Contract No. 004420

eu-DOMAIN - enabling **u**sers for
Distance-working & **O**rganizational **M**obility
using **A**mbient **I**ntelligence **N**etworks

D9.6 Exploitation Plans (Final)

Specific Targeted Research or Innovation Project

Project start date 1st June 2004 **Duration 36 months**

Published by the eu-DOMAIN Consortium **8 May 2007 Version 1.1**
Lead Contractor C International Ltd.

Project co-funded by the European Commission
within the Sixth Framework Programme (2002 -2006)

Dissemination Level: Confidential (CO)

Document file: D9.6 Exploitation Plans (Final).doc

Work package: WP9 – Dissemination and exploitation

Task: T9.2 Exploitation

Document owner: Jesper Thestrup (IN-JET)

Document history:

Version	Author(s)	Date	Changes made
1.0	Jesper Thestrup (IN-JET)	02-05-2005	First draft of final version
1.1	Jesper Thestrup (IN-JET)	05-05-2005	Updated, review input included
			Final version for the EC

Review history:

Reviewed by	Date	Validated
Beatrice Pregarz, T-CON	04-05-2007	Minor comments
Gwen Earl	05-05-2007	No comments

Index:

1. Executive summary

eu-DOMAIN is 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 can not only connect people and content but also buildings, devices and machines in an interoperable network and so contribute to the first structured Ambient Intelligence middle-layer widely available.

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 and visibility of their host organisations and generally improve the quality of life for Europe's citizens.

eu-DOMAIN enables mobile workers to access their "conceptual user domain" wherever they need to work, intelligently accessing the services and devices they need. It allows content providers and domain service providers to offer advanced augmented reality services to such users, creating new ways of collaborative working.

The eu-DOMAIN platform is going to be deployed in a broad range of industrial, government, healthcare and other citizen centred applications. The eu-DOMAIN project will prove the feasibility of this in a practical way by developing and validating demonstrators in two different domain scenarios as presented in *D2.1 User Validation Framework Plan*.

1.1 Exploitation

The projects exploitation plans provide a comprehensive view of the expected results, their possible contribution to new or existing products, services, infrastructures and knowledge bases, the intended exploitation, dissemination and use by the consortium ensemble and by the individual participants. The objectives of the exploitation plans are to use the results for the benefits of the collaborative partners and potential customers.

The eu-DOMAIN consortium has develop a full set of draft exploitation plans, which identify the key success factors, trends, threats, and opportunities pertinent to eu-DOMAIN deployment. The exploitation plans are fully coordinated with the project's dissemination activities and take full advantage of the 'potential-market' feedback available from the dissemination activities, which were undertaken through the project lifetime.

The intention is to establish eu-DOMAIN as a stand-alone business available to potential users throughout Europe initially, and then potentially Europe wide and worldwide. It is expected that the joint venture will cover sufficient technological ground to be able to offer and operate a complete Europe-wide eu-DOMAIN platform. The most effective Europe-wide exploitation will be for the partners to continue to work together in a more formal cooperation after the project has ended.

1.2 Business models

An integral part of the project has been the development of realistic business models for users and service providers. The business models emphasis has been on identifying value creation and new business opportunities for SMEs as service providers.

The final eu-DOMAIN exploitation plan includes the validation results of the business models in the two user domains: Healthcare and Industrial Services. Based on these findings, the final exploitation plans defines precisely how eu-DOMAIN should be "taken to market", extended to other services, and supported after the project's work is completed. The various exploitation options pertinent to each of the project's results have be assessed to provide individual exploitation actions and supporting business plans, which will then commence at the end of the project.

During the last review, concerns were raised about the realism of the business planning process and the developed business cases. The recommendations given have been addressed.

2. Introduction

2.1 Background

This present document represents the final version of the eu-DOMAIN exploitation plans. The project plan identifies two versions of the exploitation plans: A draft version was developed in the middle of the project (Month 16, September 2005) when the general architecture and applications of eu-DOMAIN was known and the final and fully operational version of the exploitation plans is to be developed towards the end of the project (Month 34, March 2006).

2.2 Purpose, context and scope of this deliverable

The purpose of this deliverable is to provide a guideline for market exploitation and a description of activities to be performed by partners after the completion of the project. A major feature of the project is the availability of a demonstration platform provided by partner TID in one year after the project ends. This platform will server as the foundation for the partners' demonstration and exploitation activities in the coming year.

The commercial exploitation guideline is concerned the various aspects of the eu-DOMAIN product, its functional characteristics, users and markets and relevant business models.

Exploitation activities are closely related to technical take-up activities and this deliverable should be seen in conjunction with *D8.3 Take-up guideline and technology watch report* and with the *D8.3 Evaluated platform for take-up activities*, which is the demonstration platform itself and guidelines to setup and use its technical features, such as intelligence functionality, interoperability to legacy systems, security models, etc. Finally, the deliverable *D9.4 Final Plan for Using and Disseminating Knowledge* contains guidelines for dissemination activities, graphical profiling and useful information for developing a dissemination and use strategy

Combined, the four documents serve as a comprehensive "user manual" for potential exploiters of the eu-DOMAIN platform, which will allow the partners (and others) to set up technical infrastructures based on the eu-DOMAIN platform and define precise business offerings and analyse the market conditions in different domains. The exploitation plans, on the other hand, are relative precise descriptions of how the individual partners plan to exploit the results of the project. Such plans are, for obvious reasons confidential, while the other deliverable are classified as public.

The first two chapters (3 and 4) in this deliverable present an overview of the eu-DOMAIN exploitable products and how actors and stakeholders group around the developed platform. The main actor for further analysis is the eu-DOMAIN Service Provider, who supplies the service platform on a commercial basis to customers. Most partners in the project fit this role.

Chapter 5 presents an overview of one of the domains, the Industrial Service sector and the related Facility Management sector. These two industry sectors are described in terms of markets, trends economies and legal and regulatory aspects. In chapter 6, the discussion is continued with focus on the business opportunities provided for eu-DOMAIN service providers in this industrial sector. The chapter also summarised the business modelling work previously carried out.

Chapter 7 presents an overview of the other domain, the healthcare sector. Again markets and structures, trends and economies are presented. The focus is here on case management and home care. The situation in different Member States is described and examples of case management programmes and commercial and research management platforms are presented. In chapter 8, the discussion is continued with focus on value offerings and stakeholders in the healthcare sector. At the recommendations from reviewers, a detailed business case for diabetes case management in the EBPCT is provided.

Chapter 10 provides an overview of the exploitation strategies and the expected impact of the results whereas chapter 11 discusses the legal framework (between the partners) for exploiting the project results. Finally, chapter 12, 13 and 14 list the individual exploitation plans for industrial, academic and user partners.

3. eu-DOMAIN exploitable products

From the range of potentially exploitable products, three main categories have been selected for further analysis and business planning. The selected product categories are:

1. The eu-DOMAIN **AmI service platform**
2. Stand-alone eu-DOMAIN **Web Service components**
3. eu-DOMAIN **consultancy services**

In the following, a further description of each of the products will be offered. For each product we will also identify which of the partners intend to exploit such product or service.

3.1 The eu-DOMAIN AmI service platform

The eu-DOMAIN Ambient Intelligence (AmI) Service Platform is a web based service that offers all eu-DOMAIN functionalities to service providers as described in Figure 1.

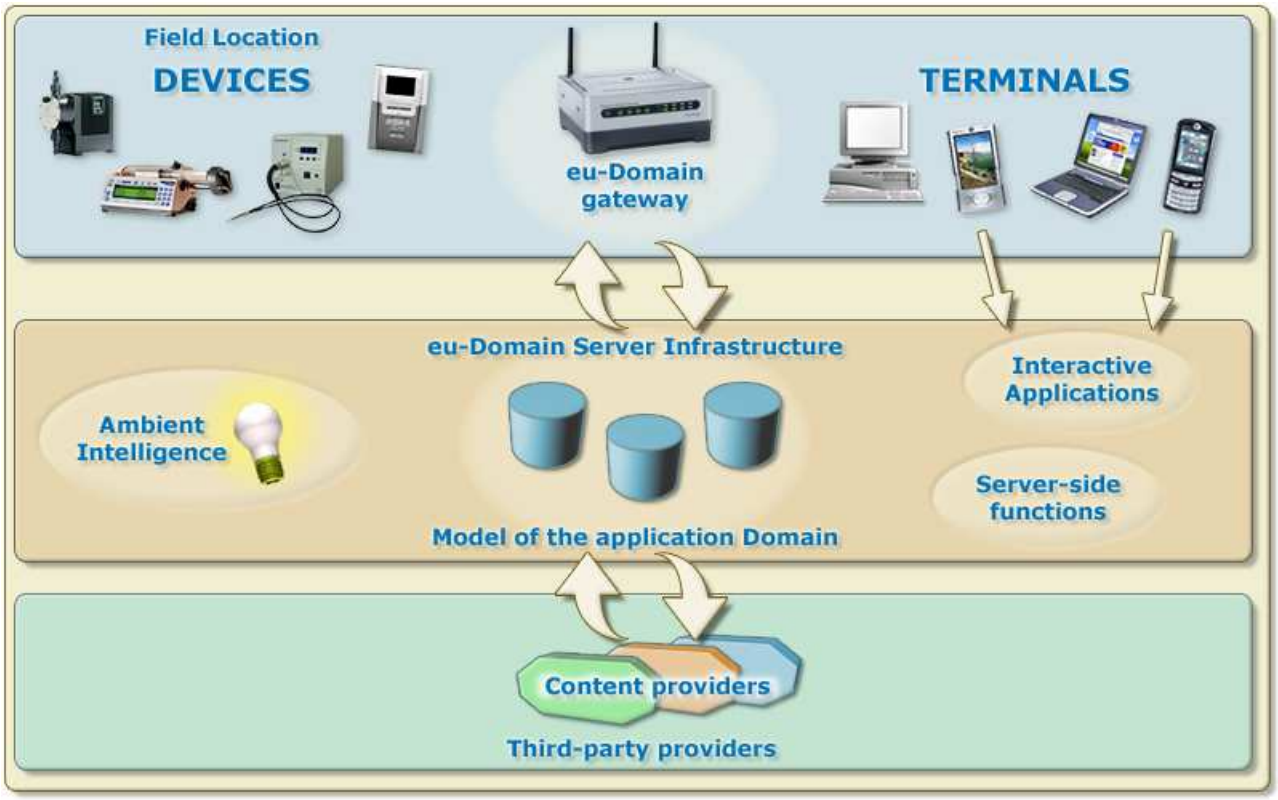


Figure 1 Logical overview of eu-DOMAIN architecture

The upper layer of the eu-DOMAIN platform comprises user and device interfaces, geographically distributed and designed for mobility and automatic configuration across heterogeneous networks. All conceivable devices will interact with the platform through existing networks and through local service gateways. In this context, a device means any sort of equipment, sensor control installation, sensor, actuator, etc. Further, the users may use any kind of known terminal type including mobile devices such as phones and PDA's as well as stationary devices such as PC's.

The central layer of the eu-DOMAIN platform consists of the actual Web Services and software architecture providing the ambient intelligence functions. This allows the user to interact with any device, terminal or external repository, acquire and store data, and activating devices and terminals using rules-based ambient intelligence functionalities programmable in the system. Web based communication is providing the connectivity between the eu-DOMAIN central server and the physically distributed service gateways and the mobile and fixed users.

The bottom layer of the eu-DOMAIN platform consists of external Service Providers providing data, services or other content to be delivered through the eu-DOMAIN infrastructure. Typical examples of data repositories are product databases, electronic patient records and weather forecasts.

The eu-DOMAIN infrastructure is capable of delivering application services directly to the remote locations. External services are negotiated from a third party Service Provider, e.g. an Electronic Patient Record system. Free web-content services, such as general health information related to the patient's current status, can also be searched and delivered to the user. Services can either be one-way service delivery or two-way interactive services.

Figure 2 below shows the perceived service provisioning platform as it would be implemented by a eu-DOMAIN service provider.

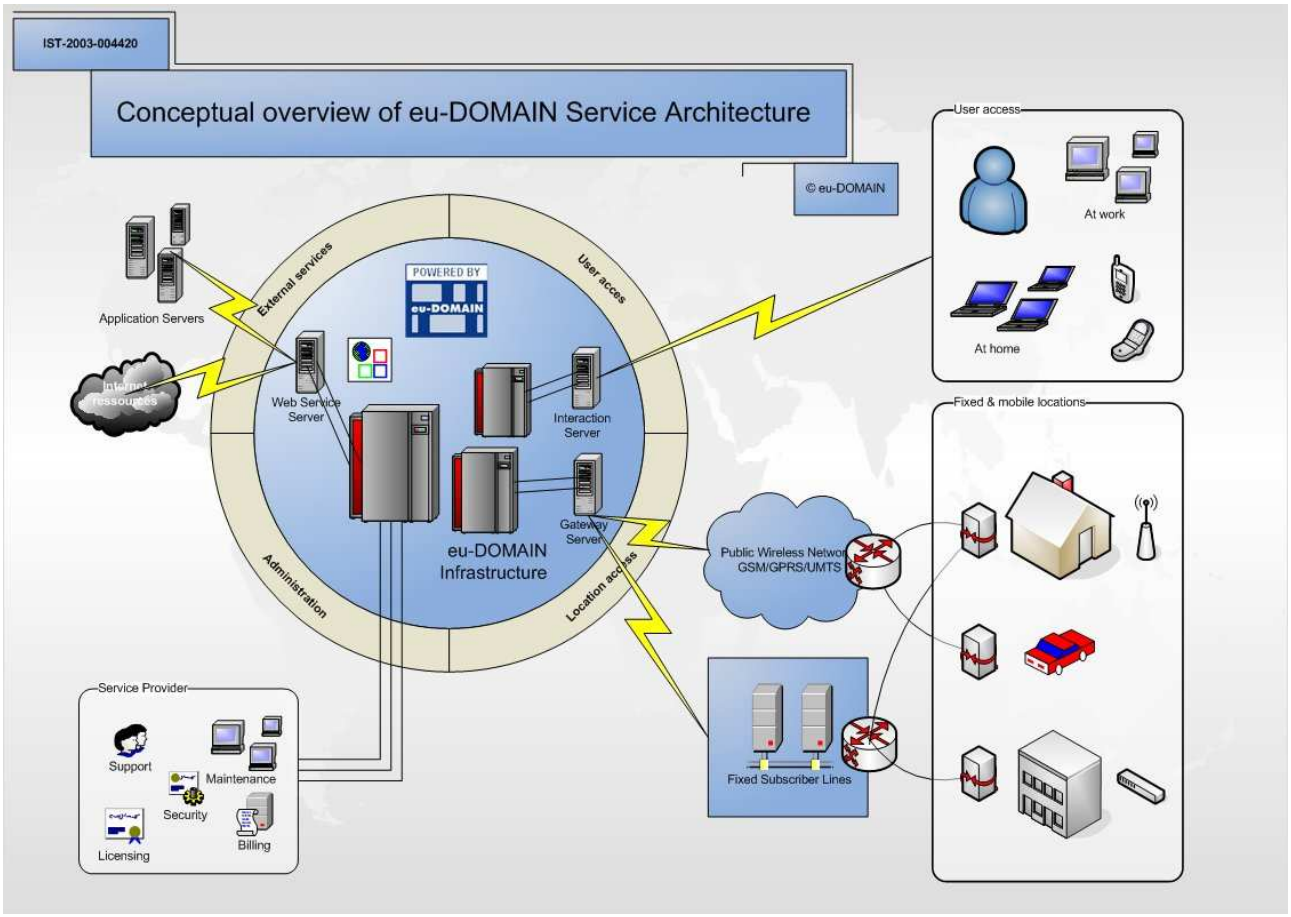


Figure 2 Typical service provisioning structure

The eu-DOMAIN service platform is hosted on a server park consisting of a set of powerful servers performing various tasks in the eu-DOMAIN platform and the ambient intelligence functionality. The server park typically consist of front-end interaction servers for user access, a gateway server for gateway connectivity, Web Service servers for third party service provider connectivity, an application server for domain models and application intelligence and data base server for data storage.

The server park is set up by a eu-DOMAIN service provider. IN-JET, CNET and TID are all planning to position themselves as service providers in selected markets. IN-JET and CNET will be covering the Scandinavian markets and possible provide services for CIL in the UK market as well. TID is considering setting up the service to serve clients in Spain. Both users GMA and EBPCT are awaiting keen to exploit the full service either as domain service provider or in collaboration with an external service provider. They are presently awaiting the outcome of the validation phase to make the final assessment of their possibilities.

3.2 eu-DOMAIN Web Service components

The eu-DOMAIN platform is an infrastructure where different components, applications and services can be plugged in and services and application can be developed in order to adapt it to the special needs and requirements of a given domain. The project itself demonstrates that the same platform can be used in two very different environments, such as industrial services and healthcare, just by adapting the conceptual domain model and adding the particular services.

The basic feature is that the same infrastructure can be used for several domains by changing the conceptual domain model that defines the elements and the relations inside the application. Thus, it's very important that application developers will have access to the software components for Web Service provisioning in order to develop eu-DOMAIN compatible applications and services, which can be automatically deployed in the specific environment. The Web Service components can be made available as a toolbox library or as a full Software Development Toolkit (SDK).

The set of tools should come with all the needed facilities such as libraries, APIs, programming tools, documentation and interfaces needed by developers in order to develop suitable eu-DOMAIN applications and services. Common tools include debugging aids and other utilities. SDKs also frequently include sample code and supporting technical notes or other supporting documentation to help clarify points from the primary reference material.

Regarding the exploitation of the SDK some thing should be taken into account. Many SDKs are provided for free to encourage developers to use the system or language. Sometimes this is used as a marketing tool. For example, eu-DOMAIN platform might provide the SDK for free to encourage people to use it. In turn, more people will be encouraged to buy more of their widgets since they can program them for free. Another way of seeing it is that the platform itself is sent and thus, the SDK comes with the platform to allow developers define and create their own eu-DOMAIN services.

Another feature to bear in mind is that usually SDKs have attached licenses that make them unsuitable for building software intended to be developed under an incompatible license. For example a proprietary SDK will likely be incompatible with free software development and a GPL licensed SDK will likely be incompatible with proprietary software development. LGPL SDKs are typically safe for proprietary development.

A number of eu-DOMAIN Web Service components will be developed in the project and aiming at the emerging market for software components. These components will be made available on an Open Licence basis for free usage. Industrial partners SAG and CNET will incorporate some of the Web Service components into their commercial products to be marketed throughout Europe.

3.3 eu-DOMAIN consultancy services

New and improved knowledge on the technical infrastructure architecture, conceptual models and Web Service components and their methods of interaction can be turned into valuable consulting services for several partners. The expertise can be used to provide general consultancy platform for innovative technologies and new services. The exploitation of these services can take place through national and regional innovation networks and thought the industrial partners existing business networks. The academic partners may use the results for inclusion in and upgrade of their research and educational programmes and for improving research collaborations with companies.

Finally, the work on business modelling has provided valuable insight into the value creation process in e-Business environments and the experiences has already turned into concrete consultancy offerings for other user domains.

INN and T-CON will promote technology innovation services and the use of new technologies to make R&D efforts more cost-effective, in particular in the mobile service industry. IN-JeT and INN are offering value modelling consultancy services based on the approach used in eu-DOMAIN.

UAAR and FORTH will exploit the project's results through their academic programmes.

4. Actors and stakeholders and the business environment

This chapter will provide an overview of the generic roles of the stakeholders composing the business environment in which the eu-DOMAIN platform is going to be exploited. The scope of this chapter is to introduce the stakeholders to be involved in delivering and buying eu-DOMAIN services. In *D6.1 Proposed business models and business cases*, the actors and stakeholders were discussed in detail and their ability to explore the business rationale related to the creation of value through new services, transactions and interrelations among the stakeholders was presented.

4.1 Business framework

The general business model framework can be seen as a pyramidal structure as shown in with thee value levels. At the top (Meta) level we find the business activities of providing conceptual solutions to support eu-DOMAIN services.

At the middle "Primary Chain" level we find the actors actually engaging in exchanging value-added services based on the eu-DOMAIN infrastructure.

At the lowest level, we find the support actors engaged in delivering network infrastructure, devices and terminals and other support functions. These actors will not be analysed in detail.

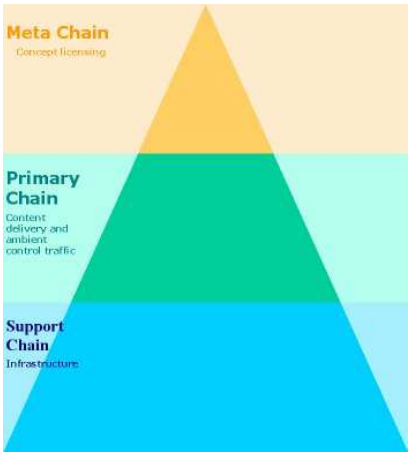


Figure 3 Business model framework

Each stakeholder has a certain business environment that will determine the most appropriate business model to be used in each case. In this section we will provide a generic description of each stakeholder. Relevant stakeholders will be analysed in greater depth when we develop value models for typical service scenarios.

4.2 Stakeholders at the Meta level

The following Meta level stakeholders have been identified:

4.2.1 Concept Owner

The Concept Owner licenses the right to use the eu-DOMAIN platform concept to one or more Service Providers. The Concept Owner develops the concept in a suitable form, based on customer requirements. The Concept Owner may develop specific domain models for the customers or he may provide the necessary development kits for the customers to program their own applications. The customer pays an initial eu-DOMIAN license fee plus a usage fee for the right to use the concept. In addition, the customer may pay development and customisation costs for the Concept Owner to develop a specific solutions. The eu-DOMAIN consortium will initially all be operating as Concept Owners.

In some cases, the entire eu-DOMAIN concept may be regarded as a concept and sold as a product. In such case, the customer will buy from the Concept Owner and install the entire eu-DOMAIN platform, perform integration with specified legacy systems, define and setup device networks, program appropriate applications and services and maybe even operate the platform in its entirety.

4.3 Stakeholders at the Primary chain level

In the primary chain we find the actors actually engaging in exchanging value-added services based on the eu-DOMAIN infrastructure. Some stakeholders are delivering actual services directly to end-user in a traditional supplier-customer relationship. Others are providing the services as Application Service Providers, working on behalf of the supplier. Yet other stakeholders are enriching the basic services with additional services.

The flow of services in a generic primary chain is visualised in the following figure:

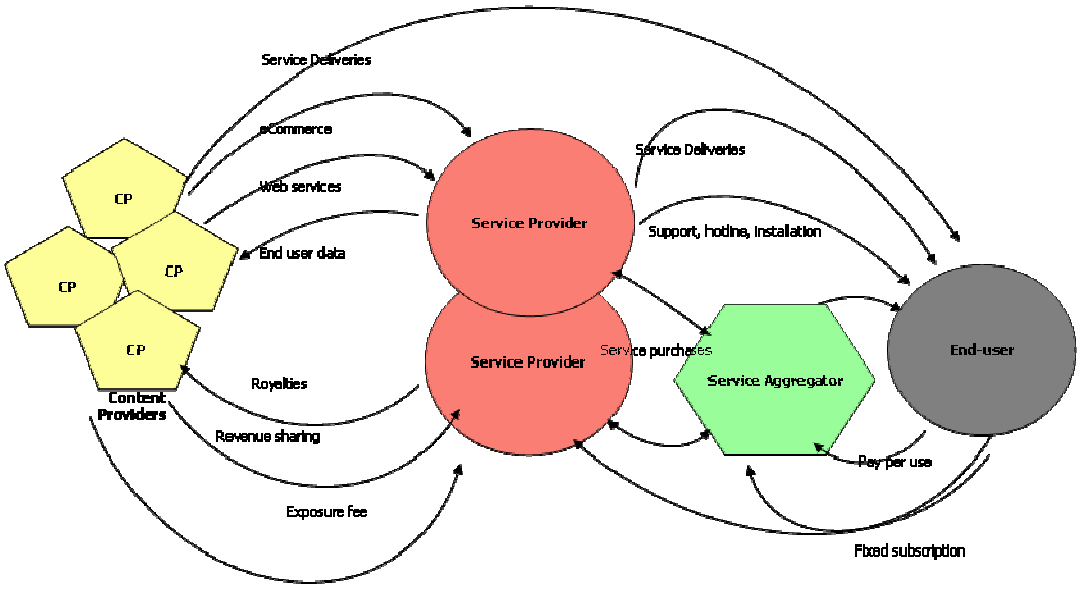


Figure 4 Actors and service flow in a generic primary chain

In the following, we will look bit closer on the primary chain stakeholders:

4.3.1 End-users

End-users are individuals (people, technicians, patients, etc) that buy or consume one or more services provided on the eu-DOMAIN infrastructure.

Typically, the end-user can also buy bundles of services from one Service Provider with each service coming from a specific Content Provider.

4.3.2 Content Providers

Content Providers are owners of the content and the services that the end-users ultimately are going to benefit from, including for example energy monitoring services, on-line maintenance of technical installations, healthcare services, security or even entertainment. Content Providers are either paid by the end-users for their usage of the services or they compensate the additional costs of the services by obtaining higher efficiency and lower operational costs.

Content Providers that participate in bundled services are being paid by revenue sharing schemes or directly by one of the other Content Providers or by a Service Provider. If the Content Provider is directly reimbursed by the end user, the main revenues typically comprise the following payments:

- Initial charges for installation and hardware (e.g. service gateways, devices, etc)
- A periodic (e.g. monthly) subscription.
- Content usage fees (i.e. proportional to the quantity of content delivered).

Alternatively, the Content Provider can be paid through the Service Provider, who in turns collects the money from the end-users.

In more complex cases involving bundling of services, the other Content Providers typically get reimbursed on a revenue-sharing basis, with revenues either being collected by a Service Provider or by the lead Content Provider.

4.3.3 Service Providers

A Service Provider is an organisation or firm that establishes the eu-DOMAIN platform and offers the functionality of the eu-DOMAIN infrastructure to end-users. The Service Provider uses one or more Network Operators as backbone and last mile delivery platform to the end-user.

Typically, a Service Provider will offer the services on behalf of a customer (Content Provider) in an ASP-type (Application Service Provider) arrangement and the Service Provider can thus operate several concurrent but separated services for various Content Providers.

The Service Providers generate revenue streams in the form of service fees from the Content Provider and possible subscription and usage fees paid by end-users depending on the contractual framework. Part of the fees can be passed on to other Content Providers that enter into a value constellation with the aim of delivering value-added bundled services to the end-users.

To manage the quality of service delivered by a eu-DOMAIN Service Provider, Service Level Agreements (SLA) must be agreed. The Service Level Agreement define the legal status and responsibilities of eu-DOMAIN Service Provider and what kind of contracts are required between service providers (e.g. healthcare provisioning bodies or industrial domains), customers or patients, and the eu-DOMAIN Service Provider.

4.3.4 Domain Service Providers

In the case where a Content Provider wants to operate the eu-DOMAIN service exclusively for its own purpose and offer customised, dedicated content and services using the eu-DOMAIN infrastructure in its own domain, we use the term Domain Service Provider.

These services can be embedded into a larger Service Provider service portfolio, but they are completely customised and secluded and fully integrated in the Domain Service Providers product offering.

4.3.5 Service Aggregators

When the Service Providers separate themselves completely from the services delivered on behalf of the Content Providers and specialise in just operating various network infrastructures, e.g. for a series of Domain Service Providers, we use the term Service Aggregators.

Service Aggregators can be likened to network operators (and are often such) that offer capabilities for value-added services on their networks. They only take responsibility for the technical operations of the service and front-end customer support is always directed to the Content Provider or to the Domain Service Provider.

Service Aggregators derive their revenue streams from network traffic fees from end-users or from fixed service fees from the Content Providers or Domain Service Providers or both.

4.4 Business modelling

As an introduction for some further considerations about potential business opportunities in the selected user domains and markets we refer to the business model framework that was developed in the eu-DOMAIN project. For further information we refer to the work reported in *D6.1 Proposed business models and business cases* and *D6.4 Validated business models and business cases* which give an overview of a potentially sustainable business model and case.

The rationale behind our analysis during these years has been the awareness that only innovative business structures can support adequately value creation in a context of collaborative service networks.

In such a fast-changing competitive environment, which we are addressing, strategy is no longer a matter of positioning a fixed set of activities along that old industrial model, the value chain. Successful companies increasingly do not just add value, they reinvent it. The key strategic task is to reconfigure roles and relationships among a constellation of actors--suppliers, partners, customers--in order to mobilize the creation of value by new combinations of players. But as potential offerings grow more complex, so do the relationships necessary to create them.

The eu-DOMAIN platform is capable of delivering a number of simultaneous services from a number of different content providers and is thus fully capable of supporting organisations' business models based on the dynamic value constellation concept. For each of the two scenarios that were developed, Industrial Services and Healthcare, Dynamic Value Constellation was applied trying to improve a baseline business model representing an accurate picture of the real-world business system.

From the baseline models, we extended the business scenario including a new actor: the eu-DOMAIN Service Provider. The Service Provider is an entity that establishes the eu-DOMAIN platform and offers the functionality of the eu-DOMAIN infrastructure in an ASP-type (Application Service Provider) arrangement to its customers. Customers are Content Providers, which could be an industrial product company (i.e. Grundfos) or a healthcare provider (i.e. EBPCT). The eu-DOMAIN end-users are employees, business partners, patients, etc. of the Service Provider's customers. At the end of the process we finally came out with a proposal for two new sustainable business models and presented an actual business case for each of the two domains.

In the following chapters we will present and updated market evaluation for each of the two domains followed by a detailed discussion of business foundation and business opportunities and the choice of proper business models. We will also present an updated business case for the healthcare domain.

5. Industry analysis – the industrial service sector

It was discussed in detail in the deliverable D2.5 Societal issues (annex), how the term "Industrial Services" lacks a clear definition and there is a great deal of overlap with "Facility Management". For the purpose of maintaining a strict and rigorous methodology, we established a clear definition and a business framework for both of these terms in *D6.1 Proposed business models and business cases*. We will continue to use this definition in the present deliverable.

Hence, we use the term "Industrial Services" to identify the business activities related to the maintenance and upkeep of specific technical installations and production equipment in a wide variety of industries including in some instances also installations in private homes[1]. The business activities are aiming at absorbing outsourced tasks relating to the whole lifecycle from installation and commissioning over maintenance to end-of-life retirement and replacements of components and complete installations, as well as new value added services such as remote monitoring and compliance services.

5.1 The industrial service sector

5.1.1 Market structure

5.1.1.1 Customer needs

The main stakeholders in the Industrial Services Business are:

- Component manufacturers
- System integrators
- Customers

Component manufacturers refer to companies that produce products and major components of products selling them to customers as new. Moreover, it can also happen that these companies acquire a product/component and then they incorporate it into a new product with their brand name or they proceed to modify or bundle it before distributing it to their customers.

Many European component manufacturers are operating in stagnating markets where the growth is limited: thus, they are forced to find new ways to enrich their offer. This means to bundle products with new services, to emphasize reliability, performances and customer satisfaction.

System integrators are value-added engineering organisations that focus on industrial control and information systems, manufacturing systems, and plant automation systems. A system integrator is a contract-engineering firm that can supply the time, talent, and technology required to integrate the disparate components of an industrial automation system with a facility's production equipment.

Control and Information System Integrators Association estimates that, worldwide, some 2,200 integrators fit its definition, but surely the total number that match the broader definition is much higher.

The following list divides the system integrator into several broad categories and describes some general characteristics of each:

- Application engineers work for vendors or distributors and generally concentrate on applying the vendor's equipment to a client's project. Some application engineering departments will offer design and implementation services as well; others will provide little more than technical advice. A few will even work with products from competing vendors if the client so desires.
- Consulting provide consulting and design services in specific technical disciplines such as civil, mechanical, electrical, and automation engineering. Larger consulting firms may also assume ultimate responsibility for completing the entire project. Individual consultants and smaller consulting firms generally do not.

[1] http://www.fabricom-gti.com

- Independent system integrators work on every aspect of an automation project other than actually manufacturing the control equipment. They design and implement the control system required by an overall plant design. They may perform all of these functions themselves or subcontract pieces of a project to specialists such as panel shops and software houses. A system integrator generally assumes ultimate responsibility for completing the entire project from initial consultation through final checkout. Truly independent integrators do so without favouring any particular vendor's products.
- Value added resellers (VARs) buy products from a vendor, add something of value, and resell the complete package to the end-user. The value they add may be other compatible products or services such as software configuration, troubleshooting, or complete system integration. VARs generally focus on a particular vendor's products or a particular industry's applications. Value added distributors (VADs) also maintain product inventories and provide technical advice.

Beside their functions, it is worth mentioning that today's market and the availability of new ICT solutions impose a dramatic enrichment of their capability. Fist of all, the expectation among facility owners and managers is that control systems be integrated and provide a level of "building intelligence." This concept speaks to managing facilities as assets transforming building data into knowledge and using that to make intelligent business decisions in real time. The driver of building intelligence and many other major trends is economic pressure to increase efficiency and productivity continuously and to do more with less. In addition to this, facility management agreements are more and more based on incentives about savings: this implies that facility managers strive for find opportunities for savings in order to share them with the end users.

