance to Hydra

MUSIC is relevant to HYDRA in the area of context-aware middleware architectures and design/development of distributed service-oriented architectures. Another similarity is in development of self-configurable applications.

Planned actions

Project is planned to finish in year 2010. The results, including deliverables and publications, should be investigated by the HYDRA partners.

4.2   SOCRADES

Service-oriented cross-layer infrastructure for distributed smart embedded systems

Type of the project:	EU IST FP6 project, Integrated project
IST SO:	Embedded systems
Project Reference:	034116

Launch:	September 2006
Duration:	36 months
Consortium:	15 partners from 5 countries
Coordinator:	Schneider Electric GMBH, Germany
Website:	http://www.socrades.eu/

Description

The goal of the SOCRADES project is to create new methodologies, technologies and tools for the modelling, design, implementation and operation of networked hardware/software systems embedded in smart physical objects. The smart embedded system is to be applied in perception and control systems in intelligent environments, in which enhanced system intelligence is achieved by cooperation of smart embedded devices pursuing common goals. These devices with embedded intelligence and sensing/actuating capabilities are expected to be heterogeneous yet they need to interact seamlessly and intensively over a network (wired/wireless).

The SOCRADES approach is to create system intelligence by a large population of small and smart networked embedded devices at a high level of granularity, as opposed to the traditional approach of focusing intelligence on a few large and monolithic applications. This increased granularity of intelligence distributed among loosely coupled intelligent physical objects facilitates the adaptability and reconfigurability of the system, allowing it to meet business demands not foreseen at the time of design. Focus from a functional view will be in managing the vastly increased number of intelligent devices and the associated complexity. Focus from a run-time infrastructure view will be in a new breed of very flexible real-time embedded devices (wired/wireless) which are fault-tolerant, reconfigurable, safe and secure.

Relevance to Hydra

This project is highly relevant to Hydra. Similarity can be viewed e.g. in middleware technologies to be developed in this project. These will be based on the Service-Oriented Architecture approach, will be generic to any networking technology or transmission medium, and will provide open interfaces that enable interoperability at the semantic level to any 3rd party. A SOCRADES service is considered a software component, which encapsulates device-specific functionality. This functionality is advertised to the system in order to be located and invoked by other networked devices.

Planned actions

The SOCRADES project is very relevant for Hydra and initial contacts have been made at the time of writing. IN-JET has been in contact with Dominique Guinard, Research Associate at the SAP Research / ETH CEC Zürich, who is a leading project partner. It has been briefly discussed to hold a joint symposium for project members to explore common issues and findings in the areas of automatic device discovery, automatic ontology building and device communication.

Relevant Hydra partners will also follow the project results by reading papers and deliverables published.

4.3   VAN

Virtual Automation Networks

Type of the project:	IST FP6 project, Integrated project
IST SO:	Integrating Technologies for the Fast and Flexible Manufacturing Enterprise
Project Reference:	016969
Launch:	September 2005
Duration:	48 months
Consortium:	14 partners from 4 countries
Coordinator:	Siemens AG, Germany
Website:	http://www.van-eu.eu

Description

The leading trend in industrial automation is its penetration by IT technologies. Due to their origin in the office world, indeed these technologies and concepts do not reach the industrial standards in areas as security, wireless, safety, and real-time. To keep its dominant market position for automation systems Europe, first, has to cope with the technical challenges which follow from this paradigm change and, second, has to avoid dependencies from the mostly non-European producers of such IT technologies. Correspondingly, the objective of VAN is to adopt, modify and extend common office/IT solutions according to the above-mentioned standards, aiming at real knowledge-based, intelligent, agile manufacturing enterprises. This implies new dimensions in the horizontal and vertical integration between office and industrial automation domains. In this context VAN aims at a concrete series of advantages for European industry: -Leadership in integrating IST into industrial communication technologies for embedded, networked, distributed automation systems - Strengthen the competitiveness and competence of Europe in industrial automation and communication technology; remarkable contribution to international standardisation -System integration over local and remote heterogeneous networks - Virtual Automation Networks -Provide new technologies and extensions to existing IST to fulfil the requirements of industrial applications; Wireless concepts for industry -Infrastructure for the joint use of embedded devices and IT systems in industrial automation, enabling multi-stakeholder involvement for multidisciplinary and dynamic industrial environments - scalable real-time, security and safety capabilities for industrial demands The VAN project focuses on an important part of a flexible manufacturing automation scheme: the required Industrial communication network for local and wide-area connection between the parts of the automation functions.

Relevance to Hydra

The relevance of VAN project to HYDRA is in industrial virtual automation network concept. More specifically, similarity is more evident in the area of embedded service-oriented architectures and environments for support of embedded services on devices.

Planned actions

Project is planned to finish in year 2009. The deliverables and publications should be investigated by the HYDRA partners.

4.4   DIP

Data, Information, and Process Integration with Semantic Web Services

Type of the project:	IST FP6 project, Integrated project
IST SO:	Semantic-based knowledge systems
Project Reference:	507483
Launch:	January 2004
Duration:	36 months (finished)
Consortium:	20 partners from 10 countries
Coordinator:	National University of Ireland Galway - DERI, Ireland
Website:	http://dip.semanticweb.org/

Description

With current web technology the computer is used as a device for rendering information for the human reader only. Providing actual support in information processing and information exchange requires machine-processable semantics of data and information. This is precisely the goal of the Semantic Web. Based on Ontologies, the computer will be enabled as a device for querying and managing semi-structured information. Recent complementary efforts try to lift the web to a new level of service based on integrating it with computational aspects. Software programs can be accessed and executed via the web based on the idea of Web Services, which can significantly increase the Web architecture's potential by providing a way of automated program communication, discovery of services, etc.

The major mission of DIP is to further develop Semantic Web and Web Services and especially to enable their combination. Web Services are the proper means to access semantically enriched data

and semantic enrichment of Web Services is essential for their scalability and maturity. This new area is called Semantic Web Services. Semantic Web Service technology will allow structural and semantic definitions of documents providing completely new possibilities in knowledge management, Enterprise Application Integration, and eCommerce.

Semantic Web Services will provide a new infrastructure for eWork and eCommerce, just as the telephone did a century ago, based on its ability to provide semantic processing of data, information, and processes. DIP will develop this technology and will focus on applications in eWork and eCommerce including sub topics such as Knowledge Management, Enterprise Application Integration and eGoverment. DIP'S mission is to make Semantic Web Services a reality, providing an infrastructure (i.e. architecture and tools) that will revolutionize data and process integration in eWork, and eCommerce as the web did it for human access.

Relevance to Hydra

This project is relevant to HYDRA work package 3.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

4.5   SIRENA

Service Infrastructure for Real time Embedded Networked Applications

Type of the project:	ITEA project within the Eureka framework
Project Reference:	032939
Launch:	January 2003
Duration:	30 months (finished)
Consortium:	15 partners from 3 countries
Coordinator:	Schneider Electric, France
Website:	http://www.sirena-itea.org/Sirena/Home.htm

Description

The SIRENA project intends to create a service-oriented framework for specifying and developing distributed applications in diverse real-time embedded computing environments, including industrial automation, automotive electronics, home automation and telecommunications systems.

Though very diverse, these domains have a lot in common as far as the basic communications and control infrastructure is concerned. SIRENA has developed a set of common services to address this common denominator, complemented with domain-specific services for each of the target domains.

The objective is to develop a Service Infrastructure for Real time Embedded Networked Applications and the project developed a framework to establish a Service-oriented Architecture on the link level. Devices that are connected to a network can expose their capabilities via service description interface and call other services. The framework resides directly on top of the Internet Protocol (IP) and is based on the DPWS (Device Profiles for Web Services) framework.

DPWS (http://schemas.xmlsoap.org/ws/2006/02/devprof/) is a further development of the UPnP device network protocol (see below). In SIRENA, the service advertisement and discovery facilities of UPnP are exploited and enhanced, while also adding security.

The application domains "Industrial Manufacturing", "Automotive", "Home" and "Telecom" are considered. A reference implementation of the SIRENA framework is available in JAVA.

Relevance to Hydra

The technology, the application domains and the consortium partners are all very relevant to Hydra. SAG has been a partner in Sirena through C-LAB. In the project's context, "Schneider Electric", SIRENA's lead contractor, started a program called "Transparent Ready", that allows all their products to communicate and access each other. Schneider Electrics builds products for the

residential, building, industry, energy and infrastructure markets. This technology is relevant for Hydra, in particular because it is available on the market from a large manufacturer.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

4.6   OBELIX

Ontology-based electronic integration of complex products and value chains

Type of the project:	IST FP5 project, Cost-sharing contracts
IST SO:	2001-2.2.2 Smart organisations
Project Reference:	IST-2001-33144
Launch:	March 2002
Duration:	33 months (finished)
Consortium:	7 partners from 4 countries
Coordinator:	Fundacion LABEIN, Spain
Website:	http://www.cs.vu.nl/~obelix/

Description

OBELIX aims to develop an e-business ontology tool suite and library to support smart collaborative e-business and the realization of innovative applications. The OBELIX tool suite consists of an ontology server providing facilities for editing, component brokering, ontology management, and Web language import and export, plus a number of ontology-based tools including an e-business scenario analysis and simulation tool for DVC models and strategies, an automatic product classifier to speed up application of content management standards, and a multi-product configuration tool for online collaborative design scenarios. In addition, OBELIX will deliver a modular e-business ontology library. The tools will be validated through three e-business applications: e-markets for energy trading and servicing, new digital music value chains and online design of events.

Relevance to Hydra

Project results can be relevant to some specific HYDRA related problems such as ontology modelling.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

4.7   METEOR-S

Website:	http://lsdis.cs.uga.edu/projects/meteor-s/

METEOR-S project proposes the application of semantics to existing web service technologies. In particular the project endeavours to define and support the complete life cycle of semantic web service processes. The project extends WSDL to support the development of semantic web services using semantic annotation from additional type systems such as WSMO and OWL ontologies. It is not based on an overall conceptual model and it is rather a collection of related discrete tools than a single, encapsulated architecture.

The development module provides a GUI based tool for creating semantic web services using WSDLS. The tool provides support for semi-automatic and manual annotation of existing web services or source code with domain ontologies. The publication and discovery module provides support for semantic publication and discovery of web services. It provides support for discovery in a federation of registries as well as a semantic publication and discovery layer over UDDI. The composition module consists of two main sub-modules - the constraint analysis and optimization

sub-module (it deals with correctness and optimization of the process on the basis of quality service constraints) and the execution environment. The execution environment provides proxy-based dynamic binding support to BPWS4J execution engine for BPEL4WS.

The current implementation of METEOR-S allows for the creation of WSDL-S descriptions from annotated source code, the automatic publishing of WSDL-S descriptions in enhanced UDDI registries, and the generation of OWL-S descriptions, from WSDL-S, for grounding, profile and service.

Relevance to Hydra

This project is relevant to HYDRA in the area of semantic description of web services. Project described various approaches to semantic web services description, as well as WSDL extensions, OWL and WSMO.

Planned Action

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

4.8   IRS (Internet Reasoning Service) III

Website: http://kmi.open.ac.uk/projects/irs/#irsiii

IRS is a framework for Semantic Web Services that supports the publication, location composition and execution of Web Services based on their semantic descriptions. IRS supports the conceptual model defined by WSMO and also provides mappings for service descriptions provided in OWL-S. Although the approach is quite competitive to WSMX, choreography and orchestration do not follow WSMO specification and they are implemented in a non-standard way.

The main components of IRS are the IRS server, the IRS publisher and the IRS client. The server stores the descriptions of goals, mediators and web services along with domain ontologies. Discovery, composition, mediation, reasoning and invocation are all controlled by the server. Finally, the client provides a user-interface for goal-based web service invocation.

The publisher carries out the tasks required for publication. Publication has two roles in IRS. The first is where a web service represented by a URI endpoint is associated with a semantic service description known to IRS. The second is where standalone Java or Lisp code is wrapped to make it appear as a web service and then, as in the first case, the service is associated with a semantic service description known to IRS. Once a service has been published to IRS it is available to be used in the achievement of a user goal.

IRS has its foundation in an earlier **IBROW project** which made the distinction between tasks that need to be solved and problem solving methods that "provide abstract, implementation-independent descriptions of reasoning processes which can be applied to solve tasks in specific domains". Adopting the WSMO conceptual model, tasks in IRS are modelled as goals while problem solving methods are modelled as services. Discovery in IRS is based on matching the pre-conditions and post-conditions defined in the semantic descriptions of goals and services known to the IRS server.

Relevance to Hydra

IRS (Internet Reasoning Service) project deals with the service description. However it elaborates more on WSMO and OWL-S technologies that are not considered in HYDRA project, the project should also be investigated as a similar approach.

Planned Action

The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

5 Sensor and wireless network projects

5.1   WINSOC

Wireless sensor Networks with Self-Organization capabilities for Critical and emergency applications

Type of the project:	EU IST FP6 project, STREP
IST SO:	ICT for Environmental Risk Management
Project Reference:	033914
Launch:	September 2006
Duration:	30 months
Consortium:	11 partners from 7 countries
Coordinator:	Selex Communications, Spain
Website:	http://www.winsoc.org/

Description

WINSOC is a STREP project co-funded by the European Commission within the RTD activities of the Thematic Priority Information Society Technologies. The project explores the possibility to develop a novel technology for Wireless Sensor Networks, which has significant potentials for overcoming conventional technologies in terms of cost, size and power consumption.

