SIXTH FRAMEWORK PROGRAMME

PRIORITY 2

Information Society Technologies

Contract for:

SPECIFIC TARGETED RESEARCH OR INNOVATION PROJECT

Annex I - "Description of Work"

Project acronym: eu-DOMAIN

Project full title: **e**nabling **u**sers for – **D**istance-working & **O**rganizational **M**obility using **A**mbient **I**ntelligence service **N**etworks

Proposal/ Contract no.: IST-2003-004420

Date of preparation of Annex I: **8th April 2004 (Version 1.0)**

Operative commencement date of contract: *(to be completed by Commission)*

1. Project Summary

The eu-DOMAIN project will develop a new, innovative European ambient intelligence service platform for automatic, context sensitive offering and contracting of mobile web services across heterogeneous networks. The eu-DOMAIN service platform will interconnect people, devices, buildings and content in an interoperable network.

The eu-DOMAIN platform can be deployed in a broad range of industrial, government, healthcare and other citizen centred applications. In the project, the platform will be validated in two sectors: Building facility management and *e*Health services.

eu-DOMAIN supports **mobility among users and workers** by integrating them with seamlessly accessible ubiquitous intelligent surroundings that support self-configuring devices using semantic agents and tools for ambient awareness and decision support.

eu-DOMAIN opens up for entirely **new ways of working in collaborative work environments** across distributed organisations by offering mobile, trusted services over heterogeneous universal communication lines. It supports working-out-of-workspace by providing seamless delivery-on-demand of content and establishes multi-modal exchange of knowledge amongst people, machines and devices.

eu-DOMAIN uses intelligent user interfaces based on context-sensitivity and automatic user profiling, tailored to the need of the mobile user.

An integral part of the project is the development of realistic business models for users and service providers. The business models will be based on the concept of value-nets and emphasis will be made on identifying value creation and new business opportunities for SMEs. The platform will be available after the completion of the project to stimulate take-up.

The main technological innovation in the eu-DOMAIN platform lies in its 3-tier intelligence pools based on a hierarchal client/server structure. Network, application and location intelligence is guiding interaction between service providers, fixed and mobile locations and devices.

2. Project Objectives

2.1. Introduction

The specific aim of the *e*Europe 2005 action plan is to *"stimulate secure services, applications and content based on a widely available broadband infrastructure"*.

Today, the realization of the vision in *e*Europe 2005 is still obstructed by a huge variety of proprietary systems not being able to communicate across platforms, users struggling to make systems from different manufacturers operate together and technological platforms that support but a few services. This is especially true when services are needed outside fixed workspaces like homes, offices or factories.

Even if underlying broadband infrastructures, both fixed and mobile, are gradually coming into place across Europe, potential service providers still cannot demonstrate the necessary business cases to realize the full potential of secure and trusted services and applications for business and government. This is particularly true, when objects of interaction involve machines and devices. The aims of the *e*Europe action plan are in great danger.

As the value of communications technologies is said to grow proportionally to the square of the number of the connected devices, it will be a crucial task to maintain universal inter-connectivity. What is needed is an ambient intelligent platform that supports integration and interoperability of services, with self-configuring devices through distributed intelligence pools and open-standard interfaces.

An estimated 12 million Europeans travel everyday across Europe to do their work outside their normal workspace. eu-DOMAIN will dramatically improve their ability to deliver quality services, optimise their professional work, increase the competitiveness or visibility of their host organisations and generally improve the quality of life for Europe's citizens.

2.2. Vision

The vision of the eu-DOMAIN project is to develop **a Europe-wide, mobile, ambient intelligence services platform that integrates users into intelligent surroundings and supports new methods of collaborative working with seamless delivery-on-demand of services from content repositories to people, machines and devices.**

eu-DOMAIN will enable mobile ambient intelligence awareness by allowing the user to integrate his virtual user profile into any location thereby providing context aware decision support combined with delegation of work.

eu-DOMAIN will give content providers the possibility of delivering standardized augmented reality services to mobile users thus creating new collaborative work environments and new methods of working across geographically distributed organisations.

eu-DOMAIN is specifically addressing the issues of interoperability, delivery of services across heterogeneous networks and terminals with different capabilities by introducing the concept of a network infrastructure with distributed intelligence pools and self configuring devices via semantic agent technologies.

The vision becomes more imaginable, when considering the following two user scenarios[1].

2.2.1. The European Service Network (ESN)

Riccardo owns and runs Servizio Provinzia S.r.l., a successful small service business in the north-eastern part of Italy. His customers are facility managers, who manage office buildings, hotels and restaurants and large apartment complexes. Riccardo's company provides

[1] Novel aspects of eu-DOMAIN services in relation to ambient intelligence and new methods of working are shown in <BRACKETS>.

installation, supervision and service of all technical installations for heating, cooling, water supply and drainage. Many of his customers are in large cities like Milano, but they have quite a few customers operating hotels and apartment buildings in the mountain ski resorts.

Last year, Riccardo decided to join the European Service Network (ESN), which was set up by the eu-DOMAIN consortium and strongly promoted by his local industry association. Every service van now has a mobile eu-DOMAIN gateway, which allows the technician not only to be in constant contact with his home offices, but also to build networks as he travels to facilitate communication among vehicles and between vehicles and customers installations. The ESN has opened completely new ways of working and interacting with customers and create ad-hoc partnerships with his colleagues in the business. As a result, Servizio Provinzia has grown considerable in the last year, due to a better utilization of company resources and much improved customer satisfaction.

Fabio is the area manager with Servizio Provenzia for the province of Lombardia. He is in charge of managing thirty technicians employed in installation, repair and maintenance of building installations. When Fabio starts his day, all service and maintenance jobs are automatically distributed on available service technicians and downloaded to his mobile service gateway. Today, he has one visit in central Milano and three in the suburbs. The necessary spare parts and documentation has automatically been derived from the service requests record and the service knowledge database. There are a few things he needs to pickup at the office, so he starts there. On the van display, Fabio graphically spots the booked service calls for the day. After having browsed the automatically downloaded information about traffic conditions, major events in the city centre and other data <WEB BASED SERVICE PROVISIONING>, he makes a coordination of his activities and determines the best route to take. Since the centre is closed for traffic at mid-day, he decides to do the centre job first. Next year, the Milano Municipality will cooperate with ESN so that the system automatically will purchase a limited access licence to the centre, whenever needed <LOCATION BASED SERVICES>.

Having done the first job, he checks his van display for new status in his area. All technical devices are connected to the central eu-DOMAIN and their own manufacturers surveillance system, so he can immediately get updated information in his van on the technical status of each device.

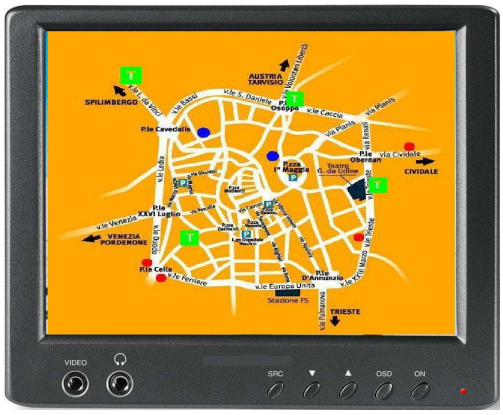


Figure 2.1: A screenshot from Fabio's display:
Green squares = Planned service calls
Red circles = New, priority service calls
Blue circles = Available service vans

There seems to have been breakdown of the hot water supply in one of the large apartment blocks outside town and Fabio must quickly decide what to do. Via the eu-DOMAIN platform he can get all pertinent data from each device send to this screen. First, he checks the status of all the pumps, but they seem to work OK, however at reduced capacity. By logging into the boiler control systems he is able to identify some possible faults, which need to be checked. His observations are sent to the eu-DOMAIN system, which automatically checks the availability of all service vans in the area, as well as their spare parts and tools, and displays it on the map.

Using the network, Fabio is now able to reschedule the day's work. He re-assigns a couple of vans and technicians to the urgent case. Unfortunately, none of the Servizio Provenzia vans contains a special feedback loop tester, which is needed for this specific job, but because they are part of the Enhanced Service Network, he can broadcast the request to other service companies operating in the area and subscribing to the ESN. Within a few minutes, he gets three offers from other firms, who have the needed tool. On the screen, he finds the firm closest to the site, checks the offered price and decides to accept this service, if he can get 25% discount. The other firm accepts this and ESN automatically creates a digitally

signed contract for the supply of up to three hours of feedback loop testing. All administrative tasks, including billing, are handled automatically <TRUSTED SERVICES>.

Fabio can now go on to visit the other planned customers. He arrives at the next site, a large hotel complex outside Milano, shortly before lunch. This job is about a scheduled service and adjustment of the hotels heating system. eu-DOMAIN uses statistical methods to predict possible breakdown based on usage and monitoring data received from each of the installed devices[2].

When he enters the building, his virtual identity is sent from his PDA via the wireless network to the eu-DOMAIN service that authorizes his certificate <REMOTE AUTHENTICATION> and establishes the relevant object profiles at the hotels service gateway. Using eu-DOMAIN's semantic web search the system downloads and provides him with device drivers and user profiles <AUTOMATIC USER PROFILING> for using the hotel intranet and broadband connections <SELF CONFIGURING DEVICES>.

Fabio has received all data on his mobile device regarding history and service records for the heating system. From Grundfos' own database, he has also downloaded all the product information and tutorials he needs, so he can go directly ahead and perform the procedures. Every device is available to him and he has the possibility to perform different kinds of tests, check the current status and to upgrade software components, if needed.

As he goes through the procedures, one pump does not perform as he expects it to. He can see from his service record that 2 weeks ago, Grundfos remotely updated the software in one of the pumps, so he assumes that there might have been some problem with the operating conditions of this pump. Instead of trying a multitude of different approaches, he decides to buy technical support directly from the Grundfos support organisation in Denmark. With the eu-DOMAIN platform, he establishes a virtual workgroup to troubleshoot the faulty pump. The support is ordered and negotiated using his PDA and within 5 minutes, a service support person from Grundfos and his own software expert from the back office are online and in direct communication with Fabio and the pump <COLLABORATIVE WORK ENVIRONMENT>.

Fabio puts on the special goggles, which Grundfos has provided him with, and sets up a portable, wireless camera <WEARABLE DEVICES>. The support person goes through a comprehensive test of all primary and secondary pump systems. Measured values are displayed on Fabios' goggles. When manual intervention is required, the goggle display shows him what to do and what the expected outcome should be <AUGMENTED REALITY>. Fabio prefers that all communication with the support person be conducted in English. However, the technical manager of the hotel has also been called in. He follows the troubleshooting on a large display screen in the meeting room <COMMUNITY SHARING> in his own language <MULTI-LINGUALITY>.

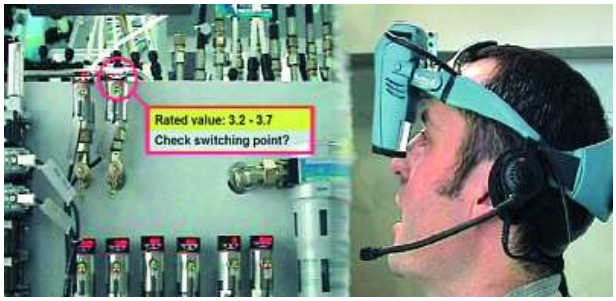


Figure 2.2: Augmented reality helps Fabio troubleshoot the installation

Experts from the group headquarter can also participate in the virtual workgroup to give advices and guidance. However, it was not necessary in this case, since the fault was quickly found in the control software for a secondary stage pump. New software was downloaded, and the heating system worked perfectly again.

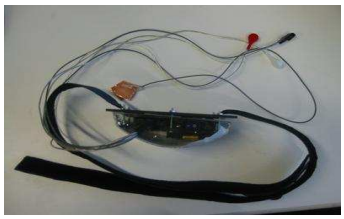
When the work is finished an update of the activities accomplished by Fabio is sent both to his own service database and to Grundfos. At the same time, the support and resources provided by Grundfos is billed to Servizio Provinziale. Before going to lunch with his

[2] This technology is similar the predictive maintenance technology used today in car Engine Management Units, but with the power of remote sensing.

customer, Fabio sets up his own condition monitoring schemes, which will notify him over the coming days, if the faulty condition reappears <ENHANCED PRODUCTIVITY>.

2.2.2. Healthcare for tomorrow

Ursula has had severe diabetes for many years now and has worked hard to manage her condition and ensure that she maintains a healthy lifestyle. She has self-monitored for the purposes of glycaemic control through both blood and urine monitoring and has regular visits from her local district nurse to check on her condition. However, despite her careful attention Ursula has occasionally suffered from hyperglaecemia, requiring prompt attention, and has twice been unfortunate enough to lapse into a diabetic coma as a result. She has also suffered from diabetic leg ulcers on a few occasions and these have required careful treatment. Coping with these problems is difficult enough for anyone but as an elderly lady living on her own they have brought particular difficulties over the years. However, since the implementation of eu-DOMAIN Ursula has found the management of her disease considerably easier than in the past in many respects.



First she has been provided with a wearable device <WEARABLE INTERFACES> that continuously monitors her blood glucose levels. If her glucose level drops below the trigger point that has been agreed with her doctor the device sounds an alarm to alert her to the need to take an insulin injection <CONTEXT SENSITIVITY>.

Ursula's injections are kept either in her fridge or in the special cooler container provided to her for use when she is away from her home. All the injections have a small RFID tag on them. The RFID tag reader in the fridge or inside the lid of the container records when the insulin injection is removed and providing this is done within 10 minutes of the original alarm no further action is initiated. However, if this does not happen, a second alarm is triggered on the wearable device to reinforce the alert to Ursula and eu-DOMAIN contacts the system at the primary care centre to tell it where Ursula is, as identified by the GPS component of the wearable device <LOCATION BASED SERVICES>, and the fact that she has not responded.

This monitoring of insulin injection usage and stocks through RFID tags also has the added benefit that eu-DOMAIN will automatically inform the supplies division of the primary care centre when additional supplies are required. These will then be automatically ordered through their own electronic purchasing system and, when these have been received, the next community nurse that is assigned to visit Ursula will be automatically informed that there is a new supply of insulin injections to be taken with her <SEAMLESS APPLICATIONS AND SERVICES>.

If this incident takes place during the day the homecare system will automatically identify the nearest community nurse, again identified via GPS and alert her, both via her mobile phone and via her in-car satellite navigation system <MULTIPLE MODES OF INTERACTION> to show her where Ursula is and how best to get there.

The nurse can then try to contact Ursula by phone, using any of the stored numbers, to check whether there is some reason for the delay in responding to the first alert before she sets off to visit Ursula wherever she happens to be if she cannot be contacted. She can also send a message to Ursula's wearable device to let her know that a nurse is on her way and request the wearable device to access eu-DOMAIN and transmit the blood glucose levels being picked up from the bio-sensors to her as she travels to Ursula's home <INNOVATIVE MOBILE AND MULTI-MODAL APPLICATIONS AND SERVICES>.

If the incident occurs at night then the first alert on the wearable device will also trigger a signal to the lights in Ursula's bedroom, which will be automatically turned on as an

additional feature to make sure she wakes up to take the injection <INTELLIGENT, ADAPTIVE AND SELF-CONFIGURING SERVICES>. Again, if the RFID reader in the fridge does not detect the removal of an insulin injection within 10 minutes, Ursula will receive a second alert via her wearable device and the lights in her bedroom will flash on and off for a short time. In addition, eu-DOMAIN will contact the primary care centre system, which will check who the nurse on duty is and inform them directly of a level 2 alert at Ursula's home by mobile phone and confirm the location and route to Ursula's house through the in-car navigation system.

When eu-DOMAIN automatically calls the primary care team it also turns on the light in front of the house and on the stairway leading to the bedroom. It also enables a Bluetooth PET (Personal Enabling Tag), which the home care nurse carries, and this allows her to open the front door if Ursula fails to answer <AUTOMATIC CONTEXT SENSITIVITY, USER PROFILING AND PERSONALISATION IN A TRUSTED ENVIRONMENT>. If the second alarm has not been acknowledged within 15 minutes, a third alarm is also sent off to the local ambulance accident and emergency centre, again providing clear details about location and route to the ambulance in-vehicle navigation system.

Ursula receives the same level of support wherever she travels within the area covered by eu-DOMAIN. The eu-DOMAIN mobile gateway in Ursula's wearable device ensures that she remains in constant touch with the local primary care centre in whatever region she happens to be visiting and she can be identified and fully supported immediately she enters the area <SEAMLESS ACCESS TO APPLICATIONS AND SERVICES>. The user-profiling component of the wearable device ensures that all the key health-related information is immediately accessible wherever she happens to be, in line with Ursula's stated preferences about access rights to her personal medical data. The multi-lingual facility of eu-DOMAIN also ensures that Ursula receives all alerts and messages on her wearable device in her native Finnish irrespective of which country she happens to be in at the time <MULTI-LINGUAL AND MULTI-CULTURAL PRESENTATION>.

At present Ursula also has also developed a leg ulcer due to her diabetes and she has found that eu-DOMAIN has brought significant benefits in this respect as well. Her local nurse has recently started to use smart compression bandages, which incorporate sensors for both temperature and humidity. The wearable platform monitors these sensors and eu-DOMAIN relays a message to the primary care centre when the bandage needs changing. This means that Ursula does not have to undergo the quite painful process of having the bandage changed when it is not really necessary. It also means that nursing resources can be planned and used more effectively as visits to Ursula and all the other similar patients for changing their compression bandages will only be scheduled when they are actually required <NEW WORK METHODS>.

For Ursula eu-DOMAIN has also brought the security of knowing that if she was to have a fall in the house or any other mobility problem this would soon be picked up by the primary care centre and assistance quickly and accurately despatched. Ursula's house is fitted with a net-work of movement sensors, which have "learnt" her pattern of movements around the house in a typical day. This means that if Ursula has not started moving around the house within 30 minutes of her usual range of times each day, the primary care centre will be automatically alerted. Similarly, if Ursula appears to be confined to just one room in the house and does not move around freely as she normally does then again an alert will be sent to the primary care centre. In these cases the nearest community nurse would be informed of the potential problem and the same procedures would be put into place as for a hyperglaecemia alert.

Ursula has also noticed significant benefits from eu-DOMAIN in terms of the introduction of new and better ways of working by the community health staff and particularly their co-operation with one another and with staff from other related agencies such as social services and housing to deliver more effective collaborative working <ANYWHERE, ANYTIME AND ANY CONTEXT>.

As with many diabetes patients Ursula suffers from problems with her feet and needs regular visits from a community podiatrist. However, the podiatrist prefers to work with Ursula after she has had a bath when the skin on her feet is as soft as possible.

Normally, the community nurse and podiatrist try to co-ordinate their visits so that the podiatrist does arrive shortly after Ursula has had a bath. However, this is often very difficult due to the fact that it actually requires two community nurses to be present to lift Ursula in and out of the bath and it is frequently very difficult to co-ordinate just the two nurses being there at the same time let alone co-ordinating this with the visit of the podiatrist. The relatively inflexible way of scheduling visits on fixed lists in the past has not helped with this type of collaborative working.

However, a core element of eu-DOMAIN is a real-time resource scheduler, which continuously monitors who needs to be visited for what purpose and then dynamically assigns the community healthcare professional who best matches the requirement in terms of key parameters such as familiarity of patient and nurse, specific nursing requirements and skills, location of patient and nurse and the time the nurse has available. Where two nurses are required simultaneously the system will perform the matching across both and ensure their arrival at the same time. The same can be done across staff groups, for example to ensure the timely arrival of the podiatrist after the two nurses have bathed Ursula. Collaborative working of all types, including inter-agency working is fully supported by eu-DOMAIN <COLLABORATIVE WORK ENVIRONMENTS>.

Ursula also likes the fact that wearable device act as a communication channel from the nurses who use it to check with Ursula when it is convenient to visit and to let her know if there are any last minute delays or changes to the times of the planned visits. In fact some of the nurses use the device to send the occasional message to her just to say hello and give her a bit of interesting information and this makes Ursula feel much more in contact than she did before.

In fact Ursula has found that the whole new way of working has actually brought into more contact with the community healthcare staff than she had before. She was concerned to begin with that the eu-DOMAIN would intrude into her home and her private life. But she very quickly came to realise that the whole thing was actually very reassuring and supportive and made her feel much more comfortable and secure. Apart from the improved communications via the wearable device Ursula has found that nurses will call in to see her when they have a little spare time before their next scheduled visit and they happen to be in her area. The nurses have explained to her that eu-DOMAIN provides their in-car navigation system with a map of all their currently scheduled calls and the best route between them. But when they have some spare time before their next call it also shows them whether they have any patients between where they are where they have to go, together with details of whether they are at home, when they were last visited and why. This allows the nurses to make extra, more social visits, to many of their patients en-route to their next appointments. They do not waste time visiting patients that are out, they can send a message via the wearable device or by phone to say that they would like to call in and, for many people living on their own, these kinds of “social” visits are as an important as the healthcare related ones <IMPROVED CUSTOMER RELATIONS>.

2.3. Project objectives

The overall objective of the eu-DOMAIN project is to define, develop, prototype and validate a mobile ambient intelligence services platform that integrates mobile users into intelligent surroundings and deliver on-demand content services and support for ad-hoc collaborative workgroups across geographically distributed organisations.

The eu-DOMAIN service platform will facilitate collaborative working with seamless delivery-on-demand of services from content repositories to people, machines and devices.

The eu-DOMAIN service platform will enable mobile ambient intelligence awareness allowing the user to integrate his virtual user profile into any location and thereby providing context aware decision support combined with delegation of work.

The eu-DOMAIN service platform will give content providers the possibility of delivering new web services, e.g. augmented reality to mobile users, thus creating new collaborative work environments and new methods of working across geographically distributed organisations.

eu-DOMAIN is specifically addressing the issues of interoperability, delivery of services across heterogeneous networks and terminals with different capabilities by introducing the concept of a 3-tier network infrastructure with distributed intelligence pools and self configuring devices via semantic agent technologies.

Specifically, the goals of the eu-DOMAIN project are:

> **Step 1:** To identify requirements and opportunities for ambient intelligence support and innovative services to Europe's 12 million mobile workers.
>
> **Step 2:** To develop ambient intelligence services provided on a platform with distributed intelligence pools based on fixed and mobile broadband networks.
>
> **Step 3:** To deploy a limited scope or mobile user services on the platform to validate potential business opportunities and support these with convincing business cases.
>
> **Step 4:** To support the first eu-DOMAIN ambient intelligence service network in Europe for commercial exploitation.

The eu-DOMAIN platform will be made available in a period after the completion of the project in order to stimulate take-up activities in other application domains.

2.3.1. Objectives for user and services

The primary user objectives of the project is to develop innovative applications with on-demand delivery of services in order to enhance the work environment for mobile users and workers and to integrate them with intelligent surroundings wherever they are: In buildings, vehicles, public spaces, etc.

The services will be seamlessly accessibly through the use of mobile and fixed service gateways imbedded in the surrounding structures, e.g. buildings or vehicles, and support completely new ways of collaborative working like augmented reality support and workgroup knowledge sharing. eu-DOMAIN gateways with distributed intelligence allow for various collaborating group members working together via heterogeneous networks (mobile or fixed communication infrastructures).

The services will be location and context sensitive in order to provide targeted decision support. The location information will be provided by wide-area GPS services (Galileo) whereas the context sensitivity will be provided by automatic interaction with the surroundings using intelligent, wearable devices. Self-configuring is achieved by semantic agents searching the web for appropriate knowledge on device interfaces and interaction.

Much focus will be given to multi-lingual and multi-cultural interaction for diverse collaborative groups as well as societal acceptance and regulatory and policy issues of operating the eu-DOMAIN services. Extreme focus on usability and intelligent interfaces will aim at alleviate issues of computer illiteracy and broadly promote *e*Inclusion.

2.3.2. Objectives for business development

The question of economic drivers, value creation and sustainable business models will be thoroughly addressed, not only for the domains involved in the project but also for general industrial applications. The eu-DOMAIN project will establish realistic business models of value creation in trusted service bundles. The business models will be developed using the concept of value-nets as suggested by Brandenburger and Nalebuff to identify business

opportunities for content providers, service providers and aggregators as well as network operators and users. Specific emphasis will be made on defining and measuring value creation and identifying new business opportunities for SMEs. The business models will be validated as part of the overall platform validation.

2.3.3. Objectives for technology development

The technological objectives of eu-DOMAIN is to show how a Europe-wide ambient intelligence network can support mobile services and integrate mobile users with intelligent surroundings that provides seamless delivery-on-demand of services from content repositories. This will be achieved by building a eu-DOMAIN platform as shown in figure 4 below.

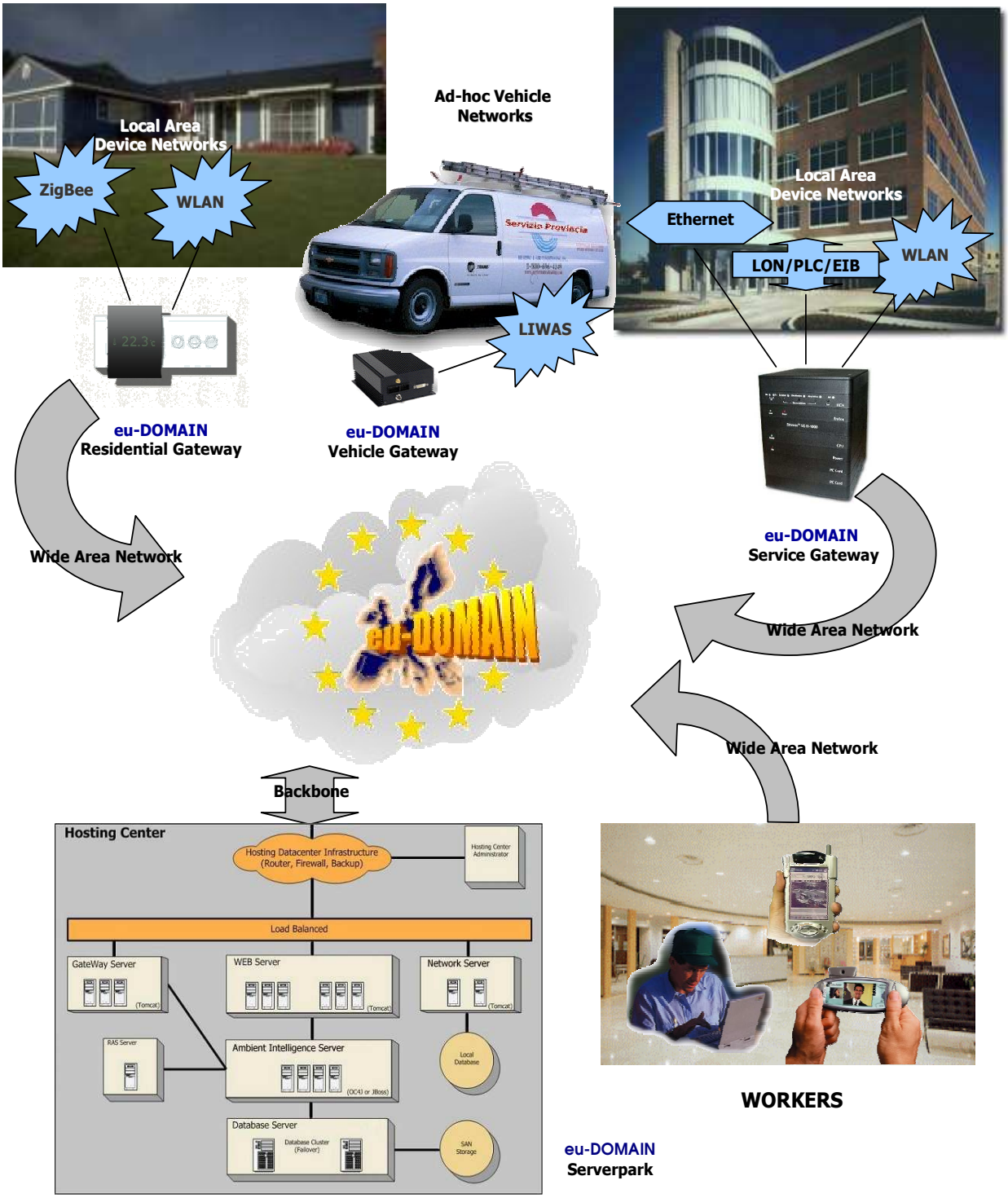


Figure 2.3: eu-DOMAIN platform

Each mobile or fixed location has one or more service gateways installed. They form the primary access point for the mobile users working in the location, and provide the location intelligence pools. They also facilitate access to existing local area networks, through which two-way communication can be established. The gateways communicate with other systems in the location via device nets (e.g. LON, WLAN or ZigBee). The gateway also facilitates access to content repositories in enterprise systems like service systems or EPR etc.

All gateways connect to the eu-DOMAIN network using IP protocols via available Wide Area Networks (UMTS and TETRA) for interoperability. A powerful eu-DOMAIN server park provides the network intelligence pool, data storage and user interfaces. Different web-services can be delivered directly to the locations via the eu-DOMAIN platform. The services are automatically negotiated from a third party Service Provider via XML schemas and semantic RDF/OWL structures. The eu-DOMAIN platform can also facilitate access to government and corporate data repositories and other content providers. Free web services, e.g. weather forecasts, traffic reports, etc., can be integrated in the service bundle.

2.3.4. Summary of objectives

The principal user service objectives of the eu-DOMAIN project can be summarised as:

1. Secure that the services reflects the identified business priorities and validate them in reference to user priorities, i.e. functionality, security and user acceptance.
2. Validate the economic feasibility of the services in the users business environment, including analysis of cost/benefit and total-cost-of-ownership.
3. Assess the potential usage of the eu-DOMAIN platform in other domains.

The principal business objectives of the eu-DOMAIN project can be summarised as:

1. Develop suitable business models based on value creation and value nets.
2. Identifying new business opportunities in particular for SMEs.
3. Build a critical mass for the commercial exploitation of eu-DOMAIN.

The principal technological objectives of the eu-DOMAIN project can be summarised as:

1. Build a wide-area ambient intelligence service platform using convergent networks.
2. Assure the ability to perform automatic roaming across heterogeneous networks in order to provide interoperable services.
3. Develop the ability to support self-configuring devices, which automatically download interface drivers, protocol structures and user interfaces from various manufactures.
4. Use a 3-tier multilevel hierarchical client/server structure as distributed intelligence pools for distributing intelligence to the appropriate level in the network.
5. Confirm the full set of technical components that need to be integrated to provide the eu-DOMAIN platform and source these components both from the technology partners own existing developments and from appropriate off the shelf products.
6. Validate the technical performance of the platform to ensure that it fully supports the identified business needs at acceptable performance levels.

3. Participant List

The eu-DOMAIN consortium partners encompasses highly skilled organisations with a wealth of the skills and experience necessary to the project's management, technical and business requirements. The consortium is:

- Functionally comprehensive with a very full and sound balance between user, technical and managerial expertise with clear and relevant roles established for each consortium partner.
- Skilled and experienced in the projects business and technical requirements with the projects requirements for user input well covered across the focus sectors of Building Facility Management and eHealth Services.
- Nationally and culturally diverse with partners from 6 European countries who conduct their business across Europe and beyond, providing the consortium with a clear understanding of the dynamic business, sociological and cultural characteristics of its potential market place.