Moreover, according to LONmark, what most facility managers want today is plug-and-play interoperability. In fact, the concept of interoperability for facility executives can be traced back to three elements:

- Harmonic coexistence: in this case, what a facility executive wants for his buildings are products from different manufacturers that operate independently without interfering with each other.
- Interchangeability: in this definition of interoperability, all chillers operate so identically, for example, that only the nameplate distinguishes one from another
- Integration that allows for individuality: most facility executives, however, want interoperability somewhere between these two extremes. They want plug-and-play interoperability. They want products that can be integrated easily without using custom hardware or software. But they also want to leave room for supplier differences within product lines.

5.1.2 Market trends

Traditionally, capital goods industries founded their strategies on products, while they are now increasingly considering service business as a opportunity for growth.

Moreover, as the competition will drive prices down across the entire product and service life cycle management, product companies will only be able to maintain their profitability by:

- Enhancing customer retention through higher integration with service customers
- Increasing service buying frequency among existing customers
- Offering new service products to existing customers
- Clearly focusing on creating economic benefits for service customers
- Becoming a leader in innovation for technology as well as in creating value for customers

This means that successful component manufactures will have to make long-term service contracts more attractive to their customers by offering individually designed service solution bundles, which could be based on the model of risk and gain sharing and, additionally, the speed of successful new technology development and its application to products or solutions is one of the key success factors today, and it will become more critical still in the future.

5.1.3 Market ecosystem

Industrial Services are closely related to manufacturer's products and no separate market analyses exist for these services. However, several estimates show that the European Industrial Service market could be as high as 3-4% of the total industrial market and could be as much as €60-70 billions annually.

Studies show that the industrial services market offers considerable growth and profit opportunities across many industries with an estimated annual growth rate of services (2000-2005) from 5-10%. Moreover, service margins could be as high as 15-20%, exceeding the average margins in the product business by a factor of 4 to 5.

5.1.4 Legal and regulatory aspects

Legal and regulatory issues concerning marketing and delivery of Industrial Services are not very different from the issues relating to marketing and delivery of traditional products. However, in Industrial Services delivered as e-Business services there are some important issues related to privacy, legal interception, ownership of location data and access to content that should of concern to service providers, network operators, equipment manufacturers, and of customers and users. The application of performance monitoring and work surveillance measures is regulated in the EU Directive on Data Protection (Directive 95/46/EC). These, and other political, ethical, economic and, sustainability issues are dealt with in the main deliverable D2.5 Societal user requirements specifications.

Security and privacy issues are focused on maintaining operational availability, integrity and confidentiality in the day-to-day operations of the organisation. The ISO-17799 and related standards sets out guidelines for the security polices to be adopted for organisations. The effects on the eu-DOMAIN security policy framework are discussed in the annex to deliverable D2.4 Trust and security user requirements specifications.

5.2 The Facility Management sector

Facility Management[2] as "an integrated process to support and improve the effectiveness of the primary activities of an organization by the management and delivery of agreed support services for the appropriate environment that is needed to achieve its changing objectives", where primary activities are "activities that constitute the distinctive and indispensable competence of an organization in its value chain". Facility Management is thus a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology.

It is increasingly common for companies to outsource a larger part of their non-core business activities as a means of encouraging greater business flexibility. The flexibility derives from the ability to shift core resources with greater ease. Outsourcing targets are no longer confined to cleaning and catering but involve complete process facilities such as water purification plants, cold stores, logistics and many other areas that previously were accepted as "core-activities". Facility Management is not confined to business-oriented activities such as manufacturing. Public services (water supplies, emergencies, buildings, sports arenas, etc.) are typical targets for Facility Management.

In the eu-DOMAIN context we use the term "Facility Management" to also include the business activities related to "Operations Management" and "Total Management" including process equipment, installations, buildings, infrastructures, services and all other material activities needed to fulfil a specific business or technical goal.

5.2.1 Market structure

5.2.1.1 Customer needs

Facility Management can be re-conducted to two main types of demand: 1) related to Space & Infrastructure and 2) related to the People & Organisation. Traditionally Facility management is

[2] prEN 15221:2005 Facility Management - Terms and definitions

closely related to buildings and the preventive and remedial upkeep of building components (HVAC, electrical, plumbing, elevators, carpentry and painting), sometimes excluding janitorial and grounds maintenance.

Facility Management was initially very much focused on non-strategic areas as property management and property maintenance. Today, the Facility Management sector is a large and complex industry, comprising a mix of in-house departments, specialist contractors, large multi-service companies, and consortia delivering the full range of design, build, finance and management. As the actors become more and more experienced and knowledgeable, the expansion into Operational Management and Total Management including the management of an increasingly broad range of tangible assets, support services and people skills is progressing.

Facility Management is a vital strategic discipline because it translates the high-level, strategic change required by senior decision makers into day-to-day reality for people in their work or living space. The business activities are aiming at absorbing all task related to the management of the business process including technical, work process, human resource, legal, ethical, health and safety and social issues. It is thus the job of the Facility Manager to create an environment that:

- encourages productivity
- is safe
- is pleasing to clients and customers
- meets government mandates
- is efficient

In the following we will address a number of Facility Management sectors:

5.2.1.2 Property Management

Property (facility) managers have extensive responsibilities for providing, maintaining and developing services related to maintenance of all sorts of professional properties.

Running and managing a property requires time, overview and control. Often, time and resources are wasted because tasks are delegated to a range of different suppliers and partners, who rarely have the complete overview nor think in terms of coordination and rationalisation of tasks. Property Management companies offer of a long list of services that contribute to optimising the value of a company's property service budget. The offers range from property strategy, space management and communications infrastructure to building maintenance, administration and contract management.

Property Management services are increasingly being combined in various ways, as selected services or as a complete solution focused on resource optimisation, efficiency and systematic planning. Facility management companies must employ a diverse pool of highly skilled employees within a variety of service areas, as well as maintaining an extensive network of subcontractors, in order to manage and deliver the type of service solution that their customer needs. One of the largest European Facility Management companies, ISS Property Services, provides the following property services, either as stand-alone services or as complete property services.

Systematic Maintenance

- Building inspection
- Maintenance tasks
- Craftsmen
- Technical installations
- Daily ad-hoc tasks
- Rebuilding

Building Maintenance

- Janitor services
- Staircase cleaning
- Repairs

HVAC

- Ventilation system maintenance
- Air pollution prevention
- Minimisation of sick days

Landscaping

- Construction and maintenance
- Parking space management
- External cleaning

Pest Control

- Extermination
- Pest control systems and surveillance
- Risk analysis

5.2.1.3 Asset Management

Some customer request guarantees for smooth operation according to established Key Performance Indices for the entire life cycle of their installations. Traditional methods of maintenance such as Life Cycle Costing, Total Productive Maintenance and Reliability Centred Maintenance have shown to be

less adequate and the maintenance problem needs to be seen in a wider context. This leads to the so-called Asset Management, an integrated management approach with various methods to manage the industrial assets by creating an added value for the industrial goods during their life cycle. Asset Management allows the customer to get more out of the optimum combination of tools and methods that are often used separately in industry.

5.2.1.4 Enterprise Asset Management

Traditionally Asset Management has been restricted to managing only the life cycle cost of assets. New concepts such as *Enterprise Asset Management* (EAM) services[3] focus on integrating people, technology and process in industries to increase asset reliability, asset utilization and service reliability using information technology and is thus a prime target for integration using the eu-DOMAIN platform. A combination of functionalities through eu-DOMAIN and EAM enables a holistic approach in providing business solutions with an asset-centric focus through the integration of engineering, operations, procurement and service segments across the enterprise value stream.

Enterprise Asset Management solutions are increasingly integrated with *Collaborative Support Solutions* (CSS). These include ASP hosting for remote delivery of EAM functions, such as e-procurement for electronic purchasing and *Asset Information & Performance Management* (AIPM) for decision support. AIPM is an important CSS component for measuring and analyzing asset management performance, and for accessing and managing comprehensive and accurate asset information. AIPM is a relatively new market with strong growth potential, which is a direct result of a maturing EAM market where services have become the main focus in delivering *Collaborative Asset Lifecycle Management* (CALM). CALM is a comprehensive vision for capital asset management that addresses all classes of capital assets, all lifecycle stages, and all stakeholder needs.

5.2.1.5 End-of-Life Asset Management and Recycle Services

Many service partners also provide full service for equipment clean-up, inventory, packaging and shipping to perspective parties at the end-of-life for equipment and installations.

Services provided range from multi-site equipment collection, reconditioning and re-sale of used equipment to environmental clean disposal through accredited recyclers.

5.2.1.6 Total and Operational Management

Total and Operational Management deals with more issues and parameters than any Facility Management scheme ever seen. Obtaining an asset or creating a technology is usually easier than knowing how to operate it efficiently, or at least how to do it better than the competitors. Total and Operational Management issues are the most complex, require huge expenditures, are the toughest to manage, and many times are simply the deciding factor between profit and loss. Successful firms have the ability to react to changing business patterns and services usages, and are able to match the services requirements of their operations as the technologies, economic factors, demand trends, and conditions change.

Effective Operational Management, combining resources and activities, is seen as a key success factor in many organisations. On a day-to day level, effective facilities management provides a safe and efficient working and manufacturing environment, which is essential to the performance of any business – whatever its size and scope, and the management must have answers to the extremely challenging question of who should do what and how they should do it.

Operational Management in industrial sectors include management of lifecycle services for every function of a business, across all phases of the business system and the equipment lifecycle.

Especially process industries are in a state of flux with dramatic changes occurring. To help companies stay abreast of these changes, actors need to address key issues like:

- How will outsourcing impact traditional operational and maintenance functions?
- What industries and segments of the market will lead the way in outsourcing?
- How do we outsource operational and maintenance functions?
- How are new technologies reshaping our business process and associated services?
- Which costs saving concepts are evolving for operating companies in the process industries?

[3] www.tcs.com/eis/ServiceLines/EAM.aspx

The table below shows industries and market segments with strong potential for Total and Operational Management solutions:

Potential industries and markets for eu-DOMAIN and Total and Operational Management Services solutions	
Energy, Utilities & Natural Resources: Oil & Gas Industry Refining & Petrochemical Industry Chemical Industry Water & Wastewater Power Industry	*Manufacturing:* Pharmaceutical Industry Food & Beverage Industry Metals Industry Pulp & Paper Industry Textiles & Apparel Industry
Professional Services: Engineering & Construction Services Operations Services Decommission Services Consulting Services Service Providers	

Table 1 Total and Operational Management users across industries

5.2.2 Market trends

Public/private partnerships are seen as being an important trend for Facility Managers in the coming years. In other major metropolitan areas large facilities, such as football, baseball, and basketball facilities are public/private partnerships with a portion of funding from the private sector and a portion of funding from the public sector. Increasingly, cash-strapped local governments seek more resources for their facilities by creating partnerships with private companies.

Experts also see terrorism and security related issues as an important area of concern extending at least through 2010. Europe and Asia have unfortunately had to deal with issues of terrorism for a long time and incidents of terrorism have been frequent. European Facility Managers have thus developed both strategic as well as hands on tactical knowledge of how security challenges are handled at the facility level.

One theme that emerges repeatedly among Facility Managers is the move from "property management" to "infrastructure management". Several studies of commercial and public buildings indicates that only about half of all the problems encountered is due to building problems with the balance being due to equipment, control and system problems. The benefits to facilities and to Facility Managers who grasp the potential of the intelligent building technology are thus potentially enormous. Facility managers are now embracing for "transformational technologies" that completely reshape their markets such as the convergence of technologies that make building intelligence possible.

5.2.3 Market ecosystem

Key points in the historic development of Facility Management include widespread needs for cost-cutting initiatives in the 1970s and 1980s under which organisations began to outsource non-core services. This quickly led to integration of the planning and management of a wide range of services both "hard" (e.g. building infrastructures) and "soft" (e.g. catering, cleaning, security, mailroom, and health & safety) to achieve better quality and economies of scale.

In recent years, a heightened awareness of the FM sector has been evident, driven by a number of factors including:

- Interest in outsourcing as a management topic
- Heavy media coverage of PFI/PPP initiatives and
- Increasing attention being paid to the sector by the financial community

Many sources, such as Outsourcing Institute, European Facility Management Found, International Facility Management Association (IFMA), Centro Ricerche Economiche Sociali di Mercato per l'Edilizia e il Territorio (CRESME), point out that the world's largest market for Facility Management is the USA, which exhibited a turnover of €448 billions in 2003. The European market is the second largest in the world with an estimated value of €343 billions in 2003 or 5 times the core Industrial Services

market estimated above. The three main European markets for outsourced services were the United Kingdom, Germany and Italy. Within the European outsourcing market the amount rate specifically related to Facility Management is about 16 billions euros, with a perspective of an increment up to 20 billions euros in 2006.

5.2.4 Legal and regulatory aspects

Legal and regulatory issues concerning Facility Management can be very complicated indeed. As service providers are offering to take over larger and larger portions of the business processes, they also assume larger and larger liabilities. A strong contractual framework for the business relationship between supplier and customer is thus essential for the successful outcome of the venture. This contractual relationship typically takes the form of a Service Level Agreement.

The inclusion of eBusiness services also introduce new important issues related to privacy, legal interception, ownership of location data and access to content that should of concern to service providers, network operators, equipment manufacturers and of customers and users. The ISO-17799 and related standards sets out guidelines for the security polices to be adopted for organisations. The effects on the eu-DOMAIN security policy framework are discussed in the annex to deliverable *D2.4 Trust and security user requirements specifications*.

Also e-Business services is beginning to see extensive national regulation, such as anti-spam provisions, data security and privacy laws including general surveillance practice in different countries as well as implication from the proliferation of electronic commerce on the traditional regulatory framework for trade and commerce.

5.3 The building automation sector

The generally accepted definition of intelligent building technologies are "…integrated technological building systems, communications and controls to create a building and its infrastructure which provides the owner, operator and occupant with an environment which is flexible, effective, comfortable and secure".

5.3.1 Market structure

5.3.1.1 Customer needs

Today's market and the availability of new ICT solutions impose a dramatic enrichment of the capability of intelligent buildings.

Fist of all, a new expectation among facility owners and managers is that all control systems can be integrated to provide a high level of "building intelligence." This concept speaks to managing facilities as assets transforming building data into knowledge and using that to make intelligent business decisions in real time. The driver of building intelligence and many other major trends is economic pressure to increase efficiency and productivity continuously and to do more with less. In addition to this, Facility Management agreements are more and more based on incentives about savings: this implies that Facility Managers strive for find opportunities for savings in order to share them with the end users.

According to LONmark, what most Facility Managers want today is plug-and-play interoperability. In fact, the concept of interoperability for facility executives can be traced back to three elements:

- Harmonic coexistence: in this case, what a facility executive wants for his buildings are products from different manufacturers that operate independently without interfering with each other.
- Interchangeability: in this definition of interoperability, all chillers operate so identically, for example, that only the nameplate distinguishes one from another
- Integration that allows for individuality: most facility executives, however, want interoperability somewhere between these two extremes. They want plug-and-play interoperability. They want products that can be integrated easily without using custom hardware or software. But they also want to leave room for supplier differences within product lines.

5.4 Market trends

5.4.1 Trends in industrial services

The price of energy is a driver of steep increase in intelligent building installations. As the world is experiencing a peak in oil production and a continuing rise in the need for energy, the trend to enable the rise of the true "smart building is becoming more and more obvious. Experts seem to feel the time is finally "right" for the rise of the intelligent building[4]. In a scenario in which energy costs are increasing, a greater utilisation of building automation systems to manage costs and utilisation is expected, but efforts to improve indoor air quality are also an integral part of many intelligent building initiatives.

Facility managers are pushing building automation systems vendors to transform today's closed technologies into web-enabled applications running over industry-standard IP networks. Facility managers are driving building automation systems by demanding more-open systems. The open architecture approach means widespread acceptance and sharing of hardware and software designs, standards, and protocols and is seen as being critical to the successful spread of intelligent building technology. It will lead to a greater interoperability of various systems.

Another area of significant resource expenditure has been in the addition of wireless networks (WiFi). A survey conducted by the Wireless LAN Association and NOP World Technology showed that the average payback for a wireless installation is about nine months. The survey also concluded that the average wireless user is 22% more productive than his or her wired counterparts. Productivity benefits are quantified at 48% of the total return on investment of a wireless network.

In the industrial service domain, the service offering is a complex bundling of services like knowledge-based preventive and predictive maintenance, remote monitoring, and operational compliance and documentation. The offering is constantly changing in content and delivery according to the operational conditions of the cold stores.

Industrial Services are closely related to manufacturer's products and no separate market analyses exist for these services. However, several estimates show that the European Industrial Service market could be as high as 3-4% of the total industrial market and could be as much as €60-70 billions annually.

The industrial services market still offers considerable growth and profit opportunities across many industrial sectors. A study from Monitor shows an estimated annual growth rate of services (2000-2005) ranges from 5-10% in the machine tool and metallurgy equipment industries to 15% in the rail vehicles industry (see Figure 5). Service margins could be as high as 15-20% (in the power equipment and the metallurgy equipment industries), exceeding the average margins in the product business by a factor of 4 to 5. Today these margins are also subjected to increasing pressure.

INDUSTRY	WORLD OEM + SERVICE MARKET 2003 (US$ bn)	WORLD OEM + SERVICE MARKET GROWTH (CAGR 00-05)	SHARE OF SERVICES	WORLD SERVICE MARKET GROWTH (CAGR 00-05)	MARGINS IN OEM BUSINESS	MARGINS IN SERVICE BUSINESS
Power Equipment	100	3%	45%	10%	2-5%	15-20%
Rail Vehicles	62	6%	35%	15%	3-6%	8-10%
Machine Tools	33	-1%	27%	5-10%	1-12%	5-15%
Paper Machines	20	3%	45%	10%	1-3%	10-15%
Metallurgy Equipment	8	-1%	13%	5-10%	-3-6%	15-20%

Source: Monitor Analysis

Figure 5 Trends in the market of Industrial Services (Monitor 2004)

[4] The International Facility Management Association (IFMA): Current Trends and Future Outlook for Facility Management, March 2005

In addition to higher margins in the service business, the statistics in Figure 5 highlight the fact that growth only stems from the service business while traditional component manufactures (i.e. what is referred as OEM in the diagram) business is stagnating in all five industries.

According to the above mentioned study, traditional manufacturers are generally aware of this market dynamics and the underlying potential. They quote "improved profit margin" and "revenue growth" as the main reasons for entering and/or broadening their offering in the service market. Service users also have economic expectations upon entering service contracts. While their main motivation is "increased flexibility", which often constitutes an economic benefit in itself, "cost savings" is the third most important impetus for purchasing industrial services.

Many sources, such as Outsourcing Institute, European Facility Management Found, International Facility Management Association (IFMA), Centro Ricerche Economiche Sociali di Mercato per l'Edilizia e il Territorio (CRESME), point out that the world's largest market for outsourcing is the USA, which exhibited a turnover of €448 billions in 2003. The European market is the second largest in the world with an estimated value of €343 billions in 2003 or 5 times the core Industrial Services market estimated above. The three main European markets for outsourced services were the United Kingdom, Germany and Italy. Within the European outsourcing market the amount rate specifically related to Facility Management is about 16 billions euros, with a perspective of an increment up to 20 billions euros in 2006.

5.4.2 Trends in Facility Management

The market for facility management software reached its peak in the years 1999 to 2001, and in recent years it has been concentrated among a few suppliers. In Germany, some 50,000 facility managers are using a software based facility management system, half of those systems from one of the top five suppliers in Germany. According to market overviews, a mere few suppliers service roughly 85% of all users.

Europe and the USA are leading the Facility Management market developments, while Japan has been particularly slow in adopting the concept. Estimates of the European market potential vary but market research suggests that, in the UK alone, the Facility Management sector is worth around €150 billion per year[5]. Extrapolated to Europe at large, it means that the European Market for Facility management could be as high as €1.000 billion.

European organisations in future will approach Facility Management as an integral part of their strategic plan. Those organisations that treat Facility Management as an "overhead" will be at a significant strategic disadvantage.

If you figure in the users who have access to the software facility management system but only fill it with data or use it for analyses (mostly through web access), the result would be even more clearly in favour of the leading systems. The company Conject (http://www.conject.com/) alone serves over 30,000 users in Germany. The trend towards market adjustment will accelerate further still. Two primary factors are responsible for this:

- Customers expect an increasing number of modules. Building on a uniform data-base, they not only need to support to entire real estate and infrastructure life cycle but also all levels of work: from individual operating measures to project management and strategic property management on the portfolio level. Whereas most of today's facility management systems cover only basic functions, a few companies are already providing support for more core processes, which can be illustrated - spanning every level of work and every phase of the real estate life cycle.
- More demanding requirements are being placed on the channels that support the IT facility management system. Fat Client or the web is no longer enough. Many requirements demand a mobile client or seamless integration into Windows.

These requirements can no longer be satisfied without a Service Oriented Architecture (SOA). New applications can be connected up to the system with no problem. At the same time, a service oriented architecture supports all channels. Migration to a service oriented architecture can no

[5] The British Institute of Facility Management - http://www.bifm.org.uk/bifm/about/facilities

longer be implemented through custom programming. Major investments are required, which only a few providers can afford.

More and more, custom programmers will simply develop single applications as Web Services for a specific client. In parallel, customers are demanding safer returns on their investments. It is advisable to follow a few basic principles when choosing a system:

- The greater the number of installation sites, the safer your investment is. A major supplier whose products are implemented in hundreds of companies will not just simply vanish from the market. It might be bought out but it won't go bust. That is not true of minor suppliers. There is no incentive for a take-over or expensive data migration costs in the case of a supplier that has only a few installation sites. And when minor suppliers fail, customers are stuck with their product.
- There is no substitute for experience. According to an old saying in the software business, it takes ten years of experience before a product really "runs smoothly". Few suppliers can fill the gap between up-to-date technology and long years of processing experience.
- Buyers want a clear market leader. The strong growth rate is also very attractive. For a long while, IT was considered a mere tool for automation and cost reduction. Now we know better: when properly used, IT opens up whole new distribution channels and business models. That is why successful businesses are thinking about ways they can use IT to improve business rather than focusing on how to cut IT costs. The question that will face facility managers in the future may be summed up as follows: "how can we use real estate and infrastructure to help the company win customers, open up new markers, and bring in higher earnings".

6. Business opportunities in the industrial service sector

6.1 Business foundation

The eu-DOMAIN platform is capable of delivering a number of simultaneous services from a number of different content providers and is thus fully capable of supporting organisations' business models based on the dynamic value constellation concept. For the industrial scenario that was developed, Dynamic Value Constellation was applied trying to improve a baseline business model representing an accurate picture of the real-world business system.

From the baseline models developed in *D6.1 Proposed business models and business cases* , we extended the business scenario.

The eu-DOMAIN end-users are employees, service technicians, engineers, etc. At the end of the process we finally came out with a proposal for new business models and presented an actual business case, which subsequently was validated by a group of Grundfos executives. The results were reported in *D6.4 Validated business models and business cases.*

6.2 A common business model for the industrial sector

An appropriate business model was developed based on the industrial market segment comprising customers, owners and users in deliverable *D6.1 Proposed Business models and cases*. We suggest applying variants of this business model as part of the individual exploitation plans for each consortium partner.

The business model was based on an accurate identification of value objects, value offerings and value exchanges. The first value object consists of remote access to installations and facilities. This value offering is requested by industrial customers, facility managers, building owner, and tenants because it provides up to date information about the status of installed assets, early warning of malfunctions and specific information on consumptions and other operational parameters. It will also facilitate compliance monitoring and storing information as documentation.

The same value object may be requested internally in the Domain Service Providers organisation. In this respect, eu-DOMAIN platform allows key technical support personnel to remotely diagnose and support field service workers directly from the manufacturer's technical facilities, without having to make visits to customers' sites.

Finally, the remote accessibility provides for remote or automatic meter reading capabilities, a new commodity (or value object) which may be requested by various external companies. Offering this information against a fee provides new influx of money into the business system.

The underlying service platform providing the remote accessibility is provided by the eu-DOMAIN Service Provider, who receives compensation in the form of subscription and transaction fees.

The business opportunities and the corresponding business model framework will be described in two cases: The industrial service case and the Facility Management case. Both of these cases can serve as model for actual business cases in the exploitation phase.

6.3 The industrial service case

6.3.1 Stakeholders

Actors involved in the process of creating value for industrial services have been identified as components in a business model framework.

The business model can be seen as a pyramidal structure as shown in Figure 6 with thee value levels. At each level, selected actors and stakeholders have been identified for further analysis:

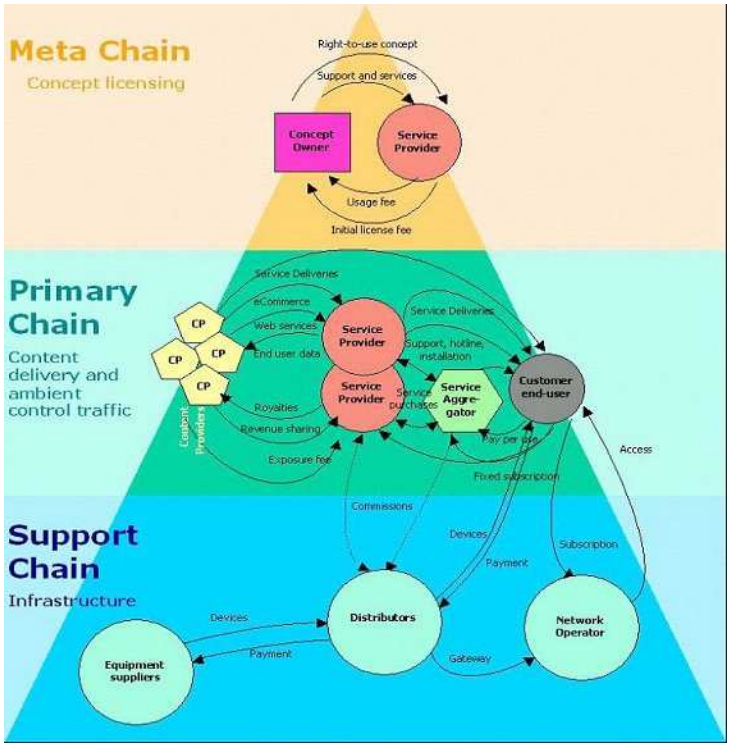


Figure 6 Business framework

The Concept Owner licenses the right to use the eu-DOMAIN concept to one or more Service Providers or service Aggregators. The Concept Owner develops the concept in a suitable form as end-to-end solutions.

Service Providers are organisations that establishes commercial eu-DOMAIN platforms and offers the services to companies in the industrial service domain. The Service Provider and offers the functionality of the eu-DOMAIN platform in an ASP-type (Application Service Provider) arrangement to industrial manufacturing companies such as Grundfos. The Service Providers charge an initial license fee plus a usage fee for the right to use the service. With the external Service Provider running the same eu-DOMAIN for many manufacturers, the industrial manufacturing company could be seen as **Content Provider** of specific product maintenance services.

Based on the volume of traffic and the importance of customer relations, the industrial company may also opt to offer the eu-DOMAIN services in its own name to end-users, i.e. its business partners, such as subsidiaries, importers and service partners, as well as independent end-users, such as installers, facility managers and even final end-users. In this way it acts as a **Domain Service Provider**. The hosting operations may still be outsourced to an external partner, but the core services are exclusively aimed at the companies own universe.

Users are people using the eu-DOMAIN applications in their daily work. Users can be defined in every conceivable domain and are very much application specific. As an example, we defined the following users in the Grundfos industrial services scenario:

End-users are technical support staff working for the pump "owner" (customer) or a facility management organisation maintaining the technical installation. They have conceptual knowledge of the complete technical installation and its integration into the operation of the facility.

Service technicians work for independent service companies which are Grundfos partners. In some cases they are directly employed in Grundfos subsidiaries. Service technicians are also end users of the ESN application. They have considerable knowledge about pumps and some knowledge of the other technical installation which the pumps are a part of. Service technicians are active both in the field and in back offices.

Engineers at Grundfos support and provide training for customers and service partner technicians. These users are experts in the pump domain.

Administrators of the European Service Network are ICT system administrators (administrative users), who are managing and administrating the ESN application on behalf of Grundfos.

Each of the stakeholders have different views and objectives. On order to define a viable business model in real life, it is necessary to carefully examine the actual stakeholders and the value propositions. We will leave this for the individual exploitation and concentrate our description of business modelling to the conceptual level.

6.3.2 User needs

User needs in the Industrial Services sector were partly based on a set of specific user needs derived at a workshop at Grundfos, where the following conclusions were drawn:

- Data must be promoted to knowledge. Knowledge must be discovered and promoted to intelligence.
- Customer loyalty must be enhanced through "continuous service management", targeted service.
- e-Marketing activities must be explored.
- Installation and commissioning must be facilitated by supporting people and their servicing work process.
- Performance measurements can be used for increasing energy efficiency and decreasing environmental load and data can be promoted to knowledge and resold to internal and external recipients.
- Connectivity can be used to make new business with other sensor data and new external stakeholders such as monitoring firms, authorities, utilities, etc.
- Customers SLA will include compliance to external requirements on pump data.
- Predictability is very important to customers and requires focus on maintenance and prevention. Knowledge of pump performances must be filtered according to ntc – need-to-know criteria.
- Security is important, especially in relation to damage control.

6.3.3 Business case

For Industrial Services, the extended business case was developed based on the industrial market segment comprising customers, owners and users of Grundfos circulation pumps for cooling and HVAC applications.

Grundfos Manufacturing is the main actor in the extended business scenario. They provide high quality service to their customers, as is part of the company's overall strategy. In addition to providing the basic service and maintenance, Grundfos Manufacturing has introduced network communication components allowing users as well as Service Partners and Grundfos' own staff to remotely access the installations. Grundfos is basing the remote services on the eu-DOMAIN platform and has outsourced the operation to a eu-DOMAIN Service Provider. As a by-product of the communication network, Grundfos Manufacturing is now able to enter into new partnerships with third parties such as utility companies, offering them automatic meter reading (AMR) of energy consumption at the customer's installation. This partnership adds enough economic volume to the system to make all actors profitable and thus creating a sustainable business model.

In the model, Grundfos Manufacturing undertakes three value activities: Contract service, installation and service support, and remote metering. Most value objects are being exchanged via the Grundfos Manufacturing actor. We have chosen this approach because it conforms with the desire of Grundfos Manufacturing to be intimately linked with their customers and to provide world class services to them. This also implies that Grundfos will not allow other service providers to get in direct contact with their customers. By being engaged in all exchanges of value objects, Grundfos retains total

customer control and supports customer satisfaction, brand recognition and a high level of customer retention.

An overall profitability analysis has been carried out based on the value model and using the e^{3}value tool. The profitability sheet below shows the result of the analysis.

Market segment / actor (k€)	Revenues	Expenditures	Gross profit/deficit
Industrial Customers	0	6,240	-6,240
Service Partner	2,400	0	2,400
eu-DOMAIN service provider	564	543	21
Utility company	0	36	-36
Grundfos Manufacturing	6,276	4,104	2,172

Figure 7 Industrial services: profitability sheet

In this hypothetical market, the number of new installations and replacements annually is 6.000, of which 1,200 customers have opted for a service agreement with annual service calls and free spare parts.

The business system is overall profitable and each actor is profitable, which indicates a high chance of the business model being sustainable over time.

The profitability sheet does not claim to be accurate in absolute terms, but indicates that sustainability can be achieved by carefully focusing on the value objects, decomposing actor activities into relevant value activities and by introducing new actors into the business system to achieve additional funds.

6.3.4 eu-DOMAIN deployment in industrial services

In previous work we explained that the term "Industrial Services" lacks a clear definition and there is a great deal of overlap with other topical themes such as "Facility Management". For the purpose of a maintaining a strict and rigorous methodology, we need to establish a clear definition and a technical, contractual and business framework for both of these terms.

From a business perspective, the main difference between Industrial Services and Facility Management has really been the "management" element and the greater responsibility that goes with it. In this respect management shall be understood to include technical, work process and human resource issues and also legal, ethical, health and safety and social issues.

In the eu-DOMAIN context we use the term "Industrial Services" to identify the business activities related to the maintenance and upkeep of specific technical installations and production equipment in a wide variety of industries including in some instances also installations in private homes. The business activities are aiming at absorbing outsourced tasks relating to the whole lifecycle from installation and commissioning over maintenance to end-of-life retirement and replacements of components and complete installations as well as new value added services such as remote monitoring and compliance services.

The business activities within Industrial Services, which are relevant to eu-DOMAIN, are related to all aspects of installation and maintenance of technical equipment and machinery used in business environments, either directly in any kind of manufacturing process or as supporting machinery for infrastructures such as commercial, buildings, supply, support and logistics systems. The following life-cycle related activities have been identified:

- *installation and commissioning*: successful commissioning and hand-over of a plant or installation to the customer is often the culmination of years of concentrated effort, and represents a major project milestone;
- *maintenance*: a proper maintenance of installed industrial assets means a guaranteed continuity of operations;

- *maintenance contracts*: maintenance contracts take very different forms. For some customers, it is essential that service is available on demand, 24h a day, 365 days a year. Others contract calls for recurrent maintenance work at agreed prices;
- *maintenance engineering*: the Industrial Service provider translates the objectives of the customers installations into an organised maintenance plan in accordance with applicable environment and safety regulations;
- *shutdowns and revamps*: an efficient and timely execution of planned shutdowns and revamps is very important in process industries.