The key idea of WINSOC is the development of a totally innovative design methodology, imitating biologically systems, where the high accuracy and reliability of the whole sensor network is achieved through a proper interaction among nearby, low cost, sensors. This local interaction gives rise to distributed detection or estimation schemes, more accurate than that of each single sensor and capable to achieve globally optimal decisions, without the need to send all the collected data to a fusion centre.

The whole network is hierarchical and composed of two layers:

- a lower level, composed of the low cost sensors, responsible for gathering information from the environment and producing locally reliable decisions;
- an upper level, composed of more sophisticated nodes, whose goal is to convey the information to the control centres.

The key point is the interaction among the low cost sensors that increases the overall network reliability, it decreases the probability of congestion around the sink nodes, it provides scalability and tolerance against breakdown or stand-by of some sensors, necessary for battery recharge.

Relevance to Hydra

In WINSOC, it's envisaged the development of a very innovative concept of sensor network that represents a significant departure from current proposals. Main relevance to Hydra can be viewed in the innovative methodology for networking and interactions of sensors. The interaction occurs through a very simple mechanism that does not require complicated modulation, MAC, or routing strategies. This interaction among the sensors is the key feature, as it improves the reliability of the local decisions and, at the same time, it yields fault tolerance and scalability.

Planned actions

The results should explored by the HYDRA partners by reading papers and deliverables published.

5.2   SENSE

Smart Embedded Network of Sensing Entities

Type of the project: EU IST FP6 project, STREP
IST SO: Embedded systems
Project Reference: 033279
Launch: September 2006
Duration: 36 months
Consortium: 9 partners from 6 countries
Coordinator: ARC, Austria
Website: http://www.sense-ist.org/

Description

The SENSE project (Smart Embedded Network of Sensing Entities) will develop methods, tools and a test platform for the design, implementation and operation of smart adaptive wireless networks of embedded sensing components. The network is an ambient intelligent system, which adapts to its environment, creates ad-hoc networks of heterogeneous components, and delivers reliable information to its component sensors and the user. The sensors cooperate to build and maintain a coherent global view from local information. Newly added nodes automatically calibrate themselves to the environment, and share knowledge with neighbours. The network is scalable due to local information processing and sharing, and self-organizes based on the physical placement of nodes.

A test platform for a civil security monitoring system will be developed as a test application, composed of video cameras and microphones. The test platform will be installed in an airport, to yield real data and performance goals from a realistic test environment. Each sensor is a stand-alone system consisting of multiple embedded components: video system, audio system, central processor, power source and wireless networking. The security application will implement object/scenario recognition (e.g. baggage left unattended). Nodes will recognize local objects, using a combination of video and audio information, and neighbouring nodes will exchange information about objects in a self-organizing network. The result is a global overview of current objects and events observed by the network.

Relevance to Hydra

The key innovative aspects are the methods by which the network perceives its environment, fuses these perceptions using local message passing to achieve local and global object recognition, and calibrates itself based on its environment. Challenges include perception, adaptation, and learning, as well as tools to diagnose and maintain a self-adapting distributed network of embedded components.

Planned actions

The results should explored by the HYDRA partners by reading papers and deliverables published.

5.3   SMEPP

Secure Middleware for Embedded Peer to Peer systems

Type of the project: EU IST FP6 project, STREP
IST SO: Embedded Systems
Project Reference: 033563
Launch: September 2006
Duration: 36 months
Consortium: 8 partners from 6 countries
Coordinator: Universidad de Malaga, Spain
Website: http://proact.tugraz.at/research/smepp/index.htm

Description

Embedded Peer-to-Peer Systems (EP2P) represents a new challenge in the development of software for distributed systems. These systems have brought about an important revolution in distributed computing paradigms, now that the roles of client and server, which are the basis of the most widely used distributed computation models, are disappearing. The new scenario consists of systems in which all the elements of the network are symmetrical and in most cases, the mechanisms of communication are not based on pre-existing infrastructures, but rather on dynamic ad-hoc networks among peers. At the same time, the recent technological advances in short distance wireless communications have opened up new areas of application, which represent an important technological challenge. In addition, these systems are extremely vulnerable against any type of internal or external attacks, due to resource constraints, lack of tamper-resistant packaging, and the nature of open and public communication channels.

One of the keys in the success of these systems is the possibility to abstract all these problems by means of convenient middleware. This middleware should hide the complexity of the underlying infrastructure while providing open interfaces to third parties for application development. The development of such a middleware is challenging, since besides the disappearance of the roles of client and server, other critical requirements appear, which have to be supported by these infrastructures (mobility, new security problems, discovery and localization protocols, new quality of software criteria, etc). The main objective of this project is to develop a new secure and generic middleware, based on a new network centric abstract model for EP2P systems. Its suitability will be demonstrated by the development of two real-life applications in the domains of Environmental Monitoring in Industrial Plants and Mobile Telephony.

Relevance to Hydra

The main objective of SMEPP project is to develop a new secure and generic middleware, based on a new network centric abstract model for EP2P systems. Important part of the project with the remarkable relevance to the Hydra project is its ability to provide open interfaces of middleware, especially in case of security, trust and quality-based aspects.

Planned actions

TID is already in contact with this project, as they are also working with P2P models.

5.4   ANGEL

Advanced Networked embedded platform as a Gateway to Enhance quality of Life

Type of the project:	EU IST FP6 project, STREP
IST SO:	Embedded systems
Project Reference:	033506
Launch:	June 2006
Duration:	30 months
Consortium:	8 partners from 5 countries
Coordinator:	Telecom Italia, Italy
Website:	http://www.ist-angel.eu/

Description

The main objective of this project is to develop methods and tools for building heterogeneous systems in which Wireless Sensor Networks (WSN) and traditional communication networks cooperate to monitor and improve the quality of life in common habitats, e.g., home, car and city environment. In particular the maintenance of the personal health potentiality will be addressed.

In the analysed scenario, users communicate with WSN's through a dedicated node called gateway. This node is responsible for injecting queries into the network, gathering responses and presenting them to users. The gateway communicates with the WSN through short-range wireless links, and it interacts with the user directly or remotely through traditional communication networks both wire-line and mobile.

Relevance to Hydra

The project considers the mobile handset as the ad hoc gateway. The usage of a co-simulation tool, based on NS-2, SystemC and ISS, guarantees the optimised interaction between the ad hoc network and the mobile infrastructure. Moreover thanks to this co-simulation environment a fine-tuning of the protocol stack and algorithms, to obtain efficient synergy and design optimisation. The project addresses the security issues in terms of encryption algorithms and protocols to define a trusted architecture.

Planned actions

Hydra partners will also explore the project results by reading papers and deliverables published.

5.5   SPICE

Service Platform for Innovative Communication Environment

Type of the project:	EU IST FP6 project
IST SO:	Mobile and Wireless Systems and Platforms Beyond 3G
Project Reference:	027617
Launch:	January 2006
Duration:	30 months (finished)
Consortium:	23 partners in 11 countries
Coordinator:	France Telecom
Website:	http://www.ist-spice.org/index.html

Description

SPICE (Service Platform for Innovative Communication Environment) is addressing the still unsolved problem of designing, developing and putting into operation efficient and innovative mobile Service creation/execution platforms for networks beyond 3G.

This project will research, prototype and evaluate an extendable overlay architecture and framework to support, easy and quick service creation, test and deployment of intelligent mobile communication and information services. Building on significant advances in IT technologies, the SPICE platform will support multiple heterogeneous execution platforms allowing for new, innovative services to be spread across different operator domains and over different countries realizing a variety of business models.

For users, operators and service providers, the SPICE project will turn today's confusing heterogeneity into an easily manageable and rich service environment by exploiting the diversity of device capabilities and fostering service adoption. The SPICE approach will broaden business opportunities in the communications and associated business sectors.

To achieve this ambition, the SPICE consortium integrates the competence and knowledge of leading European telecom operators/service providers and key IT and telecommunications suppliers The SPICE project is part of the Wireless World Initiative (WWI).

Relevance to Hydra

In SPICE project innovative aspects relevant to HYDRA are related to design and development of mobile devices service platform for wireless heterogeneous networks. Important fact is that project consortium consists of leading telecommunication companies.

Planned actions

This project is finished. The results will be investigated through the available literature. Because some partners are also involved in HYDRA, contacting for details is not needed

5.6   EMBEDDED WISENTS

Cooperating Embedded Systems for Exploration and Control featuring Wireless Sensor Networks

Type of the project: EU IST FP6 project, Coordination Action
IST SO: Embedded systems
Project Reference: 004400
Launch: September 2004
Duration: 24 months (finished)
Consortium: 12 partners from 10 countries
Coordinator: Technische Universität Berlin, Germany
Website: http://www.embedded-wisents.org/

Description

Individual entities in complex technical systems might often have sufficed to efficiently control such a system, the growing system complexity necessitates the cooperation of individual entities. This is particularly true for embedded systems. Embedded systems are characterized by their very need to interact with the environment. This interaction can take place in the form of sensing as well as actuation. In the interaction with, exploration of and control of the environment, cooperation between individual entities becomes a necessity. Wireless sensor networks are one typical example of such cooperation. Such networks consist of objects, individually capable of simple sensing, actuation, communication, and computation, but only by cooperation the full capabilities of such networks is reached. More generally, these networks can cooperate themselves with other individual, intelligent objects, other networks, other controllers, or even users via proper interfaces. While these "cooperating objects" represent a potentially disruptive technology, the concrete realization of this vision is still unclear. This clarification is the essential goal of the coordination action proposed here.

WiSeNts intends to explore the actual needs of manufacturers and appliers of this technology as well as the ensuing, most challenging research issues; to identify road blockers for progress; to present a roadmap how these road blockers can be removed; and to foster teaching and education to form a basis for future research.

Relevance to Hydra

Important inspirations of WiSeNts project are the needs and approaches to design and development of wireless sensor networks and their applications, especially in the form of cooperative objects.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

5.7   GOLLUM

Generic Open Link-Layer API for Unified Media Access

Type of the project: EU IST FP6 project, STREP
IST SO: Embedded systems
Project Reference: 511567
Launch: September 2004
Duration: 24 months (finished)
Consortium: 7 partners from 4 countries
Coordinator: Mobnets, Germany
Website: http://www.ist-gollum.org/

Description

The GOLLUM project aims at studying and creating key parts of an embedded, open, operating system independent link-layer API to unify the various methods for accessing different wired and especially wireless links. The aim is to remedy the current, very difficult situation where a separate

programming interface exists for almost every wireless technology. The existence of such an API and corresponding middleware would greatly improve interoperability between various technologies. It would enable better portability of applications between devices using different, usually wireless, communication interfaces. The GOLLUM API is aimed to simplify the wireless access programming as seen by programmers, and same time providing more flexibility and new features for innovative application. This would potentially enable operators and software vendors to provide new kinds of services and greatly enhance the user experience. Applications could properly adapt to changes in the network connection, allowing for smart applications to be developed. An API of this type is also a building block for middleware and embedded systems for intelligent, networked devices. The project will provide not an openly available API specification, but also is doing practical, partial prototype implementations on various commercially viable technologies and different operating systems.

Relevance to Hydra

The main importance of GOLLUM project to Hydra is design of API aimed to improve the development of interoperable solutions using various, mainly wireless, technologies. For more, such a API can be used as the building block of the middleware and embedded systems for networked devices.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

5.8   E2R

End-to-End Reconfigurability

Type of the project: EU IST FP6 project
IST SO: Mobile and wireless systems and platforms beyond 3G
Project Reference: 507995
Launch: January 2004
Duration: 24 months (finished)
Consortium: 28 partners from 10 countries
Coordinator: Motorola Labs
Website: http://e2r.motlabs.com/front-page

Description

The End-to-End Reconfigurability (E²R) project aims at bringing the full benefits of the valuable diversity within the Radio Eco-Space, composed of a wide range of systems such as Cellular, Wireless Local Area and Broadcast. The key objective of the E2R project is to devise, develop and trial architectural design of reconfigurable devices and supporting system functions to offer an expanded set of operational choices to the users, applications and service providers, operators, regulators in the context of heterogeneous mobile radio systems.

Innovative Research, development and proof of concept will be sought in an end-to-end aspect, stretching from user device all the way up to Internet protocol, and services, and in reconfigurability support, intrinsic functionalities such as management and control, download support, spectrum management, regulatory framework and business models. End-to-End reconfigurability systems will provide common platforms and associated execution environments for multiple air interfaces, protocols and applications, which will yield to scalable and reconfigurable infrastructure that optimise resource usage, increased network and equipment capability and versatility by software modifications. The users will benefit from these capabilities by reaching the required service at times and places when and where needed at affordable cost. Furthermore, E²R proposes also to serve niche markets and provide users with special services via customised solutions that are open, flexible and programmable at all layers.

Relevance to Hydra

Project should be interesting in HYDRA WP5 – wireless networks.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

6 Security projects

6.1   PRIMELIFE

Privacy and identity management in Europe for life

Type of the project:	IST FP7 project, Collaborative project (generic)
IST SO:	Secure, dependable and trusted infrastructures
Project Reference:	216483
Launch:	March 2008
Duration:	36 months
Consortium:	15 partners from 9 countries
Coordinator:	IBM Research GMBH, Switzerland
Website:	http://www.primelife.eu/

Description

Individuals in the Information Society want to protect their autonomy and retain control over personal information, irrespective of their activities. Information technologies hardly consider those requirements, thereby putting the privacy of the citizen at risk. Today, the increasingly collaborative character of the Internet enables anyone to compose service and contribute and distribute information. Individuals will contribute throughout their life leaving a life-long trail of personal data.