List of Participants

Partic.Role*	Partic. no.	Participant name	Participant short name	Country	Date enter project**	Date exit project**
CO	1	C International Ltd.	CIL	UK	1	36
CR	2	Innova S.p.A.	INNOVA	IT	1	36
CR	3	In-JeT ApS	IN-JET	DK	1	36
CR	4	University of Aarhus	UAAR	DK	1	36
CR	5	Foundation for Research and Technology – Hellas	FORTH	GR	1	36
CR	6	CNet Svenska AB	CNET	SE	1	36
CR	7	T-connect s.r.l.	T-CON	IT	1	36
CR	8	Software AG Nordic A/S	SAG	DK	1	36
CR	9	Telefónica I+D	TID	ES	1	36
CR	11	Grundfos Management A/S	GMA	DK	1	36
CR	12	Eastern Birmingham Primary Care Trust	EBPCT	UK	1	36

*CO = Coordinator
CR = Contractor

A detailed description of the consortium is provided in Appendix A of this document.

4. Relevance to the objectives of the IST Priority

4.1. Contribution to 2003-04 Programme objectives

The outcome of the proposed validation will clearly contribute to the European Union objective as set out at the Lisbon European Council to *"…become the most competitive and dynamic knowledge-based economy in the world…"* through the use of appropriate emerging technologies to create an open Europe-wide Ambient Intelligence mobile platform.

The proposed validation is completely consistent with the relevant European policies as set out in the Lisbon, Stockholm and Seville councils as it is intended to help ensure that Europe does play a prominent role in capitalising on the next wave of work and business innovations. Both selected users cases help demonstrate the contribution to programme objectives:

4.1.1. The European Service Network

The 2003-04 Workprogramme recognises that:

> *"the strategy adopted in Lisbon 2000 is for an accelerated transition to a competitive and dynamic knowledge economy capable of sustainable growth, with more and better jobs and greater social cohesion. This requires wider adoption, broader availability and an extension of IST applications and services in all economic and public sectors and in the society as a whole".*

This is particularly true in the application of ambient intelligence to industrial and commercial business needs. A lack of self-configuring, open standard devices combined with a high degree of complexity has resulted in repeated difficulties in defining realistic business models with economic benefits, which again has restricted rapid development of services.

The inclusion of the concepts of self-configuring devices and distributed intelligence pools combined with semantic and intelligent decision support capabilities within the eu-DOMAIN platform will make a significant contribution to realising the vision of ambient intelligence, that lies at the heart of the ISTAG strategy.

4.1.2. Healthcare for tomorrow

The 2003-04 Workprogramme also notes:

> *"eEurope 2005 aims at a wider deployment of IST including to modernise further public services including eGovernment, eHealth and eLearning and to create a dynamic business environment. eEurope will therefore contribute to the adoption of the research results as they emerge. It will also provide feedback about their acceptance and the problems related to their use".*

The eu-DOMAIN results will make a clear contribution to the achievement of the *e*Europe 2005 Action Plan, when deployed as a decision support tool in security, emergency and healthcare applications.

4.2. Contribution to IST Programme objectives

The general policy objectives of the 6th Framework Programme in the IST area are:

- Contribution to European policies for the knowledge society and the *e*Europe Action Plan;
- Medium and long term RTD on the future generation of technologies integrating computers and networks into the everyday environment;
- Placing the individual at the centre;

- Improving integration and co-ordination of research in Europe targeted at strengthening the competitiveness of the European economy and solving societal questions.

The objective of eu-DOMAIN is targeted towards three general policy objectives of: (a) Contribution to European policies for the knowledge society and the eEurope Action Plan, (b) integrating computers and networks into the everyday environment and (c) anticipating value creation and improving the competitiveness of European industry.

(a) The eu-DOMAIN project is directly aligned with the focus on Ambient Intelligence, so profoundly embedded in the *e*Europe 2005 Action Plan and originating from the original ISTAG report on "Scenarios for Ambient Intelligence in 2010". Even though there are only a few years to go until 2010, very little of the envisioned infrastructure, applications or services are available today. The main reason for these shortcomings is the lack of uniform infrastructures, which allow the many intelligent products on the market to act in a truly "ambient" intelligent manner. The eu-DOMAIN project will seek to correct this problem.

(b) The eu-DOMAIN is highly focused on applied research in improved inter-connectivity and networking of computers into homes, buildings, cars and other locations in our everyday environment, where it puts the user in the centre by creating a fully automated, intelligent, adaptive and self-configuring environment for the mobile users.

(c) Finally, the eu-DOMAIN project will create useful and commercially valuable innovations, which will strengthen the competitiveness of the European economy by creating a new Europe-wide service platform, where especially SMEs will benefit because they are depending on secure, affordable and accessible digital networks for delivery of their products and services.

The 6th Framework Programme also calls for applied IST research to be addressing major societal and economic challenges such as:

- Trust and security
- Ambient intelligence
- *e*Inclusion
- *e*Business, *e*Government, *e*Work systems, *e*Learning
- Complex problem solving

The eu-DOMAIN project is addressing all of the above themes in its scope and is aiming at solving all of these challenges in the framework of supporting new methods of working for mobile users and workers.

4.3. Strategic Objective 2.3.2.6 Applications and Services for the Mobile User and worker

The objective of the 2.3.2.6 Strategic Objective reads:

> *"To foster the emergence of rich landscape of innovative applications and services for the mobile user and worker and to support the use and development of new work methods and collaborative work environments. These should be based on interoperable mobile, wireless technologies and the convergence of fixed and mobile communication infrastructures. Such applications and services will enable new business models, new ways of working, improved customer relations and government services in any context. The target applications and services will be capable of being seamlessly accessed and provided anywhere, anytime and in any context."*

The proposed project clearly falls within the vision for this objective, as it will, for the first time, promote realization of ambient intelligence mobile networks, to be used by SMEs and large corporations as well as government. It also clearly contributes to new work methods

and collaborative work environments by supporting the dynamic creation and maintenance of appropriate communities.

In particular, the chosen user domains will demonstrate contributions in the areas of *new business models, new ways of working, improved customer relations and government services.*

4.4. *e*Europe 2005 Action Plan

The *e*Europe action plan is based on two groups of actions, which reinforce each other. On the one hand, it aims to stimulate services, applications and content, covering both online public services and e-business; on the other hand it addresses the underlying broadband infrastructure and security matters.

The foci of the eu-DOMAIN scenarios fall directly within both the *e*Health and the dynamic e-business environment actions of the *e*Europe 2005 Action Plan, particularly in relation to the delivery of online health services and encompassing both buying and selling online and restructuring business processes to make the best use of digital technologies.

The infrastructures aspects of eu-DOMAIN are also carefully focused on addressing both the broadband and trust and security issues that surround initiatives such as those proposed by the project and the success of the *e*Europe 2005 Action Plan itself.

The eu-DOMAIN project is expected to make a contribution to all these relevant areas by promoting the early and widespread use of emergent ambient technologies and associated business models in both commercial and public service settings.

4.5. State of the Art and progress beyond it

The eu-DOMAIN is leaning heavily on leading-edge technologies[3] in different fields. The members of the Consortium, as will be demonstrated later, have an excellent insight into the state of the art in their fields. A selection of state of the art background information relevant to eu-DOMAIN is presented here. More information can be found under other initiatives.

4.5.1. Wireless World applications

The objectives of the Wireless World Research Forum[4] (WWRF) is to formulate visions on strategic future research directions in the wireless field and to generate, identify, and promote research areas and technical trends for mobile and wireless system technologies.

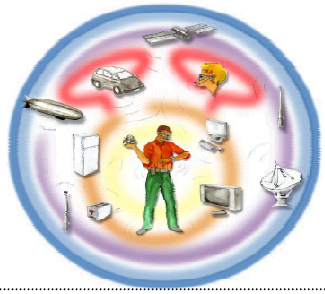


Figure 4.1: The WWRF wireless world

WWRF operates with a MultiSphere wireless environment consisting of several levels ranging from the Personal Area Network (PAN) over the Immediate Network and Instant Partners to the Cyber World.

eu-DOMAIN will encompass a few of the WWRF Building Blocks[5], namely: Semantics Aware Services, Security and Privacy, Networking and Peer Discovery.

[3] A glossary of acronyms used in this DOW is provided in Appendix B.

[4] Alcatel, Ericsson, Motorola, Nokia, and Siemens founded the "Wireless World Research Forum (WWRF)" in early 2001. A collaborative research project – IST-2001-37680 Wireless World Research Initiative (WWRI) – was completed in 2002.

[5] For a detailed description of the WWRF Building Blocks, see: WWRF - The Book of Visions 2001, www.wireless-world-research.org

4.5.2. Ambient Intelligence

Ambient Intelligence (AmI) is a conceptual vision about a future world in which ICT is used to create a user-friendly and intelligent support of personal interaction. The concept of Ambient Intelligence provides a *"vision of the Information Society where the emphasis is on greater user-friendliness, more efficient services support, user-empowerment, and support for human interactions. People are surrounded by intelligent intuitive interfaces that are embedded in all kinds of objects and an environment that is capable of recognizing and responding to the presence of different individuals in a seamless, unobtrusive and often invisible way."*[6]

The technological development of "intelligent" devices progresses rapidly with new materials and components with ubiquitous computing capabilities: Sensors and actuators embedded in devices, wearable devices and multimodal devices and interacting with users and between themselves in the physical environment with new protocols like ZigBee and IPv6. In such cases, the information exchange would be based on dynamically configurable networks of low power interfaces located in appliances with varying information-processing capabilities.

The eu-DOMAIN will implement decision support intelligence based on logic state structures.

4.5.3. Semantic Web

The Semantic Web is the representation of data on the World Wide Web. It is a collaborative effort led by The World Wide Web Consortium (W3C) with participation from a large number of researchers and industrial partners. It is based on the Resource Description Framework (RDF), which integrates a variety of applications using XML for syntax and URIs for naming. When looking at a possible formulation of a universal Web of semantic assertions, the principle of minimalist design requires that it be based on a common model of great generality. Only when the common model is general can any prospective application be mapped onto the model. The general model is the Resource Description Framework.

OWL is a language for defining structured, Web-based ontologies, which enable richer integration and interoperability of data across application boundaries. Early adopters of these standards include medical communities, corporate enterprise and governments. OWL enables a range of descriptive applications including managing web portals, content-based searches, enabling intelligent agents, web services and ubiquitous computing.

W3C has now issued OWL as a W3C Candidate Recommendation, which is an explicit call for implementations, indicating that the specification is stable and ready for implementation.

eu-DOMAIN will use RDF and OWL to formulate semantic searches for methods of interaction and data exchange among devices and terminal in order to support self-configuration and service deliver on-demand.

4.5.4. Position location-based services

A major prerequisite for rollout of location-based services is the availability of information on a users exact position. Positioning systems are already revolutionising air traffic control, ship and lorry fleet management, road and rail traffic monitoring, the mobilisation of emergency services and the tracking of goods carried throughout the world.

In buildings and other fixed locations, the users position can quite easily be established through identification devices like RFIDs, biometrics login, automatic terminal discovery, etc. In open areas satellite radio navigation (GPS) is used to determine the users position precisely in longitude, latitude and altitude at any given moment, by picking up signals emitted by orbiting satellites. The Galileo programme, a joint European Commission and European Space Agency initiative, represents the first global satellite positioning and navigation system designed specifically for civilian use worldwide. Based on a constellation of 30 satellites orbiting at an altitude of 24 000 kilometres, Galileo will provide a wide range

[6] ISTAG AmI scenarios for 2010

of improved and more reliable services to users over the entire surface of the earth. eu-DOMAIN will establish contact to the Galileo organisation for setting up a prototype access network for use in the eu-DOMAIN use-cases.

Vehicles travelling in urban areas use the eu-DOMAIN technology to establish a communication network among a group of vehicles and their surroundings. In combination with in-vehicle data acquisition equipment and GPS data, they collect location-based information and transmit it to a central application server for further processing and decision support.

4.5.5. Communication infrastructure

The eu-DOMAIN will use several communication infrastructures in order to demonstrate interoperability and roaming of services.

Universal Mobile Telecommunications System (UMTS) represents an evolution in terms of services and data speeds from today's "second generation" mobile networks. As a key member of the "global family" of third generation (3G) mobile technologies identified by the ITU, UMTS is the natural evolutionary choice for operators of GSM networks. Using fresh radio spectrum to support increased numbers of customers in line with industry forecasts of demand for data services over the next decade and beyond, UMTS is synonymous with a choice of WCDMA radio access technology that has already been selected by approaching 120 licensees worldwide[7], one of them being Telefónica Moviles Espana. As partner in the eu-DOMAIN project, Telefónica I+D will provide access to the UMTS infrastructure for testing eu-DOMAIN applications.

TErrestrial Trunked RAdio (TETRA) is an open digital trunked radio standard defined by the European Telecommunications Standardisation Institute (ETSI) to meet the needs of the professional mobile radio users. TETRA provides a wide range of data transmission capabilities, from simple text messages to advanced applications based on packet data techniques to transfer large amounts of information quickly and easily using standard Internet Protocol (IP). TETRA can seamlessly manage voice, telephony, video and data in a control room. Automatic Vehicle Location (AVL) application can track and manage fleets of vehicles over a wide area.

4.5.6. Business modelling

Business exploitation has clearly been trailing the technological development and despite many predictions to the contrary, ambient intelligence concepts have still not reached commercial breakthrough in Europe or USA.

Network operators like Telco’s are interested in increasing their average monthly revenue per subscriber and decreasing customer churn to competitors so they want to offer bundles of value-added services. These services must be priced right, easy to access and compelling to consumers in order to drive usage. Operators have been developing business models for the delivery of stand-alone digital value-added services, but they are very cautious about rolling out new services because uncertainty about what will be successful[8].

Security companies, facility management firms, construction firms, healthcare authorities etc. are also looking for business opportunities with new products and services based on connected buildings, but they too have difficulties in defining the right services and achieve critical mass in their smaller, proprietary networks.

The reason for the lacklustre business performance is generally agreed to be a combination of the following shortcomings:

[7] The UMTS Forum

[8] William Bao Bean, Digital Home Industry Overview, Banc of America Securities, 2001

- No real understanding for how value creation is achieved and lack of realistic business model causes business cases to fail.
- Lack of simple, affordable plug-and-play products makes it too difficult for non-technical users.
- Existing products and infrastructures cannot be reused, forcing too high replacement costs.
- Little socio-economic knowledge about perception and user needs causes uncertainty about the scope and limitations of ambient intelligence networks.

The eu-DOMAIN project will overcome these obstacles, by – for the first time – establishing realistic business models of value creation in trusted, societal acceptable service bundles.

4.6. Related EC funded and other projects

The Consortium will participate in the clustering events and conferences organised by the Commission in order to present the progress of the project and to carry out collaboration with other projects related to mobile networks, web services, Ambient Intelligence and general Knowledge Management.

The eu-DOMAIN project will link to other international initiatives in the field. The project will establish link to the following international initiatives:

4.6.1. *AMI @ Work family of communities*

The eu-DOMAIN project will participate as an active member of the new initiative AMI @ Work family of communities. Ambient Intelligence @ Work is the common heading for a family of self-organising ERA communities relating to New Working Environments. The communities link people in new and existing member states and beyond, with the aim of facilitating new working environments innovation.

The purpose for eu-DOMAIN to link with AMI @ Work is to collaborate with other New Working Environments users and projects in Europe, in order to disseminate and increase awareness of the eu-DOMAIN service, stimulate synergies and avoid duplication of work, possible integrating functionality with other projects, finding collaboration partners in the new member states and last, but not least, facilitate exploitation of the eu-DOMAIN service. A preliminary contact has been made to the Support Action *MOSAIC* about developing a live video storyboard of the eu-DOMAIN project for continuous presentation to the communities during the project.

Since the eu-DOMAIN service has the ability to be delivered across heterogeneous networks and providing a multitude of services, it has the potential of becoming a standardised platform for other projects as well. eu-DOMAIN will work throughout the AMI @ Work communities to promote the idea of using eu-DOMAIN - when it becomes functional - as a service platform, which can facilitate the presentation of New Working Environments concepts and semi-finished prototypes from other projects to the communities.

Already now, agreements have been made to explore possibilities with two other Integrated Projects from the 2nd call: *wearIT @ Work* (development of wearable computing devices for the augmented reality part of the eu-DOMAIN use case) and *MyCAREVENT* (Integration of European Vehicle Emergency Network with the mobile gateway technology in eu-DOMAIN). Further, a first contact with IP *MobileLife* (which is linked to the Wireless World Initiative, see below) has also been established.

It has been planned that eu-DOMAIN will be permanently represented in the two communities: Well-being @ Work and Mobility @ Work. Other communities will be continually as the project progresses.

4.6.2. OSGi

The OSGi Service Platform leverages and links two key market trends - the ubiquity of broadband connectivity and Internet access in homes, offices, vehicles and mobile/portable devices, and the emergence of new applications and services in networks and networked devices.

In the OSGi world, a services gateway can be a set-top box, cable or DSL Modem, a PC, a web phone, or a dedicated automotive, multimedia, or residential gateway. Today, multiple services (i.e. traditional telephony, Internet access, video and other on-demand content, interactive entertainment, mobile commerce, telemetry and energy management, home appliance control, etc.) can be bundled and managed by any of the traditional service providers. These services are offered via the Internet and various last mile broadband connections to the home, small office, and or to mobile/remote devices.

While there are many wide-area network and home networking standards, there has been no service delivery specification. The OSGi specifications provide the 'glue' in this new value chain, through an open-platform independent framework and API's that allows for the dynamic delivery of managed services with secure, scalable and reliable metrics. eu-DOMAIN will deploy the OSGi framework in service gateways. More information at: www.osgi.org.

4.6.3. WWRF

The "Wireless World Research Forum" (WWRF): The objective of the new forum is to formulate visions on strategic future research directions in the wireless field, among industry and academia, and to generate, identify, and promote research areas and technical trends for mobile and wireless system technologies. It is intended to constructively contribute to the work done within the UMTS Forum, ETSI, 3GPP, IETF, ITU, and other relevant bodies regarding commercial and standardisation issues derived from the research work.

The WWRF has issued a comprehensive “Book of visions 2001” which addresses many of the aspects of eu-DOMAIN for the wireless networks. The eu-DOMAIN project will, as one of its first tasks, establish a working relationship with relevant committees of WWRF. More information at: www.wireless-world-research.org

4.6.4. WWRI

The “Wireless World Research Initiative” (WWRI) is an accompanying measure under the IST-programme in the Fifth Framework Programme.

Many years of rapid market expansion have been followed by dramatic cutbacks in due to reduced global economic activity. At the same time, new wireless technologies are emerging and systems work on beyond 3G has been started. Strategic directions in the sector need to be reassessed to prioritise research topics in the 5 to 10 years timeframe. Key players in the wireless sector initiated the WWRI project to provide a launch pad to the wireless community (industry and academia) for a balanced cooperative research programme for the Wireless World.

The operational objectives of the project are to analyse the state of the wireless sector and its likely transformations and to establish research framework for the future wireless sector. The project consortium consists of representatives of all players of the telecom value chain. Operators, manufactures and academia are joining forces to establish concepts and key requirements for future research within the telecommunication area. More information at: www.ist-wwri.org.

4.6.5. e-PASTA

The “e-Protection of Appliances through Secure and Trusted Access” (e-PASTA) is a RTD project under the IST-programme in the Fifth Framework Programme.

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 OSGi initiative). 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 standardisation in the home networking and gateway community. More information at: www.trialog.com/e-pasta/about/index.htm.

4.6.6. Galileo

Satellite radio navigation allows the possessor of a small receiver to determine his position very precisely in longitude, latitude and altitude at any given moment, by picking up signals emitted by orbiting satellites. Such systems are already revolutionising air traffic control, ship and lorry fleet management, road and rail traffic monitoring, the mobilisation of emergency services and the tracking of goods carried throughout the world.

The Galileo programme, a joint European Commission and European Space Agency initiative, represents the first global satellite positioning and navigation system designed specifically for civilian use worldwide. Based on a constellation of 30 satellites orbiting at an altitude of 24 000 kilometres, Galileo will feature full interoperability with the American GPS and Russian Glonass systems, both of which are designed for military use. Galileo will provide a much wider range of improved and more reliable services to users over the entire surface of the earth. Several types of signal will be provided, from one that is free to anyone to signals for a number of specific users such as safety-of-life and governmental users. More information at: europa.eu.int/comm/dgs/energy_transport/galileo.

5. Potential impact

5.1. Strategic impact

By helping to place European companies at the forefront of the development and deployment of ambient intelligent technologies eu-DOMAIN has the potential to significantly increase the competitiveness of European businesses in two main ways. In the first instance it will provide SMEs with an easy-to-deploy strategic platform for using ambient intelligence technologies in their products thereby giving them a comparative advantage against large firms, who have huge resources for developing proprietary platforms. In the second instance, small companies can drastically improving time-to-market of new products and services by simply renting access to the ambient intelligence platform from service providers. This will also ensure that European companies are amongst the first to realise the strategic advantages of an ambient intelligent platform to support mobile workers and hence will provide them with tools to stay in the forefront in their respective markets in a global competitive environment.

The eu-DOMAIN project is also focused on correlating socio-economic, regulatory and policy issues with the deployment and wide spread use of ambient intelligence platform. Aspects of e.g. social acceptance, economic performance, regulatory frameworks for surveillance and control of private citizens, privacy of data, governmental provisions for health and safety, etc. will be addressed and integrated with the functional and trust and security user requirements to round off the package of specifications for socially acceptable new ways of working.

The infrastructure, applications and services to be provided out of the project clearly have the potential to make a major contribution to solving societal problems both through their support in the delivery of directly relevant public services, as illustrated by the Healthcare for tomorrow scenario to be validated during the project, and indirectly by facilitating the full set of benefits that can be realised from a proper knowledge based economy.

5.2. Economic impact

The eu-DOMAIN project represents a specific application of the integration of a number of emerging technologies in the form of an infrastructure and set of applications and services. The specific scenarios being validated here are in the *e*Business and *e*Health domains but the results will have wider applicability in many other domains, which will be further explored in the take-up activities.

The importance of the scenario domains selected is demonstrated by their prominence in the *e*Europe 2005 Action Plan and reflects the fact that they play highly important economic and social roles in Europe. A platform that significantly improves both the efficiency and effectiveness of a market of this size and importance must by definition have a major impact at the European level.

The platform will have a clear economic impact on the business users of the platform. By opening up the possibilities that ambient intelligence offers to all businesses, no matter how large or small, eu-DOMAIN has the potential to make a significant economic impact on their operations through improved competitive position. The potential for generating economic benefits is further enhanced by the efficiency gains that will arise from the possibilities for introducing the new and more effective collaborative ways of working that are enabled by the technologies embedded in the eu-DOMAIN platform. All of this will be provided in a business modelling framework for direct implementation in the companies.

Citizen users will similarly realise both economic and social benefits both eu-DOMAIN as a result of their more efficient and effective interaction with all types of organisation using eu-DOMAIN. The individual partners have the opportunity to realise individual exploitation opportunities, which is being addressed in the exploitation discussion below.

5.3. Technology innovation

The main technological innovation in eu-DOMAIN lies in its innovative 3-tier hierarchical client/server structure with multilevel distributed, configurable intelligence pools. This structure opens up for at wealth of different applications, which can be integrated into the Europe-wide ambient intelligence service network.

Another very innovative feature is self-configuring devices that use semantic agents to search for configuration setup, protocols and user interfaces. Application specific intelligence pools perform intelligent adaptation and user setup, tailored to the users precise needs in the actual situation.

A further feature of eu-DOMAIN is the web based service-provisioning platform, which allows any service provider (industrial, healthcare, government, etc.) to deliver web services to people and devices in any location across Europe.

Finally, eu-DOMAIN will be the very first ambient intelligence civil applications to utilise the full potential of the new UMTS and TETRA communication infrastructures.

5.4. Business innovation

An integral part of the eu-DOMAIN project is the analysis and development of realistic business model for users and service providers. New research into defining and measuring value creation in web service networks will be undertaken, leading to innovative business structures involving content providers and service providers in collaborative systems.

Network operators and others will be provided with a novel framework for increasing business opportunities, by setting up platforms for collaborative value nets based on eu-DOMAIN. Acting as service providers or service aggregators, whey will be able to offer services to a large amount of content providers and thereby overcoming uncertainty about precisely what services will be successful.

Industrial companies in a wide range of sectors will be provided with a business model for implementing eu-DOMAIN platform to support ubiquitous intelligence in their entire product range with a standardised, easy to use interface. They will also be able to bring out new, innovative services to enhance customer satisfaction.

Specific emphasis will be made on identifying new business opportunities for SMEs. Especially SMEs with few products and limited resources find it difficult and expensive to embed ubiquitous intelligence in their products, because they need to communicate via e.g. GSM and Internet. eu-DOMAIN will benefit SMEs because it will provided an open, secure, affordable and accessible platform for communication to their products and delivery of new, innovative services, including easy and open interaction with other manufacturers products.

Governments, especially in the healthcare and social services area, will be provided with a fully developed platform for delivering public services directly to the citizens' homes and integrate mobile workers in the platform using existing communication networks. The potential is enormous for improving quality and reduce costs in this area.

The eu-DOMAIN platform will be available for a period after the completion of the project in order to stimulate take-up activities in other application domains.

5.5. Added-value at the European level

5.5.1. European dimension of the problem

The European dimension of the challenge being addressed by the eu-DOMAIN platform is addressed in the introductory sections of the proposal. Interoperability is a serious issue for cross-European infrastructures, requiring automatic roaming across heterogeneous structures in order to provide interoperable services across national and regional boundaries. This problem can only be solved by a network topology as proposed in the eu-DOMAIN.

The broad acceptance of new communication infrastructures such as UMTS and TETRA is a major European concern. EU has, through ETSI and other bodies, been instrumental in the development of these new infrastructures. Widespread public and business use of new services provided on these infrastructures are eagerly sought after.

For business development in an open European market, multilingual functionality is necessary. The eu-DOMAIN will be designed with multilingual functionality and will simultaneously offer all the languages of the EU. The aim is to speed up the deployment of eu-DOMAIN as a pan-European infrastructure.

5.5.2. European added value of the consortium

The proposed consortium has clear European added value. The sheer amount of leading-edge technologies needed to realise the eu-DOMAIN platform, requires a cross-border and cross-sectoral approach.

The technology and application developers belong to the most innovative knowledge bases within software architecture, web services and telecommunication infrastructures. The partners also bring together a unique combination of both technical and business skills and experience necessary to form an effective consortium.

The user participants have been selected due to the pan-European nature of their operations and sectoral diversity.

5.6. Contributions to Standards

The project will not make any direct contribution to the development of standards but it will certainly help with the dissemination and adoption of relevant, emerging standards such as XML, RDF, OWL and SOAP

It will also promote the standardisation of services to be delivered on high profile EU based infrastructures such as TETRA, UMTS and Galileo.

5.7. Contribution to Policy Developments

eu-DOMAIN will contribute to general EU policies in the following areas:

5.7.1. Quality of life and health and safety

It is clear that the outcome of this project could have an impact on the quality of life of European citizens in a number of ways. It will result in the delivery of higher quality and more timely services to citizens wherever they happen to be, particularly in the collaborative healthcare and customer support fields that form the foci of the scenarios, but also more generally as the results of the work are deployed elsewhere. It will also significantly improve the quality of life of a very large number of mobile workers across Europe who will, for the first time, be provided with effective, customised support for new and collaborative ways of working wherever they happen to be. These impacts will not be weak and indirect but very strong and extremely direct and capable of being quantified in a directly measurable way.

5.7.2. Employment

The main expected result of the project is not to make a major contribution in the field of employment. However, by facilitating mobile working it may open up new employment opportunities to people who currently do not have the skills, digital or otherwise, to be able to operate effectively in these roles without such support. It may also have the indirect effects of improving mobile workers digital skills and hence their employment prospects as well as potentially increasing overall employment levels by helping to improve the competitiveness of European businesses.

5.7.3. Preservation and enhancement of the environment and conservation of natural resources

In the European Service Network, one of the specific aims of the project is to improve energy conservation in pumping and heating system by improved preventive maintenance and upkeep of component. It is estimated, that 1½% of the worlds production of electricity is consumed by Grundfos pumps worldwide. A slight improvement in the pumps operating conditions due to continuous monitoring and better service can save large amounts of energy, resulting in reduced ash generation and less emission of CO_2, SO_2 and NO_x. Emission of CO_2 alone amounts to 0,5 metric tons per MWh electricity generated. Community research is aiming at reducing EU energy requirements in buildings by 30% by 2010 and 50% in the longer term. Currently, the built environment in the EU accounts for about 40% of the total energy requirements. eu-DOMAIN will be an important step towards realisation of these goals.

The Healthcare for tomorrow application will inevitably lead to more efficient and effective use of resources in the healthcare area as more co-ordinated ways of working are enabled. This will have significant impact on travel levels and patterns leading to major energy savings. Also here, eu-DOMAIN will help to achieve community goals of improving the energy and environmental performance of vehicles and the related infrastructure.

In most cases, *e*Work will lead to significant reductions in paper communications and hence contribute to the further preservation of forest resources. Also by facilitating the identification and resolution of potential problems at the earliest possible stage it will help to prevent the need for the typically more resource intensive solutions that are typically required the longer a problem is left before being addressed.

6. Project Management & Exploitation

6.1. Project Management

6.1.1. Management Activities

eu-DOMAIN's project management activities are responsible for ensuring that the project is completed within the terms of the contract with the European Commission. This includes ensuring that:

- Appropriate agreements and management framework are in place between the partners,
- All the projects activities are properly coordinated with appropriate levels of legal, contractual, ethical, financial and administrative management of the consortium
- Proper operational project management is provide throughout the project
- The project's work is completed to the expected timescales, resources and quality levels
- Appropriate reporting to the European Commission is undertaken.

An extremely experienced management team from CIL has been identified for the project. The individuals involved have successfully run many past European Research projects, and, as can be seen from their curricula, have many years of industrial experience.

The management procedures have been designed to specifically deal with the management requirements of the EU-DOMAIN Project they include the following:

- Consortium Agreements:
  - Definition of rights regarding IPR management and access, including patent searches
  - Management of knowledge generated by the project, and rules for knowledge transfer
  - Structure of project, project activities, reporting mechanisms, controls, penalties and
  - Rules for partners joining and leaving the consortium.
- Project Coordination and Management:
  - Definition and implementation of the management framework (structure and procedures) to be adopted throughout the project
  - Co-ordination of the management and technical activities of the project
  - Project Reporting, archiving and automatic generation of management material
  - Appropriate guidelines for each of the participants and the coordination of cost statements and audit certificates
  - Overseeing the management of quality control, ensuring high standards of excellence.
- Consortium Evolution:
  - Competitive calls to find new participants for inclusion in the project when necessary, and the funding to be assigned to them
  - Feasibility studies for creation of spin-offs
  - Overseeing Exploitation and Dissemination of results
  - Exploring take-up activities.

6.1.2. Coordination

At different levels in the structure, appropriate technical and coordination activities will ensure that the project runs smoothly, making certain that the goals are clearly defined and understood, that the workpackages and tasks represent a sensible division of the work and include the necessary expertise to fulfil the objectives, that responsibilities are clearly assigned, and that there are clear lines of communication among the participants.

6.1.3. Quality Plan

Progress of the work in the project will be monitored against the milestones and the objectives defined in this description of work document. To this end a project Quality Plan will be produced at the start of the project. This document will be the reference point for the quality procedures for the whole project. It will include a set of product descriptions for each of the project deliverables which include the definition of the quality criteria against which the deliverable will be assessed for fitness for purpose and the quality method that will be used to test this compliance.

The plan will define a set of rules for the organisation of the day-to-day cooperative work, including the procedures to be used, the reporting mechanisms, the organisation of meetings, and the preparation of documentation for submission to the EU.

Quality Control is managed first at a task level, then at workpackage level through overall project and technical management, and task and workpackage leaders with the overall quality control function reporting to the Project Manager and the project's board.

The quality plan establishes the on-going evaluation and assessment requirements built in to each workpackage, with their coordination and management under a dedicated review and assessment workpackage, to ensure that the progress towards the attainment of the projects objectives is properly monitored and clear at any given time.