6.3.5 Contracts

There are literally millions of manufacturer and distributors of industrial products in Europe and each of them has their own contractual framework. We will thus report a typical model of industrial service agreements and relate it to similar requirements expected to be levied on services provided on the basis of the eu-DOMAIN platform. Specifically, the analysis is based on a Service Agreement for Grundfos pumps being representative of the Industrial Service sector. A sample model has been included in *D2.5 Societal user requirement specifications (Annex).*

Parties

The parties in the Service Agreement are the Customer, i.e. the owner or operator of the pumps, and "Grundfos" i.e. the "maintenance contractor" , represented by one of its sales and service companies around the world. It should be noted, that the "service provider" is not the headquarter (manufacturing) company of Grundfos, but the local company close to the customer. This construction is relevant for physical products but may not be relevant for future eBusiness offerings.

Subject of agreement

The subject of the Service Agreement is to provide service and maintenance on installed Grundfos pumps at the customer's location. The service product is offered in three versions: Basic, Extended and Total. The three products offer the same basic service, but with more features included and higher levels of service. The scope of the Service Agreement is defined by the products listed in an appendix.

Service level – quantity

All service products cover a fixed number of visual inspections of application per year within normal working hours. The minimum number of visits is one, but the customer has the option to sign up for more frequent inspections at extra cost.

The basic service products encompass man-hours and travelling to the place plus a final status report with recommendations for needed repairs and adjustments based on the visual inspection alone. If the customer signs up for the Extended service product, all wear parts are included and an additional 20% is offered on other spare parts. The customer must authorise the repair before it is being made.

With the Total service product, the customer further gets a full pump park evaluation with regards to optimisation of energy consumption and efficiency, free service calls within working hours and a fast response (within 12 hours) in case of operations breakdown.

Service level – quality

The Service Agreement does not explicitly state a service level or quality to be achieved in terms of responsiveness or reaction time except for the Total Service agreement, which involves that Grundfos, or one of its service partners, will make initial response within 12 hours of the reporting. If not the customer will get the repair for free (normal charges for man-hours and driving on Sat.+ Sun. and outside working hours). It should be noted, that this is the only place where it is mentioned that Grundfos can perform its duties through service partners instead of using its own service technicians.

Economic values

The model Service Agreement does not contain prices, which varies according to location and customer. The price structure is one of annual payments, invoiced at the beginning of the period. Service Agreements thus are net contributors to the service provider's cash flow. Prices can be increased at the time of renewal, but with four months notice, thus leaving the customer one month to consider if she/he wants to continue or terminate the Service Agreement.

Reporting requirements

Grundfos will after each visual inspection of the pumps deliver a Status Report describing the result of the visual inspection. Further, a Recommendation Report will be delivered with recommendations for repairs and adjustments needed to bring the pump up to a reasonable working standard.

Other contractual conditions

The service agreement has a limited life span, but is automatically renewed for a new period of one year. Termination of the agreement can take place with three months written notice.

The customer guarantees that Grundfos is given necessary access to the pump installations. This includes that the customer blocks up the pumps from the remaining installation and interrupts the current to the pumps and controls during the inspection if requested by Grundfos.

The Service Agreement is generally subject to Grundfos' general sale and delivery terms and conditions, which sets up additional requirements not specifically related to the service products.

6.4 The Facility Management case

The European Committee for Standardization defines Facility Management as "an integrated process to support and improve the effectiveness of the primary activities of an organization by the management and delivery of agreed support services for the appropriate environment that is needed to achieve its changing objectives", where primary activities are "activities that constitute the distinctive and indispensable competence of an organization in its value chain". Facility Management is thus a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology.

In the eu-DOMAIN context we use the term "Facility Management" to also include the business activities related to "Operations Management" and "Total Management" including process equipment, installations, buildings, infrastructures, services and all other material activities needed to fulfil a specific business or technical goal.

The facility management market is adapting itself by changing into a new one: companies are looking for software that provides complete real estate life cycle management. Market overviews reflect the scarcity of suppliers in a new, very large market. They forecast that the only survivors will be the companies that can sell customers the best technology at a fair price with a reliable return on their investment.

The actual demand requires a proactive attitude. Whenever a window is broken and not repaired quickly, there is a higher probability that all the windows will be broken shortly thereafter. This "Broken Window" effect can also be observed in real estate and infrastructures. Processes related to the building are always the most obvious to employees. For that reason, facility management systems need to be proactive in order to win new customers. This requires fast and accurate information:

- Facility management processes must be clearly defined and communicated in order for industry experience, which is the key to quality assurance, to have an effect.
- All the necessary information (e. g., dates for proactive maintenance) needs to be available and consistent.
- Problems must be reported quickly to the proper place. Such process quality can only be achieved through specialized building managers with more powerful IT support.

In the past, many companies improved their earnings significantly by setting up a facility management group. For example Hapimag (Hotel- und Appartmenthaus Immobilien Anlage AG): this real estate company is using the money from its shareholders to build holiday resort facilities that can be used by the shareholders themselves. Each visitor to the resort is therefore a co-owner at the same time. This gives them a dual perspective on the facilities: on the one hand, they want to enjoy the resort, while at the same time appraising the value of the real estate, as an indicator of the potential return on their investment. Hapimag has derived a simple facility management philosophy from this: each apartment needs to look new at all times! That is why they invest large sums every year "to maintain the value of our resort through careful and planned upkeep of building materials and well organized optimisation of the infrastructure, thereby steadily increasing shareholder value".

6.4.1 Stakeholders

Actors involved in the process of creating value for Facility Managers are to a great extent the same as those who have been identified as components in a business model framework for industrial services The business model can be seen as the same pyramidal structure as shown in Figure 6 with thee value levels. The difference between industrial services and Facility Management are seen in the following stakeholders.

The Service Provider and offers the functionality of the eu-DOMAIN platform in an ASP-type (Application Service Provider) arrangement to Facility Manager companies, for use with all of the facilities managed by these companies regardless of location and technical installations. The Service Providers charge an initial license fee plus a usage fee for the right to use the service.

Based on the volume of traffic and the importance of customer relations, a Facility Manager may also opt to offer the eu-DOMAIN services in its own name to end-users, i.e. its business partners, such as installers, craftsmen, care takers, service partners, etc. as well as independent end-users, such as building owners and government inspectors. In this way the Facility Manager acts as a **Domain Service Provider**. The hosting operations may still be outsourced to an external partner, but the core services are exclusively aimed at the companies own universe.

Users are people using the eu-DOMAIN applications in their daily work. Users can be defined in every conceivable domain and are very much application specific. As an example, we can define the following users in Facility Management:

> **End-users** are technical support staff such as installers, craftsmen, care takers, service partners, etc. working for the Facility Manager
>
> **Service technicians** work for independent service companies. They have considerable knowledge about the technical installation.
>
> **Support engineers offers technical** support for specific installations and are typically employed by the manufacturer of the installation.
>
> **Administrators** are ICT system administrators who are managing and administrating the eu-DOMAIN platform on behalf of the Facility Manager.

Each of the stakeholders have different views and objectives. On order to define a viable business model in real life, it is necessary to carefully examine the actual stakeholders and the value propositions. We will leave this for the individual exploitation and concentrate our description of business modelling to the conceptual level.

6.4.2 User needs

User needs in the Facility Management sector must be derived in a fashion similar to the method used in the industrial service domain. Some common needs are foreseen:

- Performance measurements can be used for increasing energy efficiency and decreasing environmental load.
- Customers SLA will include compliance to external requirements.

- Predictability is very important to customers and requires focus on maintenance and prevention.
- Security is important.

6.4.3 Contracts

To really manage the quality of service received from Facility Management service provider, Service Level Agreements (SLA) are a must. According to Sturm, Morris and Jander in Foundations of Service Level Management, a good service level agreement:

- Provides permanence
- Provides clarity
- Serves as a communications vehicle
- Guards against "expectations creep"
- Sets mutual standards for service
- Defines how a level of service will be measured

Service Level Agreements are agreements that any company that's purchasing services from an external provider can't be without. If a company gets less-than-acceptable service from its service provider and does not have a Service Level Agreement in place, that company may not have many options to either force the service provider to address the problem or terminate their contract without penalties.

7. Industry analysis – the healthcare sector

The healthcare sectors in EU Member States are tremendously complicated in terms of how healthcare services are delivered and financed. The structures of European healthcare systems are diverse and it is therefore necessary to be aware of fundamental differences in order to be able to commercially exploit eu-DOMAIN successfully across Europe. Therefore, the healthcare systems of eight chosen EU member States (UK, Denmark, Sweden, France, Germany, Italy, Spain and Greece) were analysed in the annex to the deliverable D2.5 Societal user requirements specifications, which the present deliverable draws upon. This deliverable also draws upon the finding in the deliverable D6.1 Proposed business models and cases. The structure of the healthcare system in the individual markets is extremely important for the exploitation vehicle to be chosen by the partners. We are thus providing a comprehensive description of the European healthcare markets in this chapter.

7.1 Market structure

The European healthcare sector is dominated by public provisioning and funding of healthcare services. The central governments are responsible for national legislation and policies on healthcare. National budgets for healthcare are generally set at central level based on both historical data and negotiation with healthcare providers. In most EU Member States, the healthcare system is decentralised (in Greece and France the systems are more centralised) with varying degrees of regional control and management of the allocated financial resources, as well as control of how to best meet national guidelines and standards (including public demands and requirements) on healthcare services.

In the UK, Denmark, Sweden, Italy and Spain the healthcare system is tax-based, i.e. the funding of the healthcare sector is based on revenue from general national taxation. Healthcare services are provided free of charge by the public sector; however, Sweden and Italy have some limited user-charges for public primary healthcare service, such as a small fixed fee for visits to a GP. The private healthcare sector in these countries is thus minimal.

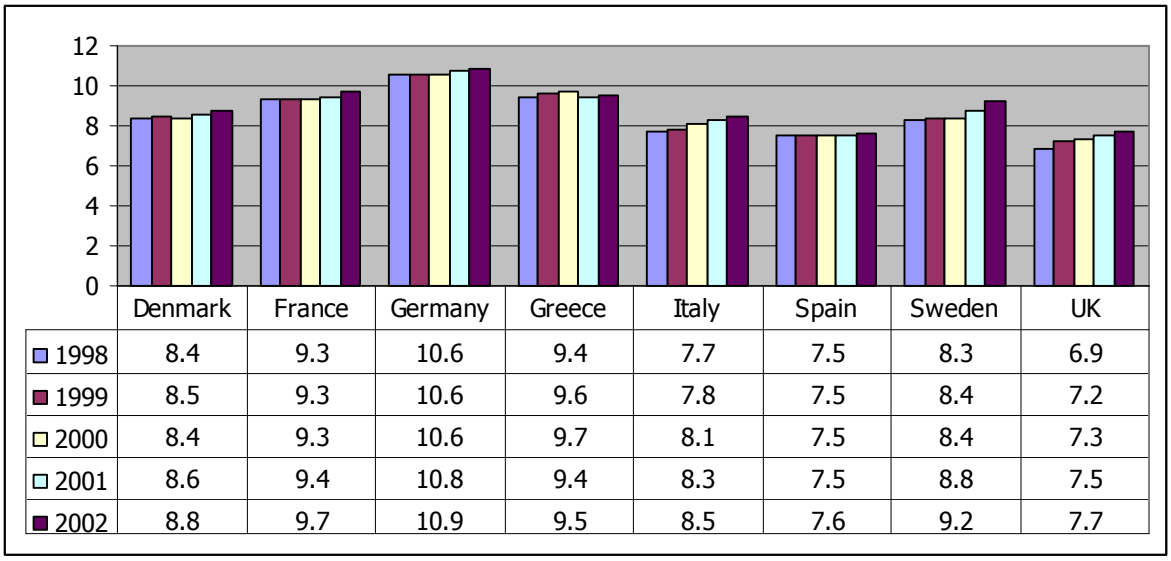
In France and Germany the healthcare system is based on statutory social health insurance funds, i.e. the funding of the public healthcare sector is based on non-risk related contributions to the statutory insurance schemes which provide public healthcare services. The private healthcare sector is more extensive and sources of finances more diverse. In Greece, the healthcare system is based on a mix between a tax-based system and a statutory insurance system. Greece has the most privatised healthcare system Europe with an almost equal divide between public and private sources financing the healthcare system.

Healthcare expenditure as a proportion of the national GDP has increased in all Member States in recent years. The average percentage of national GDP expenditure on health for the eight EU Member States analysed here increased from 8.5% in 1998 to 9% in 2002 (see Figure 2)[6]. It should be noted, however, that these statistics do not give us any precise information as to why the expenditure has increased. We may therefore question whether the rise in health expenditure has meant better high quality and more comprehensive healthcare services and whether the rise has been accompanied by a sufficient cost-efficient use of resources.

For example, in Germany and France, which have the highest percentage of health expenditure of the GDP, cost-containment and cost-efficiency have been important issues in recent years In France, financial sustainability has been a central issue for the healthcare system since 1970s. The French healthcare system's organisational structure makes it difficult to control expenditure and, although relatively high levels of expenditure on health have resulted in patient satisfaction and good health outcomes, cost containment remains a permanent policy goal.

Figure 8 illustrates the development from 1998 to 2002 of total expenditure on health as percentage of gross domestic product (GDP).

[6] World Health Statistics 2005 (http://www.who.int/whr/2005/annex/annexe5_en.pdf). It should be noted that these figures are not necessarily the official figures from Member States, which may use alternative rigorous methods.

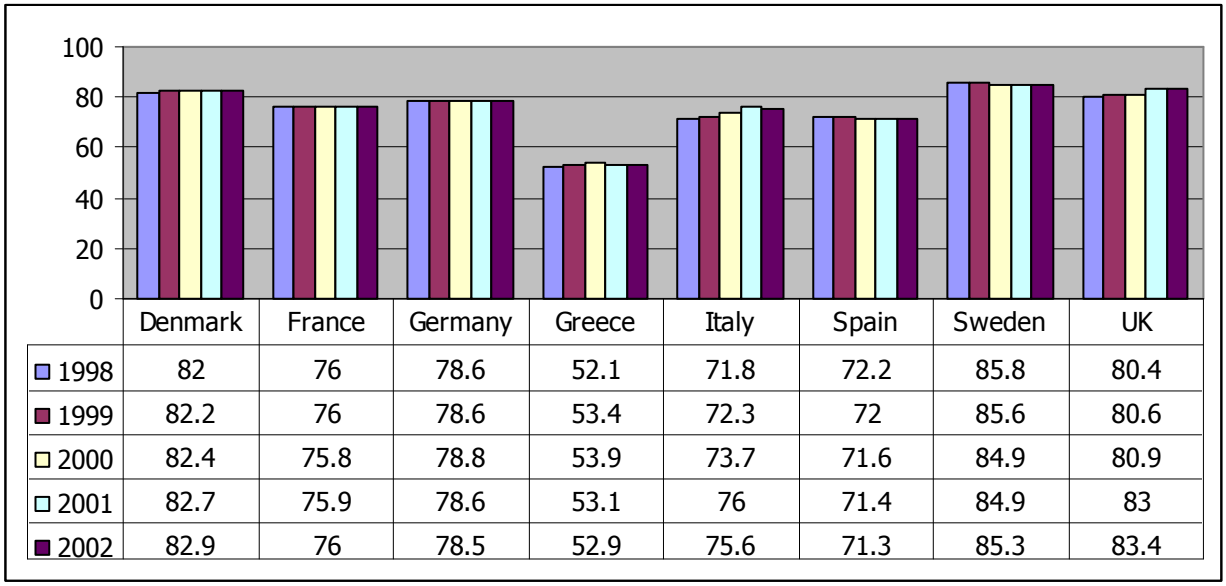


	Denmark	France	Germany	Greece	Italy	Spain	Sweden	UK
1998	8.4	9.3	10.6	9.4	7.7	7.5	8.3	6.9
1999	8.5	9.3	10.6	9.6	7.8	7.5	8.4	7.2
2000	8.4	9.3	10.6	9.7	8.1	7.5	8.4	7.3
2001	8.6	9.4	10.8	9.4	8.3	7.5	8.8	7.5
2002	8.8	9.7	10.9	9.5	8.5	7.6	9.2	7.7

Figure 8 Total expenditure on health as % of gross domestic product. Source: World Health Organisation

As Figure 8 shows, France and Germany have the highest level of expenditure on health as percentage of the GDP, while Spain and the UK have the lowest with still less than 8% in 2002. In contrast to Spain however, there has been a significant increase of the total expenditure in the UK since 1998. In Sweden, total expenditure of GDP was 8.3% in 1998 compared to 9.2% in 2002, thus accounting for an increase of 0.9 % which is the highest increase among Member States. On the other spectra, we find Spain where total expenditure in 1998 was 7.5% compared to 7.6% in 2002, which is the lowest increase among Member States of only 0.1%.

Figure 9 illustrate the total general government expenditure on healthcare.

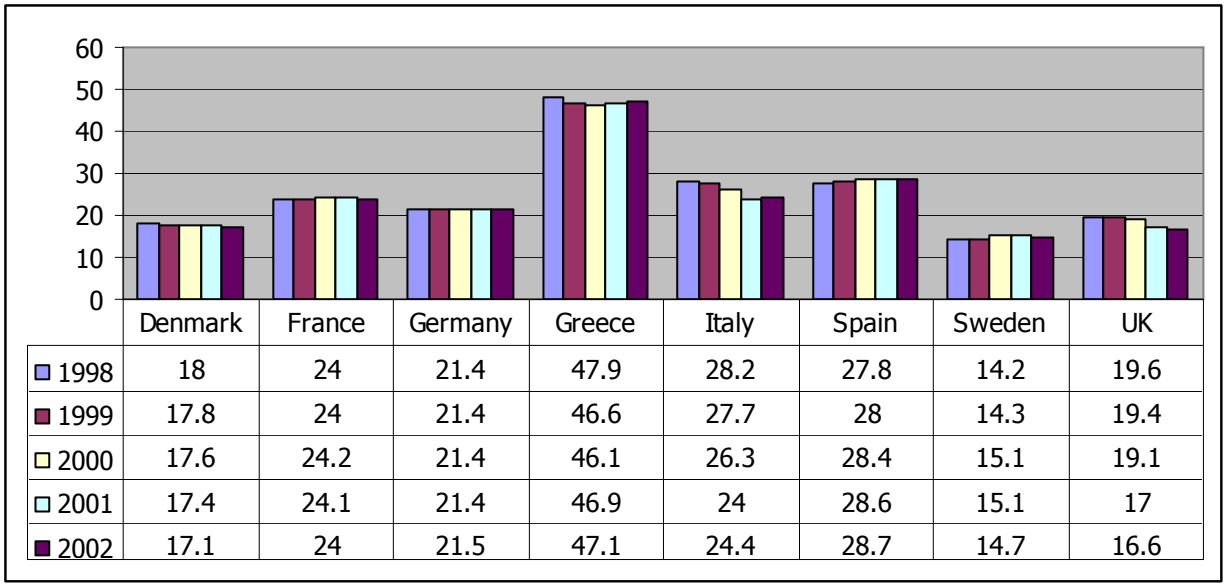


	Denmark	France	Germany	Greece	Italy	Spain	Sweden	UK
1998	82	76	78.6	52.1	71.8	72.2	85.8	80.4
1999	82.2	76	78.6	53.4	72.3	72	85.6	80.6
2000	82.4	75.8	78.8	53.9	73.7	71.6	84.9	80.9
2001	82.7	75.9	78.6	53.1	76	71.4	84.9	83
2002	82.9	76	78.5	52.9	75.6	71.3	85.3	83.4

Figure 9 General government expenditure on health as % of total expenditure on health Source: World Health Organisation.

The average general government expenditure on health as percentage of total expenditure on health among the EU Member States was 74.9% in 1998 compared to 75.7% in 2002, i.e. a small overall increase of 0.8%. Accordingly, the average private expenditure on health as percentage of total expenditure on health has decreased from 25.1% in 1998 to 24.3% in 2002, also an overall decrease of 0.8%. Sweden, Denmark and the UK have the highest general government expenditure and Greece has the lowest.

Figure 10 illustrate the total private expenditure on healthcare.



	Denmark	France	Germany	Greece	Italy	Spain	Sweden	UK
1998	18	24	21.4	47.9	28.2	27.8	14.2	19.6
1999	17.8	24	21.4	46.6	27.7	28	14.3	19.4
2000	17.6	24.2	21.4	46.1	26.3	28.4	15.1	19.1
2001	17.4	24.1	21.4	46.9	24	28.6	15.1	17
2002	17.1	24	21.5	47.1	24.4	28.7	14.7	16.6

Figure 10 Private expenditure on health as % of total expenditure on health Source: World Health Organisation.

As the figures have shown, Italy and UK have had the largest change in general government and private expenditure on health from 1998 to 2002: Italy had an increase/decrease of 3.8% and the UK had an increase/decrease of 3%. Private expenditure mainly accounts for out-of-pocket payments for medical products, dentistry and voluntary health insurance. Greece has the most privatised healthcare sector.

7.2 Healthcare providers

The tax-based healthcare systems in Europe offer mainly publicly provided and managed healthcare services. Public bodies often act as both providers and commissioners (purchasers) of health services. In general, there is a very limited number of private healthcare providers who provide healthcare services directly to the patient on a fee-for-service basis. In the Scandinavian countries, national legislation, coupled with a comprehensive public healthcare sector and general consensus, place general restrictions on a specific development of a private healthcare sector. Generally, only specialists have private practices but their services are usually covered by the national health services when patients have been referred to specialist treatment by their GP.

Statutory insurance contribution-based healthcare systems in Europe have a greater mixture of public and private providers of both primary and secondary healthcare services. The statutory health insurance schemes mainly act as purchasers of healthcare services from both public and private providers, albeit they may provide some healthcare services as well (as in Greece). The statutory social health insurance schemes are responsible for providing public healthcare services and are the major source of financing healthcare. In France, statutory health insurance funds approximately three quarters of total health expenditure, while in Germany statutory health insurance funded approximately 57% in 2002, with other statutory insurance funds contributing 10%. Overall, public funding accounted for approximately three quarters of health expenditure in Germany in 2002.

Hospital care is generally delivered by a mixture of public and private providers. The number of private hospitals, and the percentage of total hospital beds which private hospitals cover, is still relatively low. In addition, there exist a number of non-profit hospitals which supplement public and private hospitals.

Table 2 below presents an overview of the main characteristics of the healthcare systems in the selected EU Member States.

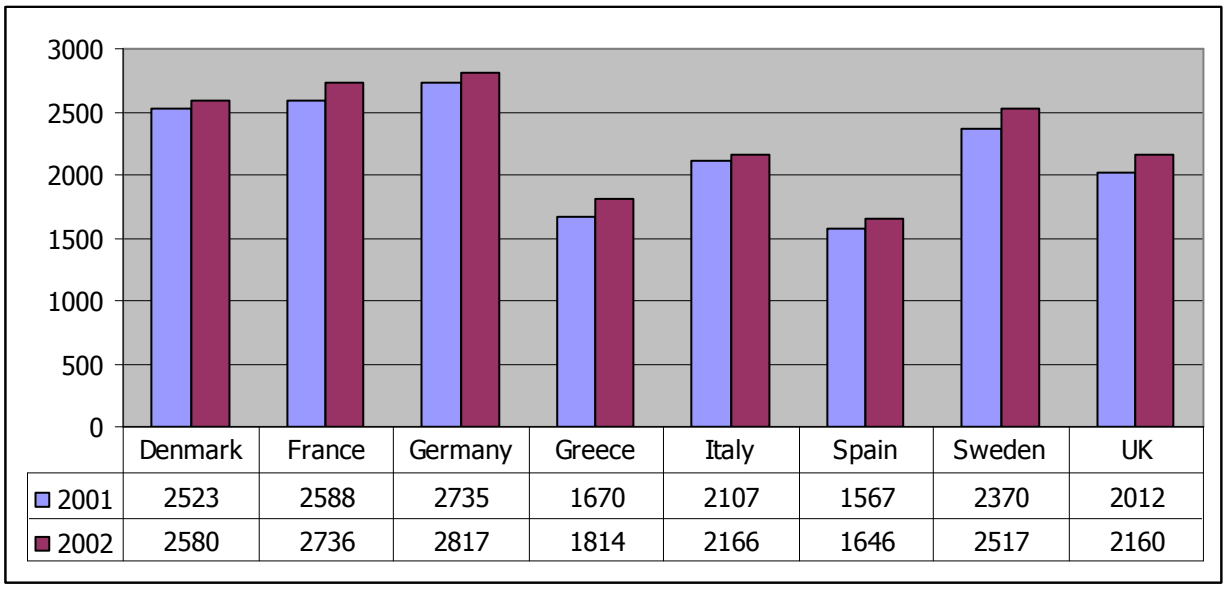
	UK	Denmark	Sweden	Germany	France	Italy	Spain	Greece
Healthcare system	Tax-based	Tax-based	Tax-based	Statutory social health insurance-based	Statutory social health insurance-based	Tax-based	Tax-based	Tax and statutory social health insurance-based
Main commissioning body	Primary Care Trusts	Counties/Regions	County councils	Sickness funds	Statutory insurance funds	Regions/NHS	Autonomous communities/ regions	NHS and statutory insurance funds
Primary care provider	Self-employed GPs and NHS walk-in clinics	Self-employed GPs and municipal health services	Self-employed GPs, local health centres, hospital out-patient departments and private local clinics	Sickness fund contracted GPs and private specialists	Self-employed GPs and local health centres	Independent GPs contracted to NHS	Publicly employed GPs	Primary care centres and hospital outpatient centres, GPs employed by insurance funds
Secondary and tertiary care provider	Mainly public hospitals	Mainly public owned and run by counties/regions	Mainly public hospitals	Public hospitals (53%), private non-profit hospitals (39%) and private for-profit hospitals (8%)	Public hospitals (65%), private non-profit hospitals (15%), private for-profit hospitals (20%)	Mainly public hospitals	Mainly public hospitals	Public hospitals (63.5%), private hospitals (28.8%), military hospitals (7%)
Public funding of total expenditure	83%	83%	85.9%	79%	73%	75%	71.4%	52.6%
Public expenditure as % of GDP	6.2%	7.1%	7.4%	8%	7.2%	6.3%	5.4%	5.2%
Private funding as % of GDP	1.4%	1.3%	1.3%	2.8%	2.4%	2.1%	2.1%	4.2%
Homecare delivery	Primary Care Trusts and Social Services	Municipalities	Municipalities	Long-term Care Insurance fund	Self-employed health professionals and specialised home care services	Health districts, local health units, GPs	Primary care teams/INSALUD	Private sector
eHealth initiatives	"Transformational Government – Enabled by Technology 2005"; NHS website: www.nhs.uk and www.nhsdirect.nhs.uk; Connecting for Health	" IT Strategy for the Danish Health Care Sector 2003-2007"; establishment of eHealth Portal: www.sundhed.dk	"An Information Society for All – a Publication about the Swedish IT-policy; establishment of Carelink: www.carelink.se	"Information Society Germany 2006"; implementation of 2nd Generation Health Cards	"The Government Action Plan 2004-2007"; Health smart cards implemented; general health information on: www.sante.fr	"The Government's Guide for the Development of the Information Society 2002"; establishing an eHealth portal; the government portal provide general health information: www.italia.gov.it	The Ministry of Health and Consumer has its own portal with general health information: www.msc.es;	"White paper: Greec in the Information Society – Strategies and Actions 2002": outlines goals, eg. IT systems in hospitals, tele-medicine; healt information site: www.iatronet.gr; generally few and limited *e*Health services; HYGIAnet

Table 2 Overall characteristics of healthcare sector in selected EU Member States

7.3 General healthcare needs and trends in Europe

Public health is a key priority for the EU Member States and an area which faces serious challenges in the near future. The European population is aging due to the falling birth rate and the increased life expectancy. At the same time, the number of people with chronic conditions associated with old age and/or unhealthy lifestyles is increasing. For example, diabetes, asthma and cardiovascular diseases have become more widespread in Europe. These demographic developments will increase the demand for healthcare services as more people will need long-term healthcare. This fact is also likely to require significant changes to the structure and organisation of existing healthcare and social services in order to meet the demand in an efficient and economically feasible manner.

A major challenge for the EU Member States is how to pay for the increasing costs of healthcare services. The per capita expenditure on healthcare services is much greater for the old than for people at working age. The challenge for Europe is how to pay for the needs of the aging population when the working age population is at the same declining due to a continuous decrease in birth rates. Figure 11 below illustrates the total expenditure (public and private) on health as of per capita US$ PPP (purchasing power parity). All EU Member States have had an increase between 2001 and 2002. Spain and Greece have the lowest per capita expenditure, while Germany and France have the highest. France, Germany, Greece and Sweden have had the highest increase from 2001 to 2002, approximately 100 US dollars higher than the remaining Member States.



	Denmark	France	Germany	Greece	Italy	Spain	Sweden	UK
2001	2523	2588	2735	1670	2107	1567	2370	2012
2002	2580	2736	2817	1814	2166	1646	2517	2160

Figure 11 Total expenditure on health per capita US$ PPP (private and public) Source: OECD Health Data 2004.

There is a noticeable difference in the prevalence of the private healthcare sector across the different EU Member States, as is the use of direct private out-of-pocket payment for certain healthcare services. However, most recent trends point toward a potential development of user-charges for primary care services even in those Member States where such payments have been unthinkable in the past and where the basic cornerstone of the public healthcare system is to provide universal free-of-charge healthcare services to the population. In the UK and Denmark, for instance, there is currently talk about introducing user payment for primary healthcare services, albeit with annual ceilings as to the maximum of private spending. Whether this will be introduced remains to be seen but it may reflect a development towards a more customer-provider relationship between patient and the healthcare system.

The European population has become more knowledgeable about their nation's healthcare system (not least to widely accessible information on the Internet) and they expect high quality healthcare that can meet their individual needs. These public demands are increasingly reflected in EU Member States' structural organisation of the national healthcare system. For example, in Denmark and the UK the national governments have implemented "waiting time guarantees" which promises hospital treatment within a fixed period of time. This means that the patient is offered treatment at private

hospitals or abroad free of charge if treatment at a public hospital is not available within the fixed time period.

Other similar changes are occurring in order to focus healthcare services on the needs of the patient, thus placing the patient in the centre. For example, another trend is the general emphasis on providing for chronically ill and old patients in their own home in response to patients' and their families' wishes. In France, "hospitalisation at home" has been introduced and in the UK some rehabilitation care is being carried out at community level or at home rather than at hospitals. Such developments not only meet the needs and wishes of the patient, in addition, they may also reduce hospital costs significantly.

The development of innovation medical technologies and information and communication technologies can contribute significantly to improve the delivery of healthcare services and to overall health status. *e*Health plays an important role in the future of healthcare in Europe; *e*Health can meet the challenges of healthcare provisioning in the future. It can deliver time efficient and better care within citizen-oriented healthcare systems. The EU Member States have already shown commitment to developing national *e*Health strategies which will improve the healthcare system and thus benefit both healthcare professionals and patients.

7.3.1 Homecare in Europe

All EU countries are confronted with increasing demand for home care; the main reasons are the aging population, the smaller family size, the increased female participation in the labour market and the continuous attempts to control healthcare expenditures. There are differences among the countries in definition and the development of home care services. In countries such as Denmark, the Netherlands, Belgium, Finland, Ireland, Sweden and U.K. home nursing and home help services are fairly developed compared to Austria, Greece, Italy and Spain.

In general, there is also a trend in the UK, Denmark, Sweden, France and Germany towards moving some healthcare services traditionally provided by hospitals (e.g. rehabilitation and monitoring) to the local health clinics and/or into the patient's home. Such developments depend to a great extent on the implementation of eHealth service and mobile health service such as the services realised by the eu-DOMAIN. In Spain and Greece home-care services are still lagging and face a serious challenge with the overall European demographic development with an aging population requiring care and support in their own home.

7.3.2 eHealth

The demographic trend across Europe means that life expectancy is increasing every year, thanks to good economical and social conditions and good services. Extended life expectancy coupled with decreasing birth rates in recent decades will lead to a general ageing of the population in Europe. Of course elderly people need more healthcare. As the European population grow older, the demand for healthcare will rise accordingly. Information technologies can be very useful in managing the flows of supply and demand, just as it could be for waiting lists. Electronic "brokerage" of services will link excess supply in one place with excess demand in another, thus, increasing access.

There will be an increase in need for day centres and for smart homes. Telecommunications will be essential in order for those with restricted mobility to keep in touch with essential support services. Responding in an adequate manner to these growing needs presents a number of significant challenges to service provision, which ICT can in significant ways help to meet.

eHealth can deliver significant improvements in access to care, quality of care, and the efficiency and productivity of the health sector and it is a key priority of the European Union's *e*Europe strategy. The EU Members States have already showed their commitment to promote *e*Health strategies and initiatives.[7] By the end of 2005, each Member State is to develop a national or regional roadmap for eHealth. Each roadmap will address the challenges of providing citizen-centred

[7] Ministerial Declaration at Ministerial eHealth 2003 Conference (http://europa.eu.int/information_society/eeurope/ehealth/conference/2003/index_en.htm)

healthcare services in a context of rising expectations, increased mobility, ageing population and limited budget conditions[8]. There is therefore great potential for the commercial exploitation of eu-DOMAIN because it is precisely capable of meeting these challenges; it is with these challenges in mind that eu-DOMAIN has been designed and developed.