This raises substantial new privacy challenges: A first technical challenge is how to protect privacy in emerging Internet applications such as collaborative scenarios and virtual communities. A second challenge is how to maintain life-long privacy.

PrimeLife will resolve the core privacy and trust issues pertaining to these challenges. Its long-term vision is to counter the trend to life-long personal data trails data without compromising on functionality. We will build upon and expand the sound foundation of the FP6 project PRIME that has shown how privacy technologies can enable citizens to execute their legal rights to control personal information in on-line transactions.

Resolving these issues requires substantial progress in many underlying technologies. PrimeLife will substantially advance the state of the art in the areas of human computer interfaces, configurable policy languages, web service federations, infrastructures and privacy-enhancing cryptography.

PrimeLife will ensure that the community at large adopts privacy technologies. To this effect PrimeLife will work with the relevant Open Source communities and standardisation bodies, and partner projects. It will further organise workshops with interested parties such as partner projects to transfer technologies and concepts. This will also validate the project's results on a large scale. European industry will be strengthened by providing building blocks for trustworthy treatment of customers' data.

Relevance to Hydra

The objectives of this project seem to fit well into HYDRA WP7 on security, especially privacy and trust issues.

Planned actions

The project is still in its infancy and results are not likely to have been published already now.

6.2   SENSEI

Integrating the physical with the digital world of the network of the future

Type of the project: ICT FP7 project, Integrated project
ICT: The network of the future
Project Reference: 215923
Launch: January 2008
Duration: 36 months
Consortium: 20 partners from 10 countries
Coordinator: Commissariat à l'énergie atomique – LETI, France
Website: http://www.ict-sensei.org/

Description

The aim of the SENSEI project is to create an open, business driven architecture that fundamentally addresses the scalability problems for a large number of globally distributed and heterogeneous wireless sensor and actuator networks (WS&AN) devices. WS&AN will be integrated into a common framework of global scale and made available to services and applications via universal service interfaces.

Tangible results of the SENSEI project are:

A highly scalable architectural framework with corresponding protocol solutions that enable easy plug and play integration of a large number of globally distributed WS&AN into a global system - providing support for network and information management, security, privacy and trust and accounting.

An open service interface and corresponding semantic specification to unify the access to context information and actuation services offered by the system for services and applications.

Efficient WS&AN island solutions consisting of a set of cross-optimised and energy aware protocol stacks including an ultra low power multi-mode transceiver targeting 5nJ/bit.

Pan European test platform, enabling large scale experimental evaluation of the SENSEI results and execution of field trials - providing a tool for long term evaluation of WS&AN integration into the Future Internet.

Relevance to Hydra

The objectives of this project seem to fit well into Hydra WP5 on wireless networks.

Planned actions

The project is still in its infancy and results are not likely to have been published already now.

6.3   TAS3

Trusted Architecture for Securely Shared Services

Type of the project: ICT FP7 project, Integrated project
ICT: Secure, dependable and trusted infrastructures
Project Reference: 216287
Launch: January 2008
Duration: 48 months
Consortium: 18 partners from 8 countries
Coordinator: Katholieke Universiteit Leuven, Belgium
Website: http://tas3.eu/

Description

The aim of TAS3 project is to develop and implement an architecture with trusted services to manage and process distributed personal information generated over a person's lifespan. This architecture will be dependable, robust, cost-effective and reliable. The personal information that will

be processed and managed can consist of any type of information that is owned by or refers to people.

The proposed architecture will be generic and cross-domain applicable. One of the application domains, in which this architecture will be instantiated, is the healthcare sector. In this case, the patient could be offered advanced services based on a number of personal health parameters (weight, body temperature, glucose level for diabetes patients, etc.) that are introduced by the patient himself.

Relevance to Hydra

The relevance of this project to Hydra lays in the approach to security and privacy, in particular the approach to stored health data.

Planned actions

The project is still in its infancy and results are not likely to have been published already now.

6.4   TransiDoc

Legally Secure Transformation of Signed Documents

Funded by: German Ministry of Economics and Labour
Launch: 2004
End month: December 2007
Consortium: 5 partners from 1 country
Coordinator: German Aerospace Center, Germany
Website: http://www.transidoc.de/website-transidoc/index-en.html

Description

Signed data cannot be changed if electronic signatures are to be kept valid. But when data has to be exchanged across systems, or these systems have to migrate and therefore data formats are altered, such changes inevitably occur. The idea of avoiding this by choosing (maybe new standardized) stable data formats contradicts practical experiences. So procedures are necessary to convert signed documents in a way which preserves their evidentiary weight and other legally essential characteristics - legally secure transformations are needed. Those procedures need to target single and particularly important documents as well as large quantities of documents e.g. in the case of large-scale archives. Therefore different security requirements must be considered. For users, the lack of such practical guidelines represents an enormous risk and obstacle to acceptance of electronic signatures in the transition to electronic business.

Based on examples of use in the fields of application "local government", "public health system", and "notaries public" the project

analyzes problems as well as legal and technical requirements,

develops practicable concepts for technical and organisational procedures,

implements prototypes and demonstrators,

evaluates developed systems and conceptual findings by means of tests and a simulation study.

Relevance to Hydra (from D7.3)

Important underlying work relevant for the container design defining the methods, data structures, and organisation was done within the TransiDoc project. Each step in the course of the workflow can be interpreted as a transformation of a document according to the definition of the TransiDoc project. The aim is to secure each step and to embed all process relevant data for a process integrated or ex post verification.

Relevance to Hydra

The relevance of this project to HYDRA is in area of WP7 on security, for deliverable D7.3 in particular.

Planned actions

Hydra partners will explore the project results by reading papers and deliverables published.

6.5   S3MS

Security of software services of mobile systems

Type of the project: IST FP6 project, STREP
IST SO: Towards a global dependability and security framework
Project Reference: 027004
Launch: March 2006
Duration: 24 months (finished)
Consortium: 13 partners from 8 countries
Coordinator: Universita Degli Studi Di Trento, Italy
Website: http://www.s3ms.org/

Description

The objective of S3MS is to create a framework and technological solution for trusted deployment and execution of communicating mobile applications in heterogeneous environments. S3MS would enable the opening of the software market of nomadic devices (from smart phones to PDA) to trusted third party applications beyond the sandbox model, without the burden of roaming trust infrastructure but without compromising security and privacy requirements.

A contract-based security mechanism will lie at the core of the framework. A contract is a claim by a mobile application on the interaction with relevant security and privacy features of a mobile platform. This contract should be published by applications, understood by devices and all stakeholders (users, mobile operators, developers, platform developers, etc.). The contract should be negotiated, and enforced during development, at time of delivery and loading, and during execution of the application by the mobile platform.

The new paradigm will not replace, but enhance today's security mechanism, and will provide a flexible, simple and scalable security and privacy protection mechanism for future mobile systems. It will allow a network operator and a user to decide what an application is allowed to do, prevent bad code from running, and allow good code to be easily designed and deployed.

The new paradigm of security-by-contract affects the entire life cycle of mobile applications and services: Contracts must be accommodated in high level design of security and privacy requirements of applications and mobile platforms, programming languages for the formulation of contracts must be developed, compilers must be modified to produce executable contracts for a piece of software, loaders must be aware of the static contract information that can be checked at load time, and runtime systems must be equipped with the mechanisms needed to ensure that the contracts are fulfilled during execution.

Relevance to Hydra

Relevance of this project to HYDRA is in the area of security aspects of security mechanisms (contract-based) for mobile devices.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

6.6   SERENITY

System engineering for security and dependability

Type of the project:	IST FP6 project, Integrated project
IST SO:	Towards a global dependability and security framework
Project Reference:	027587
Launch:	January 2006
Duration:	36 months
Consortium:	15 partners from 9 countries
Coordinator:	ENGINEERING - INGEGNERIA INFORMATICA - S.P.A., Italy
Website:	http://www.serenity-project.org/

Description

Serenity is a R&D project funded by the European Union and it was launched in January 2006. The main issue of Serenity lies in the fact that the computing and networking technologies that will be embedded in everyday objects - the concept of AmI - entail strong requirements for confidentiality, availability, integrity and dependability. In these new environments, the concepts of "system" and "application" as we know them today will disappear, evolving from static architectures with well-defined pieces of hardware, software, communication links, boundaries and owners, to architectures that will be sensitive, adaptive, context-aware and responsive to users' needs and habits. These AmI ecosystems will offer highly distributed dynamic services in large scale environments that will be heterogeneous, and nomadic, where computing nodes will be omnipresent and communication infrastructures will be dynamically assembled. The combination of heterogeneity, mobility, dynamism, sheer number of devices, along with the growing demands for security and dependability (S&D), is going to make the S&D provision for these ecosystems increasingly difficult to achieve with existing security engineering mechanisms and tools.

The project aims at providing security and dependability in Ambient Intelligence systems. Main goal is to develop specifications, methods and a suite of tools ensuring dependability and security for future AmI solutions. The software results will be made available as open source.

Relevance to Hydra

Serenity project is highly relevant to HYDRA as it deals with aspects of providing the security mechanisms in AmI systems. Project will develop methods and tools for these purposes.

Planned actions

The results should explored by the HYDRA partners by reading papers and deliverables published.

6.7   UbiSec&Sens

Ubiquitous sensing and security in the European homeland (UBISECANDSENS)

Type of the project:	IST FP6 project, STREP
IST SO:	Towards a global dependability and security framework
Project Reference:	026820
Launch:	January 2006
Duration:	36 months
Consortium:	9 partners from 5 countries
Coordinator:	European Institute For Research And Strategic Studies In Telecommunications GmbH, Germany
Website:	http://www.ist-ubisecsens.org

Description

Wireless Sensor Networks (WSNs) are a exciting development with very large potential to have a significant beneficial impact on every aspect of our lives while generating huge opportunities for European industry. What is needed to kick off the development and exploitation of WSNs is an architecture for medium and large scale wireless sensor networks integrating comprehensive security

capabilities right form the concept stage. This would support the rapid development of sensor networks and would open up the application domain for commercial activities.

UbiSecandSens intends to solve this by providing a comprehensive architecture for medium and large scale wireless sensor networks with the full level of security that will make them trusted and secure for all applications. In addition UbiSecandSens will provide a complete tool box of security aware components which, together with the UbiSecandSens radically new design cycle for secure sensor networks, will enable the rapid development of trusted sensor network applications.

The UbiSecandSens approach is to use three representative WSN scenarios to iteratively determine solutions for the key WSN issues of scalability, security, reliability, self-healing and robustness. This will also give a clearer understanding of the real-world WSN requirements and limitations as well as identifying how to achieve a successful rollout of WSNs.

UbiSec&Sens will provide a comprehensive architecture for medium and large scale wireless sensor networks with the full level of security that will make them trusted and secure for all applications. The overall project goals are to:

Focus the work on the intersection of security, routing and in-network processing to design and develop efficient and effective security solutions and to offer effective means for persistent and encrypted data storage for distributed (and tiny) data base approaches

Provide a complete toolbox of security aware components for sensor network application development. We aim at extremely energy-efficient and condensed data transmission as well as highly robust and reliable solutions for concrete WSNs that, at the same time, still provide an appropriate level of security

Prototype and validate the UbiSec&Sens solutions in the representative wireless sensor application scenarios of agriculture, road services and homeland security

Relevance to Hydra

Project is relevant to several HYDRA work packages, as it deals with architecture of wireless sensor networks. It is highly relevant for WP7 as it mainly aims at development of security solutions.

Planned actions

Hydra partners will also explore the project results by reading papers and deliverables published.

6.8   SENSORIA

Software Engineering for Service-Oriented Overlay Computers

Type of the project:	IST FP6 project, Integrated project
IST SO:	Global Computing
Project Reference:	016004
Launch:	September 2005
Duration:	48 months
Consortium:	19 partners from 7 countries
Coordinator:	Ludwig-Maximilians-Universität München, Germany
Website:	http://www.sensoria-ist.eu/

Description

Service-oriented computing is an emerging paradigm where services are understood as autonomous, platform independent computational entities that can be described, published, categorised, discovered, and dynamically assembled for developing massively distributed, interoperable, evolvable systems and applications. These characteristics pushed service-oriented computing towards nowadays-widespread success, demonstrated by the fact that many large companies invested a lot of efforts and resources to promote service delivery on a variety of computing platforms, mostly through the Internet in the form of Web services. Tomorrow, there will be a plethora of new services as required for e-government, e-business, and e-science, and other areas within the rapidly evolving Information Society.

The aim of Sensoria is to develop a novel comprehensive approach to the engineering of software systems for service-oriented overlay computers where foundational theories, techniques and methods are fully integrated in a pragmatic software engineering approach. It will focus on global services that are context-adaptive, personalisable, and may require hard and soft constraints on resources and performance, and will take into account the fact that services have to be deployed on different, possibly interoperating, global computers, to provide novel and reusable service-oriented overlay computers.

The results of Sensoria will include a new generalised concept of service for global overlay computers, new semantically well-defined modelling and programming primitives for services, new powerful mathematical analysis and verification techniques and tools for system behaviour and quality of service properties, and novel model-based transformation and development techniques. The innovative methods of Sensoria will be demonstrated by applying them in the service-intensive areas of e-business, automotive systems, and telecommunications.

Relevance to Hydra

Project is relevant to several HYDRA work packages, as it focuses on semantic modelling of web services.