6.1.4. Guidelines and communication

The project management function will also be responsible for advising and preparing guidelines for the project participants so that they understand how to keep track of project costs, which costs are eligible, how they should be documented and reported, and what budget has been assigned to them.

Existing telecommunications and information technology, such as email, and web management, will be routinely exploited in order to optimise the level of resources needed for the project and thus maximise the resources available for the technical work.

However, and very importantly, appropriate face-to-face communication between partners at all levels of the project's structure will be employed throughout the project to ensure a common understanding of the work required to attain the project's objectives. This will take the form of both formal and informal meetings such as scheduled Project steering meeting, workshops and technical meetings together with ad-hoc meetings as the need arises.

6.2. Project Structure

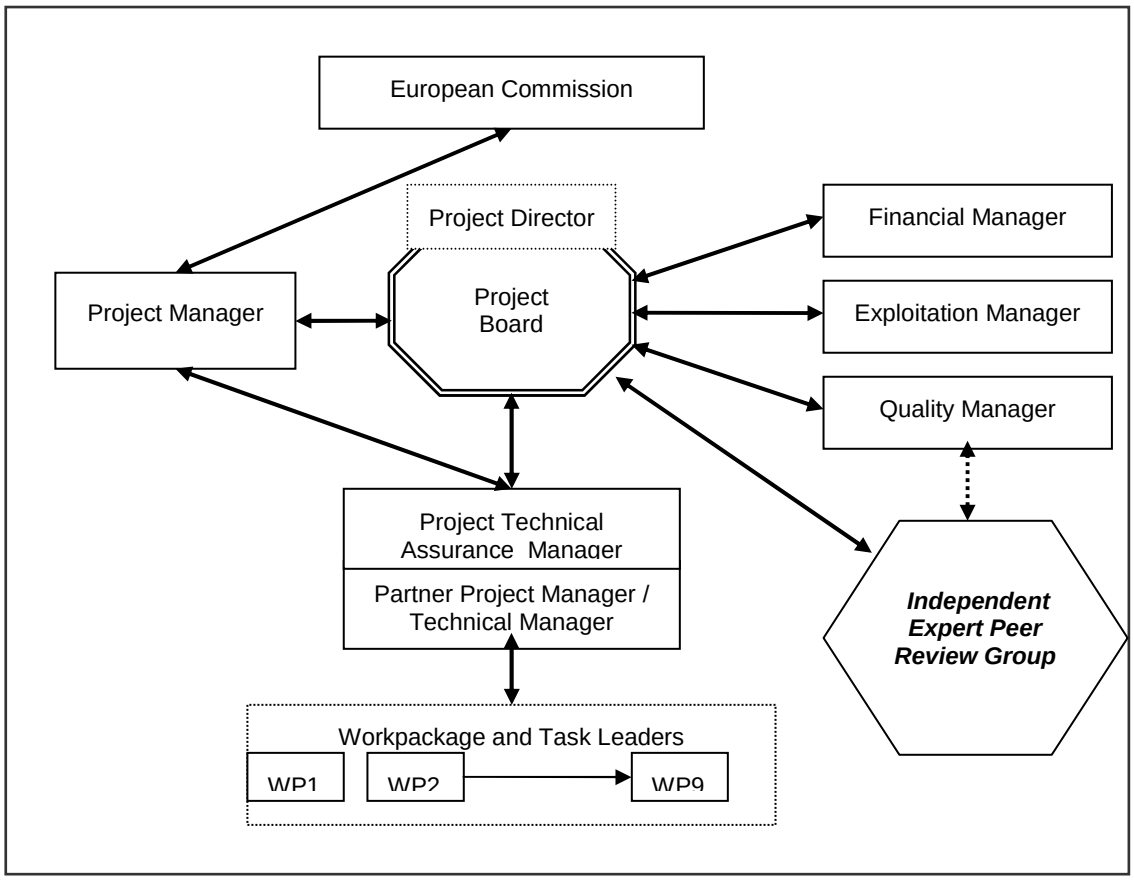


Figure 6.1 : EU-DOMAIN project structure

6.2.1. Project Board

From a structural point of view, the project will be supervised by a project steering committee – the Project Board, which will address the main decisions concerning the project. It is composed of one Management Representative from each partner plus the Project Manager and is chaired by the Project Director. The Project Board is formally empowered by the project's Consortium Agreement to take decisions affecting the budget and the objectives of the project, changes to the consortium, and exploitation agreements, and is the highest authority for conflict resolution, with the Project Director having a casting vote if necessary. The Board will meet when needed, normally every three to four months, and as a minimum at the key milestones of the project such as completion of each workpackage/major /milestone.

Additional members, such as partner's project and technical managers will attend the Project Board meetings as agreed. The roles are not exclusive in that the Project Board representative for a partner may also be the partner's project manager or technical manager if appropriate.

The Project Director is responsible for the overall execution and strategic management of the project and chairs the Project Board. Due to the strong business prospects of the EU-DOMAIN project, the Project Director will also be responsible for monitoring the evolution of the project towards its commercial goals, taking initiatives where necessary in order to ensure that these goals are met.

All members of the Project Board will have an equal say in the project. Where necessary, decisions will be taken by voting, when all of the members will have one vote. In cases of equal numbers of votes, the Chairman's decision will prevail. Additional members, such as partner's project and technical managers will attend the Project Board meetings as agreed;

roles are not exclusive in that the Project Board representative for a partner may also be the partner's project manager or technical manager if appropriate.

The Project Director for EU-DOMAIN will also fulfil the role of exploitation manager.

The Project Board responsibilities shall include:

- Deciding upon the allocation of the Project's budget to Work Packages in accordance with the Contract, including the Project Plan, and reviewing and proposing to the Contractors budget transfers
- Making proposals to the Contractors for the review and/or amendment of terms of the Contract and/or the Consortium Agreement
- Deciding to suspend all or part of the Project or to terminate all or part of the Contract, or to request the Commission to terminate the participation of one or more Contractors
- In case of default of a Contractor agreeing on actions to be taken against the Defaulting Contractor, including a request to the Commission for an audit or for the assistance of the Commission, and making proposals to the other Contractors to assign the Defaulting Contractor′s tasks, and if appropriate to agree upon a new entity to join the Project for that purpose
- In case of default of the Co-ordinator in the performance of its tasks as a coordinator, agreeing on actions to be taken and possible nomination of a new Co-ordinator
- Deciding upon the entering into the Contract and the Consortium Agreement of new Contractors
- Deciding upon the designation of the depository and rules for the management of the funds received from the Commission and for the management and co-ordination budgets rules
- Deciding upon major changes in Work Packages and the technical roadmap for the Project
- Agreeing press releases and publications by the Contractors or by the Commission or with the Commission with regard the Project as per the Commission contractual rules. Supporting the Co-ordinator in preparing meetings with the Commission and related data and deliverables.

The eu-DOMAIN Consortium will use reasonable endeavours to amicably settle any dispute arising among them in relation to the implementation of the Contract for such purpose, to bring the dispute at the appropriate body level. Failing to reach an amicable settlement within 2 calendar months of a dispute arising, then any dispute arising out of or in connection with the eu-DOMAIN Contract and/or the eu-DOMAIN Consortium Agreement shall be referred to mediation under the auspices of the Centre For Dispute Resolution (CEDR) who shall apply their Model Dispute Procedure, unless the parties agree otherwise. The mediation shall take in London and be conducted in English. Failing to reach an amicable settlement within 2 calendar months of a dispute being referred to mediation, it shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said Rules.

6.2.2. Project Manager

CIL will provide the Project Manager who will report to the Project Director and will be responsible for the day-to-day management of the project and its operational execution. He will implement the agreed strategies, oversee the choice of techniques, and supervise the monitoring of the results. He will also implement the decisions taken by the Project Board and be responsible for taking any decisions between Project Board meetings, seeking its approval if necessary.

The Project Manager will undertake all liaisons with the European Commission and act as the consortiums designated representative in this respect.

The Project Manager will work closely with the project's partners and oversee the technical and quality management functions to ensure that the eu-DOMAIN objectives are achieved. Each partner will designate a local Project Manager who will be responsible for liasing with the Project Manager on all project management matter relating to their partner.

6.2.3. Technical and Quality Management

CIL will designate a project Technical Assurance Manager and the Project Board will designate a project Quality Manager from within the consortium to work closely with the Project Manager and Partner's. The Technical Assurance Manager will report to the Project Manager and co-ordinate the project's internal technical assurance and evaluation function.

These internal project roles will be responsible for supporting the Project Manager in validating that the project attains its technical objectives (as identified in the DOW, detailed workplans, the project's quality plan and additionally by the Project Board), are fully met, and that all technical issues are identified and managed. They will advise the partners, Project Manager and the Project Board on the projects technical and quality aspects throughout the project.

The Quality Manager will co-ordinate the quality assurance function. They will be responsible for validating that the project's quality plan is being implemented, that all quality issues are identified and managed and that the project attains its quality objectives throughout the project. The Quality Manager will advise the partners, Project Manager and the Project Board on the projects quality aspects throughout the project.

Very importantly the Quality Manager will oversee the support activities of the Independent Expert Peer Review Group and ensure their full engagement in the project's review and assessment workpackage. This peer review group will supplement the project user group but will be smaller in number (two to three experts in appropriate fields) and will focus on the independent evaluation of the project's on-going work. Its role will be to review the projects work and outcomes and advice the Project Board. Its activities will be coordinated through the project's Quality Manager.

Each partner will designate a local (internal) Technical Manager, who may also fulfil the role of local Project Manager, who will be responsible for liasing with the Project Manager and project Technical Assurance Manager on all project technical matters. These will be responsible for work and resource allocation at the partner level.

These roles will ensure that the technical and quality requirements of the project are fully implemented in the production of the projects deliverables, that resources are deployed in an optimum way and that all necessary liaison with other elements of the consortium is carried out.

Partners will meet as often as necessary, and in appropriate groupings, to address technical issues and synchronise work tasks. Technical issues impacting the overall strategy of the project will be addressed by the Project Board.

6.2.4. Workpackage and Task direction

Each workpackage is under the responsibility of a single partner who designates a workpackage leader to oversee the work of the workpackage. The workpackages are split into a set of tasks, the main responsibility of which will reside with a single partner, with each task in turn having a task leader assigned.

The workpackage leader organises the work on the tasks between the concerned partners and is in charge of producing the project deliverables from the workpackage, for delivery to the Project Manager. They will work in close liaison with the other partners, task leaders and the project's Technical Manager.

6.2.5. The Exploitation Manager

The Exploitation Manager (EM) will be a senior business development person with experience in the R&D development and dissemination field. The Exploitation Manager's role is that of ensuring the successful outcome of the project, in terms of future sustainability and the management of the knowledge coming out of the project. He will co-operate closely with the QAM, so that sufficient market feedback is put into the project, addressing the issues of competition and positioning. He will also be supported by an Exploitation Team, with members assigned by each potential exploitation partner, so as to clearly define the marketing and exploitation strategy for the eu-DOMAIN platform.

6.2.6. Project Administration and Financial Management

The Project Administrator, a specialist from the co-ordinating partner, will be responsible for the administration of the internal consortium structure along with formal administrative arrangements with the EC (such as cost statement gathering and submission, etc.).

The Financial Manager is the accountant for the co-ordinating partner CIL and will be responsible for the financial administration of the project, including ensuring the proper completion and consolidation of the Cost Statements and their timely submission to the Commission.

6.3. Reporting

The formal periodic project periods for EU-DOMAIN are at every 12 months. For months 1 through 12. 13 through 24 and 25 thru 36, the consortium will submit a detailed activity progress, management and financial report to the European Commission, together with partner cost statements and an audit certificates as appropriate. In addition to this reporting cycle the project will submit quarterly progress reports to keep the European Commission informed of progress.

The reports will be submitted to the Commission within the period specified under the eu-DOMAIN contract.

For all reports, where they exist, the Consortium will use the formats laid down by the Commission. They will include:

- For quarterly reports:
  - A management-level overview of the activities carried out by the project during the period and effort incurred;
  - A description of progress toward the scientific and technological objectives and associated innovation-related activities;
  - A description of progress toward the milestones and deliverables foreseen;
  - Identification of problems encountered and corrective action taken.
- For period reports (in additions to quarterly report contents)
  - Summary financial statement cost breakdown showing the total eligible costs incurred broken down by cost category and type of activity
  - Justification of costs incurred against progress and resource usage reported for partners
- Each period report will be accompanied by
  - A formal signed Cost Statement per participant and summary report of these and the reimbursement distribution to date
  - An appropriate Audit Certificate (furnished by an independent auditor under the terms of the EU-DOMAIN contract) as agreed with the European Commission.

6.4. Consortium Agreement

6.4.1. Overview

Before the project commences, the consortium members will sign a formal Consortium Agreement in which roles, responsibilities and mutual obligations will be defined. These will include the questions of IPR, and the structure and organisation of the project. It will adopt the recommended guidelines laid down by the Commission and will include:

- Specific arrangements concerning intellectual property rights to be applied among the participants and their affiliates, in compliance with the general arrangements stipulated in the contract;
- Management of knowledge generated by the project, and rules for knowledge transfer
- The internal organisation of the consortium, its governance structure, decision-making processes, reporting mechanisms, controls and management arrangements;
- Arrangements for the distribution of the Community contribution among participants and among activities;
- Rules for partners joining and leaving the consortium
- Provisions for the settlement of disputes within the partnership.

6.4.2. Evolution of Consortium

The Consortium Agreement will specify the rules for partners leaving and joining the consortium. Partners may *voluntarily* leave the consortium, provided that specific procedures are followed and that their responsibilities and possibly their liabilities have been reassigned.

Partners may also be asked to leave the consortium in case of defaulting on their obligations. The mechanism to accomplish this will also be defined in the Consortium Agreement, and it is in order to manage these difficult questions, that in eu-DOMAIN it has been decided to not accept any participant who does not sign the Consortium Agreement before the start of the project.

Under the Sixth Framework Programme, the participants in a project have been granted increased autonomy to manage the project and regulate amongst themselves a number of issues, which previously were regulated by the EU Contract. It is crucial that these be clearly defined beforehand.

The procedures for identifying and accepting new participants in the project will similarly be defined in the Consortium Agreement.

6.4.3. Management of knowledge and access rights

These have been clarified and simplified in the EU model contract. Any specific exceptions or circumstances will be included in the Consortium Agreement before the project starts. Provisions for protecting pre-existing know-how and IPR will also be included in the agreement.

The owner of knowledge must provide adequate and effective protection for knowledge that is capable of industrial or commercial application. eu-DOMAIN participants may publish information on knowledge arising from the project, provided this does not affect the protection of that knowledge. So before any knowledge dissemination takes place, the matter must be presented to the Project Board, which will decide if this is to be allowed. The Project Board will take its decision based on its interpretation of the Consortium Agreement.

Participants will also be able to *use* knowledge which they own arising from the project, in accordance with the provisions agreed amongst them in the Consortium Agreement. When using knowledge, the eu-DOMAIN participants will take into consideration the following elements:

- The benefits of swift dissemination (in order to avoid duplication of research efforts and create synergies between actions);
- The need to safeguard intellectual property rights;
- Confidentiality;
- The legitimate interests of the participants.

6.5. Risk Management

The eu-DOMAIN Project Manager will maintain a risk management log throughout the project and report against its progress to the Project Board. The following table summarises the eu-DOMAIN risk plan, which will be further developed and managed as part of the WP1 Project Management workpackage.

Risk	*Impact*	*Preventative/Remedial action*
The user requirements identified for the scenarios are not feasible within the scope of the project.	Not all of the requested functionality would be available for the pilot implementations.	The project will manage the user requirements process in order to ensure that expectations are realistic. It will also clearly prioritise those functions that will be essential for piloting and identify any longer term priority requirements, which could be incorporated at a later date into potential products brought to market.
The required components to construct the eu-DOMAIN platform are not available.	Pilot results could be jeopardised.	The partners are already familiar with the relevant technology domains and are confident that all the major items of the required infrastructure can either be sourced or developed within the constraints of the project.
The infrastructure components cannot be properly integrated and it fails to operate properly to support the pilot implementations.	Pilot results could be jeopardised.	The project will ensure full documentation and quality assurance of the development of the pilots to minimise such risks. It will also make plans for backup hardware to be available for rapid replacement in the event of hardware failure.
The required applications and services cannot be developed within the time and resource constraints of the project.	Pilot results could be jeopardised.	Prioritise applications and services development to ensure maximum deployment and evaluation within project constraints.
Appropriate users are not available to implement and evaluate the eu-DOMAIN platform.	Pilot results could be jeopardised.	User partners have already been carefully selected to ensure that they are suitable for the piloting exercise. Additional users will be identified as part of the scenario development process and these will be kept in reserve as potential additional pilots if required.
The pilot process fails to produce consistent evaluation feedback.	Low level of confidence about future potential of eu-DOMAIN.	Both the evaluation criteria and testing and validation plan will be rigorously specified before the pilot implementations commence. This means that any variations in the feedback received should provide valuable information about real differences in the potential of eu-DOMAIN within each of the scenario arenas.

Risk	*Impact*	*Preventative/Remedial action*
The consortium experiences disruption, e.g. a partner resigns or fails.	Could cause slippage in delivery time; could impact the completeness of deliverables	There will be strong management of the project by experienced co-ordinators and senior management within each partner organisation has provided full assurance of their commitment to the project.

Figure 6.2: Identified risks and remedial actions

6.6. Plan for using and disseminating knowledge

Exploitation plans will from the onset be closely coordinated with dissemination activities. Commercial exploitation will commence, as soon as the platform is operational and in parallel with the user test and evaluation.

6.6.1. Framework

eu-DOMAIN's dissemination and exploitation aspirations will be conducted within a clearly defined framework of resources and activities which will be defined in the project's dissemination and use plan. This will in turn be updated at six-monthly intervals to assess and report progress, and update the plans of action. The approach being adopted will ensure that the eu-DOMAIN consortium:

- Effectively disseminate the project's objectives, aim and scope to the widest audience possible
- Establish a clear business framework for the commercial exploitation of eu-DOMAIN
- Prepare to dynamically introduce eu-DOMAIN into the market
- Introduce effective mechanisms for the continuous monitoring of industry developments and competing products
- Establish a mechanism for the improvement and further development of the eu-DOMAIN system
- Achieve a pricing structure which maximizes return-on-investment and competitively positions eu-DOMAIN
- Establish any necessary strategic alliances with key market players.

Very importantly, the approach is to address the project's dissemination and use requirements at both a project consortium and individual partner level. This puts an onus on the consortium to work together in defining and embracing an appropriate overall business framework oriented towards a European and Worldwide market. Additionally, it also places the onus on partners to clearly define their individual business aspirations and local approaches and requirements.

6.6.2. Exploitation

eu-DOMAIN exploitation is planned at three levels:

- Exploitation of the results jointly by all partners
- Exploitation by individual partners of their own IPR within healthcare and building facility management
- Exploitation by individual partners of their own IPR across other vertical markets.

The partners' initial intentions within each of these three strategies is summarised in the following table:

Partner	Consortium exploitation	Individual partner Exploitation	Transfer to other markets
CIL	Lead in overall exploitation planning and implementation.	Strengthen business credentials and reputation, and widen client base in Health consultancy to increase revenues in addition to eu-DOMAIN implementations	Lead the adaptation of eu-DOMAIN to other applications

Partner	Consortium exploitation	Individual partner Exploitation	Transfer to other markets
INNOVA	Lead marketing for Italian-speaking market.	Extend existing client base through enhanced technical consultancy knowledge applied to new technology exploitation services.	Extend SME market by adding to technology transfer product and service portfolio.
IN-JET	Lead marketing for Danish-speaking market.	Productise and support eu-DOMAIN and derivative ambient intelligence platform services to existing and extended market.	Further develop market to other ambient intelligence application areas.
UAAR	Support marketing for Danish-speaking market.	Research benefits from project involvement and exploitation of outcomes.	Not applicable.
FORTH	Support marketing for Greek-speaking market.	Research benefits from project involvement and exploitation of outcomes.	Not applicable.
CNET	Support marketing for Swedish-speaking market.	Productise and support eu-DOMAIN XML web-services and derivative applications for existing and new clients.	Further develop market to other XML and web-service applications.
T-CON	Support marketing for Italian-speaking market.	Productise and support eu-DOMAIN communication facilities and derivative applications for existing and new clients.	Further develop R&D activities based upon eu-DOMAIN experience.
SAG	Support marketing for Danish-speaking market.	Supporting the productisation of eu-DOMAIN XML web-services and derivative applications for existing and new clients.	Further develop market to other XML and web-service applications.
TID	Lead marketing for Spanish-speaking market.	Productise and support eu-DOMAIN communication facilities and derivative applications for existing and new clients.	Further develop products and R&D activities based upon eu-DOMAIN experience.
GMA	Provide prestigious Danish validation user	End-user benefits from roll-out.	Not applicable
EBPCT	Provide prestigious UK validation user	End-user benefits from roll-out.	Not applicable

The eu-DOMAIN consortium will develop an exploitation plan (draft and then final) which will result into the identification of the key success factors, trends, threats, and opportunities. The Exploitation Plan will define how eu-DOMAIN should be 'taken to market' – continued, extended to other services, and supported after the current programme. The various exploitation options will be fully assessed and costed to provide recommended exploitation actions which will then commence at the end of the project.

6.6.3. Exploitation route

Detailed exploitation strategies will be developed after the platform architecture has been clearly defined, societal issues have been clarified and realistic business models have been developed. From this framework, potential target groups in different sectors will be identified, analysed and prioritised according to commercial attractiveness. The exploitation activities will be focused on the most potential customers, in order to optimise time-to-market.

A major instrument in the exploitation strategy is the availability of a fully working eu-DOMAIN platform in a prolonged period after the end of the project, so that customisation and trials can be performed for potential customers.

When the exploitation strategy has been decided, detailed exploitation plans will be developed including comprehensive sales and marketing plans.

The supplier partners involved in the project can individually realise economic benefits from the results of the project in a number of ways. However, since the product contains a wide range of diverse technologies, the most effective exploitation will be for the partners to continue to work together in a more formal cooperation after the project has ended. Discussions amongst these partners about the creation of a joint venture vehicle are already under way.

CIL has recently set up two similar spin-off web services joint ventures coming out of EU-funded projects and is currently raising finance for a third. CIL will use the experience it has gained through these other ventures to assist the Consortium partners to launch a successful commercial venture after the end of the project.

The intention is to establish eu-DOMAIN as a stand-alone business available to potential users throughout Europe initially, and then potentially worldwide. It is expected that the joint venture will cove sufficient technological ground to be able to offer and operate a complete Europe-wide eu-DOMAIN platform.

In addition to participation in the joint venture, partners will also be able to exploit the knowledge they have gained from participation in the project to improve their consultancy services and/or research activities to all types of private and public sector organisations who are interested in exploiting emerging technologies to implement new and better ways of working.

Exploitation plans will from the onset be closely coordinated with dissemination activities. Commercial exploitation will commence, as soon as the platform is operational and in parallel with the user test and evaluation.

6.7. Raising public participation and awareness

A comprehensive dissemination programme will be performed in order to support eu-DOMAIN's impact and wider European Commission dissemination objectives. This will ensure that the project engages with actors beyond the research community and the public as a whole.

The programme will promote the project to a wide audience:

- research community and peer projects;
- wider scientific community;
- prospective customers;
- general public,

and use a wide range of techniques for achieving this such as:

- Events and exhibitions
- Advertisements and notices in journals and newspapers
- Newsletters, leaflets and brochures
- Scientific papers and articles
- Mail shots.

One of the main channels for communication will be a public web site, which will be regularly updated as progress is made, deliverables are produced and milestones are achieved. This will be accessible by persons within and without the research community.

A key aspect of the project's dissemination and exploitation drive will be to produce and present professional video promotions of the project's results. This will be done using appropriate resources already funded within the eu-DOMAIN budget. The specific content, presentation and audience for these will be finalised as the project progresses.

Additionally, a number of other channels of communication will be adopted such as: official project brochure and newsletters, participation at sector-relevant exhibitions and conferences, information campaigns, journal articles, press releases, production of other appropriate printed material (leaflets, flyers, etc.) and participation at EC events. The consortium will not only target events within (specialised for) the research community but also events that are likely to attract a wider interest from the European Community of citizens.

The project will maintain a contacts database which it will use to distribute publicity material to throughout the project. The database will identify organisations and individuals and the appropriate means of communicating with them. This will include membership of the research community and the wider public as appropriate.

Being part of the research community it will be relatively easy for eu-DOMAIN to conduct awareness raising with a naturally interested research and scientific community. However, interaction with the wider community and in particular the general public is not so easy, as there is less direct interest in, and knowledge of, IST. To overcome this issue the consortium will focus every effort on ensuring the widest possible dissemination of the project to a more public audience. This mechanics of this will be detailed in the project's Dissemination and Use Plan and will include:

- Free access to a eu-DOMAIN public website with facility to provide feedback to the consortium
- Publicity, such as advertisements, targeted through widely read websites, journals and newspapers
- Attendance and exhibiting at events that embrace the wider public and not just the research community
- The display of notices and issue of publicity materials to their daily public contacts by the partners and in particular through the two pilot users

The impact of the project will be strengthened as the system build and then the validation activities progress, and as more industry 'professionals' come to learn of the approach being taken in eu-DOMAIN. The table below summarises the dissemination responsibilities.

Partner	Responsibility
CIL	Lead in UK NHS dissemination
INNOVA	Lead in European and IST/EC project dissemination
IN-JET	Coordinate International dissemination
UAAR	Support in academic dissemination - publications and conferences
FORTH	Lead in academic dissemination - publications and conferences
CNET	Support IST/EC project dissemination
T-CON	Dissemination coordinator; responsible for website

Partner	Responsibility
TID	Production of project brochures and project newsletters for use by the consortium
GMA	Support building sector dissemination.
EBPCT	Support UK NHS dissemination and clinical professional dissemination.

The activities and deliverables required to support EU-DOMAINS dissemination objectives encompass three main phases of activity:

Time	*Objective*	*Methods*
Year 1	1) Create awareness about the eu-DOMAIN project. 2) Dissemination in strategic boards of participants	• Publication of support material, brochures and the web site. • Attendance in seminars and congresses. • Preparation of a eu-DOMAIN mock-up.
Year 2	3) Verify opportunities to further apply the eu-DOMAIN results in other sectoral domains. 4) Solicit first commercial interest in the project to potential service providers.	• Aligning events with similar EU or national projects. • Seminars focused on business opportunities involving top and middle management of participant organisations. • Preparation of pre-commercial brochures. • Visit to potential service providers • Web site enrichment.
Be-yond	5) Promote the exploitation of the eu-DOMAIN platform.	• Preparation of a commercial brochure. • Promotion in commercial fairs. • Newsletter to potential service providers.

The following specific dissemination activities have already been identified:

1. The project will be presented at several of the numerous conferences across Europe on Connected/Intelligent Homes, Ubiquitous Computing, Pervasive Computing Knowledge Management and similar topics. In particular, the project will be presented at:
   - The international Net@Home conferences in France 2004
   - The LONWorld and OSGi annual conferences.
   - The 3G World Congress and 3G World Forum
   - KM seminars organised by the Knowledge Board
   - Seminars and conferences relevant to the user domains, e.g. in *e*Health and Condition Monitoring
2. The results of the scientific research work will be submitted for publication to international, peer-reviewed journals and conference proceedings.
3. Partners in the consortium will disseminate internally the project through their internal bulletins and by presentations at internal and external meetings.
4. A brochure will be produced during the first 6 months of the project in order to disseminate the objectives and the future results
5. The project will produce a quarterly newsletter describing obtained results and continued activities.
6. The project website will be established at the beginning of the project. This site will contain information about the project as well as relevant news and events.

Detailed exploitation strategies will be developed after the platform architecture has been clearly defined, societal issues have been clarified and realistic business models have been developed.

From this framework, potential target groups in different sectors will be identified, analysed and prioritised according to commercial attractiveness. The exploitation activities will be focused on the most potential customers, in order to optimise time-to-market.

A major instrument in the exploitation strategy is the availability of a fully working eu-DOMAIN platform in a prolonged period after the end of the project, so that customisation and trials can be performed for potential customers.

When the exploitation strategy has been decided, detailed exploitation plans will be developed including comprehensive sales and marketing plans.

7. Workplan

7.1. Approach

7.1.1. Introduction

In this section we present the overall workplan structure. First we describe the envisioned eu-DOMAIN architecture and the provisioned set of integrated services, as realised by the respective tools, operations, functions and services to be included in the project. We go on to explain the methodology chosen to carry out the project and achieve the objectives, including a risk analysis and derived contingency plans. Based on the methodology, we have derived a comprehensive work plan broken down in project tasks, which again has been assembled in eight cohesive work packages. Workpackages are presented with full resource allocation and time scheduling.

7.1.2. Technological infrastructure to be developed

A major part of the project is devoted to research and development in infrastructure components that eventually will be integrated into a workable validation platform upon which the two user cases can be evaluated against user requirements defined at the onset of the project.

A detailed description of the technological infrastructure is provided in appendix B. The infrastructure work contains the following main components:

Ambient Intelligence platform

Distribution of location specific, application specific and network intelligence pools and definition of information object classes is developed based on system architectural and security analysis.

Web services provisioning and content delivery

Development of web provisioning tools, protocols, negotiation tools, billing and other components of the service and content delivery chain.

Client architecture

Client architecture involves development and prototyping of service gateways for buildings and vehicles with location and application specific intelligence pools.

Communication infrastructure

A prototype communication infrastructure will be created for use in system integration and validation of the eu-DOMAIN platform.

Server architecture

A powerful eu-DOMAIN server park will provide the main network Ambient Intelligence functionality.

7.1.3. Workplan structure and breakdown

The eu-DOMAIN project is a 36 months project. The work is divided into four phases covering the following topics: Project processes (including project management, dissemination and exploitation activities), research and development, prototyping and system integration and user testing and uptake.

Project activities are broken down into manageable sections of coherent tasks as shown in figure 7. The project tasks are grouped in a total of 9 Workpackages, as described later in this document.