The deliverable D2.5 Societal requirements specification and regulations, and the annex attached to it, outline the main EU *e*Health targets and policies as defined in the *e*Europe Action Plan 2005 and i2010 – European Information Society 2010. The latter (which is a strategic follow-up on the former) has a particular focus on the further development of *e*Health strategies and it sets out an interoperability roadmap for greater use of technologies, new services and systems, to create a "European eHealth Area". The i2010 Action Plan states that ICT can contribute strongly to improvements in the quality of life. ICT are capable of improving the health of our citizens via new ICT enabled medical and welfare services. In light of the demographic challenges facing Europe, ICT can help make public health and welfare systems more efficient and effective[9].

There should be no doubt of the advantages of *e*Health developments and EU Member States are already working towards various *e*Health strategies, policies and goals in order to meet the future challenges of healthcare provisioning. Although there are some variations as to the present stage of *e*Health developments in the different Member States the incentives are there, and as general IT infrastructure and Internet access continues to improve across Europe the differences between Member States' *e*Health developments should decrease.

It is noteworthy also, that for example in Spain, where the IT infrastructure and general IT skills are somewhat lower compared to other EU Member States, the Internet penetration among physicians is one of the highest in Europe. This indicates that the "working culture" among Spanish physicians is a great potential market for ICTs and the services offered by eu-DOMAIN; they are, despite the relatively poor overall Internet penetration in the country, actively using online services in their professional life, thus demonstrating a demand for improved and more comprehensive ICT services.

Table 3 on the following page provides an overview of available online health services in each of the eight EU Member States analysed in this deliverable. The table is intended to serve as an indicator of each Member State's developments in eHealth areas, as well as the public use of e-services related to healthcare.

[8] http://europa.eu.int/information_society/activities/health/policy_action_plan/working_group/national_roadmaps/index_en.htm
[9] http://europa.eu.int/information_society/eeurope/i2010/docs/communications/com_229_i2010_310505_fv_en.doc

	UK	Denmark	Sweden	Germany	France	Italy	Spain	Greece
General information	Yes: www.nhs.uk www.nhsdirect.nhs.uk	Yes: www.sundhed.dk www.netdoktor.dk	Yes; county councils have their own *e*Health portals	Yes; regional health portals at *Länder* level	Yes: www.sante.fr	Yes: www.italia.gov.it But there are distinct regional differences in quality and level of online information on health issues	Yes, run by the autonomous counties: www.msc.es	Yes: www.iatronet.gr
Online consultation	No	Yes	No, but possible to post questions to a doctor via www.infomedica.se	No, Internet-based communication only allowed after face-to-face consultation	No	Not encouraged and very rare	No (not developed)	No
Diagnosis	No	Yes	No	No	No, only between health professionals to confirm a diagnosis	Commercial web sites offer diagnosis online; patients may get second opinion on diagnosis online; online diagnosis generally not encouraged	No	No
Electronic prescription	Is being developed	Yes	Yes	Yes, but are low although demand is high	No	No	No	No
Medicine sale	Non-prescription medicines only	Yes	Non-prescription medicines only; pilot programme running for selling prescription medicine online	Yes	No	Non-prescription medicines only and only available from some pharmacies	Not allowed by law	No
Overall user accessibility	Very good; 70%+ with broadband connection by 2005; average of 500,000 visits per month to NHS Direct	Very good; approx. 47% use Internet for health information (2003)	Very good; 80% have Internet access at work or at home	83% of web users search for health and medicine information (2004)	Low penetration and usage of Internet but is improving quickly	Low public demand for *e*Health services	Infrastructure and general IT skills are low	Infra-structure is poorly developed; two thirds of population do not use Internet; only 7.4% have used Internet to search for health related information

Table 3 Overview of main eHealth initiatives in EU Member States

7.4 Existing management programmes

This section reports on current mainstream diabetes management model in operation in various parts of the world and compares them to the potential diabetes service model based on the eu-DOMAIN platform. The purpose is to highlight its benefits and its added value as proposed by the project reviewers.

Practically every health organisation and health provider in the Western World offers dedicated Diabetes Management Programme in one form of the other.

In the typical diabetes management programme, eligible members identified with diabetes are identified and risk stratified to the appropriate level of care. Health profiles are completed and medication requirements are collected at enrolment and updated frequently. In most programmes, patients receive proactive care calls at regular intervals. During these calls, the patient's compliance with the carer's recommendations and adherence to the diabetes self-care programme are monitored.

Patients also receive diabetes self-care education materials and have telephone access to diabetes patient education and a care management team which includes case managers, registered nurses and certified diabetes educators.

Some of the programmes are managed by commercial or charity healthcare providers on behalf of the healthcare organisations such as Blue Shields[10] in the USA or some regional Primary Care Trusts in the UK.

A common approach in almost all of the diabetes management programmes is the verbal communication between patients and professional cares. Very few of the deployed programmes have ICT supported communication such as computer based interaction. Remote monitoring and automatic data transfer is even less used, a part from a large group of research and demonstration projects. It seems that these demonstrators have a hard time getting into the real healthcare systems.

And only a couple of systems support remote monitoring, clinical based intelligent rules for alarms and automatic decision support for cares, which is the platform to be offered by eu-DOMAIN.

In the following we report on some of the diabetes management programmes in operation which uses computer programmes and/or on-line technologies as part of the management programme.

7.4.1 Children with Diabetes / Diabetes123

7.4.1.1 Organisation and offering

"diabetes123" and "Children with diabetes" are US based online community for kids, families and adults with diabetes. Their mission is to promote understanding of the care and treatment of diabetes, especially in children; to increase awareness of the need for unrestricted diabetes care for children at school and day care; to support families living with diabetes; and to promote understanding of research into a cure.

"Children with diabetes" offers links to computer programs for kids to computerizing their meter readings. The programs consist of off-line and online computer analysis of blood sugar readings and other computerised tools for patients to manage their diabetes.

For more information see: www.childrenwithdiabetes.com

7.4.1.2 Comparison with eu-DOMAIN

"Children with Diabetes" and "diabetes123" are both health information portals for patients with diabetes. They are excellent examples of well structured and targeted health information with strong focus on the self-management aspects and a large and active community. Medical advisors are ready for on-line consultations. However, the portals do not provide any on-line monitoring and does not allow doctors to monitor specific patients. It has not automatic interface to official health record systems.

[10] Horizon Blue Cross Blue Shield of New Jersey to embrace Matria's diabetes engagement model", Virtual Medical Worlds, February 2001

7.4.2 Health Hero Network

7.4.2.1 Organisation and offering

Health Hero Network's health management programs cover over 30 health conditions and are compiled into programs that provide interactive scripted content based on standard practice guidelines. The programs are delivered via Health Buddy monitoring technologies to educate patients, enhance medication compliance and improve patient behaviours. Each program consists of sets of questions and answers that encompass all of the key aspects of care for each chosen condition. Questions are divided between symptom, behaviour, knowledge and general and build in education reinforcement and reminders to help patient's better manager their own care. Outcomes and standardized survey tools are also incorporated to track patient's progress and clinical outcomes during the program. Additionally, our flexible Health Buddy Composer software allows healthcare providers to develop their own programs specific to the needs of their patient population or to customize our pre-packaged health management programs to fit healthcare organizations' policies and procedures for any application or disease area.

Health Hero Network customers using health management programs for disease management include hospitals, health plans, government health organizations, disease management companies, and pharmaceutical companies or universities conducting clinical trials or studies. The Health Hero Network diabetes programs cover:

Co-Morbid	**Endocrine**	**Pharmaceutical**
CHF/Diabetes Program for Long Term Care	Diabetes	Diabetes Medication Compliance
CHF/Diabetes - Maintenance	Diabetes Program for Long Term Care	Diabetes/Asthma Medication Compliance
CHF/Diabetes/Hypertension	Diabetes - Acute	Diabetes/CHF Medication Compliance
CHF/Diabetes/Hypertension - Maintenance	Diabetes - Acute Vital Signs Monitoring	
COPD/Diabetes	Diabetes - Maintenance	
COPD/Diabetes - Maintenance	Pre Diabetes - Metabolic Syndrome	

The focus of the diabetes program is to monitor and educate patients on self-management behaviour. It includes medication reminders, educational curriculum about medications-effects/side effects, information on the importance of taking medications as ordered by the physician, and medications compliance. The program also includes monitoring of blood glucose levels, dietary guidelines, foot care, treatment for hypo- and hyperglucemic events, prevention of complications, lifestyle modifications, preventive care regarding eyes, heart and skin, and activity and psychosocial factors affecting the patient and carer. Patients are taught signs and symptoms to report, the disease process, risk factors and other pivotal aspects of care for diabetes. Each daily session ends with an affirmative or fun trivia question.

For more information see: www.healthhero.com

7.4.2.2 Comparison with eu-DOMAIN

The Health Hero Network is possible the most comprehensive network in the world for on-line communication with patients, but it does not perform on-line monitoring. The patient must perform all the measurements himself and all data communication between the patient and the Health Hero Network data centre takes place using the question/answer sessions in the Health Body Desktop device.

The Health Hero Network cannot in its present form be integrated with medical devices. Data analyses and risk assessment is based on the stored data, which the patient has entered, rather than on automatic measurements.

The Health Hero relies on its own proprietary secure data centre and cannot easily be integrated with European-style public Health Information System. One European Health Hero Network application is currently installed for diabetes patients in The Netherlands, but this application stores all patient data in the US based data centre.

7.4.3 CSO/DiabetesRASK

7.4.3.1 Organisation and offering

IntraMed's Disease Management System called CSO (Clinical System Organiser) is an on-line system, increasing the treatment quality of the single patient and which enhances a radical cost reduction in the healthcare sector. The CSO module for diabetes is called CSO/DiabetesRASK.

The purpose of CSO/DiabetesRASK is to support healthcare personnel in the treatment and management of patients, and to improve the efficiency and quality of the treatment using functions that target all aspects of diabetes treatment. CSO/Diabetesrask is a future-oriented system built upon a solid and thoroughly tested platform.

CSO/DiabetesRASK makes it possible for a patient with diabetes to manage many routine check-ups without visiting the hospital or the physician's clinic. The patient performs the tests at home and enters the data into the CSO system. The data are automatically made available to the physician in charge of the patent and are automatically registered in the Electronic Patient Record systems.

The healthcare providers buy the CSO platform software and integrate it into their own Health Information System. According to IntraMed, the CSO is installed in selected hospitals in Scandinavia and US, and under evaluation by a number of institutions in Europe and the USA.

7.4.3.2 Comparison with eu-DOMAIN

The CSO cannot perform automatic measurement and upload of data. The patient has to perform the measurement and enter the data manually. There is no immediate feedback to the patients, which makes it difficult to use in self-management program. The CSO platform lacks most of the intelligent and automatic functions available in the eu-DOMAIN platform.

7.4.4 Software based diabetes management tools

The following software based diabetes management tools are all useful for diabetes management, but non of the allow for the automatic, intelligent monitoring, direct involvement of healthcare professionals and the build-in integration to public or private healthcare information systems, as is the case for a fully equipped eu-DOMAIN platform.

7.4.5 AIDA

AIDA is an educational simulator of insulin and dietary adjustment in Type 1 diabetes. It contains a simple model of glucose-insulin interaction in the human body. It is intended for simulating the effects on the blood glucose profile of changes in insulin and diet for a typical insulin-dependent diabetic patient. In addition, AIDA On-Line Diabetes and Insulin Tutorial, accessible from the AIDA site, is a web-based application that can help you learn about diabetes, insulin, and how food and insulin adjustments can affect blood sugar. AIDA is only intended to be used for educational / teaching / demonstration purposes. Given the complexity of the human glucoregulatory system it is not possible for a simple model, such as that contained within AIDA, to accurately predict an individual patient's blood glucose profile. Therefore the software cannot be used for therapy planning.

For more information see: www.2aida.net/welcome/

7.4.6 Balance PC

Balance PC Diabetes Software is one of thousands of commercial and share ware PC based diabetes management system that includes downloading from several types of meters, event logging, diet and weight targets, and more.

Balance PC makes it easier for patients to work with their healthcare team and manage their treatment plans. The meters that can be downloaded directly into the software are: LifeScan OneTouch II, LifeScan OneTouch Profile, LifeScan Ultra, and Precision Q.I.D.

Managers organize the information into different, easy-to-read reports and clear graphs. The Daily Analyzer shows the factors affecting blood glucose levels. Comprehensive Quarterly Report with HbA1C can be printed out for review with the team of healthcare professionals. Each CD can accommodate up to eight users, and, if with the Bundled Package, the entire family will benefit, not only those who control their diabetes. Balance PC features private, password-protected, separate Personal Medical Records. Each user has the opportunity to complete a health assessment interview, scored according to the Framingham Heart Study, to draft their own regimen, and to follow their progress.

For more information see: www.mangesius.com/BalancePC/

7.4.7 Diatrends diabetes management software

DiaTrends by Overlook Software is another commercial PC based software designed for healthcare professionals to help track diabetes management outcomes. DiaTrends was designed by practicing clinical endocrinologists for use by endocrinologists, diabetologists, primary care physicians, diabetes educators and allied medical professionals. It includes robust, easy to use reporting capabilities and bridges the gap between published diabetes guidelines and the labour-intensive process of providing targeted diabetes care. It also helps diabetes care providers achieve optimal outcomes in their patients with diabetes, while preparing for evolving "pay-for-performance" initiatives.

DiaTrends is designed to complement, not replace, the medical record. It helps improve diabetes outcomes by tracking individual patients, providing real-time interactive reminders, and displaying aggregate data to help users develop systematic approaches to quality improvement. DiaTrends improves workflow productivity in busy practices focused on evidence-based diabetes care.

For more information see: www.overlooksoftware.com

7.4.8 Programs from medical device companies

There are both software packages available and web-based systems that allow patients to upload blood glucose and other data, generate graphs and charts, and share that data with healthcare professionals. Software packages can run on PC, Macintosh and other computers, including PDAs.

Several manufacturers of medical devices for diabetes offer computer programs for self-management and better understanding of patient's diseases:

- ACCU-CHEK Compass is for all ACCU-CHEK® meters with download capability
- Precision Link® Direct Diabetes Management System is for users of the FreeStyle® meter, FreeStyle Flash® meter, FreeStyle Freedom® meter, and Precision Xtra meter by Abbott Diabetes Care
- OneTouch Diabetes Management Software v2.0 is for all LifeScan meters with a data port
- Win Glucofacts interfaces with the Ascensia DEX2 and provides an easy-to-use package that can e-mail blood glucose data to the doctor
- DIABASS (Diabetes Assistant): program by Oliver Ebert, himself a diabetic, which supports input from OneTouch Profile, OneTouch II, MediSense Precision QID, AccuTrend DM, AccuTrend GC, RefloLux S, and MelliComp meters. It produces graphs and statistical analysis of insulin dosages and blood sugars.
- Diabetes Partner PC by NuMedics, Inc. reads data directly from six meters (Accu-Chek Advantage, Accu-Chek Easy, Glucometer DEX, One Touch II, One Touch Profile, and Precision QID), has a 6,000-item food database, and has an electronic log book with various charts and graphs to help you manage your diabetes.
- SweetSheet is a Mac program for uploading and analyzing data from LifeScan One Touch II, One Touch Profile, SureStep, and FastTake meters. Compatible with virtually all Macintosh computers including the newest iMacs, iBooks, G4s, etc.
- Abbott Diabetes Care offers several data management systems for their glucose meters

7.5 Legal and regulatory aspects

EU-countries have the freedom to organise their own healthcare system and European countries have very different:

- national legislation for healthcare
- definitions of the ownership of health data
- rules of access rights
- rules for consent management
- responsibilities for service providers

In deliverable D2.5 the following regulations or documents have been mentioned to impact on deliveray of healthcare services:

- Data Protection Directive (95/46/EC)
- Regulation 1408/71
- Electronic Commerce Directive
- Communication, COM (2004) 301
- e-Europe action plans

Hence, a specific legal and regulatory analysis is required for each consortium partner wishing to exploit eu-DOMAIN services in a national healthcare setting before actual exploitation starts. The result of these analyses will then need to be incorporated in the Service Providers standard Service Level Agreement framework for that particular market segment.

8. Business opportunities in the healthcare sector

The eu-DOMAIN platform is capable of delivering a number of simultaneous services from a number of different content providers and is thus fully capable of supporting organisations' business models based on the dynamic value constellation concept. For the healthcare scenario that was developed, Dynamic Value Constellation was applied trying to improve a baseline business model representing an accurate picture of the real-world business system.

From the baseline models developed in *D6.1 Proposed business models and business cases* , we extended the business scenario including a new actor: the eu-DOMAIN Service Provider. The Service Provider is an entity that establishes the eu-DOMAIN platform and offers the functionality of the eu-DOMAIN infrastructure in an ASP-type (Application Service Provider) arrangement to a healthcare provider such as EBPCT. The eu-DOMAIN end-users are employees, doctors, nurses, patients, etc. At the end of the process we finally came out with a proposal for new business models and presented an actual business case, which subsequently was validated by a group of EBPCT doctors, nurses and GPs. The results were reported in *D6.4 Validated business models and business cases.*

8.1 Business foundation

In the healthcare domain, enabling patients with chronic diseases to manage and monitor their condition from home or away, thus avoiding spending hours in the doctor's office for regular check-ups, will not only mean that patients are more mobile and less dependent on their GP or the surgery's opening hours, it will also enable patients to take control of their disease. Studies have shown that when patients are more involved in their own healthcare, they monitor and manage their chronic disease more efficiently, for example by taking their medicine as appropriate. This is particularly crucial for diabetic patients who must follow a strict diet, monitor their glucose level and take injections. eu-DOMAIN will allow patients to self-manage their disease through the use of home testing devices and two-way remote communication with their GP, nurses and the hospital.

In the PaC Scenario "Patients as Customer", which we use as our starting point for creating sustainable business models, we learn that remote monitoring not only benefits the patient's health condition by the improved monitoring of the disease, thus keeping it in check, but it also makes life with diabetes easier, more mobile and involves relatives in family-oriented assisted care.

In the deliverable *D6.1 Proposed business models and cases,* we developed a sustainable business model for our user partner Eastern Birmingham PCT (EBPCT), as well as for the eu-DOMAIN service provider. In the following, we will use this business model as our reference point for defining the various actors involved in a similar business model for the selected EU Member States: UK, Denmark, Sweden, Germany, France, Spain and Greece. For this purpose, we will draw on the analysis of these member states' healthcare system in the deliverable *D2.5 Societal user requirements specification (Annex)*. Generally, eu-DOMAIN services should be offered to the actors responsible for commissioning (financing) primary and secondary healthcare services.

8.2 A variety of business model for the healthcare sector

In this chapter we discuss the possible business models available for delivering healthcare services based on the eu-DOMAIN platform. We first discuss the models, i.e. the framework of actors and services, which we derive from the business model work undertaken and reported in *D6.1 Proposed business models and cases*. At the recommendation of the reviewers from the second review meeting, we will analyse the business models in various national settings in selected EU Member States: UK, Denmark, Sweden, Germany, France, Spain and Greece.

Further, we will instantiate the models in one specific business case. The exact implementation of the eu-DOMAIN business case depends very much on the actual healthcare provider (customer), so it is not possible to provide a generic business case as suggested. Rather, we will develop the business case for delivering eu-DOMAIN services to Eastern Birmingham PCT, the healthcare user partner in the eu-DOMAIN project.

Before using the business models to develop specific business cases for exploitation of the eu-DOMAIN platform, it is necessary to make a thorough analysis of the value offerings, the value actors and the value exchanges they perform.

8.2.1 Value offerings

The value offerings enabled by the eu-DOMAIN platform are time and cost savings, convenience, quality of life improvements and better quality of care.

Enabling patients with chronic diseases to manage and monitor their condition from home or away, thus avoiding spending hours in the doctor's office for regular check-ups, will not only mean that patients are more mobile and less dependent on their GP or the surgery's opening hours, it will also enable patients to take control of their disease. Studies have shown that when patients are more involved in their own healthcare, they monitor and manage their chronic disease more efficiently, for example by taking their medicine as appropriate. This is particularly crucial for diabetic patients who must follow a strict diet, monitor their glucose level and take injections. eu-DOMAIN will allow patients to self-manage their disease through the use of home testing devices and two-way remote communication with their GP, nurses and the hospital.

In the PaC Scenario "Patients as Customer", which we use as our starting point for developing the eu-DOMAIN platform, we learned that remote monitoring not only benefits the patient's health condition by the improved monitoring of the disease, thus keeping it in check, but it also makes life with diabetes easier, more mobile and involves relatives in family-oriented assisted care.

8.2.2 Stakeholders and value exchanges in eight countries

In the deliverable D6.1 Proposed business models and cases, we developed general sustainable business models and in the following, we will use this business model framework as our reference point for defining the similar business models and various actors involved for the seven selected EU Member States: UK, Denmark, Sweden, Germany, France, Spain and Greece. For this purpose, we will draw on the analysis of these member states' healthcare system in the deliverable *D2.5 Societal user requirements specification (Annex)*.

8.2.2.1 UK

In the UK, NHS healthcare is free of charge at the point of use for all residents in the UK. The 303 Primary Care Trusts (PCTs) are responsible for commissioning and providing NHS healthcare services to the residents in their respective geographical area. Both primary care (provided by GPs) and secondary care (provided by hospitals) are commissioned by PCTs.

The budgets for PCTs are historically set and funds allocated by the Department of Health. The healthcare system is predominantly publicly funded through revenues generated by general taxes (national insurance contributions based on income).

The business model will involve the following actors:

- Diabetic patients
- GPs
- Hospitals
- The PCTs
- eu-DOMAIN Service Provider

The PCTs would purchase eu-DOMAIN services directly from the eu-DOMAIN Service Provider. The improved monitoring and care of diabetic patients realised by eu-DOMAIN will allow PCTs to save significantly on commissioning costs to hospitals as the frequency and length of hospital stays for diabetics will be reduced. GPs are paid on basis of a combination of capitation and quality points. PCTs will therefore not be able to reduce the capitation fee per patient. However, GPs themselves will be able to cut down on consultation time as remote consultation of diabetics will be less time consuming. This will mean that GPs' overall cost per consultation will be reduced.

8.2.2.2 Denmark

In Denmark, NHS healthcare is free of charge at the point of use. A structural reform is currently underway in Denmark (completed 2007), which will establish five health regions in the country. The

health regions will be responsible for commissioning and providing both primary and secondary healthcare services.

The healthcare system will continue to be publicly funded through revenue generated from general taxes and paid to the health regions as a block grant from the state. This block grant is based on objective criteria for the expenditure needs of each health region.

The business model will involve the following actors:

- Diabetic patients
- GPs
- Hospitals
- Health regions
- eu-DOMAIN Service Provider

The respective health region would purchase eu-DOMAIN services directly from the eu-DOMAIN Service Provider. The improved monitoring and care of diabetic patients realised by eu-DOMAIN will allow health regions to save significantly on commissioning costs to hospitals as the frequency and length of hospital stays for diabetics will be reduced, thus indicating savings on hospital budgets on healthcare for diabetics. GPs are paid on a basis of capitation (a third of their remuneration) and a service fee. Health regions will therefore not be able to reduce the capitation fee per patient. However, GPs themselves will be able to cut down on consultation time as remote consultation of diabetics will be less time consuming. This means that GPs' overall cost per consultation will be reduced.

8.2.2.3 Sweden

In Sweden, NHS healthcare is free of charge at the point of use. The 21 county councils are responsible for providing, organising and financing primary and secondary healthcare services. The county councils decide on the allocation of resources to health services and are responsible for the overall planning of these services.

Healthcare in Sweden is mainly financed by local taxation, i.e. municipal, county and parish taxes. The county councils and the municipalities have the right to levy income tax on their residents and to decide the rates of taxation. Local taxes are proportionate to income.

The business model will include the following actors:

- Diabetic patients
- GPs
- Hospitals
- County councils
- eu-DOMAIN Service Provider

The county councils would purchase eu-DOMAIN services directly from the eu-DOMAIN Service Provider. The improved monitoring and care of diabetic patients realised by eu-DOMAIN will allow county councils to save significantly on commissioning costs to hospitals as the frequency and length of hospital stays for diabetics will be reduced, thus indicating savings on hospital budgets on healthcare for diabetics. GPs are paid on a basis of capitation or global budgets. County councils will therefore not be able to reduce the capitation fee per patient. However, GPs themselves will be able to cut down on consultation time as remote consultation of diabetics will be less time consuming. This means that GPs' overall cost per consultation will be reduced.

8.2.2.4 Germany

In Germany, the healthcare system is based on statutory social health insurance funds (sickness funds). The healthcare system is characterised by federalism and delegation to non-governmental corporatist bodies as the main actors in the social health insurance system. Sickness funds and their associations purchase healthcare services from healthcare providers.

The 292 sickness funds collect contributions and purchase proactively or pay retroactively for health and long-term care services for their members. In ambulatory physician care, a regional physicians' association negotiates a collective contract with a single sickness fund in the form of a quasi-budget for physician services. The association distributes the funds among GPs and specialists who claim reimbursement mainly on a fee-for-service basis. Hospitals are financed on a dual basis: investments are

planned by the governments of the 16 Länder, and subsequently co-financed by the Länder as well as the federal government, while sickness funds finance recurrent expenditures and maintenance costs.

The business model will involve the following actors:

- Diabetic patients
- GPs
- Hospitals
- Regional physicians' associations
- Sickness Funds
- eu-DOMAIN Service Provider

The sickness funds would purchase eu-DOMAIN services directly from the eu-DOMAIN Service Provider. The improved monitoring and care of diabetic patients realised by eu-DOMAIN will allow sickness funds to save significantly on hospital expenditure as the frequency and length of hospital stays for diabetics will be reduced, thus indicating savings on hospital budgets on healthcare for diabetics. The Länder are not included in the business model as we assume that their investment in the hospitals will not be affected by the savings made to recurrent expenses as realised by the introduction of eu-DOMAIN services.

Regional physicians' associations are mainly paid on a basis of capitation. Sickness funds will therefore not be able to reduce the capitation fee per patient. However, the associations distribute the funds to GPs according to a fee-for-service basis. Therefore, GPs may be able to include remote monitoring as an extra service but at the same time as a service that replaces the traditional direct consultation. We may therefore assume that this service collects a smaller fee from the association because it is less time consuming. Subsequently, the association will be able to save on fees to GPs. GPs themselves will be able to cut down on consultation time as remote consultation of diabetics will be less time consuming. This means that GPs' overall cost per consultation will be reduced proportionately to the reduced service fee income.

At the same time, we may assume that the associations will be charged a commission fee by the sickness funds for the use of eu-DOMAIN services.

8.2.2.5 France

France's health system is based on a statutory national social insurance system complemented by elements of tax-based financing (especially the General Social Tax) and complementary voluntary health insurance. It relies on a combination of public and private supply, even in the hospital sector.

Public hospitals (65%) are allocated funds every year by the government through the Ministry of Finance. The Ministry of Health controls a large part of the regulation of healthcare expenditure on the basis of the overall framework established by parliament. Private hospitals charge higher fees to patients and receive no fixed funds by the government. Patients have to pay to see a GP or a specialist but get their expenses partially reimbursed by the statutory health insurance system. Patients may get all their expenses reimbursed if they hold a voluntary health insurance (90% of population).

The business model will involve the following actors:

- Diabetic patients
- GPs
- Public hospitals
- Private hospitals
- Statutory social health insurance schemes
- Ministry of Health

eu-DOMAIN could be offered to statutory national social insurance schemes and the Ministry of Health who will make eu-DOMAIN services available to patients, GPs and hospitals. eu-DOMAIN would bring about savings on hospital budgets.

8.2.2.6 Italy

The healthcare system in Italy grants universal access to healthcare services, although there are out-of-pocket co-payments for e.g. diagnostic procedures and specialist consultations. The 20 health regions are responsible for organizing and administering the healthcare system, including allocating funds to public

hospital trusts and local health units. There are significant differences in healthcare provision between the north and south regions.

The healthcare system is financed by regional business taxes and revenues from general taxation. GPs are paid mainly on a capitation basis. Hospitals are financed by a predefined overall budget.

The business model will involve the following actors:

- Diabetic patients
- GPs
- Public hospitals
- Health regions
- Local health units
- eu-DOMAIN Service Provider.

The eu-DOMAIN Service Provider may offer eu-DOMAIN services directly to the health regions or to local health units. There would be significant savings on hospital budgets and GPs would be able to cut consultation expenses. eu-DOMAIN would mean enormous benefits to diabetic patients particularly in the south and rural areas where access to and the quality of healthcare services is not as good as in the north.

8.2.2.7 Spain

In Spain, the healthcare system is tax-based and free at the point of use. However, it does not offer a completely universal coverage because it is still linked to social security on an employment-related basis and not to citizenship and residence. The responsibility for healthcare has largely been devolved to Spain's 17 regions, the autonomous communities. The healthcare system is concentrated on hospital care, despite efforts to promote primary care as patients' first point of contact with the healthcare system.

The healthcare system is financed out of general taxation such as value-added tax and income tax but also regionally raised taxes. GPs are paid a capitation fee. Public hospitals are financed through a global budget, set against individual spending headings. The regions and the National Institute of Health (INSALUD) allocate funds to public hospitals. INSALUD manages the social security healthcare services in the 10 Autonomous Communities (of 17) which have not yet assumed full political responsibility for health services.

The business model will involve the following actors:

- Diabetic patients
- GPs
- Public hospitals
- Regions (autonomous communities)
- INSALUD
- eu-DOMAIN Service Provider.

eu-DOMAIN services can be offered directly to the regions and to INSALUD (for those regions it manages healthcare services) who will make eu-DOMAIN services available to patients, GPs and hospitals. There will be savings on hospitals budgets and GPs will be able to cut overall consultation expenditure per patient.

8.2.2.8 Greece

The healthcare system in Greece is based on a combination of a tax-based NHS and a compulsory social insurance system. Healthcare services are delivered by both the NHS and the social insurance funds. The largest insurance fund is IKA which is mainly responsible for providing primary care. The Ministry of Health and Social Solidarity defines the extent of funding and allocates financial resources.

The healthcare system is financed almost equally by public and private resources. Public resources come from revenues from general taxes and compulsory contributions to social insurance funds. GPs are salaried government officials. Public hospitals are funded by both social insurance fund and state subsidies.

The business model will involve the following actors:

- Diabetic patients
- GPs
- Public hospitals
- Private hospitals
- Ministry of Health and Social Solidarity
- Insurance funds
- eu-DOMAIN Service Provider.

eu-DOMAIN services could be offered to statutory insurance funds and/or the Ministry of Health and Social Solidarity who will make eu-DOMAIN services available to patients, GPs and hospitals. eu-DOMAIN would enable these actors to save money on GP consultations and hospital expenditure.

The table below summarises which actors are most relevant customers of eu-DOMAIN services.

UK	*Denmark*	*Sweden*	*Germany*	*France*	*Italy*	*Spain*	*Greece*
PCTs	Health regions	County councils	Sickness funds	Statutory social health insurance schemes Ministry of Health	Health regions Local health units	Regions (autonomous communities) INSALUD	Ministry of Health and Social Solidarity Insurance funds

Table 4 Relevant customers of eu-DOMAIN services

8.2.3 Business case

The potential of eHealth services is confirmed by many experts and universally agreed for the following reasons:

- The quality of the treatment of a patient depends to a great extent on the quality and quantity of the available information. In this context, two important criteria for quality are reliability and availability.
- A number of healthcare professionals (physicians, dentists, pharmacists, nurses, etc.) are involved in the treatment of a patient. The information created during a clinical process has to be made available to everyone involved.
- For many years, cost reduction has been known to be the highest priority in the healthcare sector. The seamless flow of information between the involved actors increases efficiency and effectiveness and thus can significantly contribute to this goal.

In fact, in the healthcare domain, enabling patients with chronic diseases to manage and monitor their condition from home or away, thus avoiding spending hours in the doctor's office for regular check-ups, will not only mean that patients are more mobile and less dependent on their GP or the surgery's opening hours, it will also enable patients to take control of their disease. eu-DOMAIN will allow patients to self-manage their disease through the use of home testing devices and two-way remote communication with their GP, nurses and the hospital.

EBPCT is the main actor in the extended business scenario. EBPCT has a value activity called "Fund management and healthcare provision" where they commission primary healthcare from GPs and secondary healthcare from hospitals. EBPCT's funding is generated by general tax revenues. The main focus in the development of new business systems has been on reducing the cost for EBPCT of diabetic care, which is already running relatively higher than the average costs of a given disease.

Taxes are being paid by the market segment consisting of all patients with diagnosed diabetes in the geographical area served by the EBPCT.

The market segment consists of individual actors (diabetic patients), who perform an activity called "Need of diabetes care". In the ontology of our business model, this activity is a "value activity" because in the viewpoint of the healthcare providers, it is casually related to the activity of providing (and provisioning) healthcare services.