Planned actions

Hydra partners will also explore the project results by reading papers and deliverables published.

6.9   SWAMI

Safeguards in a World of Ambient Intelligence

Type of the project: EU IST FP6 project, Specific Support Action
IST SO: Information Society issues
Project Reference: 6507
Launch: February 2005
Duration: 18 months (finished)
Consortium: 5 partners from 4 countries
Coordinator: Fraunhofer Institute Systems and Innovation Research, Germany
Website: http://swami.jrc.es/

Description

SWAMI stands for Safeguards in a World of Ambient Intelligence. It is an FP6 funded IST project which has as its main objective to identify the social, legal, organizational and ethical implications related to issues such as privacy, anonymity, security and identity in the context of AmI. This has been achieved through the elaboration of 'dark scenarios' as a centre piece of the SWAMI project methodology. These are realistic future scenarios which highlight threats and vulnerabilities which are subsequently analyzed so as to extract useful options aimed at overcoming the identified possible risks.

The objective of many scenario exercises and foresight studies is to present images of desirable futures and sometimes to determine the necessary steps to realize such futures. Consequently, they have an inherent bias towards presenting only optimistic visions of the future. The SWAMI scenarios are different because they present certain visions of the future that we in principle, do not want to become realities. SWAMI has labelled them "dark" scenarios. They depict a realistic future that could emerge from the application of new AmI technologies but focus on the likely adverse effects which often are overlooked by technology developers and policymakers. The first objective of the dark scenario exercise thus consisted of the identification of potential threats and vulnerabilities that need to be mitigated if AmI is to become a future success story.

The SWAMI dark scenarios have been developed in ways similar to other mainstream scenario exercises. The major difference is, that SWAMI focuses on dark situations, i.e., situations that enable us to highlight vulnerabilities and threats related to AmI; and those safeguards to mitigate the dark situations are considered.

Relevance to Hydra

One of main potential contributions of SWAMI project to Hydra is design of dark scenarios that enable to identify much useful security, but also technological requirements that should be focused and took into account in the middleware and SOA development phase of Hydra project.

Dark Scenario 1 is most related to Hydra project, while it refers about AmI threats in smart homes. It introduces dark situations in the smart home, at work and while taking a lunch break in a park - presents AmI vulnerabilities in the life of a typical family moving through different environments.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

6.10 RUNES

Reconfigurable Ubiquitous Networked Embedded Systems

Type of the project: EU IST FP6 project, Integrated Project
IST SO: Embedded systems
Project Reference: 004536
Launch: September 2004
Duration: 32 months (finished)
Consortium: 21 partners from 8 countries
Coordinator: Ericsson AB, Sweden
Website: http://www.ist-runes.org/

Description

RUNES is very similar to Hydra project, while its main objective is to design a middleware system that is adaptive and intelligently self-organizing. RUNES (Reconfigurable Ubiquitous Networked Embedded Systems) investigates and develops solutions for supporting applications and services running on heterogeneous architectures of networked embedded systems. For this support an adaptive and intelligently self-organizing middleware is important. The communication between different instantiations of the middleware running on the distributed embedded systems often requires secure communications services. RUNES aims to provide an adaptive middleware platform and application development tools that allow programmers the flexibility to interact with the environment where necessary, whilst affording a level of abstraction that facilitates ease of application construction and use. The respective security functionality has to be set up automatically and has to satisfy the needs of heterogeneous platforms. Possible application scenarios are similar to Hydra project - healthcare, factory automation, retail settings, in-home safety and security and many more. Especially in healthcare scenario security and privacy issues are important in emergency response systems, since medical records should remain private. However in a large-scale emergency, particularly one involving rescue teams from many organizations, these concerns are likely to decrease in importance compared to those associated with dealing with data from large numbers of people, how to react when personnel or casualties show a significant change in status, and transferring data from patients to hospitals.

Relevance to Hydra

RUNES identified several security requirements on such a middleware. The middleware must allow components to specify their security behaviour and dependencies. There must be a semantically well-defined specification mechanism by which the security properties of middleware components can be specified and that allows the specification of constraints on the security properties of those components to which they are bound, possibly indirectly, if their own security properties are to hold. The architecture must constrain device operation in the way specified by the security policy through the concept of a policy enforcement point. In order to do this, the architecture should ensure that the following information is accessible: data sensitivity, application state, internal system state, external context information, and trust relationships. It must be possible to determine whether combinations of components satisfy security policy in any given context.

Important inspiration of RUNES project is the implementation of semantic technologies for representation of security constraints designating the behaviour and access of several components in the system. Hydra should take into account the semantic modelling of properties and roles for devices, sensors and users in the specific context of the specific application. Another important attribute of RUNES is the adaptation and intelligent self-organization. Hydra should focus on intelligent security solutions covering the adaptation and learning of devices, sensors and user interfaces to local and specific situations on the semantic level. Roles, identities, federations, access control can be modelled, but particular components should be also prepared for learning and adaptation to unexpected situations.

Planned actions

The RUNES project is very relevant for Hydra. Hydra partners will also explore the project results by reading papers and deliverables published.

6.11 PRIME

Privacy and Identity Management for Europe

Type of the project:	EU IST FP6 project, Integrated Project
IST SO:	Towards a global dependability and security framework
Project Reference:	507591
Launch:	March 2004
Duration:	48 months (finished)
Consortium:	22 partners from 8 countries
Coordinator:	International Business Machines, Belgium
Website:	https://www.prime-project.eu/

Description

PRIME aims to develop a working prototype of a privacy-enhancing Identity Management System. To foster market adoption, novel solutions for managing identities will be demonstrated in challenging real-world scenarios, e.g., from Internet Communication, Airline and Airport Passenger Processes, Location-Based Services and Collaborative e-Learning.

The PRIME project envisions user-controlled identity management systems within which the players concerned act together, mediated by technology to enforce the rules set by law and the contracting partners.

PRIME is having more of a centralized approach in providing security of communication. It has a certifying authority that issues certificates, i.e., digitally-signed statements. By issuing a certificate, a certificate authority vouches for the truthfulness of the statement. The main building block of PRIME is the use of credentials. A credential is a piece of data such as a birth date or postal address, or a list of such data items, certified by a third party and is bound to its owner by cryptographic means. From a privacy perspective, the use of credentials prevents the certifying party from profiling the user because it is unaware of the identity of the user and is preferable to the direct request to the certifying party. Credentials can either be realized using traditional attribute certificates where the reference to the user could be the user's real name or a pseudonym, also known as private credentials. Private credentials allow users to disclose selectively certain personal information and be certain that nothing more than the selected information is disclosed. It can also allow for the verifiable encrypting of an attribute under a third-party public key to ensure that only the third party can access the attributes. The main parts of the PRIME system architecture are explained below.

Relevance to Hydra

PRIME offers flexible solution to identity management enabling user to negotiate with service provider in order to establish required secure communication. Important element in the communication process is certificating the user using the credentials. Hydra needs such identity management also on level of devices and sensors, which should be also provided by trustful identity. In PRIME, ontologies are used to name the categories of data, instances of data, process workflows, specifications, elements of policies and obligations defined in the system using RDF. In order to

allow more general and more readable modelling, Hydra needs higher-level description language, such as OWL.

In short, PRIME has more of a centralized approach in providing security for communication. It has a certifying authority that issues certificates which are stored in a database. Communication/transaction takes place in the system based on these credentials. The main disadvantage of these types of systems is their single point of failure.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

6.12 UBISEC

Ubiquitous Networks with a Secure Provision of Services, Access, and Content Delivery

Type of the project: EU IST FP6 project, STREP
Project Reference: IST-2002-506926
Launch: January 2004
Duration: 24 months (finished)
Consortium: 9 partners from 3 countries
Coordinator: Siemens Business Services
Website: http://www.ubisec.org/

Description

UBISEC's mission is to address new business areas and technologies originating from the integration of public wide area networks (e.g., cellular, Internet), and private corporate and home/SOHO local area networks. This integration is commonly expected to create new markets and new opportunities, hence helping European telecommunication network operators and smart card integrators to secure leadership in those markets. The new integrated networks will create new demands in terms of services and will improve quality of life for the users both in their private or professional environment.

In order to address the related issues and technology challenges, UBISEC is aiming at an advanced infrastructure for large-scale mobility and security based on SmartCard technologies for context-aware and personalised authorisation and authentication services in heterogeneous networks. This requires advanced personalisation and localisation technologies with high security in order to keep privacy and to protect computing devices, their software components, and personal user data including user profiles.

Automatic customisation is provided through situation-dependent (context-aware) secure management and access control evolving user, device, and application profiles. Automatic SmartCard-based access control and authentication is preserved by a set of advanced distributed network services which guarantee personalised content delivery through efficient pre-fetching and caching. Flexible service announcement (directory services), discovery, provisioning, and delivery support the mobile user while moving across heterogeneous networks.

Relevance to Hydra

Project deals with situation-dependent secure management, which is basically context awareness in this area. It describes various important aspects of heterogeneous networks equipped with mobile devices.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

6.13 SEINIT

Security Expert INITiative

Type of the project: EU IST FP6 project, Integrated Project
IST SO: Towards a global dependability and security framework
Project Reference: 001929
Launch: December 2003
Duration: 28 months (finished)
Consortium: 14 partners from 7 countries
Coordinator: Thales Communication S.A., France
Website: http://www.seinit.org/

Description

The overall objective of the Security Expert INITiative (SEINIT) project is to ensure a trusted and dependable information security framework, ubiquitous, working across multiple devices, heterogeneous networks, being organisation independent (inter-operable) and centered around an end-user.

SEINIT is exploring new information security models and building the architecture and components to address our nomadic, pervasive, multi-player communicating world. This new solution uses information gathered by ambient intelligence and then deals with the new threats this entails.

Relevance to Hydra

SEINIT project delivers new security models to design innovative security architectures, the security policies addressing the existing and coming threats, and the components to build network infrastructures. Project is considering V2V (Virtual to Virtual) virtualization paradigm aiming to inspire trust and ensure the security of heterogeneous "infospheres", communities, networks and infrastructures. The V2V virtualization paradigm is for creating an end-to-end, progressively adaptive security system across heterogeneous and mobile virtual worlds. Virtualization is a powerful principle used to conceive a heterogeneous computerized reality in a different manner by reducing its visible complexity. Control of privacy is left with the user while the framework applies the appropriate level of security. SEINIT designed the framework security protocols and technologies as components. When new security components or technologies emerge, they can be added to the framework. A separate EU project DISCREET will design and develop the user interface.

The main importance of SEINIT project is the component based approach. Designing of security protocols and technologies as components allows significant flexibility and extensibility of the architecture. Newly emerging technologies can be easily added to the infrastructure without need for any modifications of existing system. Basic disadvantage of SEINIT is the centralized key distribution approach. Hydra project requires more generic solution which covers mainly distributed and also centralized approaches.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

6.14 DAIDALOS II

Designing Advanced network Interfaces for the Delivery and Administration of Location independent, Optimised personal Services

Type of the project: EU IST FP6 project
IST SO: Mobile and Wireless Systems and Platforms Beyond 3G
Project Reference: 026943
Launch: November 2003
Duration: 60 months
Consortium: 37 partners from 13 countries
Coordinator: Deutsche Telekom AG
Website: http://www.ist-daidalos.org/

Description

Daidalos II is the second phase of the Integrated Project Daidalos. The project addresses the fact that mobility has become a central aspect of our lives in business, education, and leisure. It deals with rapid technological and societal changes with proliferating technologies and services that have resulted in complex and confusing communications environments for users and network operators. By rethinking fundamental technology and business issues, Daidalos targets usable and manageable communication infrastructures for the future. The goal is a seamless, pervasive access to content and services via heterogeneous networks that supports user preferences and context. The project will use a user-centred, scenario-based and operator-driven approach to effectively cover user and business needs.

Daidalos will be guided by five key concepts: MARQS (Mobility Management, AAA [Authentication, Authorisation and Accounting], Resource Management, QoS and Security), supporting functional integration for end-to-end services across heterogeneous technologies; VID (Virtual Identity), which separates the user from a device, thereby enables flexibility as well as privacy and personalization; USP (Ubiquitous and Seamless Pervasiveness), enabling pervasiveness across personal and embedded devices, and allowing adaptation to changing contexts, movement and user requests; SIB (Seamless Integration of Broadcast), which integrates broadcast at both the technology level, such as DVB-S/T-H, and at the services level, such TV, carousels and data-cast; Federation, which will allow network operators and service providers to offer and receive services, allowing players to enter and leave the field in a dynamic business environment.

Daidalos brings together several domains and will follow a strictly methodological approach on modelling, testing, and integration cycles with feedback loops via early integration.

Relevance to Hydra

The concepts identified in this project should help the HYDRA in some particular aspects of the project. For example, virtual identities, privacy and personalization issues are highly relevant for WP7, as other issues can be relevant for other work packages as well.

Planned actions

Project is planned to finish the second phase by the end of the year 2008. The deliverables and publications should be investigated by the HYDRA partners.

6.15 PAW

Privacy in an Ambient World

Type of the project:	Privacy based project funded by the Dutch Ministry of Economic Affairs
Launch:	October 2003
Duration:	4 years (finished)
Consortium:	8 partners
Website:	http://www.cs.ru.nl/paw/

Description

PAW aimed at providing full privacy in an ambient world by developing privacy protection architecture. It proposed four categories of privacy:

Protecting a person's identity

Protecting a person's personal data

Protecting the actions of an identity

Protecting the instructions or tasks of an identity.