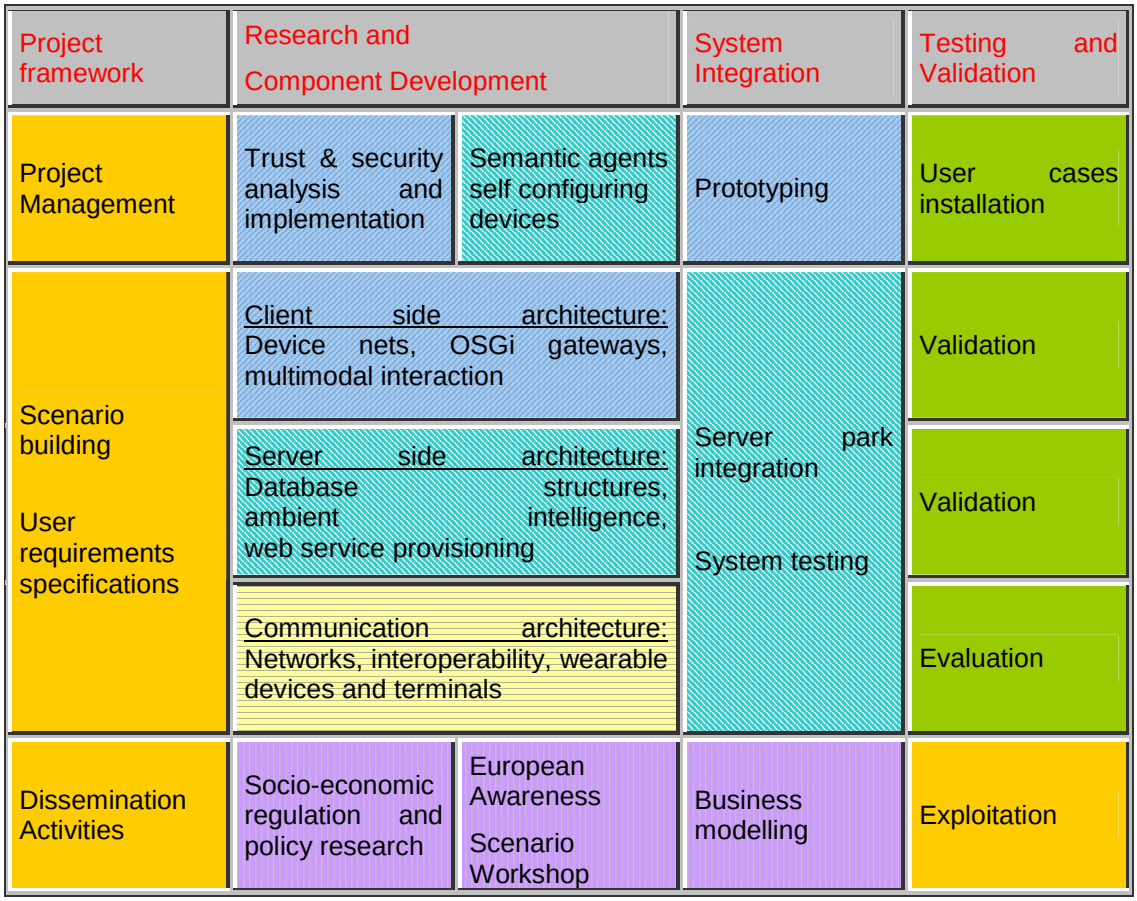


Figure 7.1: Project breakdown in subtasks

There are four scientific disciplines involved in the project:

Client side technologies involve research and development and prototyping of embedded, real-time software architectures, OSGi framework, communication protocols for LAN and WLAN, new devices and ways of interaction and usability and implementing trust and security tools.

Server side technologies involve research, development and integration of on-demand services, web services based on XML and RDF, semantic web architecture and semantic agent searches for self configuring devices, ambient intelligence decision support architecture, database architecture, internet protocols and web server park operation.

Communication technologies involve fixed and mobile network topography, interoperability and broadband / narrowband communication for web services and content.

Supporting research involve socio-economic research in user acceptance, regulatory and policy issues and privacy issues and business modelling involving value creation, value nets, actor roles and development of business cases.

7.2. The eu-DOMAIN methodology

7.2.1. Overview

The eu-DOMAIN project will cover technological and socio-economic research, component development, large-scale system integration, testing, and validation activities in a complex interaction. Therefore it is essential to develop a clear and well-structured methodology for the project.

The overall methodology proposed in the project is illustrated as follows:

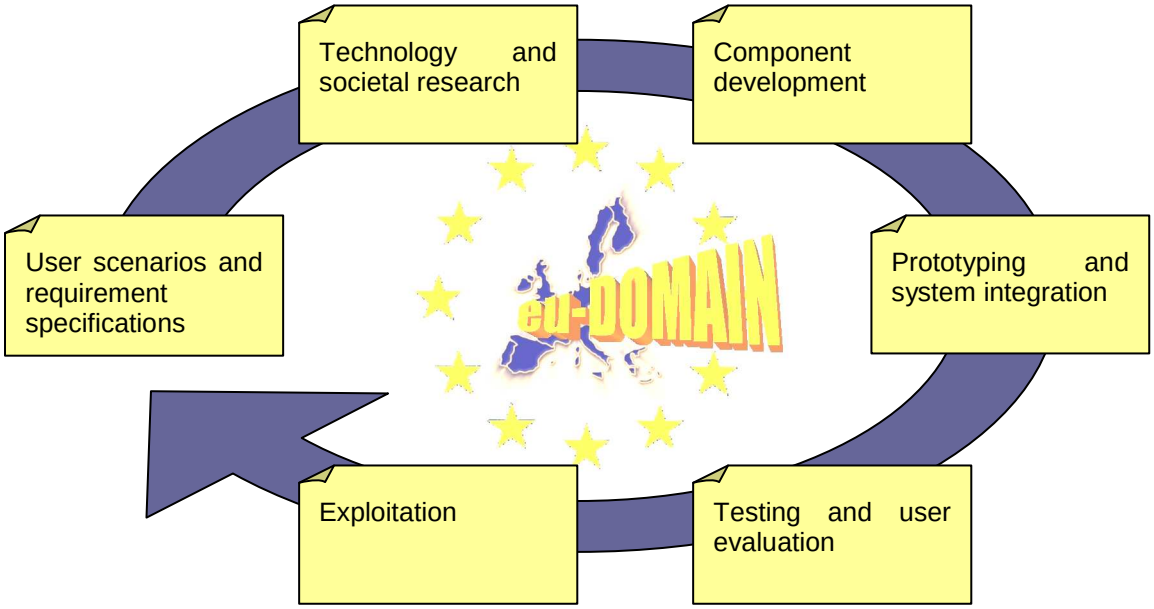


Figure 7.2: Overall methodology in eu-DOMAIN

The project has four phases:

Phase one: Definition

The definition phase marks the beginning of the project. There are three fundamental project objectives, which are of the utmost importance to the overall success of the project, to be addressed in the definition phase: 1) User acceptance, 2) availability of technology and 3) exploitability of the eu-DOMAIN platform. If the functionality and architecture of the eu-DOMAIN platform is not marketable, the project objectives have not been achieved.

A user-centred approach and iterative development process with participation of users in all phases will be implemented to test alternative scenarios. Emphasis will be put on improvement of human-computer interaction with respect to user and customer needs such as efficiency, effectiveness, user preferences, and quality of life will be applied. Validation will show the success in terms of user quality, user preferences and acceptance.

The definition phase involves the following multidisciplinary and cross-sectoral tasks:

- **Creating scenarios** of user behaviour and interaction with platform functionality is an extremely useful instrument for identifying key technological, security, socio-economic and business drivers for future user requirements of new work methods and collaborative work environments. The scenarios will be deduced from sectoral settings defined by users and provide the framework for all subsequent user requirements specifications.
- Defining **functional user requirements specifications** based on the user scenarios involves most importantly aspects of user interface and usability, which will provide ease-of-operation and alleviate issues of computer illiteracy. Seamless interoperability, widespread mobility, openness, and specific user requirements for the selected user cases must also be integrated in the functional requirement specification.
- Defining **trust and security user requirements specifications** involves identifying not only trust and security issues, but also privacy and safety issues, where relevant for the testing user cases. Trade offs between usability and security will be in focus.

- Defining **societal user requirements specifications** will be done by correlating socio-economic, regulatory and policy issues with the deployment and wide spread use of Ambient Intelligence infrastructures. Aspects of e.g. social acceptance, economic performance, regulatory frameworks for surveillance and control of private citizens, privacy of data, governmental provisions for health and safety, etc. will be addressed and integrated with the functional and trust and security user requirement to round off the package of complete and cohesive user requirements specifications for eu-DOMAIN.

  The output of the definition phase will be a comprehensive set of user requirements specifications covering all major research and development topics of the project.

Phase two: Research and development

The research and development phase takes off from the user requirements specifications and comprise a range of integrated, multidisciplinary research and technology tasks:

- **Identifying technology requirements** from user requirements specifications. The Consortium knows large parts of the technological requirements of the eu-DOMAIN platform. However, the scope of the platform goes well beyond state-of-the-art, particularly in the areas of content and service management, self-configuring devices and decision support and it will be important to ensure that the technologies behind these services are properly specified before the platform development begins. In particular the integration work in building the platform needs specifying, including agreeing XML formats and establishing security levels.
- **Identifying current offerings** encompass research of existing technologies available from consortium partners, from commercial off-the shelf vendors and from other EU, international and/or national research projects.
- **Identifying gaps and specifying research needs** involves a comparison of needed and available technologies leading to a set of specifications for new research and development demands as well as a catalogue of Best Available Technologies for the eu-DOMAIN platform.
- **Designing a prototype platform** involves constructing a UML description of the software architecture and communication framework for the service delivery. It also involves prototyping new sensors, devices and terminals, to be used in the user scenarios.
- **Designing a prototype platform** involves constructing a UML description of the software architecture and communication framework for the service delivery. It also involves prototyping new sensors, devices and terminals, to be used in the user scenarios.
- **Designing a business environment,** which can provide the framework for commercial exploitation, including identifying actor roles, value creation, value nets as well as analysing user acceptance through conduction of two European Awareness Scenario Workshops.

Phase three: Prototyping and system integration…

With the successful completion of all tasks in the research and development phase, the project has reached the stage, where realization of the platform and installation in user environments are possible, with the following activities:

- **Prototype development** involves prototyping new devices for multimodal interaction, integrating client side infrastructures and establishing communication means to the server park. User interfaces and elements of trust and security are also implemented.
- **System integration and testing** involves building, installing and testing a suitable server park infrastructure with appropriate communication links to locations and users for interoperability of services. The system architecture must include the appropriate measures for trust and security and identified societal needs, as described in the societal user requirements specifications.

- **Building and installing user scenarios** will mark the successful completion of this phase. The client side infrastructure will be installed at dedicated locations by the users and exposed to the cases described in the user scenarios.
- **Testing** will involve population of the user scenarios with relevant data.

The output of the prototyping and system integration phase will be a fully operational eu-DOMAIN platform that will be validated in the user scenarios created in the definition phase.

Phase four: Testing , validation, evaluation and uptake

The final phase of the project will be concerned with validation of the prototype eu-DOMAIN platform in the two user cases as well as overall project evaluation and preparation for take-up activities and exploitation.

- **Validation** of the prototype platform will involve user testing of the prototypes (letting the users execute the user scenarios on location). Also the socio-economic and security aspects will be tested, by involving focus groups and questionnaires. Validation will be performed jointly by the users and the developers and documented in a report for each user scenario.
- **Evaluation** and uptake of the entire project and its achievements compared to the project objectives will be performed jointly by all partners and documented in the final project report. A special technology watch report will discuss the eu-DOMAIN technology and services with other available technologies on the market at that time.
- **Uptake activities** involve, in the first instance, a dissemination program, including the possibility to provide illustrative technical presentations to various potential service providers, system integrators, component manufacturers and governments across Europe, allowing them to consider the new services. During this process, the industrial partners will work on implementing their exploitation strategies for the ultimate goal, a Europe wide deployment and commercial exploitation of the eu-DOMAIN platform.

The tested platform, together with supporting descriptive information material, will be used for take-up activities and exploitation by the consortium partners.

7.2.2. Software architecture analysis

A critical part of the development work is to understand the (software) architecture of the computing system. This section describes the methodology to be used for architectural analysis of both the client and the server side architecture.

The software architecture of a computing system represents the highest level of design choices of such systems. Making the wrong choices at this level of abstraction seriously impedes system development – making the right choices helps in developing, maintaining, and evolving systems. Analysis at this level of abstraction is thus essential in system development.

The user requirements specifications developed in workpackage 2 will point to a number of corresponding generic requirements, which in turn lead to derived qualities – aspects of the system not related to the actual functionality of the system – that will be analysed.

Potentially important qualities for the eu-DOMAIN system are:

- Usability
- Integratibility
- Modifiability
- Security
- Scalability
- Adaptability
- Performance
- Interoperability
- Portability
- Reusability
- Testability

The software architecture of the chosen platforms will be described using the Unified Modelling Language (UML; (OMG, 2001)). The use of UML as a description language provides for communication (the notation is standardized and can be used as a basis for comparison of and communication about systems) and overview (the notation is visual and visualizes systems on a high level of abstraction).

The initial proposed views of the eu-DOMAIN architecture consist of:

- **Logical view**. The logical structure of the system in terms of main design elements and the connections between these is visualized using UML class diagrams, object diagrams, sequence diagrams, and state chart diagrams.
- **Execution view**. Describes how the system's components execute at runtime and how components map to hardware elements. Visualized using combined UML component, deployment, and object diagrams.

The software architectures will then be evaluated using a variation of Quality Attribute Workshops (QAW) developed at the Carnegie Mellon Software Engineering Institute (SEI). The QAWs will be based on interesting quality attributes (as outlined above) and be based on refinements of the user requirements specifications as well as the scenarios.

An initial description of the evaluation architectures will be made. This description will be used as input to a Quality Attribute Workshop. The specifics of this workshop will drive the need for iterations on and refinements of the software architecture descriptions.

Quality Attribute Workshops provides a method for analysing the software architecture of a system against critical quality attributes at a very early stage of development. It is thus suitable for the situation in the eu-DOMAIN project in which we do not have – and do not control – fully evolved software architectures for the envisioned system.

7.2.3. Trust and security analysis

Trust by users is an essential pre-requisite for successful exploitation of the eu-DOMAIN platform. This is not only the case in emergency and security applications, but equally in all other thinkable applications. Trust is, to a great extent, built on the security and privacy provided by the platform. The project will therefore put extraordinary high focus on trust and security issues in all technology areas: Server, Client and Communication technologies. Security demands will often influence software architecture and design, and will be a core element of the respective workpackages.

The trust and security approach for eu-DOMAIN will build on the results of the e-Pasta project and the ISO15408 - Common Criteria standard. The specifications will be based on a security analysis with three steps:

1) Identify a scenario.
2) Perform a security analysis of the scenario and formulate a security specification.
3) Identify the best security architecture that satisfies the security specification.

The **scenario** contains a description of the logical and physical configuration along with some uses of this configuration.

The **security analysis** proceeds with the following steps:

1. Assets: Determine the assets, which are going to be protected.
2. Security environment: Determine the environment of the system: 1) who are the actors in the system, what are their roles and responsibilities, and what policies are expected to govern their behaviour? 2) What are the security assumptions of the system? 3) What are the risks, who are the threat agents, who may exploit them, and using what types of attacks? A risk exploited by a threat agent using a certain attack is called a security failure.

3. Security objectives: Define the objectives of the security to be implemented. These objectives will either be to prevent, detect, or recover from a security failure for a given asset. I.e., they are countermeasures addressing the identified threats.
4. Security Specification: The specification contains two elements: User trust requirements and Functional requirements. The two elements are in principle independent on each other. They bind together the security objectives with the platform of the scenario.

User trust requirements quantify how much trust the users expect to be able to put in the system, i.e. how good the system must be at realising the security objectives.

Functional requirements basically this describes the functionality required to implement the security objectives in the platform of the scenario.

One may say that trust addresses the quantitative security requirements whereas the functionality addresses the qualitative requirements. The **security architecture** specifies how to implement the security of the system so that the security requirements are met.

According to security folklore there is a trade-off between usability and trust, but there is no a priori reason for this. However, if we are to avoid this classical problem we must identify and address the exact needs of the user in terms of usability as well as trust. In eu-DOMAIN users will be involved in several ways, including:

- Determining the trust requirements.
- Developing good user interfaces in the implementation of the security architecture.

7.2.4. Business modelling

Business modelling involves analysis and development of realistic business model for users and service providers. The business models will be developed using the concept of value-nets as suggested by Brandenburger and Nalebuff to identify business opportunities for content providers, service providers and aggregators as well as network operators and users.

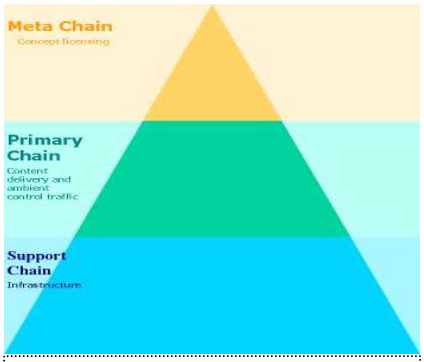


Figure 7.3: Business model framework

Specific emphasis will be made on defining and measuring value creation and identifying new business opportunities for SMEs. The business models will be validated as part of the overall platform validation. The business model is seen as a pyramidal structure with thee value levels. At each level of the business model, the following main actors have been identified for further analysis:

7.2.5. Meta chain roles

Concept Owner licenses the right to use the concept to one or more Service Providers or Service Aggregators. The Concept Owner develops the concept in a proprietary form, with value added in terms an end-to-end solution based on all of the necessary services. The customer pays an initial license fee plus a usage fee for the right to use the concept and resell it to his own customers.

7.2.6. Primary chain roles

Content providers are owners of the digital content that the users ultimately are going to pay for including web services such as energy monitoring, on-line maintenance of technical installations and healthcare services. Content Providers are paid be the Service Providers for usage and/or revenue sharing.

Service Providers sell content and services from a range of Content Providers (content and web services). The Service Provider uses one or more Network Operators as backbone and last mile delivery platform to the end-user. He offers a full value-added service package.

Service Aggregators bundle several Service Providers in one package for his customers. Each Service Provider appears to the end-user as an independent Service Provider, but access is provided through a common Service Aggregator infrastructure.

Customers, users are either private consumers or businesses using the eu-DOMAIN platform as part of their internal business system.

7.2.7. Support chain roles

Equipment Suppliers and Distributors Have the roles to deliver devices for various functions embedded in the service platform. The often sell directly to users.

Network Operators The backbone and last mile infrastructure is to be provided by one or more Network Operators and paid for by users and Service Providers.

7.3. eu-DOMAIN Technical Architecture

7.3.1. Ambient Intelligence platform

Ambient Intelligence pools: The proposed eu-DOMAIN platform is based on an Ambient Intelligent network that provide dynamic, self configuring intelligence support for users; anywhere and anytime.

Users need different levels of intelligence support depending on location and situation. The demand for intelligence power is thus highly dynamic in time and space and the platform must be able to adapt to system dynamics. System architecture analysis will performed to define the most suitable system architecture for eu-DOMAIN, but a priori it is expected that a distributed network system will provide the best possibility for optimising system architecture according to factors such as power consumption, terminal size, availability, usability and costs.

The eu-DOMAIN operates with three different “pools” of Ambient Intelligence (as seen from the user):

1. *Location Specific Intelligence*, i.e. intelligence support based on the actual location of the user and the situation to be supported.
2. *Application Specific Intelligence*, i.e. intelligence support targeted to an actual service provider application like alarm services, healthcare, tourist board etc.
3. *Network Intelligence*, i.e. the under laying intelligence support that is not tied into neither a specific application or to a specific location, e.g. web provisioning of weather forecasts.

The Ambient Intelligence hierarchy can be represented in the following structure:

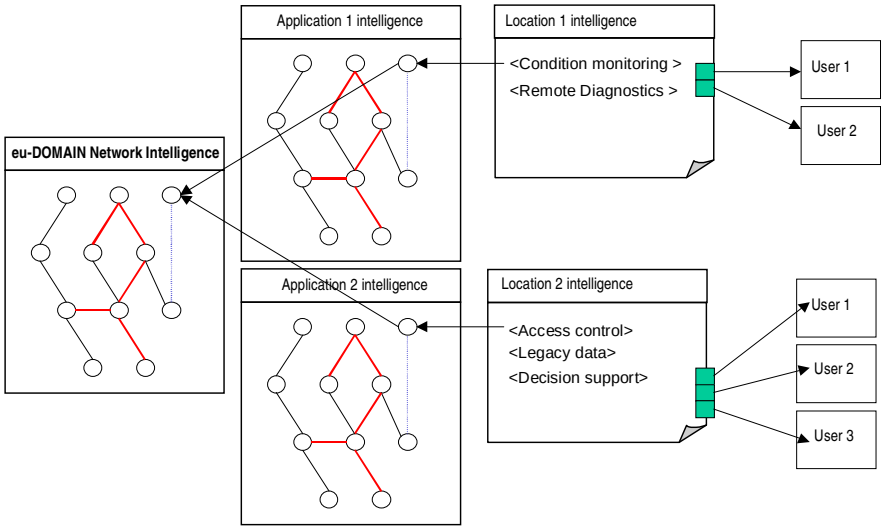


Figure 7.4 : Intelligence Structure Hierarchy

Users have automatic access the eu-DOMAIN network via multimodal interface devices through fixed or mobile communication according to the location and context in which the dialogue is going to take place.

Locations A location is a geographically well-defined area such as an office building, a restaurant, the private home, a car etc. Each location is registered in the eu-DOMAIN and comprises three different objects, which engage in multimodal interaction supported by the ambient intelligence platform. The types of objects are: Personal objects, facility objects and content objects.

Personal objects All users within or near the defined location boundaries are considered to be Personal Objects (PO) of the location. Every person present in the location is automatically identified using available multimodal devices such as a mobile phone, Smart Card, RFID, etc. and registered as an instance of the Personal Objects authorized for that location.

In the example in figure B-2, the HQ building has both permanent and ad-hoc Personal Objects. The permanent status is used for PO's that are regular visitors in the building e.g. resident and visiting employees, maintenance Staff, etc. Permanent PO's are created and maintained by the location owner. A visiting, anonymous customer can also be a permanent PO, provided he/she is authorized by other means.

Ad-hoc PO's are identified individuals in the building, which have not been pre-authorized, e.g. police or ambulance staff or employees of the facility management / building operator company. Add-hoc PO's are subject to remote authorization through e.g. the semantic web. PO's that are not authorized can be grouped as "Unauthorized Visitor" and dealt with accordingly, i.e. by alarming security staff.

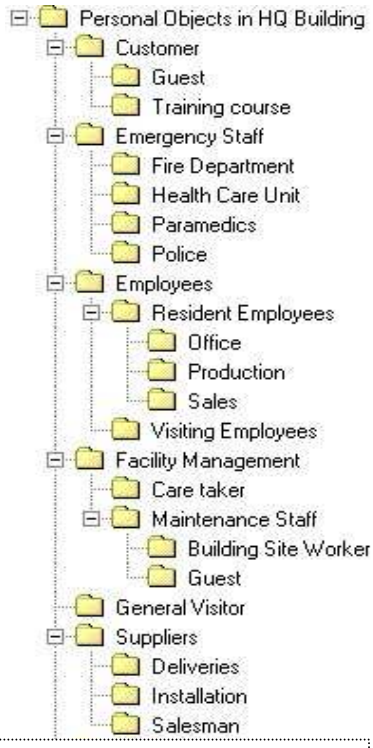


Figure 7.5: Personal Objects

Once the individual has been identified and authorized as a Personal Object, the eu-DOMAIN system will allocate and release all resources to that individual as described in a

user profile associated with the PO descriptor. The individual will now have access to both facilities in the location and relevant sources of content.

Facility objects All facilities available in the location e.g. network installations; display terminals; pump equipment, access systems, etc. are considered to be Facility Objects (FO). Facility Objects are treated in the same manner as Personal Objects using intelligent, adaptive and self-configuring device identification and authorisation using e.g. semantic web agents.

Content objects All content available to the users of the eu-DOMAIN network is considered to be Content Objects (CO). Content Objects can either be proprietary (i.e. belonging to a specific organisation for use by its authorized users only), commercial (i.e. available to all or a subset of users against payment) or public (i.e. available for all users at no cost). Proprietary CO's are introduced into the eu-DOMAIN and maintained by the CO owner, who also manages access privileges. FO's and PO's know URI and structure of the content in the network.

Commercial CO's are made available to the eu-DOMAIN users against payment. URI and structure can either be made available on subscription (regular payment) or as a result of a context sensitive semantic search, in which case payment will be autonomously negotiated between the content web service provider and the user profile, e.g. via micro payments.

Public CO's are free Internet resources available to the user either at a fixed URI or as a result of a context sensitive semantic search.

7.3.2. Web services provisioning and content delivery

Different web-services can be delivered directly to the locations via the eu-DOMAIN network. The services are automatically negotiated from a third party Service Provider, e.g. via XML and semantic web RDF[9] (Resource Definition Format) protocols. Also free web-content services can be delivered to the user, such as weather forecasts, traffic reports, etc.

The eu-DOMAIN server also facilitates access to government and corporate data repositories as well as multimedia content providers. The figure below shows the service-provisioning framework:

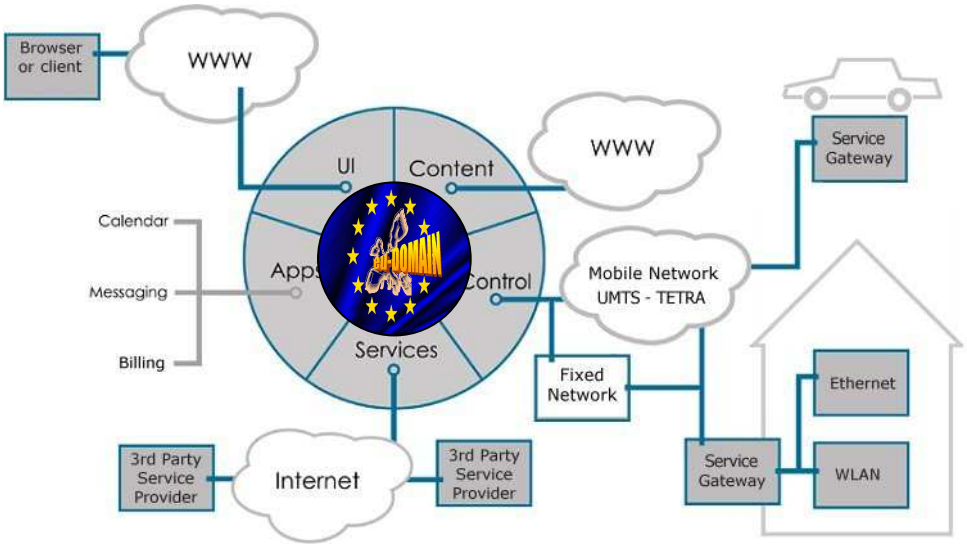


Figure 7.6: Service Provisioning Structure

Third party Service Provides may deliver web services via the eu-DOMAIN network and the service gateway directly to the user. The services can be either one-way service delivery or

[9] The W3C Resource Description Framework (RDF) for web relationships, see also www.w3.org

two-way interactive services. The provisioning platform also allows for provisioning of traditional one-way HTML content and for advanced semantic web searches.

The structure also allows for WWW user interfaces and system applications provided to all applications operating on the network.

7.3.3. Client architecture

Each location has installed one or more service gateways. They form dynamic, local intelligence clusters and access points to existing local area networks, through which, two-way communication with other installations in the building (e.g. alarm systems, energy control, etc.) can be established. The gateway can communicate simultaneously with other systems in the location via build in device nets, e.g. LONWorks, WLAN or the new ZigBee wireless data protocol. The gateway also facilitates access to internal and external content repositories, e.g. EPR systems, manufacturing systems, etc.

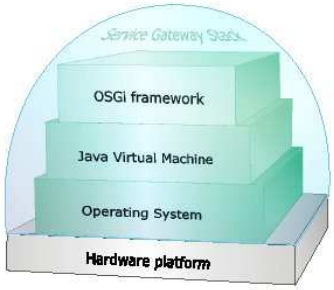


Figure 7.7: OSGi Framework

Service gateways are configured with an OSGi Framework[10] for bundled services thus being able to download a wide variety of services made available from different manufacturers and service providers for the range of services to be delivered by the eu-DOMAIN network.

Examples of service bundles are: User profiles for local community sharing, access to content repositories, XML schemas for data search, etc. Usability facilitators such as communication protocols, device drivers, access profiles and other tools for providing the Ambient Intelligence support is downloaded on demand, either from location or application based repositories or as RDF as a result of semantic search on the web.

Further, the service gateway provides the Location Specific Intelligence, i.e. the intelligence that can and should be provided locally, without involving higher hierarchy intelligence layers.

7.3.4. Server architecture

The server park is the central element in the eu-DOMAIN service platform. A powerful eu-DOMAIN server park provides the network Ambient Intelligence functionality. The servers handle both the eu-DOMAIN Network Intelligence and the Application Specific Intelligence. In the testing project, all servers are hosted in the same location, but in real life, application serves will be hosted with various Service Providers in geographically distributed locations.

The figure below provides an overview of the server park and its components. The **Application Specific Intelligence** is provided by the following components:

An Ambient Intelligence Server provides the Ambient Intelligence functionality. This server contains management structures, application specific and location specific decision support structures, alarm handling, user profiling and other tasks inherent to the intended functionality of the application specific intelligence. The Ambient Intelligence Server connects to a Database Server with large volume storage capacity, which stores user information, access privileges, user setup profiles as well as measured data and alarm situations.

It also connects to the Web Service Server, which handles web and content provisioning including negotiation and billing requests with Content Providers.

[10] Open Service Gateway initiative – see also www.osgi.org

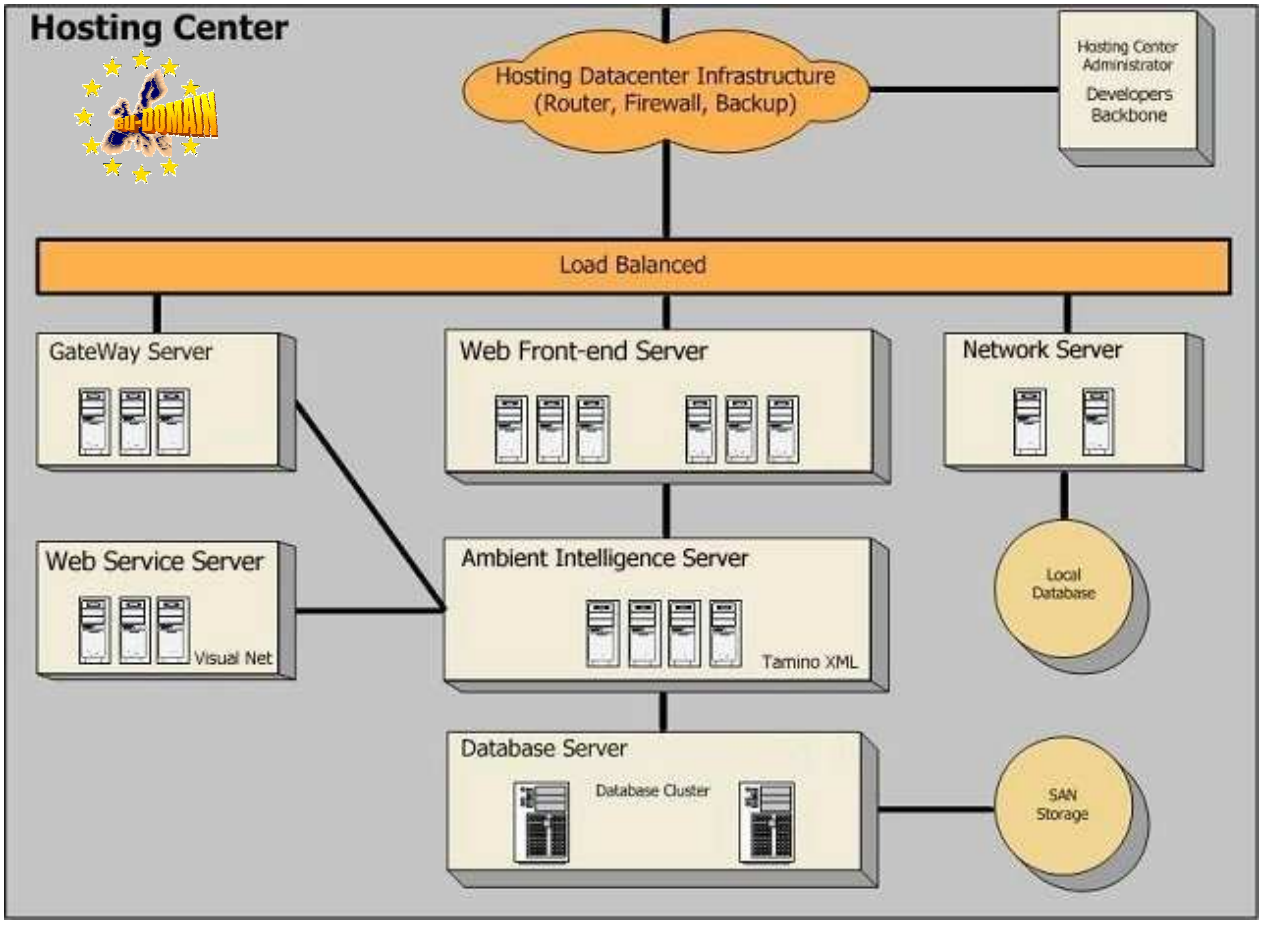


Figure 7.8: eu-DOMAIN Server Structure

The Web Front-end Server provides connectivity to the internet and user access to the eu-DOMAIN network for user administration, programming of local and application specific intelligence, alarm setup and handling, access to stored data and other user functions. The Web Front-end Server will be accessible from multimodal terminals.