Another market segment comprises all GPs commissioned by the EBPCT. GPs are responsible for providing NHS primary care and receive healthcare funding per patient from EBPCT. By establishing remote monitoring and self-management programmes, GPs save costs (by not seeing patients so often) and increase the quality of their services (by having more well-regulated patients).

Finally, the third market segment comprises the hospitals commissioned by EBPCT to deliver secondary healthcare in EBPCT. Hospitals offering remote monitoring can save a significant number of admissions and can thus save on costs. This saving is in turn passed on to the EBPCT, which uses it to pay the eu-DOMAIN service provider. The surplus can be spent on upgrading other disease areas (thus realistically excluding tax cuts).

The extended business model has thus uncovered potential for a re-prioritising of the financial structure within EBPCT.

An overall profitability analysis has been carried out based on the value model and using the e^{3}value tool. The profitability sheet below shows the result of the analysis.

	Baseline model			Extended model		
Market segment / actor (M€)	**Revenues**	**Expenditures**	**Gross profit/deficit**	**Revenues**	**Expenditures**	**Gross profit/deficit**
Diabetic patient (7560)	0	19.0	-19.0	0	19.0	-19.0
GP (140)	0.6	0.35	0.25	0.605	0.330	0.274
Hospital (3)	22.0	0	22.0	21.00	0	21.00
EBPCT	19.0	22.5	-3.5	19.00	22.26	-3.36
eu-DOMAIN Service Provider	-	-	-	0.832	0.550	0.282

Figure 12 Healthcare services: profitability sheet

The profitability sheet shows that all actors in the model are able to increase their cost/benefit ratio from the new services when compared with the baseline model. EBPCT will see a gross reduction in the cost of diabetic healthcare and GPs will be able to reduce their average expenditure per consultation because they will have a smaller number of direct consultations. The eu-DOMAIN Service Provider also has a good profitability and there is a high chance of the business model being sustainable over time.

8.2.4 eu-DOMAIN deployment in healthcare services

We have identified the following drivers for deployment of new eu-DOMAIN based services:

- The increasing trend in miniaturization and the mutual networking of medical devices allows a seamless and permanent monitoring of the patient, even in their home and when mobile.
- From an economic point of view, the competition between healthcare providers on different levels, new but expensive medical technologies and the aging population puts pressure on costs.
- On the customer side, a movement from pure treatment of diseases to wellness and self-management can be observed.
- The utilisation of health services is going to be a regular service available anywhere and at anytime. The patient is mobile and healthcare services should be available pervasively, integrated into the patient's environment.
- Better use of existing knowledge or faster update of and access to knowledge for all participants like doctors, nurses or patients is increasingly needed for proper clinical practice.
- Citizen-centred services are increasing being used with success. Self-management programs, educated patients, family assisted and palliative care are examples of increased integration between technology and clinical practice.

Healthcare providers are now looking to use the new eBusiness and eHealth technologies to provide efficient, cost-effective health services and care to citizens.

8.2.5 Competition

A large number of projects have demonstrated components and infrastructures for home monitoring concepts for chronically ill patients. However, only few of them are commercially available in Europe and it is not known how wide spread the take up has been for these platforms. Health Hero, well@home and HealthPal are all US based management systems. Only Health Hero has a European implementation in The Netherlands. In this implementation, the patient data are stored in Health Hero Networks data centre in the USA. A more detailed technical explanation of some of the systems can be found in *D8.4 Take-up guideline and technology watch report*.

doc@HOME is an integrated, UK based telehealth solution for the remote management of chronically ill patients. Through the network HealthHUB, it has means for remote collection and analysis of essential patient related data, efficient interaction between clinicians and patients at home. HealthHUB can be set to monitor a range of long term conditions and co-morbidities, well-being and any combination of these and is compatibility with Electronic Patient Record systems at local, national and European level.

Ericsson's Mobile Health (EMH) system is intended for remote follow-up of out-patient long-term medical conditions. The system comprises a wearable Sensor Node and a Patient Node that transmits data via GPRS to a backend system. The backend system comprises a servers that receives, proceses and stores the data. The backend system provides the operator with the operator web interface with which the operator can study the patient data.

The EMH has been marketed in Sweden and according to Ericsson, some installations are already in operation. The EMH system has no provision for securing patient data and it is not obvious what kind of security has been implemented on the central server, which stores the patients health data. The system has no standard interface to backend health information systems.

The CSO - Clinical System Organizer from IntraMed A/S in Denmark is a web-based system that offers home monitoring with a decision support program for drug administration. CSO is currently configured for Anticoagulation, Diabetes, COPD, Hypertension, Hyperlipidaemia, Retinopathy and foot. The system integrates to Danish EPR but has only support for medical devices in COPD. All other management programmes are based on a dialogue between physician and patient.

8.3 A new business case in the healthcare sector

At the second review meeting, the reviewers proposed that the project should develop and document more realistic business cases for healthcare than the one business model presented. In this model (or case) responsibilities between partners should be defined uniquely.

The proposal has merit and it is, for obvious reasons, a very useful exercise in planning the exploitation. No exploitation can start without a firm business case and careful analysis of the market based on updated intelligence information and the specific strategic aims of the service provider offering the eu-DOMAIN services.

The eu-DOMAIN is a research project aiming at researching and developing a generic platform for network agnostic e-services to a large variety of domains. Moreover, the characteristics of the service provider and the other actors in the healthcare domain cannot easily be generalised, which would lead to a tremendous complex situation with numerous actors operating on a large amount of very different market segments, as illustrated in the eight countries above. As such, it was not been planned to perform detailed market studies with the limited budget available. Instead, the plan was to develop a more generic business modelling tool which could be used by potential exploiters (service providers) acting in specific markets.

However, the usefulness of a specific and detailed business case, which can be used as a model for exploiters, justifies the extra effort. We have thus decided to expand the EBPCT business case of diabetes monitoring and present it as a normal commercial business plan for exploitation by a service provider of the eu-DOMAIN platform.

The present business case is presented as it would appear in a business plan for a commercial company, who wants to enter the UK market with the eu-DOMAIN platform offered as an application service platform.

The Business Development unit is proposing to install and offer an eu-DOMAIN based self-management service in the UK. The service will initially be target at hypertension in diabetes management. Each patient enrolling in the system will be provided with a wearable blood monitoring device (other sensors may be added later) and is expected to measure blood pressure three times every morning. The eu-DOMAIN platform will be integrated into a legacy NHS Healthcare Information System so that data can be uploaded to an Electronic Patent Record. The patients formal carers will provide expert monitoring and case management remotely. The aim is to reduce the number of hospital admissions with 15 per cent from better control and management of diabetic patients.

The company's senior management is asked to make a decision on this strategic move and has requested a detailed business plan from the Business Development unit. The following business case forms part of said business plan.

8.3.1 Business opportunity in self-management

Enabling patients with chronic conditions to become more involved in managing their condition will not only ensure a better and more effective management of their disease, it will also allow these patient to remain, or become, highly mobile. Studies have shown that the more informed and involved patients are with their own healthcare and treatment, the better they are able to manage their condition. Through more efficient management of their condition, they may both be able to keep the disease in check thus preventing serious complications to develop and effectively avoid unnecessary and repeatedly hospitalisation.

There are several prerequisites which must be met in order to ensure efficient self-management of chronic conditions. The patient must receive proper education about the condition in order to fully understand the disease itself and it's complications. Moreover, the patient must be able continuously carry out various necessary tests and measurements as part of managing the condition, as well as being able to remotely submit these results to the relevant health professional for clinical assessment. Finally, the patient must receive regular feedback which gives concise information on any health risks caused by deviations or changes to their predetermined healthcare plan.

Self-management of diabetes is an area that offers exceptionally good prospects, both in clinical terms and in business terms.

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia (high blood sugar) and other signs, as distinct from a single illness or condition. There are two main forms of diabetes: type 1, type 2, both of which are incurable chronic conditions, but have been treatable since insulin became medically available in 1921, and are nowadays usually managed with a combination of dietary treatment, tablets (in type 2) and, frequently, insulin supplementation. Gestational diabetes typically resolves with delivery.

Diabetes can cause many complications. Acute complications (hypoglycemia, ketoacidosis or nonketotic hyperosmolar coma) may occur if the disease is not adequately controlled. Serious long-term complications include cardiovascular disease, chronic renal failure, retinal damage (which can lead to blindness and is the most significant cause of adult blindness in the non-elderly in the developed world), nerve damage, microvascular damage, and poor healing, which can require amputation.

Adequate treatment of diabetes, as well as increased emphasis on blood pressure control and lifestyle factors (such as smoking and keeping a healthy body weight), may improve the risk profile of most aforementioned complications and decrease the need for hospitalisation. Self-management of diabetes can include home-testing of blood pressure, blood glucose level, weight and urine (to test for the ketone level).

Healthcare specialists have in several studies reported that self-management concepts in diabetes management leads to exceptionally good results; also in the UK. Other medical cases such as HIV, CHD, and COL patients could also benefit. Studies also points to important diabetes case benefits that can be obtained with good compliance. Patients tend to control their disease less and less over time, especially if they are well controlled and having an active life. Mobile technologies could even extend the compliance regime beyond the home into the workplace and nomadic situations.

People with long-term diabetes problems and poor management are significantly more likely to be admitted to hospital as an inpatient (on average about twice as likely, given a particular problem) and

stay in hospital for longer. Treating the different complications caused by diabetes is very expensive and patients with diabetes account for 5% of the NHS budget and up to 10% of hospital budgets which in EBPCT amounts to more than 22 M€ annually.

Diabetes management programmes offers highly attractive business opportunities, because just a slight reduction in admission rates can cause massive economic benefit for the healthcare provider. And well organised management programmes provide marked improvements in the patients quality of life.

8.3.2 Market structure

In the UK, healthcare is provided by the National Health Service (NHS) free of charge at the point of use for all residents in the UK. 303 Primary Care Trusts (PCTs) are responsible for commissioning and providing NHS healthcare services to the residents in their respective geographical area. Both primary care (provided by GPs) and secondary care (provided by hospitals) are commissioned by the PCTs.

The budgets for PCTs are historically set and funds allocated by the Department of Health. The healthcare system is predominantly publicly funded through revenues generated by general taxes (national insurance contributions based on income).

Eastern Birmingham Primary Care Trust (EBPCT) 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 140 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 broader role in relation to delivering services across the whole of Birmingham, including adult speech and language therapy, and dietetics. The 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 €475m to purchase hospital and community services for Eastern Birmingham. They commission specialised services on behalf of the eight PCTs forming the Pan-Birmingham Specialised Services Consortium and also host the trading account for the West Midlands Specialised Services Agency - a further €625m in total. In 2007 EBPCT has merged with North Birmingham PCT to become BEN - PCT, but this merger does not change the material content of the business case we present here.

Depending on the strategy of the eu-DOMAIN service provider, the market actor is either the EBPCT or the Pan-Birmingham Specialised Services Consortium, who is commissioning healthcare services for the entire Birmingham Metropolitan area. A cautious plan would be to start a trial in the "limited" Eastern Birmingham area and then extend a successful implementation to the much larger pan-Birmingham area.

8.3.3 Actors, needs and the value chains

The company has identified five major actors in the diabetes self-management business case. The perform the following roles:

- Diabetic patients
- General Practitioners (GPs)
- NHS Trusts (Hospitals)
- Eastern Birmingham Primary Care Trust (EBPCT)
- National Health Service (NHS)
- Department of Health
- The eu-DOMAIN Service Provider

8.3.3.1 Diabetic patients

An estimated 3% of the UK population have diagnosed diabetes. In East Birmingham, there are a total of 251.000 residents. For the purpose of our business, we therefore estimate that there is a total of 7,530 patients with diagnosed diabetes in East Birmingham. This may actually be a conservative figure considering the demographic and class factors in East Birmingham, which has a large population of Asian origin that is known to have an over proportional prevalence of diabetes.

Patients tend to control their disease less and less over time, especially if they are well controlled. Patients who enrol in the self-management program are expected to obtain substantial benefits due to the improved compliance and better control of their illness.

The obvious benefits of self-management and home-testing for the patient are that it can be done at any time and any place. This ensures continuity in the management of the disease and it also allows the patient to practically live a normal life without the restraints of having to go to the doctor to have these tests done. The patient is not only mobile but will also save travel time back and forth to the doctor, as well as avoiding being stranded for hours at the health clinic.

Patients will benefit in terms of receiving more efficient and convenient care and overall better health, thus preventing serious complications. They will, however, benefit indirectly in terms of saving time (i.e. they do not have to go to their GP as often) and possibly medicine costs and loss of working time. Mobile technologies could extend the compliance regime beyond the home into the workplace and nomadic situations. Further, measurement of vital parameter should be extended to include blood sugar level.

While the other stakeholders have direct financial interests and must obtain financial benefits, patients do not have direct financial interests in the self-management program, beyond the possible extra cost. In the context of the UK health system, the patient expect most healthcare to be provided by the NHS at no or minimal cost. The main interest of the patient is in terms of better health and better quality of life.

The relationship between the patient and the eu-DOMAIN service provider is indirect. The service will be offered to the patient as a part of the NHS offering. A possible co-payment from the patient for e.g. the blood pressure monitor has been considered and abandoned. Firstly, there is no tradition in the UK for individuals paying their own health care costs and secondly, Eastern Birmingham is one of the country's most deprived areas and few patients would be able to afford the app. 1,000 € that the equipment costs.

Patients would expect the eu-DOMAIN service and the technology to work effortless. It must work at all times and be very simple for patients to use. If the interaction contained some kind of "gaming" or "entertainment", it would be more interesting to a broad group of patients.

8.3.3.2 General Practitioners (GPs)

There are 140 GPs in the EBPCT area. Each GP has 1,793 registered patients in average. However, in this business case we are only concerned with patients who are diagnosed with diabetes, so we can assume that each GP has 54 diabetic patients who require 2 yearly check-ups in order to monitor the disease.

Diabetes case management is fairly standardised in the UK. The GP performs initial examination appropriate clinical tests to arrive at a diagnosis. When first diagnosed, a practice nurse will assist the GP with certain less complicated tasks such as testing cholesterol, blood pressure, liver functions and blood sugar. The data from the tests will be presented to the GP, who assesses the. The GP also instructs the patient on how to manage and control the disease

Often, tests have to be taken every six months in order to monitor the development of the disease. In the event of complications, the GP will refer the patient to the hospital for secondary care. If the condition worsens, the patient may not be able to come to the GP's office for tests, in which case, the GP must arrange home visits to the patient.

Remote monitoring can never replace the direct contact between patient and the GP. It can only augment it. Besides, patients like to have face-to-face consultations about their disease. However, the increasing caseload is somewhat obstructing this relationship.

When the self management platform will be introduced, the GP's will mostly benefit from savings in time. Fewer visits by patients in the office and fewer home visits would save substantial time for the GP. The opportunity to present fast, targeted education in risk assessment and risk profiling will also save considerable time in the clinic. Finally, communication will be facilitated not only between patient and

health professionals, but also between professionals (shared care) which could lead to a further improvement in the health status of the patient. However, there need to be a reimbursement system in place in order for the GPs to fully embrace the system.

The pay system for GPs in the UK is so complex it requires an explanatory book that runs to hundreds of pages[11]. GPs are technically self-employed and there is no set rate for the job. Rather, the NHS sets an average amount that GPs are supposed to earn. This is known as intended average net remuneration (IANR) and is usually based on the level recommended by the Doctors' and Dentists' Pay Review Body.

This figure is used to set the levels of fees given to doctors for various services they provide to patients. The actual amounts GPs earn varies depending on the amount of services they provide, and the expenses they incur. Any expenses incurred by GPs in providing primary care to their patients are paid back to the profession in full. About 60% of the fee scale is made up of the following:

- A standard payment for each patient on a GP's list
- A registration fee for taking on new patients
- Fees for child health surveillance
- A supplement paid to GPs working in deprived areas
- A similar payment made to GPs working rural areas.

Other fees are paid to recognise certain characteristics of a GP's practice. These include:

- Seniority payments - paid to long-serving doctors
- Payments to take on assistant doctors
- An allowance for doctors with teaching duties
- Payments for providing health promotion services

The rest of the fee scale is made up of piece work, or "item of service", payments. These include:

- Minor surgery fees;
- Night visit fees
- Payments for providing contraceptive services;
- Maternity service payments.

Doctors are also set targets in areas such as the immunisation of children and the screening of women for cervical cancer. If they do not reach the set levels, they receive either a reduced payment.

It is noteworthy that, unlike many other national health systems, UK fee schedules do no include a specific fee for visits to the doctors office. This means that the GP has no interest in having more patients in the clinic. On the contrary. The fewer patients that visit the clinic, the more patients can be signed up. This fee schedule encourage GP to aim for many healthy patients in contrast to other national systems, where GPs are rewarded for having many ill patients in the waiting room.

The fee structure does not, for obvious reasons, include special fees for remote monitoring. But it does include fees for new patients, so GP would have a financial interest in providing remote innovative monitoring services to attract more patients. The fee for providing health promotion service would possible could include remote monitoring as well. If the NHS, as is intended, will put massive support behind remote monitoring schemes, the reimbursement scheme is expected to reflect this as well.

Until then, the main financial incentive for GPs to embrace remote monitoring is the potential for saving time in the clinic and the improvement in care that it offers.

In the budget it is assumed that 10% of the diabetic patients will use remote monitoring resulting in an average reduction of 10 office visits per year (54 diabetics each with 2 visits per year). Under normal circumstances the saving will allow the GP to contract another 10 patients in his constituency which would provide an extra income of app. 1,000 € annually.

The relationship between the GP and the eu-DOMAIN service provider is indirect. The service will be offered to the GP as a part of the NHS offering. GPs would expect the eu-DOMAIN service and the technology to work effortless. It must work at all times and be very simple for GPs and nurses to use.

[11] BBC News, "The GP pay system", 1 February 1999

8.3.3.3 NHS Trusts (Hospitals)

NHS Trusts run most hospitals in the UK and are responsible for specialised patient care and services, such as mental health care. The trusts' role is to make sure that hospitals provide high quality health care and spend their money efficiently and some pay for private treatment to clear backlogs and waiting lists.

The three acute hospital NHS Trusts used most by people from Eastern Birmingham are: Birmingham Heartlands and Solihull NHS Trust, Good Hope Hospital NHS Trust and University Hospital NHS Trust.

Extended and unnecessary hospitalization is expensive and the government is pushing for more healthcare services to be provided in the patient's home or locally. Preventing unnecessary hospitalisation and reducing the length of hospital stays is also key to reducing waiting lists. The emphasis on improving intermediate care in the community and home care is both in response to general wants and needs of the population, but it is also a huge cost effective strategy, particularly considering the overall demographic and health trends that point towards an aging population and the increase of people with chronic conditions requiring long-term care.

The NHS is considering employing a strategy to move more healthcare services for patients with chronic disease from the secondary to the primary care sector with the aim of reaping enormous benefits. First of all, around 60% of adults (a total of 17.5 million people) report having long-term or chronic health problems and this group is twice as likely to be admitted to hospital. The impact on hospitals becomes clear when considering that 5% of inpatients (many with long-term conditions) at hospitals account for 42% of overall inpatient stays.

Diabetes care takes up about 5% of national NHS costs whereas the prevalence (of diagnosed diabetes) is around 3%. The cost of treating diabetes is thus over proportional to the number of patients frequenting the health care systems, in particular due to complications from diabetes, such as renal failure, retinal damage and amputations. If remote monitoring can reduce the risk of hospitalisation and complications, hospitals will be able to reduce cost significantly.

Up to 10% of hospital budgets are spent on treating diabetes and its complications. In the UK as a whole, people with diabetes spend 1.1 million days per year in hospital for inpatient care and complications. This correspond to 1,65 days per year for every diabetic. The three hospitals in the EBPCT area have some 12,500 admission days per year for diabetic patients at a cost of €22 m. If 10% of the patients are enrolled in the self-management scheme and, as a consequence hereof, they are able to cut their admission in half, the savings in the hospitals would amount to app. €1 m annually.

These funds could then be redeployed to other sectors of the hospital system and help improving care or reducing waiting lists in other clinical domains.

8.3.3.4 Eastern Birmingham Primary Care Trust (EBPCT)

EBPCT covers a population of 251,000 people living in 10 wards of Britain's second city. Based on the Index of Multiple deprivation, nine of these wards fall within the 20% most deprived wards in England. When income deprivation is measured, all wards fall into the 25% most deprived wards in England; nine are amongst the country's 25% most employment deprived. All wards are classified as urban and are classified within the 25% least healthy. There is a relatively high rate of chronic disease e.g. diabetes, which is partly related to these facts. Another important factor to consider in relation to diabetes is the fact that Eastern Birmingham is home to distinct populations whose diversity impacts on health related values.

Considering the national figures of patients with diagnosed diabetes, we can roughly estimate that there are 7,530 patients with diagnosed diabetes and 5,020 people with undiagnosed diabetes. These figures are probably higher in reality considering the ethnic, economic and general health status facts of the population (see above). Also, this means that on average each GP in EBPCT has a rough estimate of 54 patients with diagnosed diabetes.

The EBPCT budget is €888 million; €409 million direct allocation for the provision of health services to the population of Eastern Birmingham and €479 million for services hosted by the PCT on a pan Birmingham or pan West Midlands basis.

In relation to the budget for direct allocation for the provision of health services, approximately 90% goes toward commissioning services, i.e. GPs, hospitals as well as prescription costs. About €29 million is paid to primary care (GPs, pharmacists, dentists etc.), €217.5 to secondary care (hospitals), €43.5 million

towards prescription costs and €101.45 million to tertiary care. The remainder 10% covers organisational and provisioning expenses (e.g. district nurses, health visitors, health centres).

The EBPCT will be motivated to commission eu-DOMAIN services by the outlook of providing better healthcare services and make the healthcare system more efficient by reducing the overall costs of patients with diabetes.

As can be seen from the calculations above, the primary care system will initially be cost neutral. When GP's offering remote services are signing up new patients, these patients most like come from other GP's that are not offering self-management schemes. The scheme is thus cost-neutral for EBPCT in the primary healthcare systems.

However, it is assumed that new reimbursement schemes are introduced, which will reward more GP's to offer the remote monitoring service. In the extended business case in D6.1 Proposed business models and cases, the net increase in primary care costs for EBPCT is estimated to be a mere €15,000.

The savings will mainly be found in the secondary healthcare system. As calculated above, the potential for cost reductions in the three Birmingham hospitals alone is €1 m (5 per cent). Further savings can be obtained by improving co-ordination and communication between district nursing teams, case managers and patients, which will lead to a more efficient use of time, improved care for patients, and improved preventative measures.

The services offered by eu-DOMAIN would allow the PCTs to provide healthcare services, such as monitoring of chronic diseases, on community level and in the patient's home, thus reducing the extent of GP and hospital provisioning for such services.

EBPCTs will purchase eu-DOMAIN services directly from the eu-DOMAIN Service Provider. As the prime commissioner of this services, the EBPCT will demand a full set of performance level requirements, security and privacy requirements as well as financial requirements, which will be discussed below.

8.3.3.5 National Health Service (NHS)

The National Health Service (NHS) provides healthcare to all according to need. Most healthcare services are free at the point of use. The NHS is mainly funded through general taxation: direct taxes, value-added tax and employee income contributions. Local taxation provides further funding for social services. In 2003, the Government announced that an extra 1% of income was to be levied as an earmarked tax through national health insurance.

In July 2000 a new Plan "*The NHS Plan. A plan for investment. A Plan for reform"* was introduced with the aim of modernising the NHS. In June 2004 "*The NHS Improvement Plan. Putting People at the Heart of Public Service"*, building on the achievements of the NHS Plan 2000, was published outlining the aim of reshaping the NHS with the patient in focus.

Two important features of the NHS plans are 1) the government's aim to develop and implement more ICT in healthcare in order to deliver services faster and more conveniently for patients and 2) the government's aim to improve long-term care for patients who are chronically ill and the elderly

People with long-term health problems are significantly more likely to see their GP (accounting for about 80% of all GP consultations), to be admitted to hospital as an inpatient (on average about twice as likely, given a particular problem) and stay in hospital for longer. A key element of the NHS Plan 2000 is to improve self-management of chronic diseases and making home-care and long-term care more effective and cost-efficient.

The overall objective is to provide – and coordinate – healthcare services and support so that patients can live independently in their own home as long as possible. For instance, self-management of the condition – feasible with integrated support – is emphasised as a key goal. This is integral to one of the main strategic aims, namely to reduce reliance on secondary care services and increase the provision of care in a primary, community or home environment.

Although the NHS is involved in strategic health policies, it is not the main contractual partner of the eu-DOMAIN service provider, aside from the unlikely (at least for now) case that the NHS decides to introduce eu-DOMAIN nationwide. In such case, it is likely that the NHS would operate the eu-DOMAIN service as its own Domain Service Provider.

However, the NHS has a strong influence in the type and form of new services, the diseases they address, the reimbursement schemes, security models and the manoeuvrability and self determination of the PCTs. As such, it is mandatory for eu-DOMAIN service providers to follow the various NHS initiatives very carefully.

8.3.3.6 Department of Health

The United Kingdom has devolved responsibility for healthcare to its constituent counties. They mainly fund healthcare through national taxation, deliver services through public providers and have devolved purchasing responsibilities to local bodies: primary care trusts (PCTs) in England, primary care partnerships in Northern Ireland, health boards in Scotland and Local Health Boards (LHBs) in Wales.

The organizational structures for health service administration and delivery vary between United Kingdom countries. In England, for example, personnel with public health functions can be found in the central Government Department of Health, the strategic health authorities (regional health administration) and the PCTs. In Wales, a national public health service has been established to provide services and support to other NHS organizations and local authorities.

Coverage is available to 100% of the population. All legal residents of the United Kingdom, residents of the European Economic Area and citizens of other countries with which the United Kingdom has reciprocal agreements are covered under the United Kingdom National Health Service (NHS). As such, the uptake of private medical insurance is quite low: 11.5% of the population in 2001.

Although NHS benefits are comprehensive, they are not explicitly defined. In England and Wales since 1999, the National Institute for Clinical Excellence (NICE) has given recommendations to the Secretary of State for Health and the Welsh Assembly Government as to whether particular services are both effective and cost-effective and should be made available to all or part of the population. The implementation of approved NICE guidance is mandatory, although early indications suggest that it has been variable.

In England, budgets for healthcare are set every three years through negotiations between the Chancellor of the Exchequer and Department of Health. In the rest of the United Kingdom, the devolved administrations set budgets separately.

In order to deliver the modernisation of the NHS, the government has subsequently increased the funding of the NHS significantly; investment in the NHS has more than doubled from 1996/97 (€48 billion) to 2004/05 (€98 billion), and is expected to rise to €130.5 billion by 2007/08.

The Department of Health is not a contractual partner of the eu-DOMAIN service provider.

8.3.3.7 The eu-DOMAIN Service Provider

As can be seen from the above discussion, the eu-DOMAIN Service Provider will provide EBPCT access to the eu-DOMAIN platform with the aim of deploying remote monitoring and expert feedback to diabetes patients as part for a self-management programme.

In order to offer the services, the Service Provider will have to make investments in server infrastructure, operating systems, hardware, server facilities, perimeter security and access control systems, etc.

In addition, the product demands sizable fixed operational costs for support and administrative staff functions, software licences, maintenance and upgrades, etc. Finally the product has a series of variable costs for network communication, power, etc.

However, once the investment is made, the eu-DOMAIN server is capable of executing several mid to large size client installations on the same infrastructure.

For the business case, the company has decided that the price structure of the services shall consists of four elements:

- An initial one-time charge for setting up the specific client domain
- Hardware investments per user for the location gateway and additional sensors and actuators
- A fixed monthly use license to cover availability and support
- Pay-per-use charges to be paid per patient and per data unit

8.3.4 Value transactions and economic positions

The financial implications for the actors in the EBPCT self-management program are affecting GP's, hospitals, EBPCT and the eu-DOMAIN service provider.

In order for the business case to be viable and sustainable, we need to look at the cost-benefit (or profit and loss) implications for all actors. According the discussion in *D6.1 Proposed business models and cases*, the proposition needs to provide positive cost-benefit or profitable operations to all actors in order to be sustainable. The value exchange model used were the following:

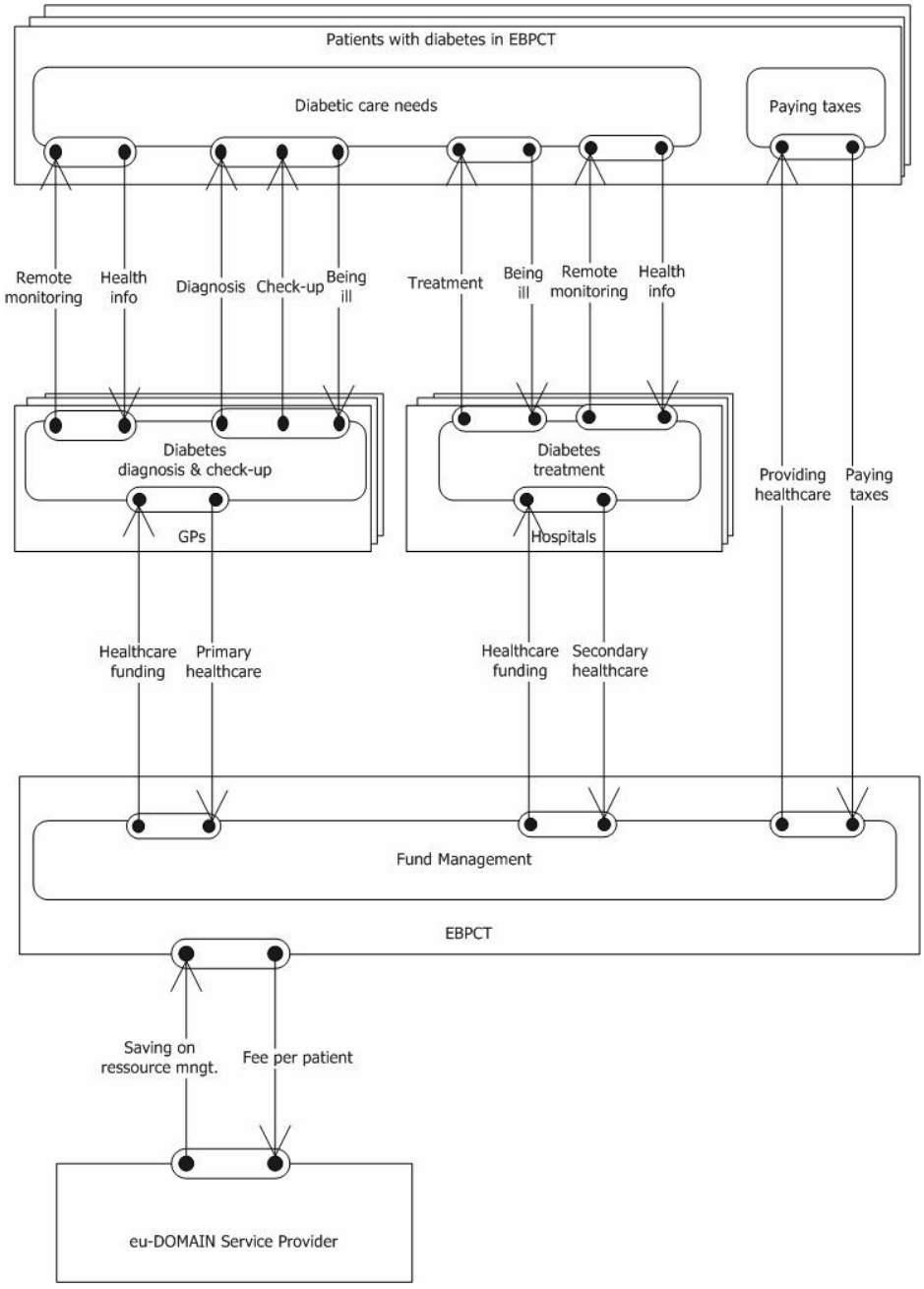


Figure 13 Value model for remote monitoring and self management of diabetes patients

The financial implications for each actor will be analysed in terms of incremental budgets for two years of operation showing revenues and costs (for the service provider) and costs and benefits (savings) for the healthcare provider. Two years are included in the budget to include start-up effects in the calculations.

8.3.4.1 The eu-DOMAIN Service Provider

We start by analysing the eu-DOMAIN service provider because the selling price for the service and corresponding revenues, become costs elements for the other actors.

The financial calculations for the Service Providers business case is based on the following revenue objects:

- An initial one-time charge for setting up the specific client domain
- Hardware investments per user for the location gateway and additional sensors and actuators
- A fixed monthly use license to cover availability and support
- Pay-per-use charges to be paid per patient and per data unit

The sample budget for calculating the prices is shown below.