While the first two categories are clear in meaning, there is a slight difference between the last two. In the third category the identity is present while the action is executed (maybe in an untrustworthy environment) while in the fourth category the identity is not present when action/tasks/instructions are executed (for example mobile agents). To provide full privacy, it assumes that for each category adequate solutions need to be found. Protecting a person's identity can be achieved by using pseudo-identities or anonymous connections. The other three categories of privacy can be achieved by the use of 'Licenses' during communication.

PAW proposes a license language "that allows agents to distribute data with usage policies in a decentralized architecture". The framework does not enforce that the data is used in compliance with the license. But the agents may be audited by an auditing authority which can be of any form, such as another agent or even a group of other agents. To enable auditing, the licenses and actions are stored in such a way that the auditing authority can access it at any arbitrary point in time. Actions here can be the transmission of a license or data. Also a model for proofing is described for an agent to be allowed to perform a certain action on the data. For that proofing, a scheme is proposed for securing data accountability based on time stamping and a signature, which are not maintained by centralized authorities. Thus, each agent can use a time stamping and signing authority which he trusts.

Relevance to Hydra

The advantage of the proposal is the decentralization, where no central authority for controlling is necessary. But unfortunately an agent can use data in a way which it is not allowed to do and can only be held responsible after the misuse of the data and so this is not ideal for real scenarios.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

6.16 OXYGEN

MIT Project Oxygen – Pervasive, human-centered computing

Type of the project:	MIT (USA) project sponsored and participated by created Oxygen Alliance
Consortium:	Acer, Delta Electronics, Inc., HP, Nippon, Nokia, Philips, IPTO (Information Processing and Technology Office)
Duration:	5 years (finished)
Website:	http://oxygen.csail.mit.edu/

Description

Oxygen enables pervasive, human-centered computing through a combination of specific user and system technologies. Computational devices, called Enviro21s (E21s), can sense the user's presence in an environment. Handheld devices, called Handy21s (H21s), helps to communicate and compute while the dynamic self-configuring networks (N21s) help the devices to locate each other as well as the people, services, and resources they want to reach. The software which runs on these devices is programmed to adapt either to the changes in the environment or with respect to the user requirements (O2S).

To summarize, Oxygen has a network based on decentralized proxies where each proxy maintains their local devices and makes sure that the communication is secure. This decentralization aids in privacy, i.e. users can locate what they need without having to reveal their own location. The communications have a security model based on SPKI/SDSI depending on the processing power/ memory of the devices. Having two different protocols allows it to run a computationally inexpensive protocol on impoverished devices and a sophisticated protocol for resource authentication and communication on more powerful devices. The advantage of this model is the decentralization it provides; but it fails to give a total-human-centered approach as it uses trusted proxies.

Relevance to Hydra

Oxygen project introduces various design approaches, which can be very important for Hydra. Intentional naming system provides scalable, dynamic resource discovery and message delivery. Concept of dynamic, self-configuring networks enabling the devices to locate each other as well as the people, services, and resources they want to reach, in addition, software on devices, adaptable to particular environmental changes is extremely relevant for Hydra. Solution to the security issues, such as SPKI/SDSI access control lists and self-certifying file system and decentralized proxy-based communication should be adapted in the Hydra platform.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

6.17 E-PASTA

E-Protection of Appliances through Secure and Trusted Access

Type of the project: IST FP5 project, Cost-sharing contracts
IST SO: Technology Building Blocks for Trust and Security
Project Reference: IST-2000-26086
Launch: January 2001
Duration: 24 months (finished)
Consortium: 5 partners from 3 countries
Coordinator: Trialog, France
Website: http://www.e-pasta.org/

Description

E-PASTA will specify, develop and demonstrate a trust and security platform for extended smart home environments. Such environments will allow applications such as remote control, remote security, or remote maintenance. Two types of connectivity will be assessed: through simple gateways and through services gateways where Java applications can be deployed (e.g. following the Open Services Gateway initiative, OSGi). The existing experience available in the smart card industry and other small systems industries, as well as in the Internet will serve as starting point. The resulting technology specification will be promoted for standardization in the home networking and gateway community.

Description from D7.1

The e-PASTA project [EPASTA] was an EU-project ending in 2002. Its objective was to design, develop, and assess a trust and security platform for smart home environments. Included in this work is a method for security architecture development based on the Common Criteria.

Relevance to Hydra

This project is relevant to HYDRA, to WP7 in particular, as it developed trust and security platform for smart home environments.

Planned actions

This project is finished. Website does not exist any longer. It would be interesting to examine the results through the available literature.

7 User domain projects – Home Automation

7.1 AMIGO

Ambient intelligence for the networked home environment

Type of the project:	IST FP6 project, Integrated project
IST SO:	Open development platforms for software and services
Project Reference:	004182
Launch:	September 2004
Duration:	42 months (finished)
Consortium:	15 partners from 7 countries
Coordinator:	Philips Electronics Nederland B.V., Netherlands
Website:	http://www.hitech-projects.com/euprojects/amigo/index.htm

Description

Amigo is an integrated project that will realize the full potential of home networking to improve people's lives. Home networking has already emerged in specific applications such as PC to PC communication and home entertainment systems, but its ability to really change people's lives is still dogged by complex installation procedures, the lack of interoperability between different manufacturer's equipment and the absence of compelling user services.

By focusing on solving these key issues, the Amigo project aims to overcome the obstacles to widespread acceptance of this new technology. The project will develop open, standardized, interoperable middleware and attractive user services, thus improving end-user usability and attractiveness. The project will show the end-user usability and attractiveness of such a home system by creating and demonstrating prototype applications improving everyday life, addressing all vital user aspects: home care and safety, home information and entertainment, and extension of the home environment by means of ambience sharing for advanced personal communication. The Amigo project will further support interoperability between equipment and services within the networked home environment by using standard technology when possible and by making the basic middleware (components and infrastructure) and basic user services available as open source software together with architectural rules for everyone to use.

Relevance to Hydra

The objective of both projects Hydra and AMIGO is to develop and validate interoperable middleware for networked home environment and motivate people to use networked home systems with great ease and pleasure as well.

Planned actions

The RUNES project is very relevant for Hydra. Hydra partners will also explore the project results by reading papers and deliverables published.

7.2 TEAHA

The European Application Home Alliance

Type of the project:	IST FP6 project, STREP
IST SO:	Networked audiovisual systems and home platforms
Project Reference:	507029
Launch:	March 2004
Duration:	36 months (finished)
Consortium:	13 partners from 5 countries
Coordinator:	Telefonica I+D, Spain
Website:	http://www.teaha.org/

Description

TEAHA is a strategic project. It addresses networked home control applications and their complementarities to A/V networked applications. Its objective is to work with the A/V world to specify an open, secure, interoperable and seamless global home platform. TEAHA Project:

- Addresses a spectrum of home applications bringing additional benefits to the end user such as improved comfort, home control, safety, personal security, energy management;

- Includes leading companies (appliance manufacturers, utilities, technology companies);

- Intends to bring together the many groups, associations, initiatives and alliances in Europe engaged in Home Systems and Networks in order that Europe presents a unified package of Applications, Services, Systems and Equipment into the home. TEAHA is nothing less than an attempt to speed up the growth of the EU Economy in the area of networked consumer equipment and technology.

TEAHA is a 3-year project. The objective of TEAHA is to provide the suitable communication components and interoperability specifications for home appliances and platforms such that products from different manufacturers will be able to interoperate in order to improve their marketability. These activities will define the technical and structural ground-work for equipment, networks, services and applications that may be deployed in future applications.

The following R&D activities are foreseen:

- Contribute towards specifications for home system architecture for seamless interoperability of equipment in a global European home platform, whatever the application in question (encompassing both the home control world and that of consumer electronics and multimedia).

- Develop an ultra low-cost power cord solution (corresponding in particular to the needs and constraints of white goods manufacturers), an advanced RF solution supporting seamless interworking, and advanced residential gateway subsystems.

Relevance to Hydra

Both TEAHA project and Hydra targets home control and home automation although in a different way.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

7.3   I'MOK

Intelligent monitoring of kitchens

Type of the project:	IST FP5 project, Cooperative research contracts
IST SO:	Advanced control systems
Project Reference:	IST-1999-57453
Launch:	November 2002
Duration:	24 months (finished)
Consortium:	8 partners from 4 countries
Coordinator:	1st Millennium Electronics Limited, United Kingdom
Website:	http://www.im-ok.info/

Description

The consortium will develop a high performance, distributed, real-time, low-cost, fully configurable system that supports 'plug and play' installation, monitoring and control of catering equipment (I'MOK Compliant Route-map) at both a kitchen specific level (LAN Control Station) and across networks of food establishments (WAN Control Station). This will automate device status, intelligent monitoring and control to leverage a step-change in operational efficiency leading to an increase in compliance with safe food storage and cooking procedures, resulting in a significant reduction in the

build up of harmful bacteria, energy wastage and cost associated with utilisation of catering equipment in diverse kitchen environments.

Relevance to Hydra

I'MOK provides support to both kitchen managers and kitchen staff through the use of new network ready kitchen appliances and counterpart intelligent software and hardware platforms. The I'MOK system utilises the NAFEM standard to provide step changes in food quality, safety and performance monitoring.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

7.4 HOMETALK

A Voice Enabled Residential Automation & Networking platform

Type of the project: IST FP5 project, Cost-sharing contracts
IST SO: Home environments
Project Reference: IST-2001-33507
Launch: June 2002
Duration: 30 months (finished)
Consortium: 6 partners from 4 countries
Coordinator: IBM Czech Republic Research, Czech Republic
Website: http://www.hometalk.org/

Description

HomeTalk creates a truly intelligent user-friendly residential environment, connected to a broadband network, equipped with advanced domestic appliances, controlled via powerline by a multifunctional residential gateway/controller and capable of communicating with the residents via natural voice interface (recognition and synthesis). A vertical Service Creation framework will make the most of the available media and networks convergence to nurture advanced services for the Residents. HomeTalk develops an innovative, distributed Communication & Control platform for the Future Home, creates awareness and contributes to Standards and Special Interest Groups related to Service Convergence, Broadband Access and Intelligent Home Networking. Through an Open Source initiative, HomeTalk will integrate with OSGI, VoiceXML and Home Automation development efforts in an open manner, to catalyze international adoption.

HomeTalk creates technology for a human-centric, fully automated home with built-in intelligence and natural voice conversational capability. It delivers an integrated solution that includes communications infrastructure, intelligent home appliances, software, and management procedures, along with a rich description set of ready-to-use value-added services.

Relevance to Hydra

Project HomeTalk creates a truly intelligent user-friendly residential environment in order to control appliances and automate everyday tasks. The aim of Hydra middleware is to improve home automation as well.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

7.5   ISPIRE

INfotainment management with SPeech interaction via REmote-microphones and telephone interfaces

Type of the project:	IST FP5 project, Cost-sharing contracts
IST SO:	Home environments
Project Reference:	IST-2001-32746
Launch:	March 2002
Duration:	30 months (finished)
Consortium:	7 partners from 4 countries
Coordinator:	Knowledge S.A., Language Engineering Department, Greece
Website:	http://www.inspire-project.org

Description

INSPIRE will combine leading-edge technology & experience gained from previous projects to provide natural spoken dialogue interaction to infotainment (information & entertainment) devices installed in a smart home environment. It will use wireless hardware for I/O, robust speech understanding, room acoustics signal processing, speaker recognition and advanced personalization features. The prototype will be able to handle sophisticated mixed initiative dialogue, it will support multilinguality, it will facilitate communication with external information sources and it will be highly user-friendly. A strong user-oriented acceptability and assessment component will ensure its efficient use especially by elderly, disabled and not-technically inclined persons, in home, work or on the move.

Relevance to Hydra

The objective of the project INSPIRE was to develop "a home assistant" for facilitation the operation with home appliances and services in peoples' daily life. One of the objectives of Hydra middleware is to allow seamless access, intelligent and secure interoperability among different devices in home.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

8 User domain projects – Healthcare

8.1   CONFIDENCE

Ubiquitous Care System to Support Independent Living

Type of the project:	ICT FP7 project, Collaborative project (generic)
ICT:	ICT and ageing
Project Reference:	214986
Launch:	February 2008
Duration:	36 months
Consortium:	10 partners from 8 countries
Coordinator:	Centro de Estudios e Investigaciones Técnicas de Gipuzkoa, Spain
Website:	http://www.confidence-eu.org/

Description

The main objective of CONFIDENCE project is the development and integration of innovative technologies to build a care system for the detection of abnormal events (such as falls) or short and long term unexpected behaviours that could indicated health problems of elderly people.

CONFIDENCE will be a cost effective, non-intrusive and reliable system that will increase the quality of life and security of the elderly and prolong their personal autonomy and participation in society and decrease the need of institutionalisation of the elderly. The proposed system will work both outdoors and indoors. Information about the user's location, together with some environment information, will be analysed to decide whether to trigger an alarm. In case of an abnormal situation such as a fall or an accident, CONFIDENCE will permit a rapid actuation of the health services, which will decrease the negative consequences of the accident (worsening of injuries, psychological impact of being alone and injured, etc…).

Relevance to Hydra

Both Hydra and CONFIDENCE has the objective to improve the quality of life of older people and simplify their healthcare using smart sensors and innovative infrastructure. However, where Hydra is focussing on generic middleware that can facilitate the development of applications, CONFIDENCE is focusing on the application itself.