The Gateway Server handles connectivity to all service gateways. This server is the primary access point for WAN communication networks that handle data traffic from local service gateways. The main function of the Gateway Server is to direct traffic, handle data priorities and perform data synchronization.

The **Network Intelligence** is provided by the following components, all of which are operated and maintained by the eu-DOMAIN System Owner:

The Network Server contains top-level hierarchal decision support and alarm handling for events that are not application specific. It handles administrative and profiling tasks on the Service Provider level, common web and content provisioning, overall system security and administration as well as billing and societal functions.

The Hosting Centre Administration encompasses all normal functions related to hosting centre operation, including firewall and virus protection, security tasks, load balancing, system maintenance and many other tasks.

7.3.5. Communication infrastructure

All service gateways communicate with the eu-DOMAIN network servers with IP protocols via available Wide Area Networks (broadband, dial-up or mobile networks) for complete interoperability.

The eu-DOMAIN telecommunication infrastructure will be based on a combination of fixed and wireless communication technologies. The main novelty aspect of the platform is the ability to perform automatic roaming across heterogeneous networks in order to provide interoperable services. As the user moves around, automatic roaming between heterogeneous networks must be accomplished. For example, when the user moves out of GSM or GPRS coverage, the service gateway automatically switches to the Galileo satellite network.

An important aspect of the telecommunication infrastructure is real-time data acquisition and synchronization. The following picture shows the communication infrastructure:

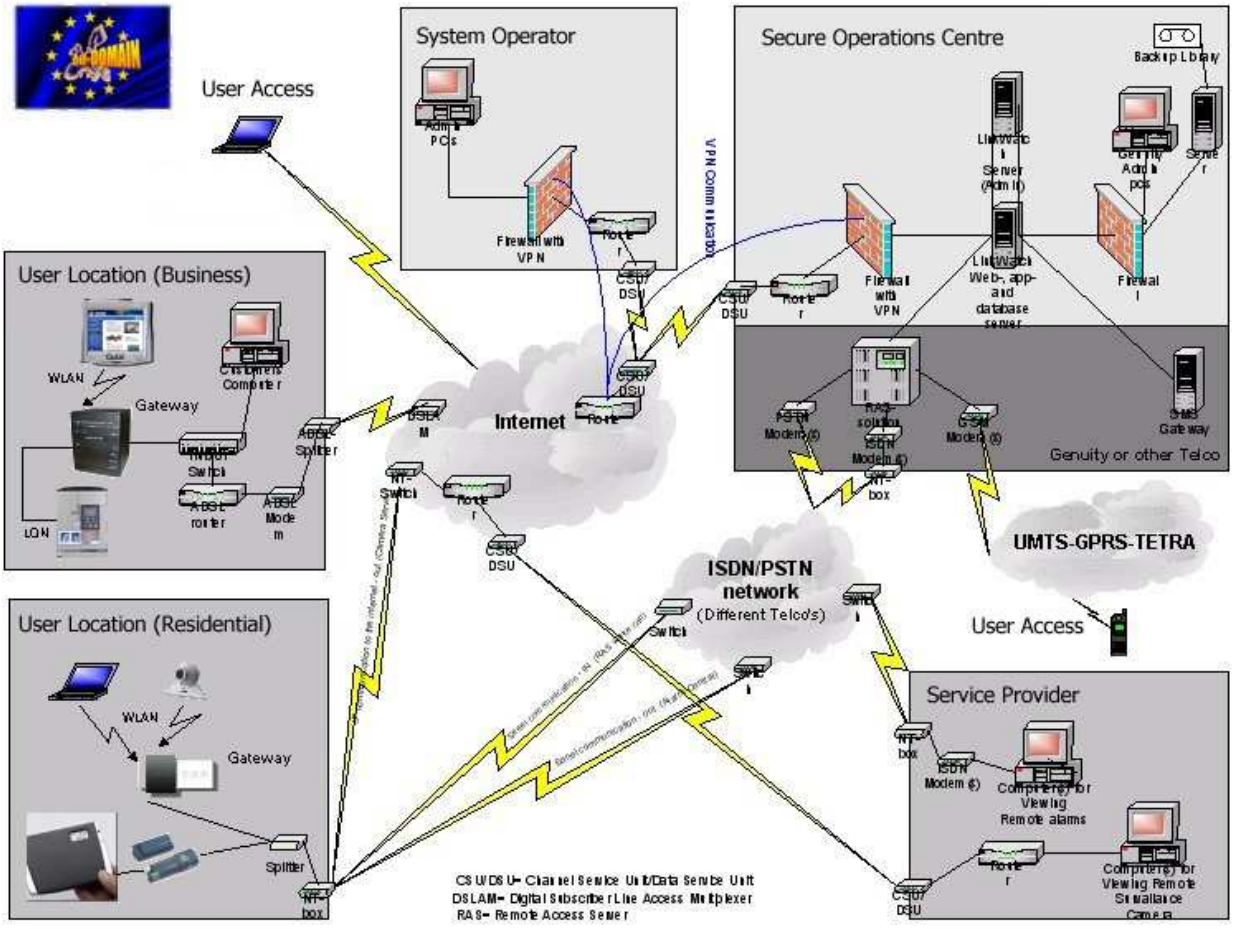


Figure 7.9: Communcation infrastructure

7.4. Workplan Structure

7.4.1. WP 1 – Project management

Objectives

This workpackage will provide an effective and efficient management and work process of the project during the contractual period. Its objective is to ensure an efficient management of the project and a consistent and high quality of the work to be performed and the reports produced. Further, it deals with the administrative and financial management of the project.

The main objectives of this work packages is to: (a) ensure the delivery of the project on time and on budget; (b) co-ordinate the technological and scientific orientation of the project and (c) secure the quality of the work and of the delivered documents and software.

Workpackage leader: *This workpackage will be lead by: CIL*

Tasks and actors in this workpackage

The tasks will be carried out according to the management structure described in section B.5.

The co-ordinating partner will coordinate all relations to the CEC and other projects in the Framework Programme.

The work will be carried out in three subtasks:

Task T1.1 – Project initiation

TASK LEADER – CIL

The first task within this workpackage will be the effective initiation of the project. This will involve the production of a Project Initiation Document (PID) to PRINCE II standards setting out the plan for the project including the detailed assignment of roles, responsibilities and resources, the project timetable and descriptions of each deliverable to be produced together with the project quality plan. This will be agreed with all the project partners at the kick off meeting. The task also involves setting up the Consortium Agreement.

Task T1.2 – Operational project management

TASK LEADER – CIL

Once the project has been initiated it will be managed on an on-going basis in line with the PRINCE II project management methodology. This task will also involve establishing and maintaining the formal project management structures.

Task T1.3 – Project reporting

TASK LEADER – CIL

As project co-ordinator CIL will be responsible for producing the formal project reporting deliverables, including the 3 monthly project management reports, the periodic progress reports and the final project report. Highlight and exception reports will be produced as required throughout the project.

Each contracting partners will take part in the overall management of the project according to the roles described in section B5.

7.4.2. WP 2 – User requirements specifications

Objectives

In this workpackage user needs, key technological opportunities, issues of trust and security as well as socio-economic and business drivers that determine the complex of user requirements will be identified and assessed. The way in which the users will be involved throughout the project will also be agreed and defined. The output of this workpackage will be an overall user validation framework for the project, and comprehensive set of user requirements specifications covering all major research and development topics of the project.

Users' requirements identification is a prior condition for the development of a demand-led service: eu-DOMAIN will be designed and customised according to market conditions and target users needs and it will fully take into account socio-economic features.

A user-centred approach and iterative development process with participation of users in all phases will be implemented to test alternative scenarios. Emphasis will be put on improvement of human-computer interaction with respect to user and customer needs such as efficiency, effectiveness, user preferences, and quality of life will be applied.

The activities in this workpackage are aimed at analysing and promoting:

1) User acceptance.
2) Availability of technology in matching users needs.
3) User validation plan for the project.
4) Exploitability of the eu-DOMAIN infrastructure.

Workpackage leader: *This workpackage will be lead by: INN*

Tasks and actors in this workpackage

The work will be carried out using of the European Awareness Scenario Workshop (EASW®) methodology and related scenario building techniques like the IDON® method. By building simulation scenarios through a participative approach, the Consortium will be able to:

- Measure the eu-DOMAIN exploitability and related impact in two different applications: The European Service Network and Healthcare for tomorrow.
- Create, according to the specific context of reference, future scenarios for eu-DOMAIN by prefiguring possible contrasting evolution schemes (positive and negative scenarios).
- Define technical, security and societal requirements.

The results of these activities are intended to define the eu-DOMAIN technical environment development and to be integrated in a complete set of user requirements specifications.

The work will be carried out in three subtasks:

Task T2.1 – State-of-the-art analysis and scenario building

TASK LEADER – INN

An analysis of technological, legal, social, economic, policy conditions and business climate will be performed for each of the two applications setting the preliminary scenario (scenario Zero) that is the starting point to simulate the natural evolution that can be foreseen taking into account actual trends in the specific sector/field of interest. A target users' group will be selected for each application: Their profiles, role, behaviours will be included in the state-of-the-art analysis. The emerging scenario Zero will establish, how the project has been conceived and what outcomes could stem from its implementation. For each application a principal scenario will be designed to:

- Foresee the natural evolution of the eu-DOMAIN infrastructure in its context of reference.
- Measure the potential of the project given present conditions.

The scenario Zero is the first action towards the application of the EASW methodology, which will be further developed in WP 6 in the form of public workshops.

Based on the scenario Zero/state-of-the-art (one for each application), the eu-DOMAIN infra-structure will be thrown in the near future in order to foresee, what will be the impact on the external environment and on users behaviour and acceptance. Prefiguring possible extreme evolution schemes will develop future simulation scenarios for each application. A simulation scenario is built to compare the different possibilities of development of a technology from every point of view. When preparing the scenarios, focus will be placed on the behaviour of different social actors, including governmental institutions, policy makers and employees associations.

Preparing a scenario facilitates access to discussion by the social communities. The number of scenarios to be developed will depend on the different variables involved in each application playing a relevant role in prefiguring future schemes.

The subsequent step will be the building of simulation scenarios for each application containing a simulated implementation of the eu-DOMAIN infrastructure or part of it. The objectives of this simulation process will be mainly to:

- Project the roll-out of eu-DOMAIN in the medium-long term to assess its impact on the external environment.
- Foresee potential diverging and extreme evolution schemes for each scenario.
- Integrate various aspects “technical and otherwise” in a complete future vision.
- Prepare the basis for the EASW participation laboratories that will be then organised.

The result of scenario building is documented in the form of **functional user requirements specifications** and **societal user requirements specifications**. This task will involve both of the users. INNOVA will be responsible for organising a participative approach, development of scenarios and formulating societal user requirements specifications. IN-JET will contribute with analysis of market drivers and business climate as well as compiling the functional user requirements specifications for both scenarios. CIL will participate in scenario building and formulation of functional user requirements for Healthcare for tomorrow. Other partners will participate in the scenario building.

During this task the prospective users will be consulted on the optimum approach to obtaining their validation input throughout the project at every stage, including the project’s review and assessment activities. This will then be presented in the project’s User Validation Framework Plan which will set out the way in which:

- User involvement will be sustained throughout each and every stage of the project
- User review of the user aspects of the eu_DOMAIN will be technically facilitated and accomplished
- User input will be impacted upon the projects deliverables in an appropriate and timely manner.

Task T2.2 – Defining trust and security requirement specifications

TASK LEADER – UAAR

This task aims at identifying trust and security issues, as well as privacy and safety issues. The requirement specifications will build on the results of the e-Pasta project and the ISO15408 - Common Criteria standard. The specifications will be based on a security analysis with three steps:

1) Identify a scenario (from task 2.1.)
2) Perform a security analysis of the scenarios and formulate a security specification.
3) Identify the best security architecture that satisfies the security specification.
4) Integrate the chosen security architecture into the general system architecture.

Identify a **scenario** containing a description of the logical and physical configuration along with some uses of this configuration. Perform **security analysis** with the steps defined in the trust and security methodology. Identify a **security architecture** describing how to implement the security of the system so that the security requirements are met. The results of this task will be documented in the **trust and security user requirements specifications** and integrated into the general system architecture.

This task will be headed by UAAR, who will also carry out the security analysis with help from IN-JET (scenarios), FORTH (security in healthcare), SAG, and CNET (implementation) and both users.

Task T2.3 – Workflow analysis and optimisation

TASK LEADER – INN

This task aims at identifying the existing workflows and work procedures, focussing on the individual user. The documentation will be based on semi-formal use cases diagrams, and complement these with workflow descriptions in a tool such as ARIS (IDS Scheer GmbH,

www.ids-scheer.de). This will allow analysis of model-based work process descriptions and optimisation of the work processes. Task and workflow descriptions will be communicated between members of the development teams.

This work complements the activities in Task 2.1

This task will be headed by INN, who will also perform the work in cooperation with the users and supported by IN-JET.

7.4.3. WP 3 – Client side architecture

Objectives

The objectives of this workpackage is to perform research and development of embedded, real-time software architectures, OSGi framework, communication protocols for LAN and WLAN and new devices and ways of interaction and usability.

The software architecture will be analysed with the assumption that the overall eu-DOMAIN infrastructure is networked through a common client/server infrastructure. The methodology of this approach is to:

- Analyse and evaluate the infrastructure and software architecture from user requirements specifications.
- Uncover proper software architectural designs.
- Define and implement a suitable OSGi framework for the service gateways.
- Research and develop new devices and user interfaces according to user requirements specifications.
- Establish interoperable communication methods between devices and gateway and gateway and server.

Workpackage leader: *This workpackage will be lead by: UAAR*

Tasks and actors in this workpackage

The work will be carried out in three subtasks:

Task T3.1 – Software architecture analysis and design

TASK LEADER – UAAR

The software architecture analysis will be carried out using a variation of Quality Attribute Workshops (QAW) as explained in the software architecture analysis section above. The software architecture will be described using the Unified Modelling Language (UML).

The user requirements specifications developed in workpackage 2 points to a number of generic requirements of the client architecture that will be analysed. An initial description of the evaluation architectures will be made. This description will be used as input to a Quality Attribute Workshop.

Main features of the client side software that need to be analysed are:

- Defining object classes for population
- Synchronisation of data structures with server
- Developing local and application intelligence pools
- Access structures and user profiles
- Protocols for connection to local device nets
- Integration with the chosen security architecture

The analysis will mainly be performed by UAAR, FORTH, IN-JET and CNET. TID will participate in defining architecture for interface to the communication infrastructure.

Task T3.2 – OSGi Framework on gateways

TASK LEADER – UAAR

This task is concerned with developing and implementing the embedded software system that will operate on the service gateways. For eu-DOMAIN, the OSGi framework has been chosen to provide real-time management of services bundles requiring simultaneous use of the gateway resources.

A service bundle is a package archive containing software written for the OSGi framework, deployed as a JAR file. It represents a functional component that can be installed, activated, deactivated and uninstalled. The operations that can be performed over a bundle form its so-called lifecycle. Bundles can share Java classes. They can import/export packages available from/to other bundles. They can also provide services and register them to the framework's service repository.

The OSGi model has advanced methods for installing the proper native libraries for the platform on which the framework is running. Just like any application that has a main method in its starting class, which is invoked by the Java Virtual Machine, each bundle has its main class called activator with some methods that are invoked by the OSGi framework.

The OSGi framework shall then be used primarily for proving location intelligence pools and for developing delivery engines for the web services defined in the user requirements specifications. Also, the framework should be extended to support the requirements for realising the chosen security architecture, so that security becomes an integrated part of the software on the gateways.

This subtask will be performed by UAAR with support from FORTH, in particular regarding interfacing medical devices.

Task T3.3 – New devices, ways of interaction, usability

TASK LEADER – TID

In order to realise the user functionality depicted in the scenarios, the testing infrastructure will be populated with a number of applications, i.e. existing products will automatically interface to the eu-DOMAIN infrastructure using semantic searches for device drivers and interface protocols. The necessary devices and interfaces will be developed in this subtask, including the relevant elements of the security architecture.

Mobile vehicle gateways and relevant sensing devices for positioning will be developed for networks in mobile units. Position devices for use with the Galileo GPS system will be incorporated in the local structure.

Both fixed and mobile gateways will interact with local wireless or wired networks, as specified in the user requirements specifications. Developing suitable interface structures is also included in the subtask.

Also in this subtask, design guidelines for the navigation structure and the user interaction dialogues for mobile and non-mobile devices including examples of optimised interaction design for the functionality needed for administrational and user profiling tasks will be developed.

The work will be performed by TID and FORTH supported by T-CON. UAAR will implement the security framework on the new devices. CNET will participate with service side applications for interaction and service delivery. Design guidelines and navigation structure will be developed by FORTH.

7.4.4. WP 4 – Server side architecture

Objectives

The objectives of this workpackage is to perform research and development of database, management and web service delivering software architectures and communication protocols.

The software architecture will be analysed with the assumption that the overall eu-DOMAIN platform is networked through a hierarchal client/server infrastructure. The methodology of this approach is to:

- Analyse and evaluate the infrastructure and software architecture from user requirements specifications.
- Uncover proper software architectural designs.
- Define and develop proper database and management structure.
- Research and develop new XML and RDF structures for semantic searches and self-configuration of devices.
- Establish interoperable communication methods between gateways and the server.
- Implement security framework.
- Develop guidelines and interfaces for user interaction.
- Develop administrative and support centre tools.

Workpackage leader: *This workpackage will be lead by: CNET*

Tasks and actors in this workpackage

The work will be carried out in three subtasks:

Task T4.1 – Software architecture analysis and design

TASK LEADER – UAAR

The software architecture analysis will be carried out using a variation of Quality Attribute Workshops (QAW) as explained in the software architecture analysis section above. The software architecture will be described using the Unified Modelling Language (UML).

The user requirements specifications developed in workpackage 2 points to a number of generic requirements of the client architecture that will be analysed. An initial description of the evaluation architectures will be made. This description will be used as input to a Quality Attribute Workshop.

Main features of the server side software that need to be analysed are:

- Defining database structures and management system
- Developing network intelligence pools
- Synchronisation of data structures with server
- Protocols for connection to fixed and mobile networks
- Integration with the chosen security architecture

The analysis will mainly be performed by UAAR and CNET with support from FORTH, SAG and TID. IN-JET will participate in the conceptual design phase.

Task T4.2 – Network intelligence pool and database management systems

TASK LEADER – SAG

This subtask will focus on building the main network intelligence pool for delivering decision support to all connected gateways, setting up the database structure with management system and designing easy-to-use interfaces for user and administrator interaction. These components must comply with the security architecture.

The main database with management structure will be based on Software AG's Tamino XML Server, which is a high-performance data management platform based on standard internet technologies. Tamino will empower to locate and manage any type of content across the various enterprises involved in the scenarios and to build platform-independent systems to conduct electronic business. The Tamino XML Server provides a common XML representation of both native XML and non-XML content. It allows for a clean XML representation of the data using standard XML tools.

Setting up the Tamino environment - including development tools - will be performed by SAG. CNET will develop semantic agents and RDF/OWL structures to be used for the application intelligence and develop interfaces to the application server. TID, and T-CON will contribute with design and development of tools for interoperability.

Task T4.3 – Application intelligence, web service provisioning and user interaction

TASK LEADER – CNET

This subtask will focus on developing the application intelligence, web service provisioning and delivery of content on demand. Web services will be facilitated by the use of the Visual Net Server from CNET. Visual Net Server is an application server and integrated development environment for building and delivering web services. It allows integration of data from different sources and converts many different content formats into XML and has full support for web services standards like SOAP, XQuery and XML Schema.

Also in this subtask, design guidelines for the navigation structure and the user interaction dialogues for mobile and non-mobile devices including examples of optimised interaction design for the functionality needed for automatic user profiling will be developed.

The development work up will be performed by CNET with support from FORTH, , TID, T-CON and SAG. UAAR will assists on compliance with the security architecture. Design guidelines and navigation structure will be developed by CNET and implemented by IN-JET.

7.4.5. WP 5 – Communication infrastructure

Objectives

The objectives of this workpackage is to build prototype acces points to fixad and mobile WAN communication networks. The following networks will be involved:

- UMTS and TETRA networks for the user scenarios
- Fixed ADSL broadband networks for the fixed service gateways
- Broadband internet access point for connecting the eu-DOMAIN servers to the internet
- Backbone networks between the various communication and development centres

Setting up the Galileo GPS network will also be included in this workpackage.

Communication takes place on several different levels in eu-DOMAIN. However, all routes of communication are defined to be Internet based using IP protocol.

Workpackage leader: *This workpackage will be lead by: TID*

Tasks and actors in this workpackage

The work will be carried out in two subtasks:

Task T5.1 – Setting up fixed and mobile communication networks

TASK LEADER – TID

This subtask will analyse the entire layout of communication infrastructure and establish the following routes:

- Between gateways and server
- Between server and users, including fixed and mobile (UMTS) networks
- Mobile networks for vehicles and fixed points
- Galileo GPS for positioning information
- System administrator backbones for development and operation of the system

Methods of roaming across the various platforms will be developed. Setting up access points to available fixed and mobile UMTS networks will be performed by TID with support from FORTH, UAAR, CNET and T-CON. TID will also establish the backbone infrastructure and broadband Internet access and will implement the vehicle mobile networks.

Task T5.2 – Setting up TETRA communication network

TASK LEADER – TID

This subtask will establish the following communication routes:

- Between server and mobile users (wearable devices)
- Mobile networks for mobile workers
- System administrator backbones for development and operation of the TETRA system

Setting up the TETRA networks will be performed by TID with CNET, FORTH and T-CON developing application interfaces and interoperability tools.

7.4.6. WP 6 – Socio-economic issues

Objectives

The objectives of this workpackage are:

- Analyse and future-project the eu-DOMAIN business environment to assess potential socio-economic impact and immediate implementation effects.
- Organise a European Awareness Scenario Workshop (EASW) for each application to stimulate an external assessment through a scenario-type approach (based on the scenarios built) and a participatory method and test the functionality, market and social potential of the proposed solution.
- Define and describe proper service provider and service aggregator roles.
- Analyse value creation in chains and networks.
- Develop realistic business models for the various stakeholders.

As the technical efforts for eu-DOMAIN take-up, the complementary activity of organising European Awareness Scenario Workshops (EASW) is necessary to develop the business model components required to bring the eu-DOMAIN infrastructure into production and to sustain its services and operations after the project has formally ended.

***Workpackage leader: This** workpackage will be lead by: INN*

Tasks and actors in this workpackage

Task T6.1 – Business modelling

TASK LEADER – IN-JET

This subtask will provide analysis and development of realistic business model for users and service providers. The business models will be based on the concept of value-nets and specific emphasis will be made on defining and measuring value creation and identifying new business opportunities for SMEs.

The work will comprise:

- Analysis of change drives in technology, market, business practise and user needs.
- Describe present business models and value chain in selected domains
- Model business opportunities based on co-operation and value nets.
- Identify and quantify value creation in the net.
- Develop proposed business cases for each actor in the value net.
- Validate and refine the business cases in the European Awareness Scenario Workshop.

The eu-DOMAIN platform will be available for a period after the completion of the project in order to stimulate take-up activities in other application domains. This subtask will be headed by IN-JET. CIL will provide analysis of present markets and business models. INNOVA will

participate in the analysis of change drivers and validation of business models. Users will contribute analysis of their respective industries.

Task T6.2 – Organise Awareness Scenario Workshops (EASW).

TASK LEADER – INNOVA

For each of the two application domains, an EASW will be organised in a target European city, a participation laboratory for joint testing of the simulation scenarios built in WP2. Special focus will be given to socio-economic, regulatory and policy issues with the deployment and wide spread use of ambient intelligence platform. Aspects of social acceptance, economic performance, regulatory frameworks for surveillance and control of private citizens, privacy of data and governmental provisions for health and safety will also be included.

Consortium partners will be activated to involve target users and local communities. Contacts will be established with local players in the areas of interest and promotion of the eu-DOMAIN vision. A local organiser will be identified and support will be given to select participants and define workshop content and programme. Each laboratory will be attended by representatives of 2-4 socio-economic groups, including users, entrepreneurs, experts, politicians, and associations.

The EASW will be a 1-2 days meeting organised as follows:

Vision making phase, during which four groups of people will articulate their own future vision of a 'sustainable' context for the field of interest for the eu-DOMAIN infrastructure. Among the tools used in this phase are double-interviewing technique, brainstorming techniques, back casting and specific assignments to visualise visions. After the visions have been presented, they will be discussed in detail, and a list is drawn up of all the elements the visions have in common. This forms the basis for a commonly shared future vision, the so-called "common ground".

Idea generation phase that is oriented towards generating ideas on how the participants' shared vision of a sustainable implementation of the eu-DOMAIN infrastructure might be realised. From the many techniques available for idea generation, the "snow-carding" technique offers interesting perspectives. Each participant writes down their best ideas towards accomplishing sustainability in terms of the topic allocated to their theme group and a "top-5 list is assembled. The plenary session that follows will select the overall best five ideas using a voting procedure. The closing discussion then focuses on the winning ideas - their merit, their feasibility, and how they might be realised.

At the end of each EASW, a set of headlines on how the eu-DOMAIN should be deployed to fit with the external socio-economic and market environment will be produced with suggestions and recommendations emerged by the discussion and structured in published in reports and articles.

This subtask will involve all the users and Consortium partners and will be headed by INNOVA. IN-JET and CIL will participate in the preparation and in the workshops.

7.4.7. WP 7 – System integration

Objectives

The objectives of this workpackage is integrate client side and server platform using the prototype communications networks. The entire system infrastructure will then tested by technical experts from the involved partners.

After thorough test and quality inspection, the testing infrastructure will be populated with the two user cases, and the overall user evaluation will be performed.

Workpackage leader: *This workpackage will be lead by: TID*

Tasks and actors in this workpackage

The work will be carried out in four subtasks:

Task T7.1 – Integration of system components

TASK LEADER – TID

System integration involves the following main tasks:

- On the client side all devices needed for the two user scenarios will be prototyped and communication links with one or more gateways will be established via relevant networks like WLAN or LONworks.
- Gateways will be loaded with OSGi framework and relevant service bundles for the location intelligence.
- On the server side, the main database, management structure, and network intelligence will be integrated with web service provisioning servers with application intelligence.
- All communication infrastructures will be established and services between gateways and servers will be enabled.
- All web services will be enabled with live access to and from content repositories and content providers.

This subtask will be jointly carried out by CNET, SAG, UAAR, FORTH, and TID with the support of T-CON and IN-JET.

Task T7.2 – Technical testing of overall platform

TASK LEADER – CNET

A technical testing of the entire platform will be carried out before the actual applications are loaded onto the platform. The test will be performed according to established test procedures and will include at least:

- Overall platform security
- Communication interoperability
- Data integrity
- Load and scalability

All the partners involved in the development work will jointly carry out this subtask.

Task T7.3 – Testing and population of user cases

TASK LEADER – CIL

After the successful technical test, the eu-DOMAIN platform will be populated with the two user scenarios. The scenarios define the requirements laid upon the platform, but user data in enterprise and EPR systems must be made available or simulated.

The developers, notably CNET, UAAR, FORTH, and TID, and the users will jointly carry out this subtask. GMA will populate the European Service Network scenario and EBPCT will populate the Healthcare for tomorrow. CIL will lead the subtask.

Task T7.4 – Development of validation plan

TASK LEADER – UAAR

A user-centred approach has been applied throughout the entire project and this subtask will focus on selecting appropriate methods for early quality of use improvement and user validation of the eu-DOMAIN platform in the developed user scenarios.

A user validation plan with appropriate criteria for user testing will be produced, derived from critical success factors of stakeholders and from the identified user needs. Appropriate methods for user testing will be selected. Usability inspection methods will be applied to assess the quality of use of the testing platforms.

This subtask will be carried out by UAAR, CIL and INNOVA together with the users.

7.4.8. WP 8 – Testing and validation

Objectives

After thorough test and quality inspection, the testing infrastructure will be populated with the two user cases, and the overall user evaluation will be performed in this workpackage.

Workpackage leader: *This workpackage will be lead by: IN-JET*

Tasks and actors in this workpackage

The work will be carried out in three subtasks:

Task T8.1 – Validation of the European Service Network (ESN)

TASK LEADER – IN-JET

The objective of this subtask will be to validate the European Service Network (ESN) according to the established validation plan in WP 7. The validation outcome will be published in a report.

The validation will be performed by GMA supported by IN-JET, INNOVA and CIL. Developing partners will participate as needed.

Task T8.2 – Validation of the Healthcare for tomorrow

TASK LEADER – IN-JET

The objective of this subtask will be to validate The Healthcare for tomorrow according to the established validation plan in WP 7. The validation outcome will be published in a report.

The evaluation will be performed by EBPCT supported by IN-JET, INNOVA and CIL. Developing partners will participate as needed.

Task T8.3 – Preparation for exploitation and take-up of results

TASK LEADER – INNOVA

After the successful evaluation, the eu-DOMAIN infrastructure will be made available for exploitation in other domains. In accordance with the exploitation plan, the evaluated infrastructure will installed at one of the partners and made available for uptake for a period of time after the project has ended and until commercial exploitation will commence. This uptake activity is necessary, taking into account the expected relatively long lead-time for new users from other domains to decide on deploying eu-DOMAIN.

A take-up guideline will be issued. Together with a technology watch report of emerging infrastructures and technologies, they will form the basis for exploitation for the partners of the Consortium. An international seminar will mark the kick-off of take-up activities. Invitations to the seminar will be sent out to en large number of potential stakeholders from different sectors, which have been identified during business modelling.

This subtask will be performed by CIL, INNOVA and IN-JET with support by the relevant development partners.

7.4.9. WP 9 – Dissemination and exploitation

Objectives

The objective of this workpackage is to provide an active and professional dissemination of the results obtained and development of an effective and realistic exploitation strategy for the project outcome according the adopted dissemination strategy.

Workpackage leader: *This workpackage will be lead by: CIL*

Tasks and actors in this workpackage

The work will be carried out in two subtasks:

Task T9.1 – Dissemination

TASK LEADER –CIL

This task will be initiated by the development of an agreed dissemination plan setting out an agreed approach to dissemination throughout the project. Appropriate marketing material will be designed and produced in several languages. A project website will be set up by the coordinating partner, providing up-to-date information about the project and its results to the public. The project will be presented at conferences across Europe on Connected/ Intelligent Homes, Ubiquitous Computing, Knowledge Management and similar topics.

The results of the scientific research work conducted in the development workpackages of the project will be submitted for publication to international, peer-reviewed journals. These results combined with outcomes from the implementation and evaluation workpackages will also be submitted for publication in journals.

Each partner will undertake dissemination according to the agreed dissemination plan. INNOVA will support dissemination with supporting material while CIL will coordinate activities and maintain contact to other initiatives.

Task T9.2 – Exploitation

TASK LEADER – IN-JET

Commercial exploitation will commence, as soon as the infrastructure is operational and in parallel with the user test and evaluation.