Setting up costs:	30.000	€		Access costs:	1,00	€ per contract per mo
Customisation:	50.000	€	(30-200)	Communication:	0,50	€ per user per month
Amortisation:	36	months				
Monthly amortised:	2.222					
Monthly operating:	15.000		(1-100)			
Fixed cost per contract:				Variable cost per contract:		
Fixed costs	17.222	€ per month		Total transaction:	7.200	€ per month
Fixed costs	206.664	€ per year		Total transaction:	86.400	€ per year
Revenues per contract:						
Subscription fee:	100,00	€ per yr		Transaction fee:	10,00	€ per yr

Table 5 Relevant cost and revenues for Service Provider

The selling price list would look like this:

1. Initial one-time charge including setting up and customisation: €80,000
2. Hardware investments per patient: €1,000
3. Monthly license fee: €15, 000 per month
4. Pay-per-use fee €1.50 per patient per month.

Using the above figures, a simplified budget for the first two years can be calculated. It is assuming that 10% of the 7,530 diabetes patients in Eastern Birmingham have subscribed to the service:

Budget for the eu-DOMAIN service provider (€)	Year 1	Year 2
Revenues:		
Start-up charges	80,000	0
Gateways	753,000	0
Monthly license fees	180,000	180,000
User fees	82,830	82,830
Total revenues	1,095,830	262,830
Expenses		
Cost of infrastructure	206,664	206,664
Cost of gateways	451,800	0
Cost of communication	1,129	1,129
Total costs	659,593	207,793
EBIT	436,237	55,037

Table 6 Simplified budget for eu-DOMAIN service provider

8.3.4.2 Eastern Birmingham Primary Care Trust (EBPCT)

The cost of running the eu-DOMAIN service is established in negotiations with the eu-DOMAIN service provider. As mentioned above, the following cost structure has been agreed:

1. Initial one-time charge including setting up and customisation: €80,000
2. Hardware investments per patient: €1,000
3. Monthly license fee: €15, 000 per month
4. Pay-per-use fee €1.50 per patient per month.

In addition, it is assumed that a new reimbursement scheme is put in place rewarding each of the participating GPs with an additional fee of €80 per patients enrolling in the self-management programme.

The savings that will be found in the hospital sector. Since diabetes treatment in the secondary health system is over proportional to the number of patients, the savings from a reduction in diabetes in-patient care and admission, can effectively be used to increase the quality of care for other diseases.

Using the above figures, a simplified cost-benefit calculation for the first two years can be calculated. It is again assuming that 10% of the 7,530 diabetes patients in Eastern Birmingham have subscribed to the service:

Cost-benefit for the EBPCT (€)	Year 1	Year 2
Costs:		
Start-up charges	80,000	0
Gateways	753,000	0
Monthly license fees	180,000	180,000
User fees	82,830	82,830
Total costs of the service	1,095,830	262,830
Savings:		
Savings in primary care	(60,240)	(60,240)
Savings in secondary care	1,100,000	(1,100,000)
Total savings	1,039,760	1,039,760
Cost benefit	(56,070)	776,930

Table 7 Simplified budget for eu-DOMAIN service provider

It appears from the simplified budget that the payback time is just slightly over one year and that annual savings of app. €750,000 can be achieved. And this is only assuming that 10% of the diabetes patients enrol in the program. The potential for savings is thus much more than shown here.

8.3.4.3 NHS Trusts (Hospitals)

As shown above, the three hospitals in the EBPCT area have some 12,500 admission days per year for diabetic patients at a cost of €22 m. If 10% of the patients are enrolled in the self-management scheme and, as a consequence hereof, they are able to cut their admission in half, the savings in the hospitals would amount to app. €1 m annually.

8.3.4.4 General Practitioners (GPs)

It was also shown above, 10% of the diabetic patients using the remote monitoring will allow the GP to contract another 10 patients which would provide an extra 1,000 € annually. Further the EBPCT will reimburse €80 per diabetes patient enrolled in the program, which will result in further €432 annually for the GP. The total additional income of €1,432 correspond to an increase in fees of some 2 per cent.

8.3.5 System integration

The eu-DOMAIN monitoring and case management platform will need to be integrated with other backend healthcare information systems in use by the EBPCT and the individual hospitals and healthcare units under the EBPCT. The precise need for integration cannot be generalised but depends on the actual installation at time of deployment.

For exemplification, we assume that EBPCT has decided that the eu-DOMAIN platform needs to have the following integrated functionalities:

- Monitoring of patients in their (fixed) home locations
- Full integration with EBPCT Electronic Patient Record system
- Full integration with each of the three hospitals Electronic Patient Record systems
- Secure access using PKI and national health cards
- Single sign on to backend systems through eu-DOMAIN to backend systems
- Future semantic integration with NNR, The National Research Register
- Future access to external Medical Information Servers
- Future access to other Electronic Case Management servers

The technical layout of the integrated infrastructure is depicted in Figure 14

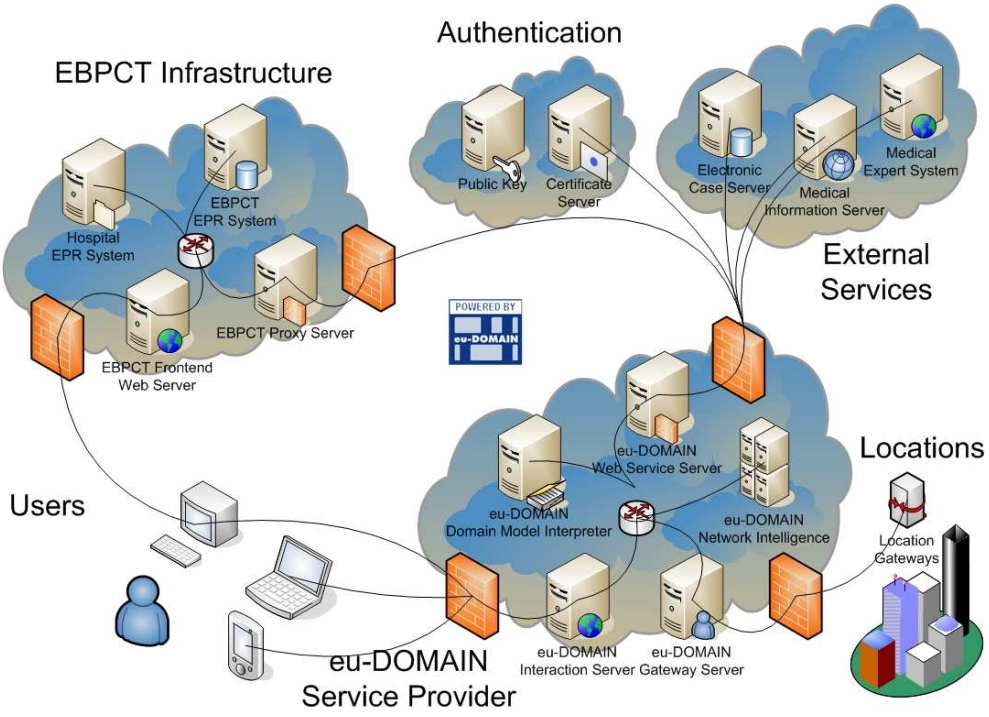


Figure 14 Integrated eu-DOMAIN healthcare infrastructure

The eu-DOMAIN server is connected to the backend health information systems via customised web services (WS) as set forth in the fundamental eu-DOMAIN architecture. A detailed technical description of the integration and how the individual services are interconnected and operate is founding *D8.3 Evaluated platform.*

The eu-DOMAIN servers connects to the EBPCT health information infrastructure through an EBPCT proxy server, which handles all communication to and from the eu-DOMAIN server. Requests for data access to the EBPCT's or the hospital's EPR systems are handles this way through secure WS calls.

Access to external health information servers is provide through direct WS calls defined in the eu-DOMAIN Network Intelligence and Content Compiler.

Users interact with the eu-DOMAIN and the backend health information systems through the Interaction Server. Patient date are collected via gateways and the Gateway Server. Finally, authentication is performed using PKI and health card trusted parties.

8.3.6 Contractual framework

In order to perform the healthcare services as suggested in the business plan, the eu-DOMAIN service provider must enter into a Service Level Agreements (SLA) with the EBPCT. The service level agreement set outs the rights and obligations of the parties, in particular in terms of mutual standards for service and how a level of service will be measured.

The NHS National Programme for IT sets out to provide NHS with SLAs for commissioning of ICT services. However, limited work has been done in this area at present[12]. To some extent this has been considered as something to be arranged at the Strategic Health Association (in England) Level. However, each PCT is recommended to consider what additional requirements they needed over and above any standard contract that has been negotiated and what the additional costs will be. EBPCT will, though its legal department, most likely present some extra requirements compared to the eu-DOMAIN Standard Model SLA provided in Appendix A.

The following is a general structure of Service Level Agreement[13] containing the most relevant conditions and specific clauses that should be considered in terms of the establishment of Service Level Agreements within the terms of the Facility Management agreement. It has not been possible to obtain such requirements from EBPCT at the time of writing, or even a hint to what may be required.

The main elements of a Service Level Agreement would most likely include:

- **General description** of the health service, i.e. clarification of the extent of the monitoring services that form part of a Diabetes Management Agreement.
- **Definitions** of all special terms related to specific health service elements (including relevant referenced standards).
- Definition of the **agreed output/targets**, through a list of specific performance criteria for the monitoring service.
- **Specification of the health service** to be provided. For example: Quality of Service, volume of monitoring service (number of patients), place of performance, applicable standards, security and privacy models, timing (frequency, number of monitoring), schedules (start and end of service), due time, event triggered start of work, man-labour years and hours per period (if applicable).
- **Description of the process**, i.e. clarification of the process and time constraints (for example: parties involved, process owner, flow of information, flow of material, flow of documents, flow of money, interaction and interfaces from/to other processes).
- **Organization and parties involved**, i.e. clarification of the relationship and interface between parties (who is who, function and role, contact persons for specific tasks, authorization).
- **EBPCT's participation and commitments** (for example: cooperation, assistance, supervision, access, etc.). Defining conditions of participation (extent of service provider's empowerment and authorization) is basic.
- **Health Carer's participation and commitments** (for example: training, cooperation, assistance, supervision, access, infrastructure, utilities, space, equipment, material, data, documentation, facilities, testing, inspection, etc.). Defining conditions of participation (extent of service provider's empowerment and authorization) is basic.
- **Equipment, material and media** (including gateways, medical devices, terminals, consumables, etc.). The intention is to identify also any specific notification/information required by the client and/or the service provider. Some examples, in this sense, can be supply procurement process and supply strategy including information, consequences of not or late ordering by the EBPCT, supply source, procedure for ordering spare parts, changes of types of

[12] NHS National Programme for IT Baseline review – Audit 2004/2005

[13] European Standard: prEN 15222:2005 (E) "Facility Management – Agreements – Guidance on how to prepare Facility Managements Agreements"

spare parts, availability and delivery time, discounts, responsibility for and location of storage, etc.

- Creation of an efficient **communication and documentation** process.
- Definition of **process requirements** and critical dates.
- Clarification of **safety precautions** and requirements.
- **Conflict resolution process and non-compliance procedures** (dealing with differences from the agreed service level and their consequences)
- **Price, payment and accounting.** For example: specific invoicing requirements, performance payment system, etc.
- **Changes of the agreement** (methodology for change of the SLA: variations, additions and omissions).

8.3.7 Decision process at EBPCT

The decision process in EBPCT is quite similar to the one described for the eu-DOMAIN service provider. The staff of the EBPCT prepares a detailed report on the service, its functional benefits, impact on healthcare and policies and its economical consequences.

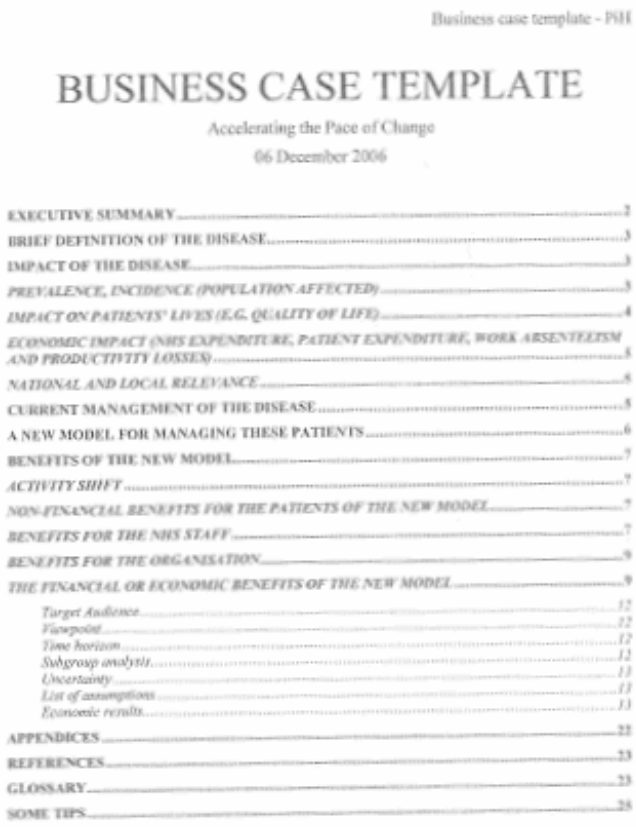
8.3.7.1 Business case

The NHS has initiated a series of "Accelerating the Pace of Change" programmes aiming at improving the NHS and its services. Activities under the programme are required to justify their cause by filling out a Business Case Template.

A typical Business Case for a health improvement programme, e.g. Heart Disease, includes a short description of the disease and its present treatment regime, the prevalence and statistical data on the disease, current management practice and the planned activities to improve practices as well as tangible benefits to the health organisation and the patient.

The business case ends with an economical overview of costs and benefits of inaugurating the new case management scheme.

A sample of the content of a Business Case[14] for heart diseases is shown in Figure 15.


Business case template - PHI

BUSINESS CASE TEMPLATE

Accelerating the Pace of Change

06 December 2006

Figure 15 Business Case content

[14] Prof. Dr. Anthony Stewart, EBPCT, April 2007

8.3.7.2 Integrated Service Improvement Programme

As part of the decision process for eu-DOMAIN services, the staff of EBPCT may be requested to provide and ISIP Change Programme Evaluation. The NHS Integrated Service Improvement Programme (ISIP) is an approach to transformational change. It provides guidance and advice to support an integrated change approach, starting with a recognition of the range of challenges that the service is addressing locally to achieve a patient-led NHS.

The ISIP method require a short description of the change programme and how it would affect the organisation and the quality of care at EBPCT. The ISIP description is summarised in the following form:

ISIP EVALUATION (PRO FORMA C)

SECTION 1) Change Programme
Which will be the dominant Change Programme and why? Tick one box

	Change Programme	Tick	How and why
	Working Together for Health		
	Lets Do		
	Mental Health Service Redesign		
	PCT Accord		
	Care Management	✓	Platform for improved self-management of diabetes will improve care and reduce hospitalisation with 5%
	A Wider View		
	Local Area Agreement		
	Choice, Plurality and Contestability		
	Connecting for Health		
	Workforce Development		

SECTION 2) which of the Organisational Outcomes will be achieved (please tick)

Patient Choice		Achieve HC standard		Increase clinical workforce	
Increased Access	✓	Increase H&SC capacity		Invest in LTC	
Implement White Paper		Reduce Inequalities		Pooled Budgets	
Organisational Merger		Address CDM	✓	Increase 1ary Care	
Workforce Role		Achieve Financial Balance		Improve Patient experience	
Agenda for Change		Admission avoidance	✓	Increase self care	✓
Transfer 2ndary to 1ary	✓	Diagnostics in 1ary Care		Reduce mortality rates	✓
Capital Development		Reduce waiting time	✓	Increase life expectancy	✓
Reduce HAI					

9. Exploitation of results

9.1 Exploitation strategies

In order for the exploitation to be effective an integrated approach will be necessary, combining experience and expertise from the development department, market specialists, and involvement of the user base represented in the consortium.

This exploitation approach has been accompanied by the following tasks:

- Transfer of research results into actual developments, products, and services
- Gaining feedback on economic benefits and impact of the research projects especially through surveys and personal interviews
- Market examinations for the best use of research results and for creating new business opportunities
- Achieving high exploitation through the feedback from large user groups and other technical and scientific networks of the consortium partners.

The Consortium partners have a priori identified individual exploitation objectives. The exploitation plans are developed according to an overall exploitation strategy to optimise the exploitability and the impact of the eu-DOMAIN platform.

The industrial partners involved in the project can individually realise commercial benefits from the results of the project in a number of ways. For the exploitation, some industrial partners will exploit research results by enhancing existing or creating new products and services. These products and services will lead to a competitive advantage for these partners and will create substantial benefits for the end users. Users and some smaller SME's will exploit the project results by incorporating eu-DOMAIN components in existing and new domain applications and thus improve performance and marketability of their products.

Alongside a possible joint exploitation of the eu-DOMAIN platform and components, each individual partner will exploit the results of the project as part of their corporate business strategy. The individual exploitation plan will thus be further developed in the form of partner's internal business plans for commercial deployment of eu-DOMAIN across the identified industry sectors.

9.2 Exploitation of project results

eu-DOMAIN's technical and business innovation, geographic and commercial scope, and uniqueness in the market place gives rise to a number of project results (outputs) that will be exploitable by the consortium as a whole and/or by its individual partners. The project results are being validated in two business sectors: *Building Facility Management and eHealth services,* but the platform can and will be exploitable in a number of other industry and government domains along with a number of other results. The eu-DOMAIN project thus has the potential to provide a wide range of exploitation opportunities for the Consortium and the individual partners.

The primary objective 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. Such services will, as our market studies show, provide timely and highly relevant exploitable products for the very near future.

In addition to providing the eu-DOMAIN service, some partners will also exploit the knowledge 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.

eu-DOMAIN exploitation is thus planned at three levels:

- Exploitation by individual partners of their own IPR initially within healthcare, industrial services and building Facility Management
- Exploitation of the results jointly by several partners in a pan-European approach
- Exploitation by some individual partners of their own IPR across consultancy markets

As can be seen from the following table there are a range of commercially exploitable products, which apply to the consortium as a whole and its individual partners. Each of these has been evaluated and included in the partners' individual exploitation plans as appropriate and represented in the individual exploitation plans, identifying the best way in which they may be exploited.

Exploitable Knowledge	Exploitable products	Application sectors	Timetable for commercial use	Owner
Ambient Intelligence (AmI) solutions development and deployment	AmI Web Services based platform	Demonstration in National Healthcare Services and Industrial Installations	2008	eu-DOMAIN consortium
	End-user services, development & maintenance services	National Healthcare Services and Industrial Installations	2009	Individual consortium technical partners
Healthcare and Pump Industry user requirements	Consultancy and Advisory services	Consultancy in National Healthcare Services and Industrial Installations	2006	Consortium's user and business partners
New working processes and analysis skills	Business processes consultancy services	General industry	2007	Individual consortium business partners
Business modelling skills	Consultancy Programmes and solutions	General industry	2007	Individual consortium technical and business partners
State of the art knowledge for AMI	Consultancy and updated products portfolio	Research Community General industry	2006	Individual consortium technical partners
Technical skills gained from development of eu-DOMAIN	Consultancy and extended products portfolio	Research Community General industry	2006	Individual consortium technical partners

Table 8 Commercially exploitable eu-DOMAIN products

Potential target groups in different sectors has been identified, analysed and prioritised according to commercial attractiveness. In order to optimise time-to-market, the first eu-DOMAIN deployment initiatives will be focused on the most commercially attractive customers. A major instrument in this approach will be the availability of a fully working eu-DOMAIN platform for a prolonged period after the end of the project, so that on-going customisation and trials can be performed for potential customers.

9.3 Exploitation roles

The amount of leading-edge technologies needed to realise the eu-DOMAIN platform, requires a multi-skilled/cross-border/cross-sectoral approach and the eu-DOMAIN partners represent a wide-range of technical and business skills and cover a wide European and multi-national commercial scope.

The technology and application development partners belong to the most innovative knowledge bases within the current state-of-the-art 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 business venture.

This is illustrated in the following table:

Partner	Individual partner exploitation	Transfer to other markets
CIL	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
INNOVA	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	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	Research benefits from project involvement and exploitation of outcomes.	Not applicable.
FORTH	Research benefits from project involvement and exploitation of outcomes. Commercial exploitation through collaborations.	Not applicable.
CNET	Productise and support eu-DOMAIN XML web-services and derivative applications for existing and new clients. Further develop products/services portfolio through enhanced technical skills.	Further develop market to other XML and web-service applications.
T-CON	Productise and support eu-DOMAIN communication facilities and derivative applications for existing and new clients. Further enhance company's products/services portfolio through eu-DOMAIN acquired technical skills.	Further develop R&D activities based upon eu-DOMAIN experience.
SAG	Supporting the productisation of eu-DOMAIN XML web-services and derivative applications for existing and new clients. Further enhance company's products/services portfolio through eu-DOMAIN acquired technical skills.	Further develop market to other XML and web-service applications.
TID	Productise and support eu-DOMAIN communication facilities and derivative applications for existing and new clients. Further enhance company's products/services portfolio through eu-DOMAIN acquired technical skills.	Further develop products and R&D activities based upon eu-DOMAIN experience.
GMA	End-user benefits from roll-out. Further enhance company's products/services portfolio through eu-DOMAIN experience.	Not applicable
EBPCT	End-user benefits from roll-out. Advisory service/consultancy to peer healthcare organisations.	Not applicable

Table 9 Exploitation roles

9.4 Expected impact from exploitation of the results

9.4.1 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 much larger resources for developing proprietary platforms. In the second instance, small companies can drastically improve 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 widespread 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 applications and services to be provided as a result of the project 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.

9.4.2 Economic impact

The eu-DOMAIN service platform 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 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 exploitation phase.

The scenario domains selected 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 will have a major economic 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 positioning. 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 has been provided in a business-modelling framework for direct implementation in the companies.

9.4.3 Business innovation

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 to support ubiquitous intelligence in their entire product range with a standardised, easy to

use interface. This will further enable them 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 provide 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.

9.4.4 Added-value at the European level

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 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. The aim is to speed up the deployment of eu-DOMAIN as a pan-European infrastructure.

9.4.5 Quality of life and health and safety

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.

9.4.6 Environmental enhancement

One of the specific aims of the project is to improve energy conservation in pumping and heating systems by improved preventive maintenance and upkeep of components. It is estimated, that 1½% of the world's 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 applications 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.

10. Contractual framework for exploitation

10.1 Industrial property rights and partners responsibilities

Each contractor is bound by the terms and conditions of the Commission contractual rules, Annex II General Conditions - Part C entitled "Intellectual Property Rights" as complemented or amended in the consortium agreement.

10.1.1 Ownership

The partners of the project are not only partners in the development phase, but are equally partners in the consortium agreement and contractors in a legally binding contract with the European Commission. Hence, a thorough determination of the ownership associated with each part of the project results must be undertaken, before commercial exploitation can be planned and carried out.

As the main rule, knowledge generated in the course of carrying out work on the project shall be the property of the contractor generating it. This means that the partners can freely use their individual knowledge and inventions in commercial exploitation without regard to the other partners, except as specifically agreed in either the consortium agreement or in the present exploitation plans.

If a *joint* invention, design or work is made with at least two contractors as contributors the concerned contractors shall seek to set up appropriate IPR agreements to protect the rights to these inventions. The contributors shall be entitled to use and to license such rights in accordance with the rules in said IPR agreement, without owing any financial compensation to or requiring the consent of the other contributors.

In the case where a contractor decides that it does not intend to seek protection, it shall inform the other contractors and any other contractor interested in applying such protection shall advise the other contractors. If several contractors are interested, they shall strive to set up amongst themselves and with the original inventors' appropriate agreements in order to do so.

The foregoing shall be without prejudice to the Access Rights of all Contractors that will remain.

10.1.2 Pre-Existing Know-How

Except for "The Grundfos Monitoring and Control System" provided by Grundfos Management A/S, none of the contractors have identified Pre-Existing Know-How to which they need to grant Access Rights.

The contractors have agreed that in order to fully exploit the results of the eu-DOMAIN project, all contractors will need to use certain Pre-Existing Know-How, products, software components and other products and services belonging to certain contractors. An example of this is e.g. the Tamino XML database products marketed by Software AG.

The contractors have thus agreed that the Access Rights on any Pre-Existing Know-How, products, software components and other products and services needed for use of a contractor's own Knowledge shall be granted on fair and non-discriminatory market conditions [the contractors may decide to agree otherwise and to grant such Access Rights on more favourable conditions].

10.1.3 Access rights

According to the consortium agreement and Commission rules, each contractor shall take appropriate measures to ensure that it can grant Access Rights and fulfil the obligations notwithstanding any rights of its employees, or any person it assigns or engages to perform its own Work Package for the Project. The Contractors have agreed that Access Rights are generally granted on a non-exclusive, no-cost basis and shall not include the right to grant sub-licenses.

Access Rights when applying to software do not comprise access to source code but only to object code, unless otherwise expressly provided. For software, which is either Pre-Existing Know-How or knowledge generated in the project, the contractors also have agreed that they shall have limited source code access for carrying out their work package under the project but they shall not have any access to source code.[How does this apply to exploitation?]

Limited source code access shall mean access to source code and also to software documentation, provided in any case that an API including software documentation for the respective software is not available; and also that use of the software in object code form alone is not meaningful.

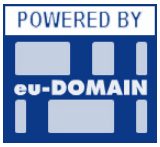
Each contractor licensing its software shall have the right to ask for a prior written agreement with the contractor(s) licensed specifying and protecting its proprietary rights.

10.1.4 "have manufactured" rights

Each of the contractors have agreed that, before any agreement concerning the application of the "have manufactured" rights is reached with a third party, the other Contractors shall themselves have a prior right to agree to undertake such manufacturing on fair and reasonable terms and conditions.

10.1.5 The use of marks

Each contractor retains all rights, title and interest in any of its trade and business names, service marks, trade marks, logos or other symbols it uses to identify itself or any of its activities and no contractor shall acquire any general license or any other right to any marks of any other contractor. Each contractor shall also obtain the other contractors' prior written approval of any publication or any press releases or public announcement making reference to the other contractors and specifically on the marks to be used and on the manner it will be used.



All contractors have further agreed, that every exploitation activity involving all or substantial elements of the projects results must carry the mark of eu-DOMAIN (as represented in the logo shown here) as well as the sentence: "Powered by eu-DOMAIN". The reference to eu-DOMAIN must be on all published material, both printed and in electronic form.

10.2 Availability of infrastructure for demonstration

A major tool for exploitation will be the availability of a fully working eu-DOMAIN platform towards the end of the project and in a prolonged period thereafter, on which demonstrations can be performed.

The demonstration platform provides the possibility to perform demonstration services to various potential service providers, system integrators, component manufacturers and governments across Europe, allowing them to test out 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 demonstration platform, together with supporting descriptive information material, will be used for take-up activities and exploitation by the consortium partners.

11. Individual industrial exploitation plans

11.1 C International Ltd. (CIL)

11.1.1.1 Company background

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.

Partner identity:	C International Ltd.
Country:	UK
Web site:	www.cinternational.co.uk

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.

11.1.1.2 Core competencies

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.

11.1.2 Exploitation strategy

11.1.2.1 Target markets and segments

eu-DOMAIN has a very wide potential in terms of the target markets that it may go on to be deployed in. The initial focus of the validation of its potential is in two areas; healthcare and building maintenance. With its background as it is CIL's focus will be upon the healthcare market as a priority and will use this as basis for moving forward in other market segments.

11.1.2.2 Geographic and organisational coverage

CIL will operate as the main commercial representative of the consortium in the United Kingdom and work closely with the other UK partner (Eastern Birmingham PCT) who will be very active in promoting eu-DOMAIN across the National healthcare arena. CIL will also use its contacts in other European countries, particularly Eastern Europe, to enable the deployment of eu-DOMAIN as agreed with the consortium partners.

11.1.2.3 Product strategy

CIL will take the opportunity provided by eu-DOMAIN deployment to offer enabling and value-added services on top of the basic eu-DOMAIN product/service set. These services will, in the main, consist of implementation and benefits-realisation support and may involve 'partnerships' with other organisations.

CIL will use the results of the eu-DOMAIN project to strengthen its business credentials and reputation, to extend its service portfolio and to widen its client base, initially in healthcare consultancy and then further a field.

CIL is neither a service delivery nor technical development company and their interest in eu-DOMAIN deployment lies in four areas.

- Firstly, providing customisation and installation consultancy (with support of technical partners) to UK customers
- Secondly, providing consultancy to ensure that the eu-DOMAIN customers exploit the products and services to their optimum benefit. This may involve a number of consultancy services from benefits-realisation planning through process re-engineering and operational change management.

- Thirdly, providing marketing and demonstration support to the UK exploitation of eu-DOMAIN. Some of this in conjunction with healthcare organisations and healthcare service and ICT suppliers
- Fourthly using the knowledge gained from the project and early deployment experience to further develop the CIL services portfolio and customer base directly; as eu-DOMAIN services to the healthcare service and industry suppliers, and indirectly; to enhance provision of other consultancy disciplines in other industry sectors.

11.1.2.4 Strategic partnerships

CIL sees it vitally important that sound strategic partnerships are developed with key market players and influencers in order that the eu-DOMAIN service offering is 'credible' to its target markets. This is particularly important, in fact critical, in the healthcare market and equally as important in the other target domains.

CIL will use its wide network with healthcare organisations to fully explore the best opportunities and criteria for the deployment of eu-DOMAIN. CIL will also use its contacts with the suppliers of ICT and services to the UK healthcare market to explore the best opportunities for commercial alliances to support the commercial exploitation of eu-DOMAIN.

CIL will use these to support both the UK and Europe-wide exploitation of eu-DOMAIN.

11.1.2.5 Strengths and threats

This area is an on-going analysis as the actual product portfolio and target customers profiles are finalised.

There is no doubt that the healthcare market, which will be the main priority for CIL, is a very competitive one. The key to commercial success is not simply having a good product but also:

- Credibility in the marketplace
- Clear ability to significantly impact and support the strategic objectives (political and operational) of the healthcare market
- Cost reduction and quality of service improvement capabilities.

CIL believes that the eu-DOMAIN ambition encompasses all of theses and that its deployment will be well supported at the end of the project through a successful validation and demonstration period and strategic partnering with the appropriate market players.

11.1.3 Implementation

CIL will develop an internal business plan describing the implementation of our exploitation strategy in terms of:

- Marketing
- Publications
- Training and education
- Management
- Organisation
- Financial estimates of revenues and costs
- Financial expectations
- Action plans

11.2 Innova S.p.A. (INNOVA)

11.2.1.1 Company background

Partner identity:	INNOVA S.p.A.
Country:	Italy
Web site:	www.innova-eu.net

Innova's core competence is to transfer technologies from the world of research to industry. Innova was set up in 1993 in response to a demand by business for technological innovation and a need on the part of research institutes to promote industrial applications of the results of their laboratory experiments.

Innova helps enterprises to acquire new technologies and research institutes to develop systems and applications in response to industrial demand. Easy access to world-class R&D institutions, international partnership and constant monitoring of the most advanced technology solutions are the visible indications of Innova's commitment to technology transfer and exploitation, its main priority and mission. Since 1996 it has promoted more than 1500 international projects of R&S and technology transfer actions on a European scale.

11.2.1.2 Core competencies

Innova is made up of a pool of 40 professional consultants and experts who have developed a long standing and consolidated knowledge in the R&D and marketing activities conducted with highly qualified European companies and universities. More specifically, Innova provides expertise to promote innovative technologies and inventions with commercial value and affect the timely transfer of knowledge and technology for development of products and processes towards the marketplace. Resources, expertise and a project-oriented team is committed to make commercial and industrial R&D efforts more cost-effective for successful commercialisation of research ideas and new technology solutions. Innova focuses on technology evaluation, protection, development and marketing. Starting from the identification of technical opportunities and market requirements Innova transforms them into strategic plans for a successful technology commercialisation process through:

- acquisition of basic information on a new technology
- research collaboration
- funding new company spin-offs

A worldwide network and strategic partnerships with leading research institutes and industrial companies allow Innova to commercialise the technology also at international level.

Specific strengths for exploitation of research results can be listed as follows:

- Since 1994 we have helped the European Commission evaluate and exploit the commercial potential of new technologies.
- Since September 2000 we have been carrying out and co-ordinating training and technical assistance activities for the network of Innovation Relay Centres and Regional Innovation Centres consisting of the 68 most important innovation centres in Europe and forming the world's largest technology transfer network.
- With our experience of technology assessment we represent an important observatory of trends in innovation and assessment of the technical and economic potential of new technology solutions, thereby strengthening our acknowledged position among industrial and scientific operators.

11.2.2 Exploitation strategy

Innova objective, being a consulting firm and not a technical development company, is to widen its services portfolio and to offer high-level consultancy by transferring know-how on eu-DOMAIN technologies and applications to its actual and future clients, which include both large industrial enterprises and SME's in Italy and abroad.

11.2.2.1 Target markets and segments

At an initial stage, Innova will target a part of the organizations, both large industries and SMEs that compose its large customer base, with a particular focus on Facility Management (e.g.: E.S.M. Consorzio Sistemi Esperti per la Manutenzione) and, as a priority, environmental services (e.g.: Labor Srl, Calzavara S.p.A, ACCAM Consorzio Intercomunale Servizi Ambientali).

Innova will use this initial approach as basis for moving forward in other market segments: one of the most promising will include healthcare market (e.g.: A.I.O.P. Associazione Italiana Ospedalità Privata, Regina Elena National Cancer Institute, Ospedale di Palmanova, etc.).