Planned actions

It could be interesting to develop the CONFIDENCE application using Hydra middleware, but such activity would probably go beyond the scope of both projects. Rather, IN-JET will follow the CONFIDENCE project with special emphasis on the validation and the results obtained from field test.

8.2   CAALYX

Complete Ambient Assisted Living Experiment

Type of the project:	IST FP6 project, STREP
IST SO:	Ambient Assisted Living (AAL) in the Ageing Society
Project Reference:	045215
Launch:	January 2007
Duration:	24 months
Consortium:	8 partners from 6 countries
Coordinator:	Telefónica Investigación y Desarrollo, Spain
Website:	http://caalyx.eu/

Description

Ambient Assisted Living (AAL), as a specific user-oriented type of "Ambient Intelligence", aims to prolong the time people can live in a decent more independent way by increasing their autonomy and self-confidence, by allowing them to discharge normal everyday activities, by improved monitoring and care of the elderly or ill person, by enhancing their security while ultimately saving resources.

The main objective is to develop, and test through real user participation, a wearable light device able to measure specific vital signs of the elder or ill person, to detect falls and to communicate autonomously in real time with his/her caregiver in case of an emergency, wherever they are. The emergency information can be directed to the personal caretaker and/or the 112 Emergency Service. The emergency information will provide the geographic position and health information of the elder in a sensible way for the caretaker or emergency service. The incorporation of largely non-intrusive new sensors for fall detection and highly sensitive positioning is expected to address many of the elderly concerns about adopting technology.

Relevance to Hydra

Hydra middleware facilitates permit communication between an electronic device and monitoring and management system developed within CAALYX.

Planned actions

The use of the CAALYX sensor for elderly is interesting in terms of the healthcare scenarios to be developed in Hydra. It would be a good demonstration, if the CAALYX fall sensor could be used in the demonstration phase of Hydra. IN-JET will approach the project when demonstration activities begin.

8.3   OLDES

Old people's e-services at home

Type of the project:	IST FP6 project, STREP
IST SO:	Ambient Assisted Living (AAL) in the Ageing Society
Project Reference:	045282
Launch:	January 2007
Duration:	36 months
Consortium:	11 partners from 6 countries
Coordinator:	Ente per le Nuove tecnologie, l'Energia e l'Ambiente, Italy
Website:	http://www.oldes.eu/

Description

The OLDES project will offer new technological solutions to improve the quality of life of older people. OLDES aims at developing a very low cost and easy to use entertainment and health care platform designed to ease the life of older people in their homes. In order to achieve this, new concepts developed in Information Technologies will be integrated and adapted. OLDES will provide: user entertainment services, through easy-to-access thematic channels and special interest forums supported by animators; and health care facilities based on established Internet and tele-care communication standards. The system will include wireless ambient and medical sensors linked via a contact centre to social services and health care providers. OLDES will also cover the definition, implementation and evaluation of a Knowledge Management (KM) program, an advanced user profiling system that will enhance the communication between all the stakeholders of the system. The system will be tested at two different locations: Italy over a group of 100 elderly (including 10 suffering with cardio disease) and Czech Republic over a group of 10 diabetic patients. OLDES puts older people at the centre and makes their needs the main priority in all developments. This will be achieved through the use of modelling and animation tools to create scenarios designed to elicit responses from older people, their carers, and service providers. Animation and simulation will help to ensure that developments are, at all stages, grounded in the realities of social and health care, the cultures and economies of the specific pilot contexts, and as wide a range as possible of other

European public service contexts. To maximise the flexibility and exploitability of its products, technical outputs will be packaged appropriately into highly configurable service components.

Relevance to Hydra

The results of both Hydra and OLDES can be used to improve the quality of life of older people and simplify their healthcare. However, where Hydra is focussing on generic middleware that can facilitate the development of applications, OLDES is focusing on the application itself.

Planned actions

It could be interesting to develop the OLDES application using Hydra middleware, but such activity would probably go beyond the scope of both projects. Rather, IN-JET will follow the OLDES project with special emphasis on the validation and the results obtained from field test.

8.4   PERSONA

Perceptive Spaces Promoting Independent Aging

Type of the project:	IST AAL project
IST SO:	ST-2005-2.6.2 Ambient Assisted Living (AAL) in the Ageing Society
Project Reference:	045459
Launch:	1 January 2007
Duration:	42 months
Consortium:	21 partners from 6 countries
Coordinator:	Vodafone Omnitel N.V.
Website:	http://www.aal-persona.org/

Description

PERSONA aims at advancing the paradigm of Ambient Intelligence through the harmonisation of Ambient Assisted Living (AAL) technologies and concepts for the development of sustainable and affordable solutions for the social inclusion and independent living of Senior Citizen, integrated in a common semantic framework.

It will develop a scalable open standard technological platform to build a broad range of AAL Services, to demonstrate and test the concept in real life implementations, assessing their social impact and establishing the initial business strategy for future deployment of the proposed technologies and services.

The main challenges of PERSONA are:

To find solutions and develop AAL Services for social inclusion, for support in daily life activities, for early risk detection, for personal protection from health and environmental risks, for support in mobility and displacements.

To develop a technological platform that allows the seamless and natural access to those services indicated above.

To create a psychologically pleasant and easy- to- use integrated solutions.

To demonstrate that the solutions found are affordable and sustainable for all the actors and stakeholders involved: elderly citizens living, welfare systems, service providers in the AAL market.

The PERSONA technical platform will exploit and incorporate a broad range of relevant technologies which are developed and integrated in the project: AAL system reference architecture, micro- and nano-electronics, embedded systems (e.g. as in smart textiles), Human Machine Interfaces (display technologies, natural language communication), Communication (e.g. body area network, wireless sensor networks), software, web & network technologies (e.g. tele-services), biosensors (to measure physiological data), embedded and distributed sensors (to observe activity patterns, nutrition, gait, sleep), energy generation and control technologies (energy harvesting), and intelligent software tools for decision support.

Relevance to Hydra

Ambient Assisted Living is a very relevant platform and domain for Hydra enabled applications. AAL relates to a global inclusion of all sorts of sensors in the surroundings, where Hydra can add self-discovery and self-configuration capabilities. Also security related results of Hydra would be relevant.

Planned actions

The PERSONA consortium will be contacted with the aim of exchanging project information and explore possible routes of cooperation in terms of prototypes and demonstration. The Fraunhofer Institute for Computer Graphics (FhG-IGD) is a project partner and would be a natural liaison partner with respect to the FhG partners in Hydra.

8.5   INHOME

An intelligent interactive services environment for assisted living at home

Type of the project: IST FP6 project, STREP
IST SO: Ambient Assisted Living (AAL) in the Ageing Society
Project Reference: 045061
Launch: January 2007
Duration: 24 months
Consortium: 8 partners from 5 countries
Coordinator: Alcatel SEL AG, Germany
Website: http://www.ist-inhome.eu/

Description

The goal of the INHOME project is to provide the means for improving the quality of life of elderly people at home, by developing generic technologies for managing their domestic ambient environment, comprised of white goods, entertainment equipment and home automation systems with the aim to increase their autonomy and safety. Contrary to the practises followed up to now, the INHOME project focuses on the problem of appliances flexible use by discriminating between experienced and inexperienced rather than enabled or disabled users. By adopting this radically different standpoint the project is posed to set out a generic set of appliance design guidelines targeting the intensification of home appliances use and user dependency. In accordance with this concept, the INHOME project aims at furnishing its offerings through the establishment of the four-tier architecture. The bottom line technology is offered by the ESTIA project (IST-FP6-4-27191), which focuses on the design and development of technologies for efficient personalised management of audiovisual content and white goods functions, locally within the home.

INHOME will utilise ESTIA architecture in order to design and develop a set of services for aged people, which will be delivered in the form of the following showcases with the aim to enhance their autonomy and safety at home: Activity Monitoring, Home Environment Simple Management, Tasks scheduling, Flexible AV streams handling, Household appliances flexible access.

Relevance to Hydra

The project INHOME aims at the same application domain as Hydra. The approach of discriminating between experienced and inexperienced rather than enabled or disabled users is interesting. However, the focus on audiovisual and white goods functions in the home is rather limited. Newer AAL projects tend to attack the problems of AAL more broadly and also focus on aspects of social cohesion and healthcare.

Planned actions

The INHOME project is closed and the website does not exist any longer. It could be interesting to look at the ESTIA technology, but considering that newer AAL projects are more ambitious and move outside audiovisual content and white goods, the Hydra project will not actively approach the previous INHOME consortium.

8.6   MonAMI Mainstreaming on ambient intelligence

Type of the project: IST FP6 project, Integrated project
IST SO: e-Inclusion
Project Reference: 035147
Launch: September 2006
Duration: 48 months
Consortium: 14 partners from 7 countries
Coordinator: Swedish Institute of Assistive Technology, Sweden
Website: http://www.monami.info/

Description

Many Europeans are at risk of being excluded from the Information Society and its benefits. Two large and growing groups in this position are the elderly, who may have some reduced physical or mental function, and persons with disabilities. Age is one of the main factors behind the gap in the use of information and communication technologies. With the demographic changes, the demand in care of elderly and disabled is forecast to increase over the coming years.

Previous European projects have shown that technological augmentation of the living space can help alleviate the problems of daily living, increase quality of life and reduce the need for institutional and other care. The proposed project builds on these results and aims to move such services from the laboratory and small scale demonstrators to the status of mainstream technology.

The project focuses on:

capitalizing on Ambient Intelligence (AmI) technologies to ensure that the services can be used without behavioural change

building on top of mainstream devices and services such as TV based internet, nomadic devices, etc.

doing initial experimentation in Feasibility and Usability centres and subsequent large-scale validation in Validation centres in five countries

addressing economic viability and long term sustainability of such services in large communities in different Member States

MonAMI will select bouquets of services in the areas of comfort applications, communication/information, health, safety and security. It will build, test and deploy these services and demonstrate that they can be economically brought through the future mainstream ambient intelligence technologies.

MonAMI will focus on services, platforms and usability: The technology platform will be derived from mainstream technology. Usability requirements will be identified, an evaluation methodology will be selected and usability analyses will be carried out.

Relevance to Hydra

The project is highly relevant to work packages dealing with ambient intelligence as well as application as it in general is from the same application domain as one of the HYDRA scenarios (healthcare).

Planned actions

The results of the MonAMI project will be closely investigated.

8.7   SmartHEALTH

Smart Integrated Biodiagnostic Systems for Healthcare

Type of the project:	IST FP6 project, Integrated Project
IST SO:	NMP-2004-IST-NMP-2 Bio-sensors for Diagnosis and Healthcare
Project Reference:	016817
Launch:	1 December 2005
Duration:	48 months
Consortium:	29 partners from 11 countries
Coordinator:	The University of Newcastle Upon Tyne, UK
Website:	www.smarthealthip.com

Description

SmartHEALTH will develop an open integrated architecture for new biodiagnostic systems to support European companies exploiting bioassays or new application concepts. The initial system has a disposable fluidic cartridge with a desktop base-station linking to the ambient eHealth environment. This concept will be miniaturised and cost engineered into a portable and more available product. It will perform multi-analyte sensing and interpretation, for nucleic acids and proteins and will handle multiple biological sample types. Results will be interpreted and presented using bio-information analysis. Systems will be healthcare "user identity-" and "ambient environment-" aware, respecting confidentiality and information access rights.

The project will enable enhanced medical diagnosis, leading to earlier and more precise results contributing to an increased quality of life as well as increasing the competitiveness of the European IVD sector. Clinical areas for SmartHEALTH application are in Cancer Diagnostics - breast cancer recurrence monitoring, cervical cancer case finding, and colorectal cancer diagnostics, theranostics and prognostics. Each application includes clinical validation and commercial exploitation partners.

Relevance to Hydra

The project aims at the same application domain as Hydra, i.e. Healthcare. In it's approach, SmartHEALTH develops dedicated sensors for specific applications. It also seems as if the supporting infrastructure is dedicated to the chosen applications, whereas the Hydra architecture is more general in its middleware approach.

Planned actions

A symposium of invited participants will be held at Newcastle University in the spring of 2009. Participants will include invited members from the SmartHEALTH consortium together with a number of invited international experts from social science, ethics, law and other relevant subject areas. The meeting will be facilitated by Simon Woods and Fionagh Thomson from Newcastle University who are involved in delivering the SmartHEALTH Workpackage on "Regulatory and Ethical Issues".

It would be a good dissemination platform for Hydra to participate and present the Hydra approach to eHealth architecture.

IN-JET will contact the organisers and suggest including a Hydra presentation in the symposium.

8.8   AAL

Ambient Assisted Living - Preparation of an Art. 169-initiative

Type of the project:	IST FP6 project, Specific Support Action
IST SO:	e-inclusion
Project Reference:	004217
Launch:	November 2004
Duration:	28 months (finished)
Consortium:	9 partners from 7 countries
Coordinator:	VDI/VDE Innovation + Technik GmbH, Germany
Website:	http://www.aal169.org/

Description

The objective of the specific support action "Ambient assisted living" is to prepare an Art. 169 initiative in the field of "Small and smart technologies for ambient assisted living" to be submitted by the end of the year 2005. Ambient Assisted Living as a concept aims at prolongating the time, people can live in a decent way in their own flat by increasing their autonomy and self-confidence, the discharge of monotonously everyday activities, to monitor and care for the elderly or ill person, to enhance the security and to save resources. The Article 169-initiative in the field of "Small and smart technologies for ambient assisted living" undertaken jointly by several Member states will tackle the major challenges Europe has to face:

It will stimulate the development of products and services for societies being characterised by demographic changes

It will improve policy co-ordination in a field where the innovation process has to be accompanied and stimulated by public authorities because of its social dimension.