From the identified user requirements specifications, potential target groups will be identified. All possible target groups will be analysed and prioritised according to commercial attractiveness and the exploitation activities will be focused on the most potential partners, in order to optimise time-to-market. The exploitation plans will take the form of an effective sales and marketing strategies for the partners involved in industrial exploitation.

An Exploitation Team, with members assigned by each potential exploitation partner, will define the general marketing and exploitation strategy. Each contracting partners will prepare his own exploitation strategy with the support from the Exploitation Manager (IN-JET) and based on the work of the Exploitation Team.

7.4.10. WP 10 – Review and assessment

Objectives

This workpackage will run throughout the eu-DOMAIN project and will ensure resources are dedicated to the effective and impartial review and assessment of the project's work. This workpackage will involve the assessment of the project's progress and outcomes at key points and in particular towards the conclusion of each workpackage. It will involve review and assessments by experts both internal and independent to the project and the project partners.

The objective of this workpackage is to internally and independently assess and evaluate the project's performance against set criteria and baseline measurements from the outset of the project to its conclusion.

Workpackage leader: *This workpackage will be lead by: CIL*

Tasks and actors in this workpackage

The work will be carried out in two subtasks:

Task T10.1 – On-going project review

TASK LEADER – CIL

This task will coordinate and undertake the assessment and evaluation of the projects work and outcomes as the project progresses. It will be led by CIL who, with the support of the eu-DOMAIN Quality Manager, will ensure the deployment of the necessary resources for both internal and independent review.

This workpackage will involve all project partners and external expert advice and opinion as appropriate. The latter will in the main be achieved through the Independent Expert Peer Review Group identified in Section 6. This expert group will be appointed by the consortium at the start of the project and include independent experts (2 to 3 in number) in the appropriate technical areas of the project's work.

This Peer Review Group will, independently from the project partners and Commission appointed reviewers, assess the project's performance at key milestones. This process will be identified in detail in the project's quality plan and will include review of the projects deliverables and the provision of expert advice to the consortium over the course of the project's work.

The project will be subject to a continuous evaluation and assessment process that will be set out in detail in the project's quality plan. Evaluation and assessment will be 'built in to' the procedures of each workpackage to ensure that the progress towards the attainment of the projects objectives can be properly monitored and evaluated through the activities and resources assigned to this workpackage.

Each workpackage will be assessed and evaluated at key checkpoints as it progresses with an evaluation report update at the end of the workpackage and submitted at months 12, 24 and 35. The Project Manager and Quality Manager will be responsible for ensuring this is completed by the closure of each workpackage.

The eu-Domain project will be evaluated and assessed against predetermined targets for quality of its results and objectives achievement. This will include the:

- Management of the project and the contract with the European Commission
- Achievement of the projects quality plan objectives
- Achievement of the projects technical objectives as agreed under the contract and description of work
- Achievement of the projects dissemination and use objectives as agreed under the contract and description of work
- Achievement of the users requirements and specific targets agreed for user testing under the project's validation plan
- The project's acknowledgement of internal and external reviews and evaluations.

Task T10.2 – Final assessment

TASK LEADER – CIL

Towards the end of the project a final evaluation assessment will be undertaken and reported. This will evaluate the project against the achievement of its set objectives and measure its successfulness. This will involve internal and external evaluation.

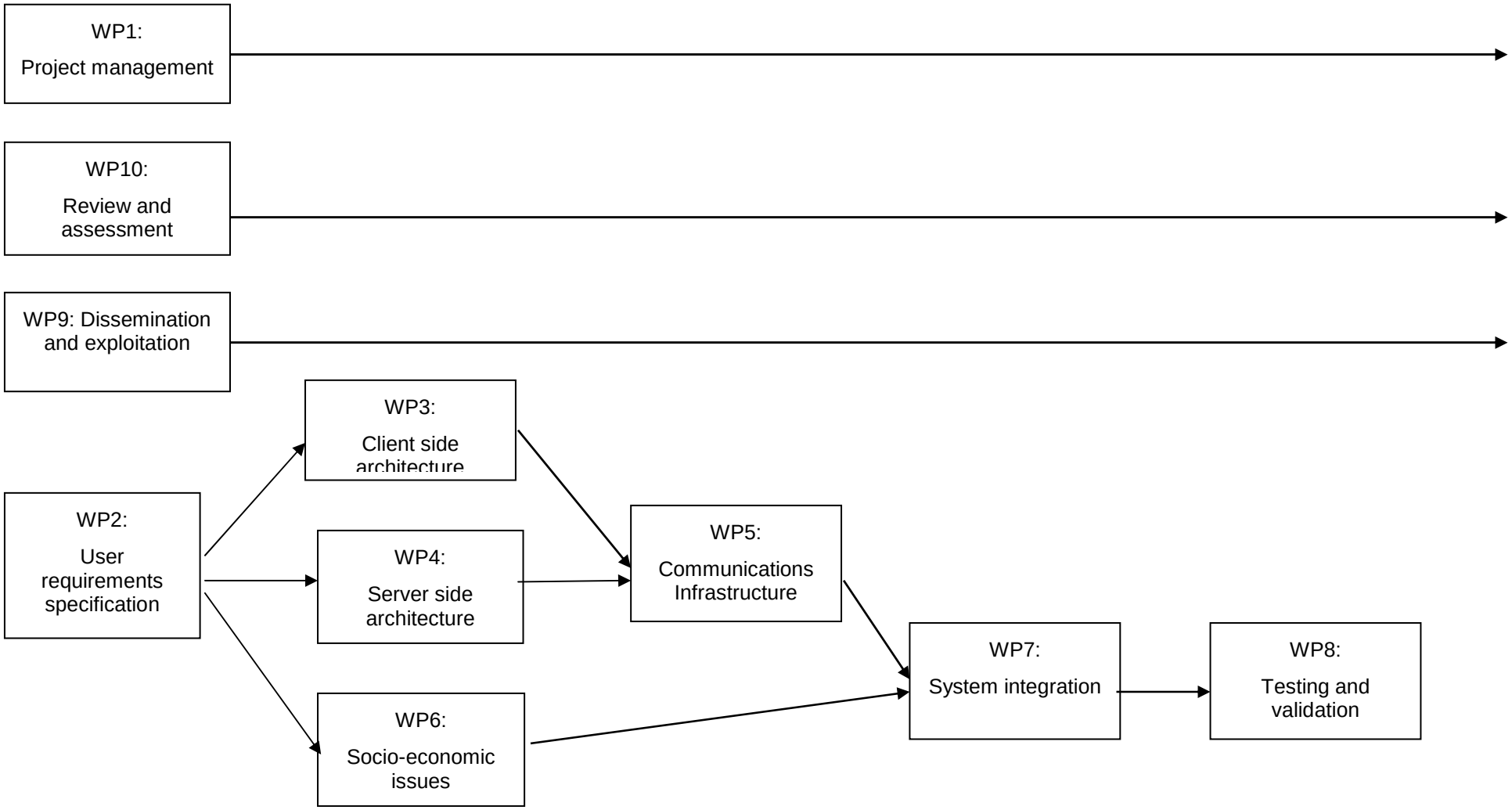
7.5. Project planning and time table (Gantt chart)

	Year/Quarter	1/1			1/2			1/3			1/4			2/1			2/2			2/3			2/4			3/1			3/2			3/3			3/4		
	Month	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
WP1	Project management																																				
T1.1	Project initiation																																				
T1.2	Operational project management																																				
T1.3	Project reporting																																				
WP2	User requirement specifications																																				
T2.1	Analyse State of the Art																																				
T2.2	Define trust and security requirements																																				
T2.3	Workflow analysis and optimisation																																				
WP3	Client side architecture																																				
T3.1	Software architecture analysis & design																																				
T3.2	OSGI framework on gateways																																				
T3.3	Research new devices, interactions.																																				
WP4	Server side architecture																																				
T4.1	Software architecture analysis & design																																				
T4.2	Network intelligence pool & databases																																				
T4.3	Application intelligence / web services																																				
WP5	Communications infrastructure																																				
T5.1	Set up fixed/mobile comms. networks																																				
T5.2	Set up TETRA network																																				
WP6	Socio-economic issues																																				
T6.1	Business modelling																																				
T6.2	European awareness scenario w/shops																																				
WP7	System integration																																				
T7.1	Integration of system components																																				
T7.2	Technical testing overall platform																																				
T7.3	Testing and user scenarios																																				
T7.4	Validation plans																																				
WP8	Testing and validation																																				
T8.1	Validation of ESN																																				
T8.2	Validation of Healthcare tomorrow																																				

	Year/Quarter	1/1			1/2			1/3			1/4			2/1			2/2			2/3			2/4			3/1			3/2			3/3			3/4		
	Month	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
T8.3	Preparation for exploitation & take-up																																				
WP9	Dissemination and exploitation																																				
T9.1	Project dissemination																																				
T9.2	Exploitation																																				
WP10	Review and Assessment																																				
T10.1	On-going project review																																				
T10.2	Final assessment																																				

7.6. Graphical Presentation of Project Components

The diagram below illustrates the interdependencies between the workpackages.



7.7. Workpackage List

The project is divided in 10 workpackages. The content and duration and deliverables of the work packages are as shown in the table.

Work-package No[11]	Workpackage title	Lead contractor No[12]	Person-months [13]	Start month[14]	End month[15]	Deliv-erable No[16]
WP 1	Project management - management, reporting, administration	1 **CIL**	24,0	M1	M36	D1 **1-4**
WP 2	User requirements - scenarios and user requirements specifications	2 **INNOVA**	37,9	M1	M6	D2 **1-6**
WP 3	Client side architecture - OSGi gateways, intelligence pools and devices	4 **UAAR**	49,1	M5	M21	D3 **1-3**
WP 4	Server side architecture - database, intelligence pools and web-services	6 **CNET**	70,2	M5	M22	D4 **1-4**
WP 5	Communication infrastructure - fixed and mobile networks, interoperability.	9 **TID**	48,0	M18	M26	D5 **1-2**
WP 6	Socio-economic issues - policy issues and business modelling	2 **INNOVA**	23,1	M10	M22	D6 **1-4**
WP 7	System integration - integration, testing population of platform	9 **TID**	75,4	M21	M31	D7 **1-3**
WP 8	Testing and validation - testing of user cases	3 **IN-JET**	48.75	M32	M36	D8 **1-4**
WP 9	Dissemination and exploitation	1 **CIL**	29.8	M1	M36	D9 **1-**
WP 10	Review and assessment	1 **CIL**	23.25	M1	M36	**D10** **1**
	TOTAL		429.5			

[11] Workpackage number: WP 1 – WP10.

[12] Number of the contractor leading the work in this workpackage.

[13] The total number of person-months allocated to each workpackage.

[14] Relative start date for the work in the specific workpackages, month 1 marking the start of the project, and all other start dates being relative to this start date.

[15] Relative end date, month 1 marking the start of the project, and all ends dates being relative to this start date.

[16] Deliverable number: Number for the deliverable(s)/result(s) mentioned in the workpackage: D1 - Dn.

7.8. Deliverables List

Deliverables list

Deliverable No[17]	Deliverable name	WP no.	Lead participant	Person-mths	Nature[18]	Dissemination level[19]	Delivery date[20]
D1.1	Project Quality Plan	1	CIL	0.5	R	CO	M1
D1.2	Periodic activity, management and financial reports	1	CIL	6.0	R	CO	M12+M24+M36
D1.3	Quarterly progress reports for the commission	1	CIL	15.0	R	CO	M3 thru M33
D1.4	Final project report - activity, management and financial (draft & final versions)	1	CIL	2.5	R	CO/PU	M35 & M36
D2.1	User validation framework plan	2	IN-JET	2.0	R	RE	M3
D2.2	State of the Art analysis	2	INNOVA	9.0	R	CO	M4
D2.3	Functional user requirements specifications	2	INNOVA	10.0	R	CO	M6
D2.4	Trust and security user requirements specifications	2	UAAR	6.0	R	CO	M6
D2.5	Societal user requirements specifications.	2	INNOVA	4.0	R	CO	M6
D2.6	Workflow procedures and potential for innovation	2	INNOVA	6.9	R	CO	M6
D3.1	Client side architecture specification	3	TID	9.0	R	PP	M9
D3.2	Gateway OSGi framework and device communication	3	UAAR	27.0	P	PP	M18
D3.3	Design guides and navigation for device interaction	3	FORTH	13.1	R	PP	M21
D4.1	Server side architecture specification	4	UAAR	8.0	R	PP	M9
D4.2	Design Guidelines for user interfaces	4	UAAR	8.0	R	PP	M9
D4.3	Network intelligence, database and user interfaces	4	CNET	32.0	P	PP	M20
D4.4	Application intelligence and web service provisioning	4	SAG	25.2	P	PP	M22

[17] Deliverable numbers in order of workpackages:

[18] **R** = Report , **P** = Prototype, **D** = Demonstrator, **O** = Other

[19] **PU** = Public, **PP** = Restricted to other programme participants (including the Commission Services).
RE = Restricted to a group specified by the consortium (including the Commission Services).
CO = Confidential, only for members of the consortium (including the Commission Services).

[20] Month in which the deliverables will be available. Month 1 marking the start of the project, all delivery dates relative to start date.

Deliverable No[17]	Deliverable name	WP no.	Lead participant	Person-mths	Nature[18]	Dissemination level[19]	Delivery date [20]
D5.1	Communication architecture description	5	T-CON	8.0	R	PP	M21
D5.2	Prototype of communication infrastructure	5	TID	40.0	P	PP	M26
D6.1	Proposed business models and business cases	6	IN-JET	5.0	R	PP	M15
D6.2	Organised European Awareness Scenario Workshops	6	INNOVA	7.0	O	PU	M22
D6.3	Public reports from the EASW Workshops	6	INNOVA	6.1	R	PU	M22
D6.4	Validated business models and business cases	6	IN-JET	2.0	R	PP	M22
D7.1	Test report of prototype platform	7	TID	46.4	R	RE	M31
D7.2	Testing platform for validation	7	CNET	20	P	RE	M31
D7.3	User validation plan for eu-DOMAIN	7	UAAR	9.0	R	RE	M31
D8.1	Validation report: The European Service Network	8	IN-JET	18.0	R	RE	M35
D8.2	Validation report: Healthcare for tomorrow	8	IN-JET	17.95	R	RE	M35
D8.3	Evaluated platform for take-up activities	8	IN-JET	6.4	D	PU	M35
D8.4	Take-up guideline and technology watch report	8	INNOVA	6.4	R	PU	M35
D9.1	Project presentation	9	CIL	0.3	R	PU	M2
D9.2	Project website	9	CIL	2.0	O	PU/RE	M2
D9.3	Plan for using and disseminating knowledge (drafts at 6 month intervals)	9	CIL	18.5	R	RE	M6 thru M32
D9.4	Final plan for using and disseminating knowledge	9	CIL	4.0	R	RE	M35
D9.5	Raising public awareness report	9	INNOVA	2.0	R	RE	M35
D9.6	Exploitation plans (Draft and final)	9	IN-JET	3.0	R	CO	M16 and M34
D10.1	Evaluation and assessment report	10	CIL	23.25	R	RE	M12+M24+M35
				429.5			

7.9. Workpackage Descriptions

Workpackage number:	**WP 1**		**Start date or starting event:**			**Month 1**					
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	18,0	0,4	3,2	0,4	0,4	0,1	0,4	0,3	0,4		0,2	0,2

Objectives

- Ensure the delivery of the project on time and on budget.
- Coordinate the technological and scientific orientation of the project.
- Secure the quality of the work to be undertaken and of the delivered documents and software.
- Management of knowledge
- Risk management and contingency planning

Description of work

T1.1 Project initiation: The effective initiation of the project involving the production of a Project Initiation Document and Consortium Agreement.

T1.2 Operational project management: The co-ordinating partner will conduct the operational management of the project on a day-to-day basis.

T1.3 Project reporting: The formal project reporting deliverables, including the 6-month progress and financial reports and the final project report. Also quarterly project progress reports will be prepared for the commission.

Deliverables

D1.1 Project Quality Plan

D1.2 Period activity, management and financial reports

D1.3 Quarterly progress reports for the commission

D1.4 Final project report - activity, management and financial (draft & final versions)

Milestones and expected result

M1.1 Acceptance of the consortium agreement by all partners.

M1.2 PID produced for kick off meeting.

M1.3 Timely issuance of a Quality Manual to be used in all parts of the project and in all project material.

M1.4 Timeliness of the planned reviews.

M1.5 Final project report produced.

Workpackage number:	**WP 2**		**Start date or starting event:**			**Month 1**					
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	2,0	13,0	5,0	5,0	4,0	0,9	0,0	0,0	0,0		4,0	4,0

Objectives

- Carry out state-of-the-art analysis and scenario building.
- Develop functional user requirements specifications.
- Develop societal user requirements specifications.
- Analyse trust and security issues and develop trust and security user requirements specifications.
- Describe, analyse and optimise user tasks and workflow

Description of work

T2.1 Build State-of-the-art analysis and future scenarios and analyse, what will be the impact on the external environment and on users behaviour and acceptance from the eu-DOMAIN platform leading to functional and societal user requirements specifications.

T2.2 Identify trust and security issues, as well as privacy issues. Analyse security assets, environment, objectives and define trust and security requirement specifications for security architectures.

T2.3 Identify work flow procedures and document these with appropriate tools. Communicate the results (task and workflow descriptions) between members of the development team.

Deliverables

D2.1 User validation framework plan

D2.2 State of the Art analysis

D2.3 Functional user requirements specifications.

D2.4Trust and security user requirements specifications.

D2.5 Societal user requirements specifications.

D2.6 Work flow procedures and potential for innovation.

Milestones and expected result

M2.1 Scenarios identifying key technological, socio-economic and business drivers for future technological development has been established and show no adverse impact on the overall concept of the eu-DOMAIN infrastructure.

M2.2 The comprehensive set of user requirements specifications based on users behaviours and simulated interaction with eu-DOMAIN infrastructure ensuring its market exploitation and social acceptance

Workpackage number:	**WP 3**		**Start date or starting event:**						**Month 5**			
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	0,0	0,0	0,4	26,2	10,0	1,0	6,0	0,0	5,5		0,0	0,0

Objectives

- Uncover proper software architectural designs from analysis and evaluation of user requirements specifications.
- Define and develop proper OSGi framework for the service gateway.
- Research and develop new devices and user interfaces according to user requirements specifications.
- Establish interoperable communication methods between devises and gateway and gateway and server.

Description of work

T3.1 Perform software architecture analysis and design.

T3.2 Analyze, decide on and implement an OSGi Framework on gateway.

T3.3 Research and develop new types of devices, new ways of interaction and optimised user interfaces as well as an interoperable communication infrastructure with protocols for the specified device nets. Develop design guidelines for the navigation structure and the user interaction dialogues for mobile and non-mobile devices including examples of optimised interaction design for the functionality needed for administrational and user profiling tasks.

Deliverables

D3.1 Client side architecture specification.

D3.2 Prototype gateway with OSGi framework, device communication and integrated security.

D3.3 Design guidelines and navigation structure for device interaction.

Milestones and expected result

M3.1 Software architecture is defined in UML with no major points of conflict with user requirements.

M3.2 OSGi framework is operational with testing bundles.

M3.3 Entire client side infrastructure is operational and can be integrated with the server side structure.

Workpackage number:	**WP 4**		**Start date or starting event:**						**Month 5**			
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	0,0	0,0	4,0	7,5	6,0	25,6	6,0	13,5	7,6		0,0	0,0

Objectives

- Uncover proper software architectural designs from analysis and evaluation of user requirements specifications.
- Define and develop network intelligence pool and make design guides for easy-to-use user interfaces
- Define and develop application intelligence pool
- Set up database structure and management system.
- Establish interoperable communication methods between gateways and servers.

Description of work

T4.1 Perform software architecture analysis and design and define proper solutions for the user cases in the testing infrastructure.

T4.2 Develop the main network intelligence pool for delivering decision support to connected gateways, setting up the database structure with management system, XML server engine, RDF/OWL semantic search structures.

T4.3 Develop application intelligence, web service provisioning and delivery of content on demand. Develop design guidelines for the navigation structure and the user interaction dialogues for the functionality required by workers and easy-to-use interfaces for administrator interaction.

Deliverables

D4.1 Server side architecture specification

D4.2 Design Guidelines for user interfaces

D4.3 Prototype network intelligence pool with database, XML server

D4.4 Prototype application intelligence pool with web service provisioning

Milestones and expected result

M4.1 Software architecture is defined in UML with no major points of conflict with user requirements.

M4.2 Entire server side infrastructure is operational and can be integrated with the client side structure.

Workpackage number:	**WP 5**		**Start date or starting event:**						**Month 18**			
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	0,0	0,0	2,5	0,0	10,0	4,0	11,5	0,0	20,0		0,0	0,0

Objectives

- Establish communication for gateways via mobile or fixed networks
- Establish TETRA network for networks of mobile users
- Build network for vehicles
- Enable Galileo GPS devices
- Establish communication for user interaction via internet
- Setup developing and system administrator backbone

Description of work

T5.1 Setting up fixed and mobile (UMTS) communication networks for gateway and server communication and user interaction, including Galileo GPS enabled devices and vehicle networks.

T5.2 Setting up and integrating a TETRA communication network for user interaction.

Deliverables

D5.1 Communication architecture descriptions

D5.2 Prototype of communication infrastructure for use in user scenarios.

Milestones and expected result

M5.1 System architecture approved.

M5.2 Network access approved.

M5.3 Entire communication infrastructure is operational and can be integrated with the server and client side structure.

Workpackage number:	**WP 6**		**Start date or starting event:**						**Month 13**			
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	2,2	12,5	5,0	0,4	0,4	0,4	0,0	0,0	0,4		0,9	0,9

Objectives

- Analyse change drivers in markets, technology business practice and user needs
- Analyse value creation in value chains and value nets
- Develop business models and business cases
- Organise Awareness Scenario Workshops to define societal and business requirements for sustainable exploitation of the eu-DOMAIN platform

Description of work

T6.1 Analyse and develop realistic business model for users and service providers. The business models will be based on the concept of value-nets and specific emphasis will be made on defining and measuring value creation and identifying new business opportunities for SME's.

T6.2 Organise European Awareness Scenario Workshops (EASW) with focus on socio-economic, regulatory and policy issues with the deployment and wide spread use of Ambient Intelligence infrastructures. Summarize in societal users requirement specifications.

Deliverables

D6.1 Proposed business models and business cases

D6.2 Organised European Awareness Scenario Workshops

D6.3 Public reports from the European Awareness Scenario Workshops

D6.4 Validated business models and business cases

Milestones and expected result

M6.1 Successful business cases for each of the two user scenarios.

M6.2 Successful organisation of European Awareness Scenario Workshops with at least 15 participants in each event.

Workpackage number:	**WP 7**		**Start date or starting event:**			**Month 21**					
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	5,5	3,0	1,2	9,0	6,5	15,2	6,0	3,0	20,0		3,0	3,0

Objectives

- To integrate client side with the server using the prototype communications networks
- Technical testing of overall platform.
- To populated the infrastructure with the two user scenarios.
- To derive assessment criteria for user validation and select appropriate methods for early quality of use improvement and user testing.
- To develop a validation plan

Description of work

T7.1 Integration of system components on client and server side and integrate them with communication infrastructures and web services.

T7.2 Technical testing of overall platform according to established test procedures including security and data integrity.

T7.3 Testing and population of user scenarios, including access to legacy systems.

T7.4 Development of user validation plan.

Deliverables

D7.1 Test report of prototype platform

D7.2 Testing platform for validation

D7.3 User validation plan for eu-DOMAIN

Milestones and expected result

M7.1 Infrastructure testing successful

M7.2 Testing and population of user cases successful

Workpackage number:	**WP 8**		**Start date or starting event:**						**Month 32**			
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	1,8	9,1	13,0	1,1	2,0	1,9	2,25	1,2	2,0		7,2	7,2

Objectives

- Validation of: The European Service Network (ESN)
- Validation of: Healthcare for tomorrow
- Preparation for exploitation and uptake of results including availability of tested infrastructure and necessary training.

Description of work

T8.1 Validation of The European Service Network (ESN) according to validation plan.

T8.2 Validation of Healthcare for tomorrow according to validation plan.

T8.3 Preparation for exploitation and take-up of results.

Deliverables

D8.1 Validation report: The European Service Network (ESN).

D8.2 Validation report: Healthcare for tomorrow.

D8.3 Evaluated platform for take-up activities.

D8.4 Take-up guideline and technology watch report.

Milestones and expected result

M8.1 User acceptance of the two user cases.

M8.2 At least two potential new users from different domains have emerged and are planning new tests.

Workpackage number:	**WP 9**		**Start date or starting event:**						**Month 1**			
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	6,5	3,0	4,2	3,4	1,5	3,0	1,1	0,0	3,1		2,0	2,0

Objectives

- Ensure that the project results are disseminated according to the dissemination strategy
- Define and execute a comprehensive dissemination plan.
- Secure that all results of the project are fully exploited through development of effective exploitation plans.

Description of work

T9.1 Dissemination: Execution and update of the dissemination plan, preparing project marketing tools and maintaining project web-site content.

T9.2 Exploitation: Development of market surveys and technology watch reports, analysis of competitors, development of consortium and individual partner exploitation plans.

Deliverables

D9.1 Project presentation

D9.2 Project website

D9.3 Plan for using and disseminating knowledge (6-monthly)

D9.4 Final plan for using and disseminating knowledge

D9.5 Raising public awareness report

D9.6 Exploitation plans (draft and final)

Milestones and expected result

M9.1 Project presentation completed by month 3.

M9.2 Inaugural conference held by month 2.

M9.3 Plan for disseminating and using knowledge Draft by month 6.

M9.4 Final plan for disseminating and using knowledge by month 35

Workpackage number:	**WP 10**		**Start date or starting event:**			**Month 1**					
Participant number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Participant ID:	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID		GMA	EBPCT
Personmonths per participant:	4,0	0,2	3,5	2,2	2,0	2,75	1,0	1,5	3,5		0,7	0,1

Objectives

To both internally and independently (peer expert evaluation and guidance) assess and evaluate the project's performance against set criteria and baseline measurements from the outset of the project to its conclusion.

Description of work

T10.1 On-going project review. This task will coordinate and undertake the assessment and evaluation of the projects work and outcomes as the project progresses.

T10.2 Final assessment. This task will produce a final evaluation assessment which will evaluate the project against the achievement of its set objectives and measure its successfulness.

Deliverables

D10.1 Evaluation and assessment report

Milestones and expected result

M10.1 Draft evaluation updated at completion of each workpackage.

M10.2 Project fully evaluated Month 36

8. Project Resources and Budget Overview

8.1. Effort for the Project

(person-months for activities in which partners are involved)	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID	GMA	EBPCT	Total Partners
Research/innovation activities												
WP 1: Project management	0	0	0	0	0	0	0	0	0	0	0	0
WP 2: User requirements	2	12,5	5	5	4	0,9	0	0	0	4	4	37,4
WP 3: Client side architecture	0	0	0,4	25,2	10	1	6	0	5	0	0	47,6
WP 4: Server side architecture	0	0	4	7	6	24,6	6	13,5	7,6	0	0	68,7
WP 5: Communication infrastructure	0	0	2,5	0	10	4	11,5	0	20	0	0	48
WP 6: Socio-economic issues	2,2	11,5	5	0,4	0,4	0,4	0	0	0,4	0,9	0,9	22,1
WP 7: System integration	3,5	3	1,2	9	6,5	15	6	3	17	3	3	70,2
WP 8: Testing and validation	1,6	8,5	9	1,1	2	1,9	2,25	1,2	2	7,2	7,2	43,95
WP 9: Dissemination and exploitation	6,5	3	3,7	3,4	1,5	3	1,1	0	3,1	2	2	29,3
WP 10: Review and assessment	4	2	3,5	2,2	2	2,75	1	1,5	3,5	0,7	0,1	23,25
Total research/innovation	19,8	40,5	34,3	53,3	42,4	53,55	33,85	19,2	58,6	17,8	17,2	390,5
Consortium management activities												
WP 1: Project management	18	0,4	3,2	0,4	0,4	0,1	0,4	0,3	0,4	0,2	0,2	24
WP 2: User requirements	0	0,5	0	0	0	0	0	0	0	0	0	0,5
WP 3: Client side architecture	0	0	0	1	0	0	0	0	0,5	0	0	1,5
WP 4: Server side architecture	0	0	0	0,5	0	1	0	0	0	0	0	1,5
WP 5: Communication infrastructure	0	0	0	0	0	0	0	0	0	0	0	0
WP 6: Socio-economic issues	0	1	0	0	0	0	0	0	0	0	0	1
WP 7: System integration	2	0	0	0	0	0,2	0	0	3	0	0	5,2

(person-months for activities in which partners are involved)	CIL	INNOVA	IN-JET	UAAR	FORTH	CNET	T-CON	SAG	TID	GMA	EBPCT	Total Partners
Research/innovation activities												
WP 8: Testing and validation	0,2	0,6	4	0	0	0	0	0	0	0	0	4,8
WP 9: Dissemination and exploitation	0	0	0,5	0	0	0	0	0	0	0	0	0,5
Total consortium management	20,2	2,5	7,7	1,9	0,4	1,2	0,4	0,3	3,9	0,2	0,2	39
TOTAL ACTIVITIES	40	43	42	55,2	42,8	54,75	34,25	19,5	62,5	18	17,4	429,5

8.2. Overall Project Budget

EUROPEAN COMMISSION 6th Framework Programme for Research, Technological Development and Demonstration	**Specific Targeted Research or Innovation Project**	**A3.1**

Proposal Number	IST-2003-004420	Proposal Acronym	eu-DOMAIN

Financial information – whole duration of the project

Participant n°	**Organisation short name**	**Cost model used**	**Estimated eligible costs and requested EC contribution (whole duration of the project)**		**Costs and EC contribution per type of activities**41			**Total (4)=(1)+(2)+ (3)**	**Total receipts**41
					RTD42 **or Innovation-related**44 **activities(1)**	**Demonstration activities**43**(2)**	**Consortium Management activities**45**(3)**		
1	**C International Ltd.**	**FC**	Eligible costs	*Direct costs (a)*	**207,042.00**		**96,029.00**	**303,071.00**	
				of which subcontracting					
				Indirect costs (b)	**82,816.00**		**38,412.00**	**121,228.00**	
				Total eligible costs (a)+(b)	**289,858.00**		**134,441.00**	**424,299.00**	
			Requested EC contribution		**144,929.00**		**134,441.00**	**279,370.00**	
2	**Innova S.p.A.**	**FC**	Eligible costs	*Direct costs (a)*	**187,708.00**		**2,646.00**	**190,354.00**	
				of which subcontracting					
				Indirect costs (b)	**131,396.00**		**1,852.00**	**133,248.00**	
				Total eligible costs (a)+(b)	**319,104.00**		**4,498.00**	**323,602.00**	
			Requested EC contribution		**159,552.00**		**4,498.00**	**164,050.00**	
3	**In-JeT ApS**	**FCF**	Eligible	*Direct costs (a)*	**312,889.00**		**8,605.00**	**321,494.00**	

			costs	*of which subcontracting*					
				Indirect costs (b)	**62,578.00**		**1,721.00**	**64,299.00**	
				Total eligible costs (a)+(b)	**375,467.00**		**10,326.00**	**385,793.00**	
			Requested EC contribution		**187,733.00**		**10,326.00**	**198,059.00**	
4	**University of Aarhus**	**AC**	Eligible costs	*Direct costs (a)*	**330,270.00**			**330,270.00**	
				of which subcontracting	**40,000.00**			**40,000.00**	
				Indirect costs (b)	**58,055.00**			**58,055.00**	
				Total eligible costs (a)+(b)	**388,325.00**		**0.00**	**388,325.00**	
			Requested EC contribution		**388,325.00**		**0.00**	**388,325.00**	
5	**Foundation for Research and Technology - Hellas**	**FC**	Eligible costs	*Direct costs (a)*	**148,654.00**		**1,436.00**	**150,090.00**	
				of which subcontracting					
				Indirect costs (b)	**196,222.00**		**1,896.00**	**198,118.00**	
				Total eligible costs (a)+(b)	**344,876.00**		**3,332.00**	**348,208.00**	
			Requested EC contribution		**172,438.00**		**3,332.00**	**175,770.00**	
6	**CNet Svenska AB**	**FC**	Eligible costs	*Direct costs (a)*	**430,040.00**		**2,131.00**	**432,171.00**	
				of which subcontracting					
				Indirect costs (b)	**309,628.00**		**1,535.00**	**311,163.00**	
				Total eligible costs (a)+(b)	**739,668.00**		**3,666.00**	**743,334.00**	
			Requested EC contribution		**369,834.00**		**3,666.00**	**373,500.00**	