Innova recognizes, however, the high potential that eu-DOMAIN can have in terms of the target markets and segments in which it may be deployed in. Possible further markets to be approached could be logistics and transport market and car sector.

Innova will aim, therefore, to widen its client portfolio launching exploitation activities (i.e.: presentation to selected potential new customers, participation to conferences and seminars, etc.). This will be done quite early in order to get first inputs and feedback from end users and therefore to sound out the market.

11.2.2.2 Geographic and organisational coverage

During past years Innova has been engaged in a programme of continuous expansion. It has set up subsidiaries in Italy and abroad and signed partnership agreements with universities and technology development agencies as part of its strategy to establish an international network for technology transfer and the promotion of innovation.

INNOVA Consulting Group Inc. This company, with headquarters in Boston at MIT, was set up in April 2000. INNOVA C.G. is an observatory for monitoring new technologies. It conducts surveys for Italian clients interested in US technologies. It promotes trade with Italy by North American high-tech companies. The new company has signed co-operation agreements with Monterey Bay International Trade Association and UCLA (University of California Los Angeles).

INNOST S.r.l. This company was set up in December 2000. INNOST has strengthened Innova's presence in the Northwest of Italy, which boasts the largest concentration of SMEs. The company works in partnership with universities and local research centres. Its main focus is on the provision of highly customized consultancy services to the private industrial sector.

INNOVA EUROPE. This company, a joint venture with a Portuguese partner, was set up in November 2000. Its objective is to assist and co-ordinate the network of Innovation Relay Centres, Europe's 68 largest technology transfer centres.

INVENT S.A.S. Invent, a joint venture with a highly specialised company in venture capital fund and consultancy services, was born in the 2001 to support development projects of high-tech companies combining Technology Transfer know-how and investment funds.

TECH-IN: it is a joint venture between INNOST s.r.l and INNOVATIKA - Thinkdom of Business Innovators - Experts in Innovation, Knowledge Management and Intellectual Capital. Tech-in mission is to support companies and research organizations in the process from designing research to carrying it out, in sectors where business growth and success depends on technological innovation. Tech-in helps companies and organizations in planning innovation, promoting new technologies and continuously monitoring the development of new technologies.

11.2.2.3 Product strategy

Innova is a consulting firm and not a technical development company, therefore it would be more appropriate to define here a "consultancy" strategy than a "product" strategy.

Therefore, eu-DOMAIN results will be used by Innova to strengthen its business credentials and reputation, by extending its service portfolio and widening its client base, starting from facility management, environmental services and healthcare consultancy, as stated above, and then expanding in further fields, that may result strategic.

On the other hand, however, in case there will be strong commitment and interest for eu-DOMAIN among clients, it could be envisaged that Innova creates a spin-off company, whose mission would be to provide organisations with eu-DOMAIN platform (service provider).

11.2.2.4 Strategic partnerships

Innova has a wide network of existing partnerships (i.e.: customers, collaborating organizations, etc.) all over Europe and with Asian organisations (e.g.: China, India).

Relevant strategic partnership will be activated nationally and, in a second stage, also internationally in the appropriate target market, according to the market segments that Innova intends to address first (for more details, please refer to section "target markets and segments").

It can be envisioned, therefore, that preliminary partnerships will be developed in the field of environmental services. Indeed, a first expression of interest has been received from Calzavara S.p.A, a company active in the radio telecommunications market, that has progressively expanded its presence, in Italy and abroad, as a supplier of both products and services. Today, Calzavara is the parent company of a Group within which there is expertise in a variety of fields in the accessories and infrastructure sectors for fixed and mobile radio and television networks, radar and wind energy systems. As a system integrator, Calzavara provides 'turnkey' services for the development of radio networks; it also has its own calibration laboratories and research and development facilities for custom radio communication products. In the last years Calzavara interest expanded also in the field of renewable energies. The company is, therefore interested in the take-up phase of the eu-DOMAIN platform: its intention is to offer monitoring services for photovoltaic products to be applied on top of the basic eu-DOMAIN platform.

Secondly, additional partnerships could be developed with Facility Management consortia in Italy and abroad, exploiting some important contacts that Innova already has with some strategic actors in this field.

As concerns the healthcare sector, some contacts with well-known hospitals in Italy can be also exploited to create a partnership that, by increasing the critical mass, could propose eu-DOMAIN platform to the national or regional healthcare system.

Of course, also partnerships with the eu-DOMAIN consortium will be fostered.

11.2.2.5 Strengths and threats

As mentioned above, Innova considers eu-DOMAIN a promising business opportunity, as several of Innova's current customers could be interested in adopting the solutions provided by eu-DOMAIN.

For instance, Innova has good relations with Italian Health Organizations, regulated by the central Ministry of Health. However, competition seems to be quite fierce, especially in the health sector, often subject to governmental and/or centralized decisions that strongly influence the market and the competition itself. Being the segment so competitive, it would be paramount to promote eu-DOMAIN platform not only as a good product, but especially as a cost-effective solution that can improve the quality of the service provided by hospitals to society. Another key aspect to successfully commercialize eu-DOMAIN in the healthcare sector would be the ability to stress the significant impact it may have in supporting the strategic objectives of the healthcare domain, both politically and socially.

As concerns the other target market (facility management and environment sector, but also logistics and transport and car sector), the most likely competition would be the one from tailored-made systems produced by software companies. On the other hand, it is also true that often these ICT companies are able to offer only narrow and domain specific services, while eu-DOMAIN platform is a flexible structure that can be customized in several domains as appropriate and that can provide an unique service enabling domain service providers to reach their final customers.

11.2.3 Implementation

At an initial stage, Innova will focus on the chance offered by eu-DOMAIN deployment to offer enabling and value-added consultancy services on top of the basic eu-DOMAIN product/service platform. These additional services will mostly consist in:

- Technology audit to have a clear picture of the client's needs in reference to eu-DOMAIN potential;
- Clear definition of the objectives of the client and their matching with the services that can be offered by eu-DOMAIN;
- Customization and installation consultancy, if necessary with the support of technical partners;
- Ex-post consultancy, to ensure an optimal exploitation of eu-DOMAIN potential by the client (cost-benefit analysis, process reengineering, predictive planning, etc.);
- Know-how transfer on eu-DOMAIN technologies and demonstration support.

Therefore, INNOVA will allocate resources on the following channels:

- Marketing: the aforementioned services will be included in promotional material (e.g.: brochures, websites, etc.) and systematically presented to potential customers in different events;
- Training: specific training programs will be foreseen to transfer the know-how developed in this project. This will be eased thanks also to the participation of INNOVA in analogous research project (e.g.: HYDRA);
- Management and organization: the management of this new service portfolio will be assigned to the ICT division of INNOVA which is located in Lecce where 5 people with a technical background work;
- Financial estimates: INNOVA reasonably retains that the investment for deploying this strategy will not be huge, as a suitable organizational structure is already in place. As concerns the revenues, INNOVA thinks that the first orders for eu-DOMAIN related services will be closed in the first semester of 2008.

11.3 In-JeT ApS (IN-JET)

Partner identity:	In-JeT ApS
Country:	Denmark
Web site:	www.in-jet.dk

11.3.1.1 Company background

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 eHealth, security and surveillance.

11.3.1.2 Core competencies

In-JeT has 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. In-JeT ApS has pioneered the LinkWatch Ambient Intelligence Infrastructure project in the period 2000 - 2003. The project resulted in a prototype service platform for the private homes to be used by various service providers.

11.3.2 Exploitation strategy

In-JeT's objectives are to enhance its portfolio of licensing opportunities and to offer high-level services to both large industrial enterprises and SME's in Denmark. These objectives will be achieved by offering eu-DOMAIN services as an Application Service Provider (ASP).

11.3.2.1 Target markets and segments

The project showed a tremendous market potential for connected homes and delivery of digital services directly to the homes. Studies also show that service providers were increasingly looking for bundling of services, either in order to increase their share of the total market or because they want to maintain their market position through customer loyalty. Even though the prospects were extremely promising, the market was not really developing then due to lack of a commercially available infrastructure to support the delivery of services. Most potential market players like Telco's could not produce the necessary business models, because the investment in infrastructure was too large and too complicated for a single service provider to handle.

11.3.2.2 Product strategy

With the appearance of eu-DOMAIN, all the smaller domain service providers will now have a commercially available infrastructure and it is believed that the market will be immediately rejuvenated when attractive business cases can be presented. In-JeT wants to exploit the eu-DOMAIN by offering the service in Denmark (and possible other places). In-JeT will market eu-DOMAIN at two levels:

In-JeT will operate its own eu-DOMAIN service. We have installed our own eu-DOMAIN servers and software architecture. The service will be offered to smaller service providers, where the volume is not sufficient to justify a proprietary installation. In-JeT will provide customisation and installation

consultancies both at start-up and during operation. Care must be taken to clearly separate these services from the services offered by the service provider customers.

The eu-DOMAIN platform will also be targeted at proprietary customers in Denmark who whish to operate as Domain Service Providers. They have a large installed base of products or people already in the market and will operate the eu-DOMAIN as an internal connectivity service. These Domain Service Providers include: Health authorities, social authorities, industrial product companies, etc. At least 15 of such Domain Service Providers have been identified in Denmark, each having between ½ and 3 million users.

11.3.2.3 Marketing strategy

In-JeT has chosen a business-to-business strategy and supplies eu-DOMAIN solutions to professional customers. This marketing strategy is best suited with our management core areas of competence and the financial foundation. By leaning on the OSGi standard , eu-DOMAIN services could in the future be bundled with media services via the same gateway.

The first marketing activities in Denmark will be directed towards large industrial companies. The newly created demonstrator will be used as platform for showing the ease of integration and the new and innovative services that can be offered with networked components. In addition to the demonstrations, In-JeT will be offering consulting services for these customers to develop the necessary technology and business development plans.

In-JeT is also setting up the first eu-DOMAIN healthcare demonstrator in Denmark in August 2007 in cooperation with Ericsson and the Danish Federation of Industries. It is the purpose of this demonstrator to provoke interest in Danish healthcare organisations for self management and remote monitoring programmes.

Geographically, marketing will be concentrated on Denmark. Since our financial resources are not sufficient for a simultaneous entry into several European markets, the company will seek partnerships wherever possible.

11.3.2.4 Strategic partnerships

The service providers will license the eu-DOMAIN infrastructure from In-JeT and the individual software components in the architecture from the relevant partners (Software AG and CNET).

11.3.2.5 Strengths and threats

There are many competitive services offered for very narrow services, but they are domain specific (e.g. surveillance, intelligent home, automatic meter reading, telematics, telehealth, etc,) and none of them have the general structure and they don't have any intelligence.

11.3.3 Implementation

IN-JET will develop an internal business plan describing the implementation of our exploitation strategy in terms of:

- Marketing
- Publications
- Training and education
- Management
- Organisation
- Financial estimates of revenues and costs
- Financial expectations
- Action plans

11.4 CNet Svenska AB (CNET)

11.4.1.1 Company background

Partner identity:	CNet Svenska AB
Country:	Sweden
Web site:	www.cnet.se

CNet is a leading-edge software house specialising in semantic-based knowledge and content systems. We are developing systems to acquire, organise, personalise and share the knowledge embedded in web, databases and multimedia content. Our technologies achieve

semantic interoperability between heterogeneous information sources and services, and allow our customers to maximise automation of the knowledge life cycle.

We are focused on content rich industries such as news and media, construction and facility management and professional publishing, but any company or organisation that needs to improve their knowledge management and streamline information flows will benefit from our solutions.

11.4.1.2 Core competencies

The core in our offering is Visual Net Server, a semantic annotation server. It is used to capture knowledge from raw information and multimedia content in webs and other distributed repositories to turn poorly structured information into machine-processable knowledge. This allows our customers to improve their work flow efficiency and streamline business processes reducing their costs.

Our semantic technologies also allow our users to organise their digital assets and deliver tailor made information products and services to their customers. Other products include NewsToBuy for knowledge and content management as well as Termado for management of ontologies and term catalogues and adEtransact for information exchange in the advertising industry.

CNet is also engaged in several research and development efforts in the area of mobile work, semantic technologies and device integration. CNet also has experience of commercialisng results from EU-fudned projects such as Intuitive, Multimedia Broker and Metis.

11.4.2 Exploitation strategy

11.4.2.1 Target markets and segments

CNet expects that the Facility Management sector and the building sector will be the first target exploitation markets. We already have an existing customer base in these sectors, which makes us well positioned to exploit the eu-DOMAIN results. This is where we see the greatest potential for eu-DOMAIN-related software and services. Some possible prospects include Securitas and Swedish Road Authority. We have already entered into initial discussions with Swedish Road Authority regarding a possible prototype implementation.

CNet is also working together with In-JeT to set up the first eu-DOMAIN healthcare demonstrator in Denmark in August 2007 in cooperation with Ericsson and the Danish Federation of Industries. It is the purpose of this demonstrator to provoke interest in Danish healthcare organisations for self management and remote monitoring programmes.

Another well-known business segment for CNet is the construction sector. The construction sector, especially in Facility Management is still immature with regards to using IT. A huge problem in a construction project is often Information Management, to get the right information and documentation to the right persons in time for them to do their job properly. There is a huge potential creating more effective work processes based on IT-solutions. Examples of potential customers are again Securitas and the Swedish Construction Society.

11.4.2.2 Geographic and organisational coverage

CNet operates mainly in the Scandinavian market. Recently we started expanding outside of Scandinavia with our first customer in England. Our main aim is to start exploiting eu-DOMAIN on the Scandinavian market.

11.4.2.3 Product strategy

Our route to exploitation will be to exploit the software of eu-DOMAIN as a product both at a system level as well as at the component level. We plan to incorporate eu-DOMAIN components into our current product offerings. eu-DOMAIN will strengthen our position as a provider of solutions for semantic-based knowledge and content systems.

11.4.2.4 Strategic partnerships

Strategic partnerships will be considered when implementation plans are being developed.

11.4.2.5 Strengths and threats

The most likely competition in Sweden will be from tailored-made systems produced by software consultants.

11.4.3 Implementation

CNET will develop an internal business plan describing the implementation of our exploitation strategy in terms of:

- Marketing
- Publications
- Training and education
- Management
- Organisation
- Financial estimates of revenues and costs
- Financial expectations
- Action plans

11.5 T-connect s.r.l. (T-CON)

11.5.1.1 Company background

Partner identity:	T-Connect S.r.l.
Country:	Italy
Web site:	www.t-connect.it

T-Connect main business is focused on developing software for the Sales Force Management and Field Force Automation of SMEs mobile workers.

T-Connect is set up in AREA Science Park, in Trieste, one of the leading multi-sectorial Science Parks in Europe (http://www.area.trieste.it/). The location enjoys one of the highest concentrations of IT and Telecommunication Research competencies in Italy and is the ideal working environment for R&D activities.

11.5.1.2 Core competencies

T-Connect is engaged in research and development of wireless applications on third generation platforms (UMTS/WLAN) for mobile communications services. The company provides also consulting services for the execution of functional and Inter-operability (IOT) tests on wireless products/systems (2.5-3G mobile networks, Wi-Fi/WiMAX and DVB). 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.

11.5.2 Exploitation strategy

11.5.2.1 Target markets and segments

Sales Force Management and Field Force Automation of SMEs mobile workers is a potential market that could be interesting for the exploitation of eu-DOMAIN platform or, at least, part of it including features as location based services, remote device configuration.

SMEs represent 42% of IT expenditure in Italian market and recent studies have pointed out their interest in innovative wireless solutions.

The eu-DOMAIN platform is able to provide significant opportunities to meet Italian SMEs requirements in wireless solutions, such as access to company applications, agenda or order tracking with an efficient solution.

A very interesting market T-Connect is going to address with the eu-DOMAIN platform is companies that offer maintenance and technical assistance on the field to Telecommunication companies.

The choice for this field of application results from a market study and a strategic consideration:

1. at present, maintenance costs for telecommunication companies are in general an important issue to cope with, although it is hard to provide general costs for telecommunication companies, as this cost is directly linked to the number of lines and subscribers it supports, and the country where the company is based. A typical provision of maintenance costs is between 2.5 and 5 USD per line per month (and such fee is charged to end-users), depending on the services contracted. Just as an example, Telefónica invests 76 million Euros (yearly) in the

maintenance of 17605 public phones, and the maintenance of private lines is estimated over 110 million Euros in Spain only;

2. addressing TLC means also interacting with big (or small) TLC companies as direct customers as well as service providers. In fact a TLC company could have the whole maintenance service or part of it outsourced to a technical partner. So eu-DOMAIN application can be provided as a service to a partner working on maintenance; in this way different sources of revenues could be identified, form the profit derived to TLC companies from the use of the communication network, to the earnings for the eu-DOMAIN service exploitation.

Moreover a number of other consideration led T-Connect to focus on this sector:

1. huge availability of investments in the TLC field and device maintenance in particular and continuous growth of the sector: over the past few years, deregulation and technological innovation have ensured that the telecommunications market is the one that has seen the strongest growth. Between 1993 and 2003 the growth rate has been of 9.8% and the market value in Billion Euro was 2.680;
2. the possibility of addressing directly TCL big companies running the technical maintenance in their organisation;
3. a flexible and adaptable business model, open to different sources of revenues and possible actors.

11.5.2.2 Geographic and organisational coverage

T-Connect operates mainly in the Italian market.

11.5.2.3 Product strategy

At this stage we had first informal contacts with an important Italian company, Calzavara (http://www.calzavara.it/) , which is working in a variety of fields in the accessories and infrastructure sectors for fixed and mobile radio and television networks, radar and wind energy systems. As a system integrator, Calzavara provides turnkey services for the development of radio networks; it also has its own calibration laboratories and research and development facilities for custom radio communication products.

The business model we think could be addressed in this case is based on the idea that Calzavara might act as a Content Provider of telecommunication maintenance services. Calzavara may opt to offer the eu-DOMAIN services to end-users, i.e. its business partners, such as subsidiaries, and service partners, as well as independent end-users, such as installers, facility managers and even final end-users. Furthermore Calzavara may opt to use the eu-DOMAIN platform of an external Service Provider (ASP). Based on the volume of traffic and the importance of customer relations, they may also wish to provide the service in its own name thus acting as a Domain Service Provider. The operations may still be outsourced to an external partner, but the core services are exclusively aimed at the Calzavara universe.

In order to have a fully operating service at a commercial/deployment stage the service needs specific content, such as datasheets, reports and technical documents with information related to maintenance for telecommunication devices. This information will be provided by users; in general it will be provided through the access to a restricted area of their database.

Another interesting opportunity to exploit eu-DOMAIN platform is Progetto Domotica F.V.G., a project promoted by AREA Science Park, Friuli Innovazione[15], Agemont[16], Polo Tecnologico di Pordenone[17], Fondazione Snaidero[18].

The project aims at giving the opportunity to the Italian region Friuli Venezia Giulia to become a leader in researching, promoting and developing domotic systems.

T-Connect has just presented eu-DOMAIN project details and outcomes that will be inserted in a database soon available at regional level. In this way eu-DOMAIN platform will be part of an integrate

[15] http://www.friulinnovazione.it/
[16] Agency for the economic development of the mountain region: http://www.agemont.it/age_en/agemont.htm
[17] http://www.polotecnologico.pn.it/
[18] http://www.snaiderofoundation.org/

offer of services and technologies to be exploited by small and medium companies based in Friuli Venezia Giulia.

11.5.2.4 Strategic partnerships

Strategic partnerships will be considered when implementation plans are being developed.

11.5.2.5 Strengths and threats

A significant improvement in internal know-how, thanks to eu-DOMAIN project, will certainly represent a competitive advantage; in fact the experience obtained in specific areas of knowledge management and software interfaces on client terminals will certainly help on providing more efficient and appealing services.

A known fact is that in health and maintenance fields many initiative have been carried on to develop innovative solutions and services and some of them have already led to concrete commercial products; for this reason we can deduce that the actual market is already characterized by some competition that will certainly grow in the following years.

11.5.3 Implementation

T-CON will develop an internal business plan describing the implementation of our exploitation strategy in terms of:

- Marketing
- Publications
- Training and education
- Management
- Organisation
- Financial estimates of revenues and costs
- Financial expectations
- Action plans

11.6 Software AG (SAG)

Partner identity:	Software AG
Country:	Belgium
Web site:	www.softwareag.com

11.6.1.1 Company background

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. 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.

11.6.1.2 Core competencies

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 areas of Web Services, content management and mobile computing. By teaming up with leading technology and distribution partners, Software AG provides best-of-breed solutions to customers' needs in these setments.

11.6.2 Exploitation strategy

11.6.2.1 Target markets and segments

Following is a list of some of the Software AG customers in the areas of healthcare and Industry that could be interested in the services of the eu-DOMAIN platform. However, promoting eu-DOMAIN to them would depend on the commercial strategy of Software at the time of exploitation.

In the healthcare sector, the following entities are customers of Software AG:

Customer	Description	Country	Services from Software AG
SERGAS	Coordinator of the public health services for the Galicia region	Spain	Database products
SESCAM	Coordinator of the public health services for the Castilla-La Mancha region	Spain	Custom Business Intelligence solution Database products

And for the industry sector:

Customer	Description	Country	Services from Software AG
Ferrovial	Large building and services company	Spain	Custom systems built on database and development products XML Integration products B2B integration solution
Miguélez	Electric components wholesaler	Spain	Custom systems built on database and development products
FCC	Large building and services company	Spain	
Telefónica de	Largest Spanish operator of fixed	Spain	Custom systems built on database and

España	phone network		development products Some mobile solution
PSA / Peugeot	Automotive manufacturer	Spain and France	
Defense Ministry of Spain	Public defense. They have a large network for field service.	Spain	Custom systems built on database and development products XML Integration products
Gas Natural	Large provider of energy	Spain	Custom systems built on database and development products
Metro de Madrid	Underground of Madrid	Spain	Mobile solutions platform
Iberdrola	Large provider of energy	Spain	
Schipol Airport	Netherlands biggest airport	The Nether-lands	Database products Integration products
Grupo Antolín	Manufacturer of automotive components	Spain	
Codere S.A.	Manufacturer and distributor of gaming machines	Spain	
Emalsa	Water provider of Gran Canaria	Spain	
Canal de Isabel II	Water provider of Madrid	Spain	Custom systems built on database and development products

11.6.2.2 Geographic and organisational coverage

Software AG is a multinational company divided into several regions. The best suited of them for eu-DOMAIN includes the following countries: Spain, France, Belgium and Luxembourg (Benelux), The Netherlands, Denmark, Italy, Turkey, and all of Latin-America.

11.6.2.3 Product strategy

An information platform will usually be caused by the initiative of some large domain service providers, joining up with a Telco, that start marketing limited proprietary services to customers. The service then grows as needed.

Since the eu-DOMAIN platform is based on open standards and XML, it will help the adoption of eu-DOMAIN services by smaller domain service providers, as plugability of their services is facilitated through the eu-DOIMAIN architecture.

11.6.2.4 Strategic partnerships

For making eu-DOMAIN a reality in some specific region, two things are needed: a Telco providing the communication services, and some large domain service providers. eu-DOMAIN has these partners; however, they are from different countries, so their synergies are smaller than if they were from the same country.

11.6.2.5 Strengths and threats

The strengths are linked to ability to providing unique services enabling domain service providers to reach their end customers, like:

- Real time device monitoring and access
- Alerts
- Location of people and devices
- Access to relevant documentation
- Videoconferencing and collaboration among workers in general
- Leveraging information and services from devices from other organisations

In doing so, it allows the end customers to buy unique services from these providers, like:

- 24x7 surveillance, monitoring and security. This in turn allows for things like e.g. 24x7 operation of some other services.
- Real time emergency handling
- Which besides the own service provided they also allow for:

- Ubiquitous service (anywhere, anytime)
- Access to all information related to the services (from EPR to device incidence history)
- Full configuration and customization

The biggest threats we see now are:

- Final implementation not up to the commercial expectations
- Lack of the communication infrastructures
- Immature domain service providers that are not prepared to buy such services because of its novelty or fear of "big brother"

Competition could mainly come from telecommunication operators (Telcos), i.e. fixed and mobile phone operators, which are the enablers for such a service. They have the basic means for a platform like eu-DOMAIN (i.e. the communication infrastructure), and they also have a huge customer base to become end customers of eu-DOMAIN services, and also a big potential for attracting domain service providers.

In Spain the largest Telco is the Telefónica Group. However, luckily one of the enterprises in this group is also a partner of eu-DOMAIN, so in Spain competence will come mainly from Vodafone and Auna, the other two relevant Telcos.

11.6.3 Implementation

SAG will develop an internal business plan describing the implementation of our exploitation strategy in terms of:

- Marketing
- Publications
- Training and education
- Management
- Organisation
- Financial estimates of revenues and costs
- Financial expectations
- Action plans

11.7 Telefónica I+D (TID)

11.7.1.1 Company background

Partner identity:	Teléfonica I+D
Country:	Spain
Web site:	www.tid.es

Telefónica I+D performs research and development activities mainly for the Telefónica Group companies. The Telefónica Group Companies (Telefónica Móviles, Telefónica de España, Telefónica Soluciones) will be in charge of exploiting the eu-DOMAIN results.

11.7.1.2 Core competencies

TID 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 TID are carried out conforming to an in-house methodology, supported with tools, which has been awarded an ISO 9001 Certification in 1994.

11.7.2 Exploitation strategy

The eu-DOMAIN project matches perfectly with the Telefónica interest and therefore Telefónica I+D will exploit the eu-DOMAIN platform results in different ways. The results of the eu-DOMAIN project will provide users with Web Service-related data through which the end-users will consume the Telefónica group basic products and services. On top of the communication infrastructure, several services will be deployed. In this way, we will target fixed and mobile users, by granting worthwhile services accessible

from very different terminals. This way TID and the Telefónica Branch companies will increase their business activities.

11.7.2.1 Target markets and segments

There are a lot of health and industrial companies that "buy" he Telefónica Group companies products and results. Telefónica I+D also have direct clients related to the eu-DOMAIN market, both from the health and industrial sectors.

11.7.2.2 Geographic and organisational coverage

Telefónica I+D is a multinational company divided into several regions. Telefónica is represented in Spain (Valladolid, Madrid, Barcelona, Huesca), Brazil and Mexico. Due to our geographical diversity the eu-DOMAIN platform will be very useful for us.

11.7.2.3 Product strategy

Once the project has finished, TID will exploit the eu-DOMAIN platform and the services developed, which allow us to charge for data traffic and architecture and service maintenance. Besides, new services can be built using the project's web based architecture. TID will use the eu-DOMAIN platform for selling new value added services to its customers.

Another key point is that this project is going to be very valuable for TID's research department, which is researching and building prototypes for many domotic applications, based on wireless communications.

11.7.2.4 Strategic partnerships

Strategic partnerships will be considered when implementation plans are being developed.

11.7.2.5 Strengths and threats

Apart from similar projects related to ambient intelligence and collaboration, eu-DOMAIN services will have to compete with specific and concrete technologies, which are not oriented to a collaborative (with other fields of application) environment. Tele-assistance global solutions, local intelligent (expert) process control systems, and of course, conventional monitoring and non computer-based systems, which will have to be proved obsolete in a convincing way.

11.7.3 Implementation

TID will develop an internal business plan describing the implementation of our exploitation strategy in terms of:

- Marketing
- Publications
- Training and education
- Management
- Organisation
- Financial estimates of revenues and costs
- Financial expectations
- Action plans

12. Individual academic exploitation plans

12.1 University of Aarhus (UAAR)

Partner identity:	University of Aarhus
Country:	Denmark
Web site:	www.daimi.au.dk

12.1.1.1 Institution background

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.

12.1.1.2 Core competencies

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 fall 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.

12.1.2 Exploitation strategy

12.1.2.1 Target areas and segments

The Department of Computer Science is conducting extensive research in pervasive computing and "pervasive healthcare" in particular. The research activities here may indirectly relevant to exploitation and dissemination in eu-DOMAIN. Furthermore, we have for several years worked closely in research collaborations with companies producing equipment for the industrial sector.

12.1.2.2 Geographic and organisational coverage

The University of Aarhus attracts international students from across the world and has a truly international research profile.

12.1.2.3 Research strategy

The Object-Oriented Software Systems group at the University of Aarhus has further strengthen its strong focus on software engineering for ambient intelligence and embedded systems development through among others employing PhD students in the eu-DOMAIN project. Collaboration with the technical partners will strengthen our research potential in the areas of security engineering, semantic modelling, and Grid technology.

Furthermore, graduate courses at the Computer Science Department on Software Architecture and Pervasive Computing will benefit from the experiences of eu-DOMAIN through the dissemination of achieved experiences.

12.1.2.4 Strategic partnerships

University of Aarhus is liasing with the public/private partnership the 'Alexandra Institute' which among others provides a way of bringing researchers and practitioners together. The results of the eu-DOMAIN project will strengthen the potential for the Alexandra Institute to further interest private companies in research collaboration.

12.1.2.5 Strengths and threats

If the eu-DOMAIN platform would be built on open standards, it could provide a great opportunity for integrating diverse back-end services and front-end devices in complex ways. A threat is that the consortium itself is not sufficiently strong to bring this forward by itself; rather it needs to rely on collaboration and precisely open standards.

12.1.3 Implementation

UAAR will develop an internal business plan describing the implementation of our exploitation strategy in terms of:

- Marketing
- Publications
- Training and education
- Management
- Organisation
- Financial estimates of revenues and costs
- Financial expectations
- Action plans

12.2 Foundation for Research and Technology – Hellas (FORTH)

12.2.1.1 Institution background

Partner identity:	FORTH
Country:	Greece
Web site:	www.ics.forth.gr

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, always maintaining close links with industries, 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. The Centre for Medical Informatics and Health Telematics Applications (CMI/HTA) of ICS-FORTH, (the group of ICS-FORTH involved in eu-DOMAIN) was founded in 1985.

It is FORTH's strategy to make every effort to exploit its IPR and research results in whatever possible way. As an example FORTH has created a spin off company, FORTHnet S.A., which is today listed in the Athens Stock Exchange in the Telecommunications And Internet Service Provision sectors. FORTHphotonics is an other example of such a spin-off company.

12.2.1.2 Core competencies

The R&D activities of CMI/HTA are focused on the development of innovative computer methods and tools in the area of medical informatics, eHealth, mHealth, medical imaging and bioinformatics. A number of innovative technological platforms in those areas have been developed and some of these have already reach deployment.

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 eHealth and mHealth services at various levels of the healthcare hierarchy, including primary care, pre-hospital health emergency management, and hospital care. Specifically, eHealth and mHealth 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.

12.2.2 Exploitation strategy

In order to realise its individual exploitation opportunities CMI/HTA at ICS-FORTH, based on its previous experiences, will evaluate the possibility to exploit the eu-DOMAIN results related to the healthcare services either through the creation of a spin-off company with or without the cooperation of other

consortium partners or through the licensing of its generated knowledge to commercially interested third-parties. In general, feasibility studies for creation of spin-offs, exploration of take-up activities and establishment of a clear business framework for the commercial exploitation will be performed in cooperation with the Exploitation Manager (EM).

The exploitation activities will be focused on the most potential customers, in order to optimise time-to-market. The various exploitation options will be fully assessed and evaluated to provide recommended exploitation actions (including comprehensive future sales and marketing plans) which will then commence at the end of the project.

12.2.2.1 Target areas and segments

FORTH is currently finalising its business plan for a possible formation of a spin off company in the healthcare domain to undertake the responsibility to market and exploit relevant technologies. If such a company is finally established in the near future, it would be the natural channel for exploiting potential results of eu-DOMAIN.

Elderly, chronically ill and citizens in remote and isolated areas represent the obvious groups that would potentially subscribe to a eu-DOMAIN type of service. For example, in Greece both FORTHnet and the National PTT (OTE) are already operating a service (call centre) offering medical advice to citizens/customers at home, with close to 15,000 customers. Also, a dedicated private company named CardioExpress S.A. is also commercially offering similar services focused on cardiological related problems, etc. The need for the envisaged eu-DOMAIN services is very urgent for a number of population segments, such as elderly, home rehabilitation, high risk patients, and people in very remote and isolated areas.

The eu-DOMAIN service platform could also, if extended beyond individual countries into a pan-European Service Platform, address the needs of other markets, such as the travelling citizen. This could prove a very important market if we take into consideration that 1) the tourist "influx" in the Mediterranean Region in 2010 is expected to rise to approximately 210 millions people from something close to 190 millions which is today, and 2) a taxonomy of health related problems in the "travelling population" is as follows:

- some minor health problem(the traveller took some medication) 1 : 2
- serious health problem without communication with a doctor 1 : 4
- serious health problem and communication with a doctor 1 : 12
- stayed in bed 1 : 17
- could not go to work upon return 1 : 50
- got hospitalized upon return (0,5%) 1 : 200
- required a air-transportation back to his/her country(0,6‰) 1 : 1,700
- died abroad 1 : 125,000

Available estimates indicate that there is approximately 400,000 medical assistance cases annually in Europe and they are increasing with a rate of 10% annually.