According to the philosophy of Art. 169 it is necessary to combine an European and national perspective and not only to work on the European or the national level. On the one hand the issue of an "ageing population" concerns all EU member states in equal measure. The European dimension allows to create a critical mass and to create synergies. Costs can be saved by a better cross-linking of national initiatives and activities. On the other hand social security systems are highly fragmented in Europe and cultures (e.g. acceptance of new products by elderly people) in the European countries still differ very much. This requires the involvement of the national level as well. This project covers all preparatory work needed to set-up the intended Art. 169 initiative.

Relevance to Hydra

Hydra middleware can be used in healthcare applications and it is one from the possibilities for supporting assisted living.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

8.9 AWARENESS

Context AWARE mobile NETworks and ServiceS

Type of the project: Project is part of the Dutch research programme Freeband Communication
Launch: 2004
Duration: 2004 – 2008
Consortium: 8 partners from 1 country
Contact: Lucent Technologies Nederland BV, Bell Labs Europe, Netherlands
Website: http://awareness.freeband.nl

Description

The goal of the Freeband AWARENESS project is to research and design an infrastructure for context-aware and pro-active mobile applications, and validate this through prototyping with mobile health applications. In the AWARENESS project vision a human user is always and everywhere surrounded by a networking environment ("ubiquitous") that is able to determine the identity of the user and the (upcoming) context information that is (or might become) relevant to service provisioning ('attentiveness'), such that the user can have anywhere, anytime access to mobile services in a secure and privacy-sensitive manner.

AWARENESS pays particular attention to mobile applications in the healthcare domain, specifically to tele-treatment of patients with chronic pain and tele-monitoring of epileptic seizures and uncontrolled movements in spasticity.

One of the results of the project will be an Integrated Health Demonstrator using proof-of-concept software components.

Relevance to Hydra

The AWARENESS project application is similar to HYDRA healthcare domain. The project elaborates on application of mobile devices in health applications, especially tele-monitoring and treatment of patients.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

8.10 MYHEART

MyHeart

Type of the project:	ICT FP6 project, Integrated Project
IST SO:	eHealth
Project Reference:	507816
Launch:	31 December 2003
Duration:	60 months
Consortium:	28 partners from 9 countries
Coordinator:	Philips Technologie Gmbh Forschungslaboratorien, Germany
Website:	http://www.hitech-projects.com/euprojects/myheart/home.html

Description

It is commonly accepted, that a healthy and preventive lifestyle as well as early diagnosis could systematically fight the origin of CVD and save millions of live-years.

The MyHeart mission is to empower citizen to fight cardio-vascular diseases by preventive lifestyle and early diagnosis. The starting point is to gain knowledge on a citizen's actual health status. To gain this info continuous monitoring of vital signs is mandatory. The approach is therefore to integrate system solutions into functional clothes with integrated textile sensors. The combination of functional clothes and integrated electronics and process them on-body, we define as intelligent biomedical clothes. The processing consists of making diagnoses, detecting trends and react on it. Together with feedback devices, able to interact with the user as well as with professional services, the MyHeart system is formed.

This system is suitable for supporting citizens to fight major CVD risk factors and help to avoid heart attack, other acute events by personalized guidelines and giving feedback. It provides the necessary motivation the new life styles. MyHeart will demonstrate technical solutions. The outcome will open up a new mass market for the European industry and it will help prevent the development of CVD, meanwhile reduce the overall EU healthcare costs. The consortium consists of 34 partners from 11 countries. It is a research effort of industrial, research institutes, academics and medical hospitals, covering the whole value chain from textile research, via fashion and electronic design, towards medical and home-based applications.

Relevance to Hydra

This is a lifestyle change project which incorporates textile embedded sensors and on-body process systems. The application is very close to some of the Hydra scenarios, but the concept is build on pre-defined sensors in confined applications, which is somewhat different from Hydra's open and dynamic middleware approach.

Planned actions

The results of the MyHearth project will be closely investigated in the validation of the Hydra solutions in the healthcare domain.

9 User domain projects – Agriculture

9.1 MONIQA

Towards the harmonisation of analytical methods for monitoring quality and safety in the food chain

Type of the project:	Network of Excellence
IST SO:	FOOD-2005-T5.4.5.1
Project Reference:	36337
Launch:	February 2007
Duration:	60 months
Consortium:	30 partners from 11 countries
Coordinator:	INTERNATIONAL ASSOCIATION FOR CEREAL SCIENCE AND TECHNOLOGY
Website:	http://www.moniqa.org/

Description

The project aims at overcoming European and worldwide fragmentation in food quality and safety (Q and S) research by integrating key organisations in a core consortium. MONIQA seeks to establish durable integration of leading research institutions, industrial partners and SMES working in complementary fields of detections and methods for food quality and safety. MONIQA aims at overcoming European and worldwide fragmentation in food quality and safety research by integrating key organisations in a core consortium. Benefits through dissemination and joint research will also be available to associated partners. The core consortium (partners / members) seek to establish mechanisms for coordinating and finally merging research activities, personnel and infrastructure. The industry and SME sector will benefit through application of the harmonised detection method and technologies, as will the consumers of high quality and safe food. A total of 174 researchers and doctoral students are planned for integration into the network with more than 40% of female researchers and more than 55% of female PhD students. Using the calculation provided in the Guideline, this results in a calculated Grant for Integration of 2,840,000 per year or 14,200,000 for a duration of 5 years.

Relevance to HYDRA

Following the purposes of HYDRA the project MONIQA is a way to be in touch with organisation at the state of the art on matters related to food security. Its intent in the direction of identifying traceability and security is a common end with the project, through the middleware development.

Planned actions

The ways Hydra can act in respect to MONIQA, is through the dissemination of results and perspectives that could be related to the assessment of implications of advanced processing and monitoring technologies (IT) in modern HACCP systems that MONIQA is carrying out. Furthermore the activity of database creation on food quality and safety issues could be another point of common interest for example analysing the possibility to install alert systems in food manufacturing plants; those activities have as a prerequisite the direct contact with the consortium coordinator starting with a reciprocal dissemination activity.

9.2   NOVELQ

Novel processing methods for the production and distribution of high-quality and safe foods

Type of the project:	Integrated Project
IST SO:	FOOD-2004-T5.4.6.2
Project Reference:	15710
Launch:	March 2006
Duration:	60 months
Consortium:	31 partners from 17 countries
Coordinator:	AGROTECHNOLOGY & FOOD INNOVATIONS B.V.
Website:	http://www.novelq.org/Default.aspx/

Description

NovelQ brings together acknowledged European expertise in science [incl. social] and technology and a substantial Industry Advisory Platform, [IAP] 50% SME, to address incremental innovations in novel processing (NP) and packaging.

New products and processes will be developed and demonstrated (10 examples). The IAP will exploit and promote these and identify bottlenecks to be examined in the project. Food manufacturers and machinery suppliers are involved to optimise cross-sectorial innovations.

The consortium has access to all basic, expensive, pilot NP facilities including unique prototypes, owned by the partners. These factors, together with the priority paid to effective dissemination and technology transfer will ensure maximum stakeholder impact of NovelQ.

Best practices will be disseminated in (new) Member States/INCO countries via established networks.

Relevance to Hydra

The development and demonstration of processes is related to Hydra actions in order to interact, considering the implication of the middleware implementation to novel processing of high quality and safe food. By our side the dissemination of our project's results gives a surplus to the projects and makes aware partners of this best in class research.

Planned actions

NOVELQ project will reach half of its duration during 2008. The results of the NOVELQ project will be closely investigated in the validation of the Hydra solutions in the agriculture domain.

9.3   SAFIR

Safe and High Quality Food Production using Poor Quality Waters and Improved Irrigation Systems and Management

Type of the project:	IST FP6 project, STREP
IST SO:	Rational use of water for quality and safe crop products
Project Reference:	23168
Launch:	October 2005
Duration:	48 months
Consortium:	17 partners from 10 countries
Coordinator:	Danish Institute Of Agricultural Sciences, Danmark
Website:	http://www.safir4eu.org/

Description

The present proposal addresses two fundamental problems that over the past decade increasingly have become concerns of the general public: the one problem being the jeopardizing of safety and quality of our food products, while the other being the increasing competition for clean fresh water.

The proposed project has a multi-disciplinary approach, which integrate the European as well as the global dimension of the EU-policy on food quality and safety. The main driving force behind the project idea is new research results that demonstrate irrigation pattern can increase the water use efficiency as well as the quality of vegetable crops. Furthermore, have recent innovations in the water treatment and irrigation industry shown potential for the use of low quality water resources, such as rivers and other surface water, for irrigation of vegetable crops without jeopardizing food safety or quality.

The proposal includes three components:

The technological development of water saving irrigation systems and management for use of low quality water resources. Technological advances will be made in the field of cost effective tertiary water treatment technology for on-farm use. Irrigation equipment for sub-surface irrigation systems will be tested in the field and developed to facilitate a new water saving strategy, PRD-irrigation, which improves water use efficiency and the quality of the produce.

Impact of the technology on product quality and safety, production system and the environment as well as a risk assessment from farm to fork.

A component concerning the feasibility and application of the system.

The financial and economic aspects will be investigated and institutional and consumer barriers will be identified. Decision Support System will be developed for the on-farm management of water resources. A range of dissemination activities addressing national and EU authorities, commercial stakeholders from the food sector, and farmers' organizations is included.

Relevance to Hydra

One of the scenarios of the usage of Hydra middleware deals with the question of irrigation system and irrigation control system. Irrigation systems and its controlling systems are of great interest in the studied agriculture scenarios. Here the Hydra enabled devices could give an important contribution.

Planned actions

Project will finish in 2009. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

9.4   CO-EXTRA

GM and non-GM supply chains: their CO-EXistence and TRAceability

Type of the project:	Integrated Project
IST SO:	FOOD-2003-T4.2
Project Reference:	7158
Launch:	April 2005
Duration:	48 months
Consortium:	46 partners from 19 countries
Coordinator:	INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE - FRANCE
Website :	http://www.coextra.eu/

Description

The objective of Co-Extra concerns GM and non-GM supply chains, their co-existence and traceability, It aims to provide all the stakeholders of the food and feed chains with a central decision-support system integrating the tools, methods, models and guidelines needed to deal with the imminent arrival of large quantities of GMOs.

Co-Extra will study and validate biological containment methods and model supply chain organisations and provide practical tools and methods for implementing co-existence. In parallel, Co-Extra will elaborate new techniques to meet the challenges raised by stacked genes and as yet

unapproved or unexamined GMOs. Co-Extra will also study and propose the most appropriate information structure, content and flow management for ensuring reliable and cost-effective documentary traceability. All of the methods and tools that will be studied and developed will be assessed not only from the technical point of view but also with regard to economic and legal aspects. In parallel, to promote harmonisation of co-existence and traceability practices around the world, Co-Extra will survey the GMO-related legal regimes and practices that exist in and beyond the EU.

By helping economic stakeholders to meet consumers requirements for reliable choices, Co-Extra will improve European competitiveness. Co-Extra outcomes will be proposed to standardisation after validation.

Relevance to Hydra

Co-Extra's intentions are related to GMO's supply chains, thus disseminate Hydra activity within the ambience of ideal application of traceability instruments is to be intended as a relevant activity to reach the objective of our project. As the stakeholders are involved in the improvement of European Competitiveness Hydra's project can give its contribution as an effective mean to reach it.

Planned actions

Project will finish in 2009. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

9.5   SMES-NET

SMEs Networking European Food Safety Stakeholders

Type of the project:	IST FP6 project, Specific Support Action
IST SO:	Realising ERA objectives - Promotion of SME participation - Stimulating international cooperation - Linking with Candidate Countries - Supporting Policy Development - Stimulating exploitation - Contributing to the EU strategy for Life Scien
Project Reference:	514050
Launch:	April 2005
Duration:	14 months (finished)
Consortium:	6 partners from 2 countries
Coordinator:	Spread European Safety GEIE, Italy
Website:	http://smes-net.ciaa.eu/asp/home.asp

Description

The Food & Drink Industry (F&DI) is the largest manufacturing sector in the EU, counting 35,000 enterprises (98% of which are SMEs), with a turnover of EUR650 billion, 90% of which is produced by SMEs. As SMEs play a critical role in food safety and nutritional issues, the present project intends to reach at least 20% (7,000) of the most representative of them, either for branch or for geographical area. SMEs are ideally placed to link consumers, industry and science to provide consumers with better and healthier food through a more "demand driven" scientific research on food safety innovation, nutritional value and raw materials and technology. On the other hand, the current links between the above mentioned "Food Quality & Safety Stakeholders - FQSS" are weak and only part of the research efforts ends up in consumers' dishes. The 10 F&DI Feds of the EEIG "Spes GEIE" have assessed the need to strengthen the links between their members and the other FQSS.

The present project aims at establishing the foot-roots of a European permanent network linking SMEs upwards with research institutions and downwards with consumers and nutritionists. The project is also a pilot action to lay the basis for the prospective participation of SMEs to future Community RTD activities, by establishing sectoral Working Groups (WGs) composed by representatives of the industry and of all FQSS. The WGs will assess and study, through a commonly

developed methodology, the local industry RTD needs. Results emerged in each individual assessment will be discussed during a series of regional meetings organised in three selected locations. During these meetings the most stringent topics on food safety, technology, and nutritional issues and consumers expectations will be identified. The Scientific Committee of SPES will collect the meeting/workshop proceedings and will prepare material to be widely disseminated throughout the participants' networks and at EU level. Project duration is 14 months.