7	**T-connect s.r.l.**	**FC**	Eligible costs	*Direct costs (a)*	**156,028.00**		**1,089.00**	**157,117.00**	
				of which subcontracting					
				Indirect costs (b)	**82,696.00**		**577.00**	**83,273.00**	
				Total eligible costs (a)+(b)	**238,724.00**		**1,666.00**	**240,390.00**	
			Requested EC contribution		**119,362.00**		**1,666.00**	**121,028.00**	
8	**Software AG Nordic A/S**	**FC**	Eligible costs	*Direct costs (a)*	**158,870.00**		**2,233.00**	**161,103.00**	
				of which subcontracting					
				Indirect costs (b)	**44,484.00**		**625.00**	**45,109.00**	
				Total eligible costs (a)+(b)	**203,354.00**		**2,858.00**	**206,212.00**	
			Requested EC contribution		**101,677.00**		**2,858.00**	**104,535.00**	
9	**Telefonica I+D**	**FC**	Eligible costs	*Direct costs (a)*	**267,284.00**		**1,939.00**	**269,223.00**	
				of which subcontracting					
				Indirect costs (b)	**312,723.00**		**2,268.00**	**314,991.00**	
				Total eligible costs (a)+(b)	**580,007.00**		**4,207.00**	**584,214.00**	
			Requested EC contribution		**290,003.00**		**4,207.00**	**294,210.00**	
10		**FC**	Eligible costs	*Direct costs (a)*					
				of which subcontracting					
				Indirect costs (b)					
				Total eligible costs (a)+(b)					

			Requested EC contribution						
11	**Grundfos Management A/S**	**FC**	Eligible costs	*Direct costs (a)*	**110,645.00**		**1,004.00**	**111,649.00**	
				of which subcontracting					
				Indirect costs (b)	**66,387.00**		**602.00**	**66,989.00**	
				Total eligible costs (a)+(b)	**177,032.00**		**1,606.00**	**178,638.00**	
			Requested EC contribution		**88,516.00**		**1,606.00**	**90,122.00**	
12	**Eastern Birmingham Primary Care Trust**	**AC**	Eligible costs	*Direct costs (a)*	**159,192.00**		**0.00**	**159,192.00**	
				of which subcontracting					
				Indirect costs (b)	**31,839.00**		**0.00**	**31,839.00**	
				Total eligible costs (a)+(b)	**191,031.00**		**0.00**	**191,031.00**	
			Requested EC contribution		**191,031.00**		**0.00**	**191,031.00**	
TOTAL			Eligible costs		**3,847,446.00**		**166,600.00**	**4,014,045.00**	
			Requested EC contribution		**2,213,400.00**		**166,600.00**	**2,380,000.00**	
Financial information – whole duration of the project									

Estimated breakdown of the EC contribution per reporting period

Reporting Periods	Start month	End month	Estimated Grant to the Budget	
			Total	In which first six months
Reporting Period 1	1	12	706,405.00	.00
Reporting Period 2	13	24	935,470.00	376,150.00
Reporting Period 3	25	36	738,125.00	357,760.00
Reporting Period 4			.00	.00
Reporting Period 5			.00	.00
Reporting Period 6			.00	.00
Reporting Period 7			.00	.00

8.3. Description of Resources and Budget

8.3.1. Resources

The eu-DOMAIN consortium is a good partnership of industrial and academic application and technology developers, equipment vendors, system integrators, service providers, usability experts and end-users. The following table shows the knowledge required to carry out the project and how the Consortium partners provide it:

Project stages	*Required knowledge*	*Provided by*
User scenarios and requirement specifications	Scenario building	IN-JET
	Requirement specifications	INNOVA
	Industrial applications	GMA
	Healthcare applications	EBPCT
Client side architecture	Architecture and security	UAAR
	Sensors and devices	FORTH
	Gateways, OSGi	UAAR
	Embedded software	FORTH, UAAR
Server side architecture	Architecture	UAAR, CNET
	Server applications	CNET
	Software development	CNET, TID, T-CON
	*e*Business	CNET
	Web services	CNET, FORTH
	Database and management	SAG
	Usability	CNET, IN-JET
Communication infrastructures	UMTS networks	TID
	TETRA networks	T-CON
	Mobile eBusiness	
Socio-economic issues	Business modelling	IN-JET, CIL
	Socio-economic issues	INNOVA
	Awareness Scenarios	INNOVA
System integration	System planning	CIL
	System integration	IN-JET

The users comprise two important players in the field of industrial and domestic pumps (GMA) and primary care and ambulance service (EBPCT).

In technology and application development, the Consortium comprises two academic institutions with highly recognized skills in software architecture and security aspects (UAAR) and healthcare networks and telematics applications (FORTH). Software development is provided by IT companies with substantial experience in innovative web services platforms (CNET) and delivery to mobile users (T-CON) and one of the most reputable providers of database solutions and XML platforms (SAG). The communication infrastructure will be supported by one of Europe's most innovative Telco's (TID) through its research and development arm and the worlds leading provider of TETRA infrastructures. Finally,

experienced technology and business consulting firms carry out the supporting research in the areas of user scenarios and socio-economic assessment (INN), concept formulation and business modelling (INJET) and business evaluation and project coordination (CIL).

The Consortium also provides an excellent mix of SMEs and large companies. Together they provide an ideal combination of complementary skills and experiences for a RTD project. All partners have previously worked together on more than one occasion in various EU projects.

Participant	*Role*	*Functions*	*Value to the Consortium*
(1) C International **(CIL)**	Co-ordinating Partner	Project management Business modelling System integration and validation Project evaluation Coordination of dissemination activities	Extensive experience of managing IST and other multi-partner projects. Substantial prior involvement in testing implementation and evaluation activities. Substantial experience in business modelling.
(2) Innova S.p.A. **(INNOVA)**	Partner	User requirements analysis Organizing Awareness Scenario Workshops Socio-economic issues Validation of eu-Domain platform	Long experience in bringing new technology to SMEs. Experience in conduction European Awareness Scenario Workshops (EASW). Substantial knowledge of Socio-economic issues in relation to technology deployment.
(3) In-JeT ApS **(IN-JET)**	Partner	Overall responsible for the conceptual vision and system structure User requirements analysis Business modelling Validation of eu-Domain platform Exploitation strategies	Substantial knowledge on frameworks for ambient intelligence and web services. Experience in integrating large ICT systems and networks. Substantial experience in business modelling and building business cases.
(4) University of Aarhus.Dept of Computer Science **(UAAR)**	Partner	Software architecture analysis Client gateway technologies and embedded systems Trust and security analysis Dissemination in scientific publications and journals	Substantial scientific knowledge of software architectures and system analysis. Experience in gateway technology and OSGi frameworks. Substantial scientific knowledge of trust and security analysis.
(5) **FORTH** **(FORTH)**	Partner	Server side technologies Technologies for embedded healthcare systems System integration Validation of eu-DOMAIN platform	Expertise in all aspects of system design for healthcare. Substantial expertise in *e*Health devices Extensive expertise in EPR and ICRS systems.

Participant	*Role*	*Functions*	*Value to the Consortium*
(6) **CNet Svenska AB** **(CNET)**	Partner	Server side technologies Web service provisioning via XML and RDF System integration Validation of eu-DOMAIN platform	Extensive experience in XML based content and web service application development. Substantial knowledge in web-based meta data creation for the construction industry. Experience in interactive environments for geographically distributed organisations.
(7)T-connect S.r.l. **(T-CON)**	Partner	Telecommunication infrastructure and terminals Web service provisioning to mobile devises System integration	Experience in wireless broadband technologies. Substantial knowledge of deliveries of personalised services via wireless networks.
(8) Software AG **(SAG)**	Partner	Server side database management Web services for mobile users System integration	Leading vendor of XML technology and solutions. Substantial experience in web services and content management. Comprehensive experience in mobile computing.
(9) Telefónica I+D **(TID)**	Partner	Server side software engineering Fixed and mobile (UMTS) telecommunication infrastructure and terminals System integration Validation of eu-DOMAIN platform	Substantial experience in intelligent network and services creation on broadband. Comprehensive skills in artificial intelligence and software engineering. Experiences in real time systems and databases and knowledge bases.
(11) Grundfos (GMA)	User Scenario: The European Service Network	User requirements analysis Population and validation of eu-DOMAIN platform	Grundfos is one of the world's leading pump manufacturers. Grundfos sees the pump as part of a complex hydraulic system - not just focusing on the pump alone, but optimising the whole system. Grundfos has decades of know-how about pumps and pump systems and is a typical case of a European Service Network user.
(12) Eastern Birmingham Primary Care Trust (EBPCT)	User Scenario: Healthcare for tomorrow	User requirements analysis Population and validation of eu-DOMAIN platform	The PCT has extensive experience in commissioning hospital services as well as providing community services and running emergency services and is a typical case of a Healthcare for tomorrow user

8.3.2. Estimated Costs

In order to estimate the costs for the work to be undertaken, the following approach has been taken. For direct costs, the hourly rates of each partner have been used. The costs of equipment, travel etc has been included in the calculations and the A3 form above summarises these estimates. These have been grouped into the two categories of 'Research and Innovation' and 'Management'.

The individual partners have all assessed the internal financing in terms of resources, manpower, investments that they will have to provide to carry out the project, and are prepared to do so. It is believed that all the resources are now in place, and that the overall financial plan for the project is adequate.

Each member of the eu-DOMAIN consortium has a clear role as set out in Section 7 and will contribute to the project's success. Responsibilities have been assigned to all workpackages and clear responsibility for each task within each workpackage has been assigned.

Each of the AC funded partners will, in addition to their 'additional eligible costs' resources (the budget shown for them in this section), also deploy valuable other non-chargeable resources to help ensure that the consortium attains its objectives. These will include:

- Local coordination and management of the work being undertaken by temporary staff (chargeable resources) and liaison with the other partners as appropriate.
- Supporting the chargeable resources to the project's user validation with additional non-chargeable staff in the development of the system and the running and assessment of the eu-DOMAIN user validation. This will be provided throughout the project from user requirements definition through design and system trial and validation. This is planned to approximate to the equivalent of the chargeable time and costs for this part of the project's work.
- The non-chargeable provision of the logistics (ICT infrastructure, administrative support, accommodation and local ICT support) required to set-up and run eu-DOMAIN validation.
- Inputting the expertise of non-chargeable permanent staff resources into the projects dissemination and exploitation work. Including incorporating these aspects of eu-DOMAIN into day-to-day contacts with peer organisations, the public and attendance at relevant 'industry' events.
- These additional resources will be assigned as is necessary to attain the objectives for the project. These non-chargeable resources represent considerable value added services to the project, particularly from the quality management perspective. It is not possible to put a monetary value to all of these, but it is anticipated to be the equivalent of 40 to 50% of the partner's project chargeable costs.

9. Ethical Considerations

EU-DOMAIN does not foresee activities potentially controversial from the ethical point of view as described below.

9.1. Ethical issues

Storage of private data on proprietary servers and surveillance of mobile workers could in some respect be seen as an ethical issue. However, in the eyes of the Consortium, this is not an ethical issue in the project, because WP 6 precisely sets out to identify where and to what extent such ethical issue exists.

There are thus no ethical issues associated with the subject of the proposal and there are no EC-policy related issues other than those already discussed that are associated with the subject of the proposal.

Does your proposed research raise sensitive ethical questions related to:	*YES*	*NO*
Human beings		**X**
Human biological samples		**X**
Personal data (whether identified by name or not)		**X**
Genetic information		**X**
Animals		**X**

The proposed research does not involve:

- Research activity aimed at human cloning for reproductive purposes,
- Research activity intended to modify the genetic heritage of human beings, which could make such changes heritable
- Research activity intended to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer;
- Research involving the use of human embryos or embryonic stem cells with the exception of banked or isolated human embryonic stem cells in culture

9.2. Gender issues

The technical service industry is a domain, in which there is a traditionally strong male representation in the labour force. However, this situation will be balanced in the establishment of the European Service Network, where female representation will be promoted.

In the healthcare industry, the female gender is in the majority, and this will be incorporated in the usability analysis to be performed for this scenario. The validation of the two scenarios will include criteria explicitly intended to identify and quantify any gender differences in the use of and benefits from the platform. These criteria will also be carried forward into the take-

up guidelines to identify and quantify any gender-related barriers to the wider implementation of the platform in other business domains.

All of the participating organisations have well-established equal opportunity policies. Female members of the project team undertake more than one third of the key roles within the project.

9.3. Safety Issues

Dealing with Care procedures implicitly means looking after safety procedures. The existing relationship between the patient and the public health service will be preserved in eu-DOMAIN, which has been designed to ensure that the safety of patients is paramount. The validation procedures put in place in eu-DOMAIN are also designed to ensure that the patient's welfare is of primary concern.

Concerning handling of dangerous materials, there is no evidence of processing or management in eu-DOMAIN which could affect the physical integrity or the bio-safety of stored tissue sample collections that might be subject to ethical principles.

9.4. Data Protection

The European directive of 1995 (EC 1995 Data Protection Directive: 95/46/EC) requires to take measure to protect data against alteration or disclosure. This law aims at protecting patient's rights, promoting the highest standard of practice, providing European citizens with maximum safeguards to their rights in face of developing technology; but also at removing obstacles for the free movement of personal data with Europe by narrowing divergences between national data protection laws.

eu-DOMAIN will fully conform to the requirements of European data protection legislation and the consortium will ensure appropriate technical and organisational safeguards are in place throughout the project.

Only data that is absolutely necessary for eu-DOMAIN will be collected, stored and processed and this data will only be divulged to appropriately authorised individuals.

Appendix A: Consortium Description

A.1 Description of the Participants

The eu-DOMAIN consortium brings together a group of experienced and professional organisations with a wealth of resources, skills and experience in the project's necessary activity areas. The eu-DOMAIN consortium is:

- Functionally comprehensive with a very full and sound balance between user, technical and managerial skills and expertise with clear roles established for each consortium partner.
- Skilled and experienced in the projects technical and business requirements with expert partners in the fields of leading-edge search technologies, linguistics, knowledge management, advance multi-media user interfaces and the business application sectors.
- Nationally and culturally diverse, with the partners being based from 6 different European countries whilst conducting their business across Europe and beyond, providing the consortium with a very clear understanding of the varying business, sociological and cultural characteristics of eu-DOMAIN's dissemination arena and potential market place.

A1.1 Partner 1: C International Ltd (CIL)

Established in 1987, C International has developed to become one of the leading European management consultancies in the field of business improvement. Based in the UK but operating throughout Europe CIL has developed a substantial reputation for supporting a wide range of different types of organisation to introduce more effective and efficient ways of working.

A particular feature of the CIL approach involves making the best possible use of the whole range of emerging technologies that are becoming available at an ever-increasing rate but which can lead organisations along expensive and unproductive paths. The CIL philosophy is to identify where new technologies can help organisations to work better but never allow the technologies to be the driver or try to fit working practices around them.

Since it was established CIL has supported over 500 organisations in various business sectors to improve their performance in a wide variety of ways. Whilst the company has particular expertise in financial services, healthcare and most types of small and medium size enterprises (SMEs) it is increasingly often being asked to apply its skills and experience to a wider range of business sectors and types of organisation.

CIL has also worked extensively at Government level within the UK and has been heavily involved in the development and implementation of a number of national policy initiatives in the field of ICT strategy and Business Process Re-engineering. As a result of the contacts CIL has made through all these activities it has now developed a substantial European client base and are currently working in France, Israel, Italy, Greece and Poland.

CIL has already been involved in a number of previous European projects within the ESPRIT programme. During the 4th Framework it participated in:

- THESIS – a business process re-engineering project in the healthcare field;
- QUANTA – the application of fuzzy cognitive mapping techniques to the development of BPR strategies for business improvement in the financial services field; and
- LiQuIT – the development of a methodology and supporting tools to identify teleworking opportunities within organisations and to prepare tailored implementation pathways, again in the financial services field;

Under the 5th Framework we have been involved in a further four IST projects:

- FAIRWIS - the development of web-based system and services to support fixed and virtual trade fairs, which is now complete although a follow up accompanying measure will be commencing shortly;
- FAIRSNET – a follow up accompanying measure to FAIRWIS;
- FINMEDIARY – the development of web-based services to support improved access to venture capital for SMEs; and
- OPTINAV – the development of an intelligent on-board navigation system for ships.

C International has been the co-ordinating partner of four of these projects and project managers of all of them with the exception of FAIRWIS, FAIRSNET and FINMEDIARY.

Key Personnel:

Justin Meadows: is the Managing Director of C International and has extensive experience of analysing business problems and defining IT and organisational solutions across a wide range of organisations. Justin's projects have involved extensive work for a wide range of public and private sector organisations in the UK and he has also been directly involved in a number of such activities supporting organisations throughout Europe. This has provided Justin with a detailed knowledge of the technical issues involved and, in combination with the experience from managing his own company, the organisational and human resources issues. Justin has an MA in Economics and Operational Research from Cambridge University.

Stephen Swift: is the Director of Operations of C International and has extensive experience of Public Sector, commercial and research based ICT projects. Stephen has had a rich professioanl career embracing both the public (Government and Healthcare) and private sectors. In recent years he has had extensive experience in working on IST programme projects and has project managed a number of these.

His professional background encompasses financial management, programming, system analysis and design, business process redesign, change management, and project and programme management. He has been a full member of the British Computer Society since 1985.

A1.2 Partner 2: Innova S.p.A. (INNOVA)

Innova S.p.A is a private consulting company specialised in Technology Transfer and Valorisation services. Established in 1993 in Italy it has now branches in France, Luxembourg, Portugal, and in the U.S. (California).

Innova assists industrial and research organisations in the implementation of their strategies for the exploitation of technologies and the valorisation of R&D results. Through its pool of 70 professional consultants and well developed network of international partners and world-class R&D Institutions, Innova has developed a strong commitment to technology transfer and exploitation, a continuous monitoring of needs and interests of different groups involved in the innovation process, an understanding of the past and persistent trends of technological, social and environmental changes and a growing responsibility in using knowledge and technology towards sustainable development.

The core of Innova is the pool of professional technical experts who have developed a long standing and consolidated knowledge in collaborating with R&D centres (strong collaboration with Enea and CNR) and in the assessment and exploitation of advanced technologies. So far, over 50 international technology actions have been carried out by Innova Team, whose experience can be attributed to the involvement in several R&D European projects and technical activities conducted with highly qualified European Companies and Universities. Innova has consolidated expertise in Market Study, Scenario Planning and Stakeholders analyses and Exploitation Plan/Business Plans realisation. So far more than 40 market studies have been carried out for SMEs and large companies.

Innova is engaged in implementing and improving the European Awareness Scenario Workshop Methodology (a methodology developed with the support of the EU Commission

to build consensus approaches through scenario formulations) to assess the socio-economic and environmental impact of new technologies and to foster bottom-up approaches for 'soft' technology integration. Furthermore, Innova promotes the consultation of Italian and foreign stakeholders and opinion leaders raising awareness on socio-economic and environmental aspects among the social interest groups, industry and governments.

Innova is also involved in rendering services connected with a number of programmes of the European Commission (Growth, Quality of Life, EESD, IST, Innovation, Joule and Thermie) relating to industrial technologies, materials, standards and measurements, socio-economic impact assessment, sustainable technologies, renewable energy, bio-technologies. Innova collaborated with the European Commission in the assessment of technological, economic and social impact of 120 projects under JOULE II programme, in the domain of photovoltaic, rural photovoltaic energies and wind energies. It has also developed and tested a new participative methodology to foster the introduction of renewable energy technologies in Network of European municipalities for the EU funded SIREN project (Scenarios for the integration of Renewables in a European Cities Network).

So far, Innova has audited and supplied its services to over 500 European SMEs for technological needs analysis and project design and management and has promoted more than 200 international projects of R&D and technology transfer actions on a European scale.

Since 1998 Innova has been involved in R&D activities in the field of Intelligent Manufacturing (optical control systems, advanced sensor applications for quality control, embedded microprocessor production systems, virtual factory) and currently participates to 5 R&D projects in these fields.

Since March 1997 Innova is one of the Italian CRAFT Focal Points in charge of the development of technical feasibility for SMEs. In this sense, it has already carried out 4 Stimulation Actions (CE.ME.LE. and PRO.SY.TT. and TRACKER and CRUISING projects) aimed at the promotion of the CRAFT programme scheme implementation. Innova is involved in 12 Stimulating Actions aimed at fostering European SME's participation in the CRAFT technology transfer Scheme.

Key Personnel:

Antonio Zangrilli: Degree in Economics (University "La Sapienza" in Rome, Italy). Post-graduate course in Export Manager at the Italian Institute for Foreign Trade (I.C.E., Rome, - Italy). Consultant for Innova S.p.A. As expert he participated and is still collaborating in several EU projects addressing the development of innovative solutions (IT platforms) and organisation models to improve business processes in SMEs' clusters or singles SMEs. It follows a short list of the EU main projects he collaborated: a) V-CHAIN, development of a new concept of enterprise the Virtual Enterprise (VE) to enhance overall internal and external business processes; b) Ecosell, addressing the new organisational model relating to the selling chain and development a new IT platform to support it; c) Contender aimed to perform a comparative analysis on the diffusion of extended enterprise models between 3 European Countries (France, Germany and Italy) and the United States, deriving specific benchmarks for four representative industrial sectors (Micro-electronics, Agro-food, Mechanical and Machinery tool industry, Automotive).

Mauro De Bona: Mauro De Bona is an Industrial Engineer and he has gained relevant experience on technology transfer and innovation processes. He has been working for several years as consultant in the innovation field. He worked as grant researcher for the University of Udine (Department of Business Economics and Industrial Engineering). He has been involved in several European and national research projects: his main areas of competence are business process analysis and re-engineering, supply chain management and complexity management. As concerns the latter, he is responsible and coordinator of the research activities on Complex Adaptive Systems carried out by INNOVA. The main research fields are the following:

- Creative processes in complex and dynamic organisations.

- Circular causality and business dynamics.
- Emerging behaviours for organisations that have to deal with the increased complexity and dynamicity of the business environment, which requires an effective capacity of adaptation to changes and continuous learning (the so-called "learning organisations")
- Intangible assets and intellectual capital assessment in complex organisations

Isabella Aiello: Isabella Aiello graduated at the University of Trieste in Economy of International Trading and Monetary Markets with specialisation in International Marketing and is fluent in three languages (English, Spanish and German). She has been working in several EU funded research projects under 5th and 6th Framework Programme and she is actually engaged in other research activities aiming to investigate the interconnections between Complex Adaptive Systems and Management.

Carlo Figà Talamanca: Master degree in Industrial Engineering at Università degli Studi di Roma "Tor Vergata"; Consultant for Innova S.p.A. Business process reengineering area: definition of new supply chain management models for the EU project Ecosell; state of art analysis of the hybrid power system training programs for the Leonardo Da Vinci project Hypos.

Technology transfer activities as patent management and commercialisation of research results; assistance and promotion of start up and spin off companies.

Technology surveys and exploitation planning of new technologies for the Area Science Park of Trieste; Worked in the logistics of event-catering of Formula 1 for Austrian firm Do&Co (Grand Prix: Germany, Hungary and Belgium). Italian and German mother tongue, fluent in English and basic French.

A1.3 Partner 3: In-JeT ApS (IN-JET)

Established in 1997, In-JeT has developed to become a renowned management consultancy firm in the field of technology development and business exploitation. Based in Copenhagen, Denmark, In-JeT has developed a reputation for supporting both large and small organisations with effective tools for technology assessments, defining technology strategies, developing business cases and bringing new technology to the market.

In-JeT ApS has been engaged in Ambient Intelligence and Pervasive Computing since 1998 and has extensive knowledge about concepts, technologies, user needs and business model creation. In-JeT ApS is working with researchers and commercial partners across Europe formulating concepts for Ambient Intelligence platforms for applications such as *e*Health, security and surveillance.

In-JeT ApS also pioneered the LinkWatch Ambient Intelligence Infrastructure project. The project resulted in a prototype service platform for the private homes to be used by various service providers. The prototype platform is now the basis for commercial exploitation.

Presently, In-JeT participates in a joint research project "Enabling Pervasive Computing in Reality" (EPCiR), with the aim to build a rapid research prototype of a Pervasive Computing infrastructure based on gateways with OSGi frameworks. Other partners in the project include the Alexandra Institute - Centre for Pervasive Computing, Aarhus University, Innovation Lab and the largest Danish Telco TDC.

Key Personnel:

Jesper Thestrup: received his MSc. of Electronic Engineering from the Technical University of Denmark in 1974 and later obtained degrees in business administration from the Copenhagen Business School and INSEAD. He worked for a number of years in various positions for a leading electronics company in Denmark and the USA. Later, he was Managing Director of a Danish based, global electronics company developing scientific measuring instrumentations. He founded In-JeT ApS in 1997 and is today the Managing Director and a principal shareholder. Jesper Thestrup has been involved in IST programme

activities for 15 years, including as participant in ESPRIT project, partner in CRAFT projects and as project reviewer. Presently, he heads the Danish Environmental Protection Agency's committee on environmental impact of manufacturing and use of electronic products. His main areas of expertise are development of technological concepts and associated convincing business models.

Lasse Christiansen: Lasse Christiansen received his BSc. degree in electronic engineering from the Technical University of Denmark in 1977. He has extensive experience in hardware and software development and project management. His experience includes development of blood measuring devices, acoustic measuring equipment, advanced alarm system and image diagnostic systems. He worked on international research projects under ESPRIT. His main areas of work in this project will be in system integration and testing.

A1.4 Partner 4: University of Aarhus, Dept. of Computer Science [UAAR]

The first chapter of the University of Aarhus' history began with the inauguration of "University studies in Jutland" in Aarhus Technical College's ceremonial hall on the 11th of September 1928. The Department of Computer Science is a part of the Faculty of Science. The faculty's research efforts are supported both by grants for basic research from the Danish government and by external sources of funding. A growing part of the faculty's research activities are managed via its centres, and the centres listed are evaluated and financed by the Danish National Research Foundation, the research councils, the EU, and a number of private foundations. These centres represent special areas of strength in the faculty's research profile. In 2003, the faculty has 45 professors, 224 associate professors out of a total staff of 729 persons. 3.327 students are registered at the faculty together with 260 PhD students and 73 foreign students.

The object-oriented software systems group and the security group at the Department of Computer Science will be the participating groups in the eu-DOMAIN project.

The object-oriented software systems group has more than 25 years of experience in programming languages, programming, modelling, software architecture, language implementations and software development tools. The group has been at the forefront of research within object-technology for more than 25 years and has participated in a range of national and international projects.

The main activities of the security group falls within: Digital signatures and certificates, public key infrastructures and usability aspects of security solutions. Special focus is put on security solutions for mobile and wireless applications.

Key Personnel:

Klaus Marius Hansen: Born November 30, 1974, Viborg, Denmark. Danish citizen. Civil status: married with one child. Fluent in Danish and English. Working knowledge of German.

Research Areas: Software architecture design and analysis; object-oriented modelling; experimental, object-oriented system development; pervasive computing.

Current Position: May 2002 – . Assistant Professor, Computer Science Department, University of Aarhus. September 2002 – . Deputy Manager, ISIS Katrinebjerg Competency Centre (Software). Involves among others establishing, participating in, and managing joint research projects between industry and academia.

Degrees:

• July 2002. Ph.D. in Computer Science at Department of Computer Science, University of Aarhus. Thesis advisors: Ole Lehrmann Madsen and Preben Holst Mogensen.
• May 2000. Master's degree in Computer Science at the Department of Computer Science, University of Aarhus. Thesis advisors: Ole Lehrmann Madsen and Preben Holst Mogensen. May 2000.
• Minor degree in Mathematics at the Department of Mathematics, University of

Aarhus.
Publications:
• Hansen, K. M. (2002b). *Experimental Object-Oriented Modelling*. PhD thesis, University of Aarhus, Denmark. DAIMI PB-559
• Hansen, K. M. (2000). Modelling in Experimental System Development. University of Aarhus, Denmark. Unpublished Master's Thesis
Relevant Previous Work Experience:
• February 2001 – August 2001. Research scholar at Everyday Computing Lab, College of Computing, Georgia Institute of Technology, visiting Elizabeth Mynatt.7
• July 2000 – October 2002. Director of Research & Development and cofounder of Ideogramic ApS. Together with two fellow PhD students and a former Masters student, I have created a start-up company that produces diagramming solutions for pen-based interfaces such as electronic whiteboards and tablet computers.
• February 1997 – June 1998. Project programmer in the Dragon Project. In the project, I worked with cooperative design and object-oriented analysis, design, and implementation.
• September 1996 – May 2000. Teaching assistant, various courses at the Computer Science and Mathematics Departments, University of Aarhus.
• October 1993 – March 1994 Technician, Halcrow Fox, Hammersmith, London. The work involved, among others, data collection, analysis, and to some extent communication in relation to report writing

A1.5 Partner 5: ICS-FORTH [FORTH]

Since its establishment in 1983, the Institute of Computer Science, Foundation for Research and Technology – Hellas (ICS-FORTH) has a relatively long history and an established tradition of internationally acknowledged excellence in conducting basic and applied research, developing applications and products, and providing services. The research directions take into consideration the state of the art, international trends, research and technological challenges worldwide, as well as the needs of the public and private sector in Greece. ICS-FORTH is a pioneering contributor towards the deployment and adoption of Information Society Technologies in Greece and plays a leading role in worldwide efforts towards the development of an Information Society accessible and acceptable by all citizens.

On-going research and development (R&D) efforts focus on: information systems; data and knowledge-based systems; information retrieval, including content-based approaches; image processing and pattern recognition; computer vision; sensor technologies; robotics; machine learning; digital communications; network management; computer architectures; VLSI design; computer aided design; human-computer interaction; virtual reality; universal access and usability; information and communication technologies in Health care; and assistive technologies for people with disabilities. Based on existing research experience and available know-how current efforts also include basic and applied research in bio-informatics, Web systems and technologies, embedded systems, and GRID and large scale computing.

ICS-FORTH maintains close links with industry and has played a major role in the development of the Science and Technology Park of Crete (STEP-C). ICS-FORTH represents Greece in the European Research Consortium for Informatics and Mathematics (ERCIM), an organisation dedicated to the advancement of European research and development, in the areas of information technology and applied mathematics. The group of ICS-FORTH involved in the current proposal is the Centre for Medical Informatics and Health Telematics Applications (CMI/HTA).

The Centre for Medical Informatics and Health Telematics Applications (CMI/HTA) of ICS-FORTH, was founded in 1985. The R&D directions of CMI/HTA are carefully selected based on international trends in state-of-the-art solutions for the health sector, R&D challenges world wide, as well as the needs of the public and private sector in Greece. The R&D activities of CMI/HTA are focused on the development of innovative computer methods and

tools in the area of medical informatics, e-Health, m-Health, medical imaging and bioinformatics. Current research activities target solutions to problems in the intelligent management of multimedia and geographically distributed medical data, the development of distributed component and middleware technologies, web services, real-time resource management in regional or national health information networks, methodologies and strategies for the integration of heterogeneous information systems, the processing and analysis of multimedia medical data, particularly 2D and 3D images, and the indexing and retrieval of medical images based on their content. Research in machine learning and data mining is an additional important activity of CMI/HTA. These techniques facilitate knowledge discovery in medical databases. More specifically, systems for inductive learning from examples have been developed to support the diagnostic and therapeutic decision making process. In addition, constraint satisfaction methods are exploited towards more flexible learning operations and systems. The use of machine learning for image indexing and retrieval based on pictorial content is also under investigation.

For a number of years, CMI/HTA worked on the development of HYGEIAnet, the Integrated Regional Health Information Network of Crete (RHIN), as a pilot and a model for RHIN at a national and European level. HYGEIAnet represents a systematic effort toward the design, development and deployment of advanced e-health and m-health services at various levels of the healthcare hierarchy, including primary care, pre-hospital health emergency management, and hospital care. Specifically, *e*Health and *m*Health services support the timely and effective management of patients, the synchronous and asynchronous collaboration of healthcare professionals, and the remote management of patients at home. Finally, e-health services are being used to support continuity of care across organizational boundaries by providing access to the life-long I-EHR. HYGEIAnet was a prize-winner at the Ministerial Conference and Exhibition *e*Health 2003.

Key Personnel:

Prof. Stelios Orphanoudakis: Stelios C. Orphanoudakis holds a Ph.D. degree in Electrical Engineering from the Thayer School of Engineering, Dartmouth College, USA, a M.S. degree in Electrical Engineering from the Massachusetts Institute of Technology (MIT), and a B.A. degree, magna cum laude with highest distinction in Engineering Sciences, from Dartmouth College. Since 1986, he holds a faculty appointment as Professor of Computer Science at the University of Crete, Greece. Furthermore, from 1991 until 1994, he was Acting Director of the Institute of Computer Science, Foundation for Research and Technology-Hellas (ICS-FORTH), from 1994 until the end of 2003 he has been Director of this Institute, and from 2004 he is the Chairman of the Board of Directors of FORTH. At ICS-FORTH, he is scientific leader of the Center for Medical Informatics and Health Telematics Applications and the Computational Vision and Robotics Laboratory. He held a faculty appointment in the Departments of Diagnostic Radiology and Electrical Engineering at Yale University, USA, from 1975 until 1991. Prof. Orphanoudakis is a member of many honorary and professional societies and a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE). He has many years of academic and research experience in the fields of computational vision and robotics, intelligent image management and retrieval by content, medical informatics, and medical imaging. He is the author of more than 120 publications in international scientific journals, refereed conference proceedings and books. He has served on various committees and working groups of the European Commission and has been active in European R & D programs. He currently serves on the Board of Directors as Vice President and he is President of ERCIM (European Research Consortium for Informatics and Mathematics). He has also served on the Board of Directors of the EuroPACS society (1994 - 2000). During the period 1995-2000, he served on the National Telecommunications and Post Commission of Greece. Finally, from 1994 until 2001, he served on the National Advisory Research Council of Greece and, from 1998 until 2002, he served on the Board of Directors of the Hellenic Foundation for Culture.

Dr Manolis Tsiknakis: Manolis Tsiknakis received a B. Eng. degree in electronic engineering, a M. Sc. in microprocessor engineering, and a Ph.D. in control systems

engineering from the University of Bradford, U.K. Dr Tsiknakis was a member of the research staff at the department of Control Systems Engineering at the University of Bradford from 1985 till 1990. In 1992 he joined ICS-FORTH where he is currently a member of its Research Staff (Researcher, Grade B), and coordinator of the Center of Medical Informatics and Health telematics Applications (CMI/HTA). Dr Tsiknakis has been the Principal Investigator of ICS-FORTH in many collaborative R&D projects and is currently coordinating the development of HYGEIAnet, the integrated health information network of Crete. Since March of 2002 Dr Tsiknakis is chairing the Health Information Technology Working Group (HIT WG) of ERCIM. His current research interests are in the areas of: multimedia systems with emphasis on medical information systems, component based software engineering, information integration, intelligent service engineering, and signal processing and analysis. He is a member of IEEE, and ACM.

Dimitrios G. Katehakis: Mr Katehakis is a telecommunications engineer, with a Batchelors degree in Electrical engineering form the Technical University of Athens and a Msc from the University of Maryland at Baltimore. His work is mainly focused on data integration analysis and the design of object-oriented systems and distributed architectures for medical telematics applications, the design of web-based medical collaboration environments, as well as the intelligent management and communication of multimedia data. Recent participation in related European RTD projects includes: RETRANSPLANT (DGXIII - Health Telematics), TEMeTeN (DGXVI - RISI 2), and HECTOR (DGXIII - Health Telematics). Past experience includes also working with the Medical School of the University of Maryland at Baltimore for the IONDT (US Federal), and MCR (MD State, Dept. of Health and Mental Hygiene - CDC) projects, as well as the National Defense Ministry, and the Hellenic Telecommunications Organisation (OTE). He is a member of IEEE, ACM, and the Technical Chamber of Greece.

A1.6 Partner 6: CNet Svenska AB [CNET]

CNet enables content and information commerce by providing actors in the media and publishing industry with software products to fully exploit their digital assets using semantic web and XML technology. Our solutions are used for news publishing, news brokering, mobile publishing, *e*Learning, meta data publishing and many more applications.

Our aim is to be a world-leading developer of XML-software for semantic web services providing our customers with scalable, robust and usable products based on the latest semantic web technology such as XML, RDF and web services. Many of the first XML-based applications Sweden have been built by CNet. CNet has also helped the construction industry in Sweden introducing a new XML-standard, sbXML, which improves information exchange between different actors and paves the way for intelligent buildings.

CNet's main products are Visual Net Server, NewsToBuy and Termado. Visual Net Server is an XML application server used for news publishing, syndication, cross media publishing, *e*Learning, and other applications. NewsToBuy is an application service (ASP) dedicated to small and medium-sized publishers offering them all tools needed to run a professional publishing business. Termado is a term catalogue system for management and publishing of term catalogues using sophisticated semantic technology.

Our customers are news agencies, newspapers, educational publishers, trade publishers, construction companies and others who needs to develop and deliver tailored content products in an efficient way. We work together with a number of partners to offer our customers tailored solutions in different industry segments.

CNet Svenska AB is a spin-off company from Swedish IT research and was originally founded by a research group from SISU, Swedish Institute for Systems Development. CNet has participated in the following EU projects:

- Multimedia Broker, IE2093
- Metis "Multimedia Interactive Environments for Distributed Teamwork Promotion in Schools", IST2000-25175.

CNet personnel also have experience from a number of our EU projects under the 4th and 5th Framework, such as Tempora, Kiwis, Intuitive, HOD, Irispol.

Key Personnel:

Peter Rosengren: is the managing director of CNet and one of the founders of the company. He has a Master's degree and a degree of Licentiate of Technology in computer science from the Royal Institute of Technology. He is one of the architects and developers behind the CNets product Visual Net Server, an XML-based server for dynamic web publishing. He has long-time experience in developing advanced database publishing solutions and is currently engaged in several XML-based web service projects.

He was the technical coordinator of the Multimedia Broker project (IE2093) within the CEC Fourth Framework for R&D in information technologies. The project focused on developing innovative tools for information commerce over the WWW. The results of the project have been commercialised by CNet. He served on the Project Management Board and the Strategic Board for FP 5 project Metis ("Multimedia Interactive Environments for Distributed Teamwork Promotion in Schools"). He has served as a project reviewer in FP5 and proposal evaluator for FP6. Prior to founding CNet he was a research director at Swedish Institute of Systems Development, SISU, where he managed the Human Computer Interaction research group 1990-92 and the research group Interaction & Communication, 1994-1995.

Matts Ahlsén, BSc, Lic.Phil: Current position is project manager at CNet, with responsibilities in product development, design and training. Main expertise include information systems design and XML-based systems architectures. Experience of participation in European Community research projects in the ESPRIT, Telematics and IST programmes. He has been the team leader of CNet's development team for FP 5 project Metis ("Multimedia Interactive Environments for Distributed Teamwork Promotion in Schools").

Previous work areas have included object-oriented software engineering, databases and federated information systems, information systems architecture, multimedia databases and co-operative work. Degree in Computer and Systems Science 1983 Univ. of Stockholm. Assistant Researcher and Lecturer at the Dept. of Computer & Systems Sciences (Univ.of Stockholm), 1983-1988. Licentiate of Philosophy degree Univ. of Stockholm 1995. Research Engineer at the Swedish Institute for Systems Development (SISU) starting 1985. Senior Analyst and member of SISU management 1995 –1998. RTD manager at SITI, The Swedish IT Institute 1998-1999.

A1.7 Partner 7: T-connect [T-CON]

T-connect is engaged in research and development of wireless applications on third generation platforms (UMTS/WLAN) for mobile communications services. T-Connect is set up in AREA Science Park, in Trieste, one of the leading multi-sectoral Science Parks in Europe.

The innovative value of the T-Connect technical approach is represented by:

- Supporting customer in the acquisition of localisation data referred to their mobile's users;
- Developing software solutions laying on a server that, elaborating localisation info, will allow mobile clients to get access to specific areas of available data banks limiting queries, data exchanges and therefore warranting high traffic saving;
- Developing software interfaces on client terminals for the correct usage of the services.

The company has already been involved in European and national R&D projects:

- Within European Programme TEN TELECOM
  - RePublic - Reliable e-Public Procurement System: validation and deployment at European level of an innovative and multimedia platform for applications on public procurement.
- Within European Programme Competitive and Sustainable GROWTH

  - o e-Volution II- Roadmap for e-business implementation in Extended Enterprises: development of a novel management methodology to support extended enterprises in their implementation process of e-business strategies.
- Within the 6th Framework - CRAFT
  - o Heartronic - Heart Rating for Objective Neural Intelligent Communication:
  - o development of an innovative system integrated in a wearable and light support like a shirt or an elastic bandage, capable to recognise cardiovascular anomalies and to alert doctors and Hospitals in real time.
- Within DM 593/00 art. 5
  - o Project NESM-3G- NEO-INFRASTRUTTURA DI SVILUPPO PER "MOBILE 3G SERVICES: definition and creation of a new platform for wireless applications for 3G devices customised for Field Force Automation users.

Key Personnel:

Beatrice Pregarz: Beatrice Pregarz received her degree in Political Science in the University of Padua. She is skilled in Total Quality Management ISO 9000 and in Franchising network and Business Plan. She worked for a software house dealing with marketing and organisation activities. For a couple of years she had been working in AREA Science park (Trieste) by the Quasi e (enterprise) Project that concerned the development of new high tech enterprise. Presently, she heads T-Connect S.r.l., the high tech start–up for wireless Third Generation platforms, working on development of technology strategies, administrative activities, business planning and project financing.

Giuseppe Menta: Giuseppe Menta received his degree in Electronic Engineering from University of Padua. He worked for a period as junior researcher for University of Padua in the field of birefringent optical fibers for high bit rate optical systems. Later he attempted, in Padua, a specialization course in Technique and Economics of Telecommunications. Afterwards he joined Future Centre-Telecom Italia Lab, where, with a multi-disciplinary international team, he studied and developed possible future business models, service concepts and strategies taking into account the introduction of new technologies. Presently he is in charge of managing the technical area in T-Connect S.r.l. working on architecture definition, project writing, business planning.

A1.8 Partner 8: Software AG Nordic A/S [SAG]

With its headquarters in Darmstadt, Germany, Software AG was founded 1969 by entrepreneurial mathematicians to become one of the world's first hardware-independent software vendors.

Known for its technology leadership and professional-services expertise, Software AG is a major supplier of enterprise software for electronic business, Web services, content management, business integration and enterprise transaction processing. Software AG's products control the central IT processes of thousands of renowned companies worldwide to include Lufthansa, Siemens, Citibank, Merck, DaimlerChrysler, Sony, BP and Telefónica.

In recent years, Software AG has focused its R&D activities on products and solutions that support the XML (eXtensible Markup Language) standard. Software AG is the leader in XML technology and solutions. The XML standard is the enabling technology for solving today's business problems. Because XML is the universal format for cross-enterprise data exchange and integration, Software AG develops XML-based products, solutions and services to address today's and tomorrow's business needs.

Software AG's core competencies lie in the following areas:

- Database management systems
- Application engineering
- Enterprise application integration
- XML storage/management/publishing/integration

- Professional services

In cooperation with partners, Software AG focuses on providing solutions in the following areas:

- Web services
- Content management
- Mobile computing

By teaming up with leading technology and distribution partners, Software AG provides best-of-breed solutions to customers' needs in these segments. Software AG is participating in the eu-DOMAIN project through its Danish subsidiary.

Key Personnel:

Philippe Vijghen: has a Master Degree in Electrical and Mechanical Engineering, orientation Computer Science, U.L.B, 1992 (graduated with high honours).

Software AG Belgium sa/nv, from August 96 to date:

Since January 2002, FOREM "*Various evolutive maintenance contract at FOREM*". This is related to the projects delivered at FOREM (See SIC, NOE and EDEN below). The team has an average size of ~3 or 4 persons, but the coordination benefits from the knowledge of complex projects backgrounds.

In December and January 2004, ADEM (Public Employement Office in Luxembourg). Study leading to recommendations about the evolution of the ADEM applications (in particular for the services to be opened on Internet).

From May 2002 to December 2003 - FOREM, "NOE – New Offres ERASME" Role and achievement: Technical Project Manager (size of project = +- 6 man/years). Analysis, design and implementation of a software for supporting the back office system for managing job offers at the FOREM. This system was put into production in February 2004 and replaced a former system ERASME – taking into account multiple and complex migration pathes - and will be used by the FOREM agents. The system will rely on SIC (see below) for the Internet/e-mail disseminations but includes new module for letting the agents control the handling of all types of diffusion (press, paper, teletext, …). The system has a radical multi-tier approach and provides a well-documented EJB API based on XML messages for all job management related tasks. Environment: Java/EJB, XooF, Tomcat/Jboss, Xalan 2/Xerces, Tamino 3.x, NT/Solaris

February 2002 to October 2002 - FOREM, "EDEN – European Data Exchange Network" Role and achievement: Project Manager (size of project = +- 3 man/years) Analysis, design and implementation of a software that aims at interconnecting Public Employement Services's systems for handling job offers and curriculum vitae. The final customer of that project is the DG "Employement and Social Affairs". The project pilot involved the Belgian Walloon Region, Norway, Sweden, France, the existing EURES systems (as well as other countries as observers). Environment: Java/EJB, XML messaging, WebLogic, Xalan 2/Xerces, Tamino 3.x, NT/Solaris, BizTalk

Since August 2001– Software AG – « Content Management Practice Leader »

Role and achievement: Content Management Practice Leader Responsible for the 'Enterprise Content Management Framework', born in Belgium and now officially supported by Software AG HeadQuarters. Activity: technical coordination of the developments and support, creation of the business plan, pre-sales, contacts with Software AG HQ, methods of good practices in the matter of content management solutions, support for other projects (like for the Tamino Content Suite, used in Fall 2003 for managing clinical protocols at Johnson and Johnson).

July 1999 to December 2001 - FOREM, "SIC - Système d'Informations Clients" Role and achievement: Project Manager (size of project = +- 10 man/years) Proposition, analysis, design, implementation and operation of an integrated portal for customer-oriented

applications. The project mainly aims at providing an information management system optimized for diffusion. See http://www.hotjob.be. Information includes job offers, job applications, periodical newletters, agenda of relevant event, a directory of addresses, ... The system covers the following activities: acquisition, classification, matching according to customer's desiderata, and finally diffusion using various medias and paradigms (push/pull).

The design and developments is based on XML at various level (data exchanges, storage, diffusion, XSL renditions). Besides XML, the technical framework is based on the Web, Java and the Tamino native XML server. Environment: Java, Jrun 3, Xalan 1 /Xerces, Tamino 2.x, NT/Solaris

May 1999 - Electrabel, "Collect et Analysis of datas for an economical Dispatching" Rôle: Consultant [étude] Functional analysis, technical offers and evaluation of the costs for a datas collect solution regarding liberalisation of the energy market and for their new roles.

March 1998 to June 1999 - BATC/swITch, " Collaborative knowledge management for a building construction project" Role and achievement: Consultant and Technical coordinator Groupware system for about one hundred drawers, architects and engineers working on a building construction project at the Brussel's airport: it covers aspects such as project collaboration, document management, workflow, computer-aided drawings, less-paper office and security. See http://www.asbuilt.be for more information. Responsibility includes gathering of user requirements, production of recommendations, coordination of the technical evaluation of the selected product (OpenText Livelink). Architectural design, developments and test activities. Environment: OpenText Livelink 8.0 (SDK), Visual C++, Windows NT 4.0, AutoCAD

December 1998 to April 1999 - Prévoyance & Voorzorg (P&V) Role and achievement: Consultant Consultant for the development of a web-based quotation system for car insurance: prototyping the user interface, implementing a proof-of-concept application. Environment: Web, Windows NT, Corba-like Object Request Broker for MVS/CICS accesses.

January 1998 - For SWIFT Role and Achievement: Consultant Consultant for the User Documentation Department: production of recommendations for the setup of an SGML-based collaborative editorial system, including a technical architecture and a cost estimation.

*February 1994 - 1997 - ESA/ESRIN, "Electronic Data Interchange of Documents" (EDIDOC)*Role and achievement: Project Manager. New developments include graphical clients for Windows, generic WWW access to the system and a custom application for the WWW publication and complex dissemination of press releases and information notes.

August 1997 – EUR-OP, SEI-BUD Role and achievement: Senior Software Engineer Development of a prototype based on FrameMaker+SGML for the structured edition of the European Commission Budget, with special attention to advanced features such as custom model for tables, entities, multi-lingual support, and low-level customization of the product through the Frame Developer Kit.

May-September 1997 - the Free University of Brussels (ULB), Programme des Cours Role and achievement: Project Leader and Consultant Redefinition of the editorial system for producing and exploiting the University program, aiming at the automation of the electronic publication and the consolidation of documents with databases. This mission included interviews, the definition of an SGML DTD and the development of a prototype based on FrameMaker+SGML.

Ronny Timmermans: 1990 Catholic University of Leuven (B) Civil Chemical Engineer (Distinction). Thesis: an expert system for corrosion inhibitors.

September 2001 – Present: Software AG

- Principal overviewing different projects since 1/1/2003.
- Business developer for Johnson & Johnson, leading to succesful sales of Tamino and 220 K € Professional Services project for content management at J&J.

- Project leader for the eProtocol project at J&J, leading to a second phase project in 2004.
- Projectleader for the Kennisbank project at KBC Bank (1.200 K € in PS revenue). The Kennisbank (knowledge bank) project uses Documentum as a document management system, X-metal as an XML editing client and moreover, a web application on top of IBM websphere application server has been created by Software AG to dissimenate the information on the web and support intelligent navigation and search.
- Presales, sales and projectmanagement of the Kennisbank Incident project at KBC (400 K € in PS revenue). In this project we have designed in XML helpdesk procedures such that they can be managed by Documentum and actually executed in a websphere application server environment. We have developed an execution engine ourselves to support this. The project also uses X-metal as editing client, as in the first kennisbank project.
- Presales and consultancy for:
  - Database of prices: dissemination of Cobol copybook information on the mainframe to a modern search and navigation environment on ibm websphere application server via XML format conversion
  - Output project: conversion of mainframe data to XML, management of these streams, with parameter instantion, transformation etc. to direct these streams to different output devices and formats (like pdf, html, CD, printers, etc..)

1997 – September 2001: BASF Antwerp

- Management of software development group (8 people) “Documentation and Groupware” at BASF Antwerp.
- Project management and support for Documentum and Lotus Notes Document Management and groupware projects (in Antwerp and Ludwigshafen)
- Project leader for the establishment of a world wide BASF Group document management standard, co-operating with BASF Ludwigshafen
- Analysis, project definition and execution in diverse fields (Energy data management, Analysis data capturing, interfacing process control systems to IT systems, Plant Maintenance in SAP R/3)
- Introduction of web technology at BASF Antwerp (project management Internet site for BASF Antwerp, introduction Netscape Navigator, intranet build-up)
- Second phase intranet technology concept & roll-out, combining Documentum, Lotus Notes and IBM Websphere application server.

1995 - 1997: Akzo Nobel Organon Teknika

- Project management for medical instrument control software (requirements engineering, configuration management, remote development management…) on a diagnostic instrument performing nucleic acid diagnostic tests
- Design and development of instrument control software (re-engineering legacy application in the C programming language)
- Software Process Improvement work (based on CMM): SOPs, process model, including Software validation & verification for medical diagnostic device to obtain FDA approval

1993 - 1995: Space Application Services London

- Building a diagnosis reasoning tool in Common Lisp Object System as a knowledge engineer on the ATOS-1 (Advanced Technology Operating System) project for European Space Operations Centre (ESOC)
- Design and development of C++ application to monitor operations in the ATOS-1 infrastructure
- Re-engineering an existing expert system in the Prokappa development shell

A1.9 Partner 9: Telefónica I+D [TID]

Telefónica I+D was formed in 1988 to contribute to the technological innovation of its parent company, by performing research and development activities. Telefónica I+D is active in the following major areas:

- Services creation, related to the broadband, intelligent network, data communications, narrow band ISDN, speech technology and public use telecommunications.
- Network and services management, using solutions based on the latest TMN standards.
- Network innovation, with the purpose of supporting Telefónica in its effort to offer the widest possible range of services.

Telefónica I+D bases its work on the use of the most advanced and competitive concepts and media. This requires thorough knowledge of the suitable technical capabilities over a range of basic technologies. Its artificial intelligence and software engineering experts have skills in formal methods, object oriented design and programming systems, software engineering tools, real time systems, databases and knowledge bases, Artificial Intelligence tool kits, knowledge representation and reasoning, man-machine interface, and software tools for network simulation.

Its hardware and hardware-software integration groups have an in depth expertise in microprocessor-based system development, custom and semi-custom VLSI integrated circuits development, electronic component testing and characterization and microwave circuits. All the activities in Telefónica I+D are carried out conforming to an in-house methodology, supported with tools, which has been awarded an ISO 9001 Certification in 1994.

Telefónica I+D has participated in numerous European projects: eight RACE I, eighteen RACE II, seven ESPRIT II, four ESPRIT III and several TEN-IBS, TEN-ISDN, CTS, COST and BRITE. Telefónica I+D houses one of the sites of the Spanish National Host, to which it has contributed its own ATM switching, transmission and supervision technology (RECIBA).

Key Personnel:

Sara Carro Martínez: Holds a Telecommunications Engineer Degree from University of Valladolid. She collaborated for more than one year on research projects of the University with internships from the University. She worked for Cedetel and for the Regional Cable Operator in several research projects related with e-commerce and the Information Society Technology. She joined Telefónica I+D as a Telecommunications Engineer where she was involved in several projects related to the IP-Network and Messenger Services developed in Spain and deployed in Spain and other countries of South America. She has been involved in many European projects, among them she worked in the EURESCOM project related to the Internet Middleware (for Customized Service Bundling), and in the EURESCOM project related to e-commerce: ICE-Commerce (Framework for Interoperable and Customised E-Commerce Solutions as Project Manager. She has also been involved and managed numerous European projects from different programmes, among them IST, eContent, IAP and eTEN.

A1.10 Partner 11: Grundfos Management [GMA]

Grundfos manufactures pumps for heating, air-conditioning, pressure boosting and wastewater systems. An annual production of app. 10 million pump units makes Grundfos one of the world's leading pump manufacturers. Grundfos pumps are used to provide water for human consumption, for irrigation of fields and watering of animals, for industrial processes, heating and cooling of buildings or wastewater discharge.

For Grundfos, Flow Thinking means seeing the pump as part of a complex hydraulic system - not just focusing on the pump alone, but optimising the whole system. Grundfos has decades

of know-how about pumps and pump systems that have been designed to: save money for the owner, reduce wear and tear and increase comfort. Grundfos Management is the corporate management arm of Grundfos dealing with strategic issues and group management.

Key Personnel:

Thorkild Kvisgaard: has a B.Sc. in Electronic Engineering from the Technical University in Denmark. He has worked a number of years on product development as a development engineer and is presently heading the Electronics Research group in the Building Services Segment at Grundfos Management A/S.

Thorkilds main research interest is in building intelligence into building components such as circulation pumps and using the intelligence for creating business opportunities. In a recent reseach project, MAGNA, Thorkild and his group succesfully demonstrated intelligent pumps with Linux based web connectivity.

A1.11 Partner 12: Eastern Birmingham Primary Care Trust [EBPCT]

Eastern Birmingham Primary Care Trust was established in April 2002 to serve 252,000 people across 9 wards to the east of Birmingham, UK. It is a diverse and vibrant community, which includes some of the most deprived wards in the country, but is also characterised by individual enterprise and commitment. There are 128 GPs working in 60 Practices supported by over 500 GP Practice staff. There are 59 Pharmacies, 28 dental Practices and 28 opticians.

In addition to local community services, such as District Nurses and Health Visitors, EBPCT also have a broader role in relation to delivering services across the whole of Birmingham, including adult speech and language therapy, and dietetics. Their hospice serves a geographically dispersed population and they act as the “host” PCT for the Birmingham Primary Care Shared Services Agency, which serves the four PCTs in Birmingham. The Agency delivers Human Resources, Information and Communications Technology, Estates and Facilities Management, Financial Services and Family Health Services strategy and support across the city.

EBPCT have one of the largest commissioning roles of any PCT in the country. They hold some £237m to purchase hospital and community services for Eastern Birmingham. They commission specialised services on behalf of the 8 PCTs forming the Pan-Birmingham Specialised Services Consortium and we also host the trading account for the West Midlands Specialised Services Agency - a further £311m in total.

Key Personnel:

Dr Richard A Mendelsohn: is Director of Health Improvement Eastern Birmingham PCT, after graduating in medicine from Birmingham University in 1987, Richard gained wide clinical experience within an extended vocational training scheme for general practice. In his early post-graduate period and particularly during his time as a registrar in general practice he developed an interest in health development and the practice of medicine at the population level. He thus embarked on a career in public health in 1993 with the intention of practicing at the interface between public health and primary care.

A consultant in public health medicine at Birmingham Health Authority from 1999 –2002, he gained experience in mental health commissioning, primary care management, general management, partnership working and generic public health.

Prior to the launch of the four Birmingham PCTs Richard worked extensively with local Primary Care Groups and PCTs acting in a public health leadership role and as a Professional Executive Committee member.

In his current role he is the Director of Health Improvement for Eastern Birmingham. He manages a Health Improvement team of over 12 people and leads the strategic development in health and inequalities for the region. He also has responsibility for research and development (R&D) within the Primary Care Trust that involves ensuring adherence to NHS R&D governance arrangements and the creation of a research culture.

Richard also has extensive teaching experience at the undergraduate level and postgraduate level in public health and epidemiology and research methods.

A.2 Sub-contracting

The eu-DOMAIN consortium envisages that it will sub-contract a relatively small amount of the project's work to enhance the consortium's core expertise in two technical areas of work.

The sub-contracts will likely be managed by CNET and UAAR and the technical aspects planned to be covered by sub-contrcat(s) are non-core activities forming a limited part of the partners' work. This includes:

- Mobile gateway aspects
- Access to TETRA network facilities
- Usability engineering support

The development of mobile networks for vehicles is not a major part of the work and is based on advanced research, which is not at the core of the eu-DOMAIN project, but is essential for realising important aspects of the user scenarios. Given these circumstances a subcontract is considered the best arrangement for value for money in satisfying the project's technical objectives.

The resource requirements for specific usability engineering activity is a very small percentage of the project budget. Given this small budget share requirement, and the specialist nature of the work, a subcontract is considered the best arrangement to obtain best value for money in this technical aspect.

The eu-DOMAIN project is planning to use a TETRA network to implement its use-cases in the industrial monitoring and healthcare areas. However, this is a small amount of effort and more appropriately undertake by the TETRA network operator themselves, so a small sub-contract will be used to achieve this.

TETRA provides a wide range of data transmission capabilities, from simple text messages to advanced applications based on packet data techniques to transfer large amounts of information quickly and easily using standard Internet Protocol (IP). TETRA can seamlessly manage voice, telephony, video and data. The requirement of the TETRA network in eu-DOMAIN is the ability to transmit voice and data between terminals and a central server and between terminals themselves.

The overall purpose of the eu-DOMAIN project is to develop the software that combines and integrates the various services and operators using standard IP transmission technologies. The planned sub-contrcat requirement is limited to setting-up and providing access to a TETRA test network with a limited number of handsets for a prototyping project with an API and the necessary tools and documentation on how to establish communication sessions etc.

Once the project is underway the consortium will procure appropriate sub-contractor(s) to undertake this work. This procurement will be undertaken in line with the guidance for sub-contracting as set out by the Commission's contractual guidelines. The tendering process will be competitive and transparent and will be awarded to the tenderer offering best value for money.

A.3 Third Parties

None

A.4 Third Country Participants

None

Appendix B: Glossary of Acronyms

3G: Third Generation

Common name for UMTS mobile telecommunication.

ADSL: Asymmetric Digital Subscriber Line

Most widespread form of broadband standard on fixed telecommunication networks.

AmI: Ambient Intelligence

Ambient Intelligence is a conceptual vision about a future world in which the information technology is used to create a user-friendly and intelligent support of personal interaction.

API: Application Programming Interface

A set of calling conventions defining how a service is invoked through a software package.

ERP: Enterprise Resource Planning

Business system used in enterprises.

GIS: Geographic Information System

A graphic application using a database of specialized information, such as geographical and demographic data.

GPS: Global Positioning System

Satellite based radio triangulation system for accurate measurement of position.

IPv6: Internet Protocol

The major network layer protocol in the Internet Protocol suite. IP describes the routing of packets, among its many tasks. Version 6 of the standard is under consideration.

KM: Knowledge Management

Management of knowledge, rather than information. Knowledge is information in context.

LAN: Local Area Network

Data communications network connecting computers and related equipment, usually over an area not greater than 10 km.

LON: Local Operating Network

Normally a wired communication network often used for industrial installations.

OSGi: Open Services Gateway OSGi initiative

An open platform independent framework that allows for the dynamic delivery of managed services with secure, scalable and reliable metrics.

OWL: Web Ontology Language

Language for defining structured, Web-based ontologies. OWL is designed for use by applications that need to process the content of information instead of just presenting information to humans.

RDF: Resource Description Framework

A XML type mark-up language for embedding semantic information in web pages developed by the W3C consortium.

TETRA: TErrestrial Trunked RAdio

TETRA is an open digital trunked radio standard defined by the European Telecommunications Standardisation Institute

UML: Unified Modelling Language

A formalistic way to describe e.g. software architecture.

UMTS: Universal Mobile Telephony Standard

Broadband mobile communication standard allowing 300-400 kbps transfer rates. Also known as 3. generation mobile telephony.

URI: Uniform Resource Identifier

The generic set of all names/addresses that are short strings that refer to resources (specified 1994; ratified as Internet Draft Standard 1998).

WAN: Wide Area Network

A broadband, or other network covering an area generally larger than a city or metropolitan area network.

WLAN: Wireless Local Area Network

Wireless LAN, typical coverage limited to 100 meter in open air.

ZigBee: Wireless Communication Standard

ZigBee is a standard created to address the market need for a cost-effective, standards-based wireless networking solution that supports low data rates, low power consumption, security and reliability. ZigBee is defining both star and mesh network topologies, a variety of data security features and interoperable application profiles.