Relevance to Hydra

Several regional meetings were organised within SMES-NET project. During these meetings the most stringent topics on food safety, technology, and nutritional issues and consumers expectations were identified and selected contribution were used for preparing material appointed for dissemination at EU level as well. This material could be the source of much interesting information useful for identifying users' requirements within agriculture domain.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

9.6   AMI@NetFood

Development of Long-term shared vision on AMI Technologies for a Networked agri-food sector

Type of the project:	IST FP6 project, Specific Support Action
IST SO:	Specific Support Action
Project Reference:	015776
Launch:	January 2005
Duration:	15 months (finished)
Consortium:	14 partners from 14 countries
Coordinator:	INNOPOLE, Spain
Website:	http://www.ami-netfood.com/

Description

The objective of AMI@Netfood project is to support the implementation of the IST Research Priority and Framework Programme, providing a long-term vision on future trends on Scientific and Technology Research oriented to the development and application of Ambient Intelligence technologies to the agri-food domain. The project will be carried out developing an ERA Pilot joint collaboration platform resulting from a roadmap the area of Applications and services for collaborative working.

As a result AMI@Netfood will provide a path, in the form of a Strategic Research Agenda, common to a number of EU Member States and Regions, which will be designed to guide RTD in ICTs to provide an answer to identified needs of the sector. The project will provide a framework to discuss about the increasingly demanding need of having collaborative and mobile applications and services and innovative ways to tackle social issues and to bring benefits to consumers, industry and the environment. AMI@Netfood results will specifically focus on the solutions adaptable to the needs of local/regional SMEs in the Agri-food sector in themes like innovative extended products and services, rural development, efficient knowledge creation; sharing and exploitation through collaborative activities involving the individual - the mobile user and worker.

AMI@Netfood analysis will be developed involving key regional and national policy makers with responsibility in the design of RTD policies and programmes in the area of ICTs and Rural development at regional and/or national scale. By this, the project will generate a basis to identify mechanisms to mobilise public-private partnerships and investment needed on Research. Project results will also be widely disseminated so that they can be used to help in preparations for future Community, National or Regional research and technological development policy activities. AMI@Netfood will help creating a sustainable network that will be used as the basis for the definition

of a set of common objectives that would be applied to a potential Technology Platform for the EU research in the area of ICTs for agri-food and Rural Development.

Relevance to Hydra

The effort of AMI@Netfood was to bring Ambient Intelligence in the agrifood sector. Since one from the Hydra application domains is agriculture, Hydra middleware has the possibility to show farmers, that for example using ICT in order to shorten their costs need not be difficult.

Planned actions

Hydra shares the goal of bringing AmI solutions to the agriculture field. We can learn use cases and ideas for applications to implement using the Hydra middleware in WP9. TID will investigate with the consortium if some joint demonstrations can be achieved.

9.7   QUALITYMEAL

Survey on the research landscape in the Associated Candidate Countries for monitoring and promoting Good Quality Meat production - the whole food chain from farm to fork of Poultry and Pork Meat

Type of the project:	IST FP6 project, Specific Support Action
IST SO:	FP6- CPM Work programme to be announced
Project Reference:	510416
Launch:	May 2004
Duration:	24 months (finished)
Consortium:	11 partners from 9 countries
Coordinator:	Instytut Podstawowych Problemow Techniki Polskiej Akademii Nauk, Poland
Website:	http://www.kpk.gov.pl/qualitymeat/index.php

Description

The QUALITYMEAT project will stimulate, encourage and facilitate the participation of organisations from the New Member States and Candidate Countries as well as SMEs. These will comprise information-; and awareness-; promotion of those countries research potential; support to researchers to participate in Brokerage Event and to encourage participation in projects as well as screening of research establishments active in "Quality and Safety Meat production" field. Links between the ACC high quality research centres to other high quality centres in ACC in Member States.

Global objective of the project is to support researchers from NMS and CC to prepare and submit projects, through screening research establishments active in the projects' field, collecting contact details and creating a detailed database of researchers and research organisations.

Relevance to Hydra

One QUALITYMEAT project specific objective is to create a database of researchers and research centres working in the specific field in NMS and CC. This database will provide contacts for getting potential partners or consumers of Hydra middleware.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

9.8   QUALITYLOWINPUTFOOD (QLIF)

Improving quality and safety and reduction of cost in the European organic and 'low input' supply chains

Type of the project: Integrated Project
IST SO: FOOD-1 Epidemiology of food-related diseases,FOOD-2002-T1 Total food chain
Project Reference: 506358
Launch: April 2004
Duration: 60 months
Consortium: 33 partners from 16 countries
Coordinator: TESCO CENTRE FOR ORGANIC AGRICULTURE
Website: http://www.qlif.org/

Description

The proposed project aims to improve quality, ensure safety and reduce cost along the organic and "low input" food supply chains through research, dissemination and training activities. It focuses on increasing value to both consumers and producers and on supporting the development formalistic business plans for all components of the food chain, using a fork to farm approach.

The proposed project has 4 main objectives:
1. To identify consumer expectations, perceptions and actual buying behaviours towards organic and "low input" foods to enable such farming systems to be developed "in tune" with consumer expectations, using a range of consumer surveys/test marketing methodologies (7% of project effort).
2. To quantify the impact of current organic and "low input" management practices on the nutritional, sensory, microbiological and toxicological quality/safety of foods, using multi-factorial field trials and food analytical & nutritional experiments/surveys (30% of effort).
3. To develop novel strategies/technologies which improve the quality, ensure safety and reduce production cost throughout the organic and "low input" food supply chains. This will be achieved by a combination of laboratory and field research, including "farmer participatory" approaches and will be facilitated through involvement of 10 industry partner (6 sees) representing primary production, processing, marketing, services and quality assurance businesses (55% of effort).
4. To identify socio-economic, environmental and sustainability impacts of project innovations and efficiently disseminate project results and provide training opportunities to user and stakeholder groups and junior scientists (8% of effort).

Relevance to HYDRA

Relevance to Hydra project is to be seen in the reduction of the supply chain costs both for low input and organic food. The identification and traceability of products along the supply chain are matters which activities could be clustered by the two projects.

Planned actions

The opportunities to cooperate are related to QLIF Subprojects 3, 4, 5 and 6, which focuses are on improving and assuring the quality and safety of foods, while seeking gains in production efficiency leading to lower production costs. The possibilities to develop applications and following dissemination will be within the research activities and are both an opportunity to have a cooperative and a possible final user for Hydra's middleware.

9.9   GOODFOOD

Food Safety And Quality Monitoring With Microsystems

Type of the project: IST FP6 project, Integrated project
IST SO: Micro and Nanosystems
Project Reference: 508774
Launch: January 2004
Duration: 48 months (finished)
Consortium: 30 partners from 11 countries
Coordinator: CSIC-CNM, Spain
Website: http://www.goodfood-project.org/

Description

The GoodFood project is an Integrated Project presented within the IST thematic area of EC VI FP and aims at developing the new generation of analytical methods based on Micro and Nanotechnology (MST and M&NT) solutions for the safety and quality assurance along the food chain in the agrofood industry. Current and future concerns related to agrofood safety and quality will increasingly require a multidisciplinary and universal approach based on the massive use of simple detection systems able to be used "near to the foodstuff". The technology used nowadays to assess food safety and quality relies on lab solutions that are bulky, costly, punctual and time consuming. On the contrary, GoodFood approach will comply, through the development of innovative M&NT solutions, with the needs of ubiquity, low cost and low power, fast response, simple use and fully interconnection to the decisional bodies. A multidisciplinary integration of know-how and technology is required for addressing the broad requirements of the agrofood field. An Integrated Project is proposed to keep such a global view. The Project aims at the vertical integration of Micro and Nano Technologies from the land to the market. The main demands identified by the agrofood sector will be the applications that will drive the technological developments within GoodFood. The need for increasing the control of products at different critical steps of the food chain (control of raw materials, improvement of food processing, monitoring of storage and logistics, and control of safety and quality of final products) will be addressed by GoodFood with a vertical and horizontal integration of food, bio, and electronics experience for developing a set of systems with clear breakthrough solutions to specific safety and quality and traceability requirements. The proposed solutions will be also integrated under an Ambient Intelligence approach, which will allow fully interconnection and communication of multisensing systems. The technological developments within GoodFood are driven by the main demands identified by the agrofood sector, and they are focused into a number of relevant food targets. The M&NT inspired solutions developed therein are foreseen as the stepping-stones of the long term GoodFood vision: "bringing the lab to the food stuff from the land to the market."

Relevance to Hydra

GoodFood project focuses on the field of European Union policies on safe food. This field is also under the HYDRa's interest.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

9.10 SaFES

Safe Food Enhancement System

Type of the project:	IST FP5 project, Preparatory, accompanying and support measures
IST SO:	Workplace design
Project Reference:	IST-1999-20842
Launch:	November 2000
Duration:	20 months (finished)
Consortium:	5 partners from 2 countries
Coordinator:	van Helsing Ltd., United Kingdom
Website:	http://www.vanhelsing.com/SaFES/SaFES.htm

Description

SaFES trials a web-enabled software tool using well-established HACCP (Hazard Analysis and Critical Control Point) principles to improve the quality of processes within food manufacturing plants. The SaFES tool is used by a team led by the manufacturer's HACCP implementer to help conduct a hazard analysis and determine the critical control points (CCPs) with their associated limits and define corrective actions. SaFES then gathers real-time data via easily installed data loggers linked to a secure management system to automatically monitor the CCPs. Corrective actions can be

established with customers. Reports of non-compliance and associated corrective action are documented and can be examined via authorised web-users within the supply chain. SaFES thus reduces effort expenditure in developing, running and auditing a HACCP-based quality system.

The results of the trial are far reaching and are examined from the perspective of each user role participating in the trial, viz: food processor, reseller, consultant and auditor. There are implications on policies and standards with the suggestion that regulatory bodies and audit authorities could well update the way they work with e-Work and ICT as the catalyst. Concepts such as SaFES have potential for society and its peoples from raising competitiveness, fuelling future growth in European industry, 'setting the standard for Europe', affecting the types of employment in Europe, improving the quality of life for people by allowing them to work smarter and cut down travelling. There is scope via the use of e-working for protecting and preserving the natural environment.

Relevance to Hydra

One of the Hydra's goals is improving quality control of food production equally as it is in SaFES project case.

Planned actions

This project is finished. The results will be investigated through the available literature, but no attempt will be made to contact the previous consortium at this stage.

10 Conclusion

The following projects are of particular high relevance to HYDRA. We have therefore defined specific action plans in relation to these projects in order share knowledge and strengthen the HYDRA project:

AmI

Hydra shares the goal of bringing AmI solutions to the agriculture field. We can learn use cases and ideas for applications to implement using the Hydra middleware in WP9. TID will investigate with the consortium if some joint demonstrations can be achieved.

CAALYX

The use of the CAALYX sensor for elderly is interesting in terms of the healthcare scenarios to be developed in Hydra. It would be a good demonstration, if the CAALYX fall sensor could be used in the demonstration phase of Hydra. IN-JET will approach the project when demonstration activities begin.

MONIQUA

The ways Hydra can act respect to MONIQA, is through the dissemination of results and perspectives that could be related to the assessment of implications of advanced processing and monitoring technologies (IT) in modern HACCP systems that MONIQA is carrying out. Furthermore the activity of database creation on food quality and safety issues could be another point of common interest for example analysing the possibility to install alert systems in food manufacturing plants; those activities have as a prerequisite the direct contact with the consortium coordinator starting with a reciprocal dissemination activity.

PERSONA

The PERSONA consortium will be contacted with the aim of exchanging project information and explore possible routes of cooperation in terms of prototypes and demonstration. The Fraunhofer Institute for Computer Graphics (FhG-IGD) is a project partner and would be a natural liaison partner with respect to the FhG partners in Hydra.

QLIF

The opportunities to cooperate are related to QLIF Subprojects 3, 4, 5 and 6, which focuses are on improving and assuring the quality and safety of foods, while seeking gains in production efficiency leading to lower production costs. The possibilities to develop applications and following dissemination will be within the research activities and are both an opportunity to have a cooperative and a possible final user for Hydra's middleware.

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SmartHEALTH

A symposium of invited participants will be held at Newcastle University in the Spring of 2009. Participants will include invited members from the SmartHEALTH consortium together with a number of invited international experts from social science, ethics, law and other relevant subject areas. The meeting will be facilitated by Simon Woods and Fionagh Thomson from Newcastle University who are involved in delivering the SmartHEALTH Workpackage on "Regulatory and Ethical Issues".

It would be a good dissemination platform for Hydra to participate and present the Hydra approach to eHealth architecture.

IN-JET will contact the organisers and suggest including a Hydra presentation in the symposium.

SOCRADES

The SOCRADES project is very relevant for Hydra and initial contacts have been made at the time of writing. IN-JET has been in contact with Dominique Guinard, Research Associate at the SAP Research / ETH CEC Zürich, who is a leading project partner. It has been briefly discussed to hold a joint symposium for project members to explore common issues and findings in the areas of automatic device discovery, automatic ontology building and device communication. Relevant Hydra partners will also follow the project results by reading papers and deliverables published.

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