12.2.2.2 Geographic and organisational coverage

FORTH is primarily located in the island of Crete. Greece overall is an area with high geographical diversity, a large numbers of small and medium sized islands and very many sparsely populated or isolated areas in the mainland. In such an environment the need for exploiting technology to bridge distance and to deliver quality services for healthcare monitoring and remote health management is obvious. FORTH would be interested to exploit eu-DOMAIN results nationally, in Cyprus (due to language) and in the wider Balkan Region.

FORTH will mainly be involved in support for Greek-speaking market and in the investigation of research benefits from project involvement and exploitation of outcomes. Thus, FORTH will cooperate with the consortium partners in the preparation of a project brochure and a newsletter to potential service providers, in the promotion in trade fairs and in the design of a business environment which can provide the framework for post-project commercial exploitation.

12.2.2.3 Research strategy

The R&D directions of CMI/HTA are carefully selected based on international trends in state-of-the-art solutions for the healthcare sector, R&D challenges world wide, as well as the needs of the public and private sector in Greece. The eu-DOMAIN will continue to contribute directly to our research activities.

FORTH will also take part to clustering activities in order to disseminate and increase awareness of the eu-DOMAIN services, 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 services.

12.2.2.4 Strategic partnerships

FORTH, as a research institution, public body and no-profit organization, will cooperate with the partners of the consortium in Greece and in Europe in order to build a critical mass for the exploitation of eu-DOMAIN.

FORTH will participate in the development of detailed joint exploitation strategies once the platform 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.

Such exploitation would take place either through FORTH's spin-off in the healthcare domain or through collaborations with other ICT companies. Amongst its close and strategic partners are:

- FORTHnet S.A. a telecommunications and Internet Service Provider (a spin-off company of FORTH)
- SIEMENS and Siemens Medical. They are not involved in eu-DOMAIN, although they would be interested to explore commercialisation of the eu-DOMAIN platform and services.

CMI/HTA at ICS-FORTH has always had its main focus within the healthcare market. However, FORTH will fully cooperate in the discussions amongst partners about the creation of a joint venture vehicle in order to support the availability of a working eu-DOMAIN platform in a prolonged period after the end of the project.

12.2.2.5 Strengths and threats

Based on our experiences from analysing service offering at a national level and from our knowledge of the European and international state of the art, we believe that the envisaged eu-DOMAIN service offering of mobility and autonomy of the citizen will be the key advantage of eu-DOMAIN when compared with current service offering. The present technological solutions are at a primitive level of technological development and do not encompass substantial technological innovation. Although one expects significant competition and barriers to market entry of new entities from existing stakeholders, we believe that the technological advantages of eu-DOMAIN are such that no real competition will exist. Obviously channels to market, collaborations and service packaging will play an important role for market acceptance.

12.2.3 Implementation

FORTH will develop an internal business plan describing the implementation of our exploitation strategy in terms of:

- Marketing
- Publications
- Training and education
- Management
- Organisation
- Financial estimates of revenues and costs
- Financial expectations
- Action plans

13. Individual user exploitation plans

13.1 Grundfos Management A/S (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.

Grundfos Management is the corporate management arm of Grundfos dealing with strategic issues and group management.

13.1.1 Exploitation strategy

Grundfos is in the middle of a corporate strategic realignment process because of it's extraordinary high growth, integration of newly acquired business and investment in a major new R6D centre in China.

The company has developed drafts of strategic plans for the future used of ICT in the company's project, which touches on the technologies and applications relevant to eu-DOMAIN.

Grundfos has been very active in the business modelling and validation in eu-DOMAIN to acquire as much experience and input as possible for the corporate strategic process.

As long as this process is ongoing, Grundfos is prohibit from making concrete statements regarding its future exploitation strategies.

13.2 Eastern Birmingham Primary Care Trust (EBPCT)

EBPCT covers a population of 251,000 people living in 10 wards of Britain's second city. Based on the Index of Multiple deprivation, nine of these wards fall within the 20% most deprived wards in England. When income deprivation is measured, all wards fall into the 25% most deprived wards in England; nine are amongst the country's 25% most employment deprived. All wards are classified as urban and are classified within the 25% least healthy. There is a relatively high rate of chronic disease e.g. diabetes, which is partly related to these facts. Another important factor to consider in relation to diabetes is the fact that Eastern Birmingham is home to distinct populations whose diversity impacts on health related values.

13.2.1 Exploitation strategy

In 2007 EBPCT has merged with North Birmingham PCT to become BEN - PCT, but this merger does not change the material content of the business case we present here.

BEN-PCT has not been active in the eu-DOMAIN project since the key person left EBPCT in the middle of 2006. As such, it has not been possible to obtain an updated exploitation strategy for the new PCT.

14. Appendix A: Model Service Level Agreement for eu-DOMAIN

The following framework for a Service Level Agreement is intended to serve as a model for the partners individual exploitation of the eu-DOMAIN service in their respective markets.

Service Level Agreement

This agreement, including all its Annexes (the "Contract") is made effective as of the _____ day of _____ , 2007 (the "Effective Date") by and between

CUSTOMER

Address
CUSTOMER

AND

Service Provider

Address
(SERVICE PROVIDER)

FOR

A eu-DOMAIN
Ambient Intelligence Application

Table of Contents

LIST OF ANNEXES TO THE CONTRACT:

ANNEX	TITLE
01.	Definitions
02.	AmI Solution to CUSTOMER
03.	Training and Documentation
04.	Testing and Acceptance test
05.	Time Schedule
06.	Prices
07.	Service Level Agreement – SLA
08.	Maintenance Agreement
09.	Marketing Plan
10.	Special Developments
11.	Security and Privacy Agreement
12.	Options

NOTE:

The Annexes form an integral part of this Contract.

1. Introduction

In connection with the implementation of an Ambient Intelligence System and software services hereinafter called the "SYSTEM", SERVICE PROVIDER and CUSTOMER referred to as the parties, have entered into this Agreement ("Contract").

The purpose of this Contract is to ensure deliveries and services defined in the Scope of Supply to CUSTOMER and legal successors, with the correct quality and function, at the correct time, at the correct delivery address, in the correct quantities and at agreed prices, all in accordance with the provisions given in this Contract.

2. Definitions

For the purpose of this Contract, words and abbreviations shall have the meaning assigned to them in Annex 00, unless the subject matter or context would obviously require otherwise.

3. Scope of Supply

SERVICE PROVIDER undertakes to supply to CUSTOMER the hardware and services as described in Annex 01, comprising the following deliverables:

- Gateways and Devices (Hereinafter referred as hardware)
- Software Services Rights of use
- Access to SERVICE PROVIDER AmI Server
- Installation & commissioning
- Maintenance and support services, as set out in Annex 09.
- Training of CUSTOMER's personnel as set out in Annex 03.
- Documentation as set out in Annex 03.

SERVICE PROVIDER undertakes to implement the SYSTEM in accordance with the specifications set out in Annex 01.

For a period of 2 years after the acceptance of a delivery, SERVICE PROVIDER is obliged to carry out repairs at CUSTOMER's request on the components delivered under this Contract.

Subject to a valid Maintenance Agreement between the Parties, SERVICE PROVIDER is obliged to carry out maintenance and support at CUSTOMER's request on the system.

4. Requirements and Specifications

SERVICE PROVIDER shall be responsible for ensuring the overall technical and functional performance of the SYSTEM and services set out in Annex 01.

5. Time Schedule

5.1 General

SERVICE PROVIDER and CUSTOMER undertake to fulfil their obligations under this Contract in accordance with the agreed Time Schedule set out in Annex 06 and any agreed extensions thereto.

5.2 Delays

A Party to this Contract shall immediately inform the other Party in writing whenever there is reason to believe that circumstances exist or might arise which may result in the Party in question not being able to fulfil its obligations under this Contract according to the Time Schedule.

If the Parties at any time consider it likely that either of the Parties will not be able to fulfil its obligations on the dates set out in the Time Schedule, then the Parties shall meet and negotiate to determine what action is required. Any action that might be taken as a result does not prejudice the rights or remedies the Parties may have under this Contract.

6. Delivery

6.1 Contractual Date of Delivery

The SYSTEM shall have been delivered and successfully tested according to Article 7 and Article 6.2 on the Contractual Date of Delivery set out in the Time Schedule as given in Annex 06.

Terms of delivery under this Article 6 shall be interpreted in accordance with the provisions of the INCOTERMS 1990.

6.1 Actual Date of Delivery

The acceptance of the SYSTEM or parts thereof shall be the date when it has been demonstrated that all relevant requirements of this Contract are met and the Acceptance Certificate has been issued.

It is recognised by the Parties that even after the Actual Date of Delivery, some minor defects and deficiencies that are non-essential for the proper operation or maintenance of the SYSTEM might exist. The Parties shall by agreement in writing enter these defects or deficiencies into a list of defects, which shall include a time schedule for the necessary corrective measures to be taken by SERVICE PROVIDER.

CUSTOMER shall without undue delay give a written statement of acceptance or reject the SYSTEM in writing when the acceptance test has taken place.

6.2 Delivery time

The SYSTEM

The Contractual Date of Delivery for the system or parts thereof is set out in the Time Schedule and Project Plan Annex 06, and any agreed amendments thereto.

Installation

Installation of Equipment shall be performed in a professional and careful manner in accordance with the Contract.

Commissioning

[To be inserted and relating to the SLA from Hosting organisation]

Training and Documentation

SERVICE PROVIDER shall provide training and documentation in accordance with Annex 02 – Training.

6.3 Place of delivery

The SYSTEM: ***Place***

Trial installation: ***Place***

Components: ***Place***

Deliveries shall, unless otherwise agreed, be made FCA pursuant to INCOTERMS 1990, including packing, but excluding other taxes.

6.4 Subsequent deliveries

Deliveries set out in Annex 06 – Time Schedule shall be made FCA at _____ premises or at third party premises given by SERVICE PROVIDER. Subsequent orders will be subject to a separate time schedule to be regulated in a separate amendment to the Contract.

6.5 Risk Passing

The risk for the Equipment shall pass to the CUSTOMER at the actual date of delivery.

7. Acceptance Procedure / Plan

The detailed acceptance procedure/plan and criteria are set out in Annex 04 - Testing and Acceptance Test.

Except to the extent otherwise specifically provided for in this Contract, SERVICE PROVIDER shall according to Annex 04, be obliged to

(i) prepare reports and Acceptance Certificates as to the results of the acceptance procedure.

(ii) perform and supervise all agreed tests needed for CUSTOMER's successful acceptance of the SYSTEM delivered

and

(iii) provide with or place at CUSTOMER's disposal, as the case may be, all agreed special equipment, special tools, programmes (software), labour, supplies, and services required for the performance of the said acceptance procedure,

If SERVICE PROVIDER is prevented from performing the acceptance testing by a cause for which CUSTOMER is responsible, CUSTOMER shall be deemed to have taken over the SYSTEM not later than 30 days from the date when acceptance testing would have been completed but for such prevention, and a certificate shall be issued accordingly and payment effected.

7.1 Acceptance of the SYSTEM & Products by CUSTOMER

To the extent provided for in this Contract, all deliveries included in the Scope of Supply shall be subject to CUSTOMER's acceptance. No such acceptance shall affect SERVICE PROVIDER's obligations hereunder or at any time limit CUSTOMER's right to demand that the Scope of Supply shall satisfy the agreed specifications and requirements of this Contract, unless otherwise agreed.

Should CUSTOMER not inform SERVICE PROVIDER of any defects in accordance with Annex 03 within the stated timeframe, the Products shall be considered delivered without defects and accepted by CUSTOMER.

8. Obligations of the Parties

8.1 General

Should the agreed Time Schedule and/or Contractual Date of Delivery be delayed due to any act or default on the part of the CUSTOMER, its servants or agents or other contractors and/or subcontractors employed by CUSTOMER, or any event for which CUSTOMER is responsible, reasonable extension of time for completion shall be given and CUSTOMER shall compensate SERVICE PROVIDER for any resulting waiting time at prevailing daily rates and documented extra expenses, if any, resulting from such delay which are brought upon him due to CUSTOMER.

8.2 Obligations of SERVICE PROVIDER

Services

SERVICE PROVIDER shall

Make available to CUSTOMER with the defined Services in accordance with the eu-DOMAIN Solution Description listed in Appendix 02

Ensure the services availability and performance levels stipulated in the SLA attached as Appendix 10

Ensure that security and privacy aspects are in full accordance with the security levels stipulated in the Security and Privacy Agreement attached as Appendix 11

Provide second line telephone support set out in Appendix 09 and perform the backup procedures set out in Appendix 10 and ensure the security and surveillance level set out in Appendix 11.

SERVICE PROVIDER shall endeavour to maintain reasonable security procedures to prevent any third party's unlawful access to the Services and data processed by the Services. However, in no event may SERVICE PROVIDER be held responsible for (i) a third party attempting to or gaining access to the Services or data processed by the Services, (ii) a third party's surveillance or collecting of traffic or data, or (iii) a third party's deliberate attack on the Services, Licensee's or any End User's data or Licensee's or End User's systems or network units resulting in breakdowns or reduced availability.

8.2 Obligations of CUSTOMER

Information and Access

CUSTOMER shall provide the following:

i. (data connection _____)
ii. (e-mail to (service) gateway, _____)
iii. (End User information, choice of services _____)

"CUSTOMER"'s Installation, Maintenance and First Line Support

CUSTOMER shall undertake to arrange installation of hardware with End Users via a third party installer in accordance with the system description in Annex 02., and is responsible for all matters in this regard, including connection and introductory testing as described.

CUSTOMER shall not interfere with, alter or modify the Hardware.

CUSTOMER's Marketing Activities

CUSTOMER shall make reasonable endeavours to actively promote the sale of the Services and the Products, always provided that the marketing activities are carried out in accordance with fair marketing practices and in a manner which favourably preserves the goodwill and market position of the Services, Products and SERVICE PROVIDER.

The Licensee shall establish and maintain a sales and local systems organisation with a high competence level.

The Business, Marketing and Budget Plan applicable from the time of conclusion of the Agreement are set forth in Annex 12. No later than 3 months before the end of a calendar year the Licensee shall complete and forward to SERVICE PROVIDER for approval a Business, Marketing and Budget Plan for the following year. In the event that CUSTOMER's Business, Marketing and Budget Plan is not approved by SERVICE PROVIDER, SERVICE PROVIDER is, irrespective of any other notice periods, termination conditions, etc., contained in the Agreement, entitled to terminate the Agreement by giving at least 3 [three] months notice in writing to expire on the first day of a month.

SERVICE PROVIDER shall make brochures and other standard sales materials available to CUSTOMER at the prices set by SERVICE PROVIDER.

Branding

CUSTOMER is obliged to make use of the SERVICE PROVIDER eu-DOMAIN logo in all marketing and sales initiatives on the market.

CUSTOMER's Training Obligations

CUSTOMER shall purchase training services to the extent and at the prices set forth in Appendix 03 in order for CUSTOMER at all times to be able to provide installation and support to the End Users on a high competence level and in accordance with best industry practices.

9. Changes

9.1 General

The Parties recognise that changes to SERVICE PROVIDER's Scope of Supply and to the Parties obligations under this Contract may be necessary or desirable after the Parties have entered into this Contract.

9.2 Changes requested by CUSTOMER

SERVICE PROVIDER agrees to effect all reasonable changes which CUSTOMER may request, in accordance with the terms and conditions of sub-Article 9.5. SERVICE PROVIDER reserves a right not to effect such changes that are proven to have significant and fundamental effect on the SERVICE PROVIDER product programme.

9.3 Changes proposed by SERVICE PROVIDER

SERVICE PROVIDER shall inform CUSTOMER in writing about any change that SERVICE PROVIDER deems necessary to improve its Scope of Supply or to implement new technology that comes to SERVICE PROVIDER's knowledge during the term of this Contract and which is not already known to CUSTOMER.

9.4 Change of SYSTEM software

"CUSTOMER" shall at any time default accept that, SERVICE PROVIDER or a subcontractor "third party licensor", system software and parts hereof is subject to general changes, upgrades and corrections defined and set out by SERVICE PROVIDER, at the time and interval proposed by SERVICE PROVIDER. The change of system software will not negatively affect the performance and functionality of the software installed and operational at the CUSTOMER's system installation.

CUSTOMER and SERVICE PROVIDER shall in cooperation, arrange to test and verify the change to the software in such manner, that the change will make no damage to the system in operation.

9.5 Supplementary Agreements

For each change, whether proposed by SERVICE PROVIDER or required by CUSTOMER, SERVICE PROVIDER shall provide CUSTOMER with a written Change Proposal. Such a Change Proposal shall set forth in detail the change to SERVICE PROVIDER 's Scope of Supply, any change to CUSTOMER's obligations, and the consequences of the proposed change on the prices, Time Schedule and other terms and conditions. Any options or alternatives shall also be described.

Any change made pursuant to this Article must be agreed between the Parties in the form of a written Change Order.

SERVICE PROVIDER shall not commence any work based on such a Change Proposal until a signed Change Order is submitted by CUSTOMER. If CUSTOMER so requests in writing, SERVICE PROVIDER shall nevertheless be obliged to commence and carry out minor or urgent changes, notwithstanding that a written Change Order may not have been prepared.

10. Warranty

10.1 General

SERVICE PROVIDER warrants the Hardware to be free from defects/errors in material and workmanship for a period of 48 months from Actual Date of Delivery and the Software to function in all respects in accordance with the agreed specifications and requirements of this Contract for a period of 90 days from Actual Date of Delivery.

SERVICE PROVIDER warrants that the SYSTEM delivered to CUSTOMER conforms to the agreed specifications and requirements as specified in Annex 02.

Any defect covered by the above warranty arising during the applicable warranty period, will be repaired or the defective item or media will be replaced, at SERVICE PROVIDER's option, when returned by CUSTOMER, freight prepaid - to the designated place of repair in accordance with SERVICE PROVIDER's authorisations and instructions. SERVICE PROVIDER shall bear the freight costs when returning repaired/replaced units to CUSTOMER.

This warranty does not cover defects which are caused by faulty maintenance from CUSTOMER's side, by alterations or repairs undertaken without SERVICE PROVIDER's written approval or which are caused due to misuse, negligence, or accident.

Additionally extended warranty and Support/Maintenance can be provided under a Support and Maintenance Agreement, if so ordered by CUSTOMER. Reference is made to Annex 09.

10.2 Notification of Defects

CUSTOMER shall without undue delay notify SERVICE PROVIDER of any defect. Notification of defects and requests for Corrective Measures shall be made in writing, accompanied by sufficient documentation. Any notification shall include a detailed description of the defect.

10.3 Corrective Measures

During the warranty period SERVICE PROVIDER shall without undue delay attempt to correct all defects reported by CUSTOMER within 10 working days calculated from receipt at the SERVICE PROVIDER's Service Centre of the defective Equipment and up to return-shipment to the CUSTOMER. If SERVICE PROVIDER can document that the time needed for correction is longer than 10 working days, the Parties shall agree on a time schedule for correcting the defect.

10.4 Warranty for software in service

SERVICE PROVIDER warrants that the Software service licensed under the Contract satisfies the agreed specifications of Annex 02, and is reasonable bug free.

During the applicable warranty period, SERVICE PROVIDER undertakes to correct any faults or defects covered by the warranty and to deliver Software bug fixing to CUSTOMER, at no extra cost.

If CUSTOMER so requests, SERVICE PROVIDER shall co-operate with other suppliers to CUSTOMER regarding contributions which may interface the SYSTEM with CUSTOMER's systems.

Assistance will be provided at SERVICE PROVIDER's then current hourly rates and material and travel charges, unless the rates/charges have been agreed in Annex 07.

10.5 Assistance by CUSTOMER

During the warranty period, CUSTOMER shall place the SYSTEM at the disposal of SERVICE PROVIDER in such a manner that SERVICE PROVIDER can commence correction of faults without any further preliminary work. CUSTOMER shall provide reasonable assistance, including making available fault reports, data files, logs and similar items concerning the SYSTEM, as well as additional computer resources required to reproduce the conditions existing at the time the defect appeared.

CUSTOMER shall make remote diagnostic access available to SERVICE PROVIDER. Routines to this effect shall be separately agreed between the parties.

11. Prices

11.1 General

All prices under this Contract are given in (currency) and are specified in Annex 07.

Subject to the above, SERVICE PROVIDER reserves the right to adjust all prices respectively. The adjustment will take place annually or if the general market price index reflects a significant change.

12. Payment

12.1 Payment Terms

At instalment: (_____)

After acceptance test: (_____).

12.1 Invoicing

SERVICE PROVIDER will invoice CUSTOMER in accordance with Article 13.1.

The invoice shall be forwarded to CUSTOMER at the following address:

Name
Street
Postal, City
Country
Reference

12.2 Payment

Payment shall be effectuated by CUSTOMER within (thirty) 30 Days after receipt of a correct invoice.

12.3 Interest

In the event of delay in payment, CUSTOMER shall pay an interest of 3% above the basic interest rate of the European Central Bank on any outstanding amounts.

13. Agreed Penalty

13.1 Delays Caused by SERVICE PROVIDER

If the Actual Date of Delivery for a specified delivery, ref. Annex 05 - Time Schedule, is later than the Contractual Date of Delivery for that delivery, and the delay is not caused by CUSTOMER or a Force Majeure occurrence, SERVICE PROVIDER shall pay CUSTOMER an agreed penalty according to Article 14.2.

13.2 Agreed Penalty

SERVICE PROVIDER shall pay an agreed penalty amounting to (X) per cent of the agreed price based on service in operation.for each commenced calendar week of delay up to a maximum of ten (10) calendar weeks (max. X%) of the calculation basis.

If CUSTOMER cannot accept the SYSTEM as such, the penalty as set out in this sub clause shall be calculated on the full price for the ordered SYSTEM in question.
The agreed penalty shall be payable irrespective of whether the delay has caused CUSTOMER to suffer financial loss or not.

Payment of penalties shall be SERVICE PROVIDER’s sole liability and CUSTOMER's sole remedy in case of delay during the first 10 weeks of delay. There after CUSTOMER may subject to prior written notice and

Article 20 cancel the order in question and/or, subject to Article 15.3, claim compensation for direct costs due to the delay.

Already paid penalties shall be deducted from CUSTOMER's claim.

14. Liability

14.1 General

Any damage to the SYSTEM or Documentation supplied or to be supplied by SERVICE PROVIDER occurring before the relevant time according to Article 12.1 when the risk of damage or loss to the SYSTEM passes to the CUSTOMER shall be remedied by SERVICE PROVIDER at its own expense, provided that the damage or loss has not been caused by negligent or will full act or omission by the CUSTOMER or anybody employed by CUSTOMER. If the damage or loss has been so caused by the CUSTOMER, SERVICE PROVIDER shall nevertheless, if CUSTOMER so requests, remedy the damage and loss, at the expense of the CUSTOMER at a reasonable price to be agreed between SERVICE PROVIDER and CUSTOMER.

14.2 Other indemnification

Either Party shall indemnify and hold the other Party, and its officers, servants and employees harmless from any direct loss, damage or expense on account of damage to property and injury , including death, to all persons, including but not limited to employees of the suffering Party, arising out of or resulting from any act or omission of the failing Party, its subcontractors, or anybody for which the failing Party or its subcontractors are responsible, in performance of its obligations under this Contract. With respect to the SYSTEM and Documentation this sub clause 15.2 shall apply only after the time risk of loss and damage has passed to CUSTOMER. Before that time sub clause 15.1 shall prevail.

14.3 Limitation of Liability

Neither Party shall be liable for indirect or consequential damages or losses, including but not limited to loss of income or profit, loss of data and/or loss of opportunities and use.

The total aggregate liability of SERVICE PROVIDER under this Contract shall in no event exceed the price for the order giving rise to a claim.

15. Intellectual Property Rights (IPR)

15.1 General

SERVICE PROVIDER agrees to indemnify and hold CUSTOMER harmless against any claim for an infringement or alleged infringement of any IPR relating to the use of the Scope of Supply delivered under this Contract, provided the Scope of Supply has not been changed by CUSTOMER or by any third Party for which CUSTOMER is responsible without the prior written consent of SERVICE PROVIDER.

SERVICE PROVIDER undertakes to defend at its own expense any claim, suit or proceeding based upon any claim that the Scope of Supply or the use thereof infringes any IPR, property right or pending IPR or property right, and to hold CUSTOMER and its employees and representatives harmless against any cost and liability therefore.

In the event the Scope of Supply or the use of the Scope of Supply under this Contract is held to constitute infringement, and where its use is enjoined, SERVICE PROVIDER will without undue delay at its own option and expense:

i. procure for CUSTOMER the right to continue the use; or

ii. replace or modify the Scope of Supply so that it no longer infringes, while maintaining full compliance with the specifications set out in Annex 01.

Any such replacement or modification shall, however, be approved in advance by CUSTOMER, whose approval shall not be unreasonably withheld. CUSTOMER shall without delay inform SERVICE PROVIDER in writing of any claim that has come to the attention of CUSTOMER. SERVICE PROVIDER shall have sole control of the defence against such actions and of all negotiations for settlement and compromise thereof.

If SERVICE PROVIDER is unable to successfully procure the right to continue the use for CUSTOMER or to replace or modify the Scope of Supply as described in ii. above, SERVICE PROVIDER shall have the right to terminate the Contract upon repayment to CUSTOMER of all payments of any kind made by CUSTOMER to SERVICE PROVIDER under this Contract, less a reasonable amount for use and wear and tear and CUSTOMER's return of the Equipment. Subject to agreement between the Parties the Contract may be terminated partly, with a corresponding obligation on SERVICE PROVIDER to repay only parts of payments made by CUSTOMER to SERVICE PROVIDER under the Contract.

CUSTOMER shall provide all available information necessary to support SERVICE PROVIDER or its subcontractors if they are alleged to have infringed upon a third party's IPR. Such support shall, however, be within reasonable limits, and shall be without expense to CUSTOMER.

15.2 Software License

General

The following license terms shall apply for" CUSTOMER's" use of any software made available by SERVICE PROVIDER hereunder. "Software" shall mean any digital instruction sequences or control data contained on any media, as well as associated documentation used to describe and use the same. The term "Software" shall also include any enhancement, modification, extension, part, portion or expansion thereof or implementation or downloading from network of any of the foregoing, or back-up copies.

Grant of license rights

CUSTOMER is hereby granted a non-exclusive right of use of the Service made available for its own internal business purposes within the scope of the Contract and subject to the particular type of license acquired.

CUSTOMER shall not without the prior written consent of SERVICE PROVIDER (a) modify the Software; (b) transfer or copy the Software except for temporary transfer in the event of computer malfunctions and a single backup or archival copy; (c) remove any trademark, trade name, copyright notice or other proprietary notice from the Software, and the CUSTOMER shall be responsible for the conservation of the same in and on any back-up copy of the Software; (d) disclose or make the Software available to any other party or permit others to use it except "CUSTOMER's employees and agents who use it on "CUSTOMER's" behalf and who have agreed to these license terms, (e) translate, reverse engineer, decompile or disassemble the Software unless otherwise provided for under mandatory laws and regulations; or (f) perform or release benchmarks or other comparisons of the Software. CUSTOMER shall comply with all relevant export control regulations and restrictions of the United States of America and Denmark to assure that the Software shall not be exported/re-exported, directly or indirectly, in violation of the laws of the United States of America and Denmark.

The Software may contain authorisation keys and license control utilities, which may not be modified or made inoperable by CUSTOMER. Authorisation keys may be installed and enabled for use in only one license control utility.

This software license also comprises third party software forming part of the Software delivered hereunder, it being understood that the third party licensors' liabilities for damages relating to such software do not extend to CUSTOMER.

Ownership to the Software shall always remain with the SERVICE PROVIDER and its licensors.

CUSTOMER shall maintain adequate records of the installation and site of the Software and make such records available to SERVICE PROVIDER or the relevant third party licensor at SERVICE PROVIDER's request.

If CUSTOMER materially breaches this software license, SERVICE PROVIDER may, subject to a prior written notice of 5 working days, terminate the license with immediate effect, whereupon CUSTOMER shall discontinue use and return to SERVICE PROVIDER all Software, associated documentation and copies thereof within 10 days.

16. Force Majeure

If an extraordinary situation arises as defined in Annex 00 - Definitions - and the Parties are thereby prevented from fulfilling their obligations under this Contract, the obligations of the Parties shall be suspended for the period during which the extraordinary situation exists.

If one of the Parties is affected by Force Majeure as described above, the other Party shall have the right to cancel the Contract with 14 (fourteen) Days' written notice if the situation lasts for more than 90 (ninety) Days.

Immediately after the coming into existence of a Force Majeure situation which will cause a delay, and immediately after the situation ceases to affect the contractual relationship or the performance of obligations under this Contract, the Party intending to plead Force Majeure shall notify the other Party of the relevant dates. If this is not done, the right to demand a suspension of obligations is forfeited.

No extraordinary situation shall be considered a case of Force Majeure if the Party concerned ought to have been aware of the situation at the time of signing this Contract.

Both Parties shall make all reasonable efforts to mitigate the effects of any delay caused by an event of Force Majeure.

17. Miscellaneous

17.1 No-Waiver

The failure of either Party to insist upon strict adherence to any term or condition of this Contract on any occasion shall not be considered a waiver of any right to insist upon strict adherence to that term or condition or any other term or condition of this Contract.

17.2 Confidential Information

All commercial and/or technical information, data, specifications, drawings, other documents and Software (collectively "the Confidential Information") supplied by a Party hereunder, shall remain the exclusive property of that Party and these terms shall under no circumstances be construed or interpreted as an assignment of present or future intellectual property rights or similar rights to CUSTOMER or visa versa.

A Party shall at all times treat Confidential Information received from the other Party as the other Party's confidential property and shall under no circumstances disclose the same to any third party or use the Confidential Information for any purpose other than that expressly contemplated hereby.

17.3 Language

Training to be provided by SERVICE PROVIDER shall preferably be in the (_____) language.

All notices and other communications between the Parties shall be in the (_____) language.

17.4 Project Management and Organisation

For the continuous supervision of the Parties' performance under this Contract, SERVICE PROVIDER and CUSTOMER shall form joint project groups and other reference groups dependent on the subject to be discussed. The project groups shall meet when decided upon by the Parties preferably at a given frequency, or when required by one of the Parties.

Each Party shall bear all costs for its own representatives. Minutes of all meetings shall be taken by CUSTOMER and signed by one authorised representative of each Party.

The technical project group is authorised to make decisions within the technical scope of the Scope of Supply only. A proposed technical change or correction which may effect prices or any contractual date of delivery, or otherwise influence on any commercial decisions shall be informed in writing to the Parties who may agree in a change or addition to this Contract, see sub clause 9.4 above.

A decision binding on the Parties shall be deemed to have been made only if it is of technical nature and all the representatives of both Parties agree and the decision is contained in duly signed minutes. It is understood that the technical project group shall not be authorised to make decisions that will affect prices or the Contractual Date of Delivery or otherwise decisions resulting in modifications of the Contract.

In the event that any of the representatives deems a question to fall outside the authority or competence of the technical project group, the question shall be referred to the Parties commercial group.

The Parties shall establish a commercial project group - meeting regularly, if so requested by one of the Parties - handling all commercial issues and preparing any Contract modifications.

17.5 Advertising

Each Party must obtain permission from the other Party in advance if he desires to disclose information about the Contract to the public, for advertising purposes or otherwise, beyond citing the delivery as a general reference. SERVICE PROVIDER undertakes to include a similar Article in all sub-contracts.

17.6 Options

The provisions of this Contract shall apply to all options contained herein. CUSTOMER shall during a period of time commencing on the date of the Contract is signed by both parties and identified in Annex 07 (Prices) and Annex 08 (Options) have the right, but not the obligation, to order from SERVICE PROVIDER such optional Equipment and services as are set out in Annex 08 Options. SERVICE PROVIDER undertakes to deliver optional equipment, spare parts, documentation and training ordered in accordance with a time schedule agreed between the Parties.

17.7 Maintenance and Support

SERVICE PROVIDER is obliged upon request of CUSTOMER to offer support and maintenance, Service level agreements as set out in Annex 08 Service Level Agreement.

18. Assignment

Neither Party may assign its rights and obligations hereunder without the prior written consent of the other Party, which shall not be unreasonably withheld.

19. Contract Period

This Contract comes into force when signed by both Parties, and is valid for two (2) from the date of signing,

The Contract may thereafter be renewed successively for periods of 12 - twelve- months at a time, provided the Parties agree of the renewal in writing prior to the expiry of the current period of validity.

Should the Contract cease to be valid and binding on the parties, the Contract's terminations, cancellation or expiry shall not result in any limitation of or have any effect on the Parties liabilities and responsibility for the individual orders placed under this Contract

20. Termination

20.1 General

The contract, may be terminated at any time by 180 – onehundred and eighty - Days written notice from CUSTOMER. Such notice shall specify the effective date of termination and the actions to be taken by SERVICE PROVIDER in connection with the termination. If such termination is not due to SERVICE PROVIDER's material failure to fulfil his obligations, which would entitle CUSTOMER to cancel the Contract, or parts of it, CUSTOMER shall pay the price for all work performed, for material and administration on the amount of work performed under the Contract, and refund any other direct cost incurred to SERVICE PROVIDER due to the termination, deducting amounts previously paid.

21. Cancellation

21.1 General

Either Party may cancel this Contract in its entirety with immediate effect by written notice, if the other Party:

i. has become or has been declared bankrupt or otherwise insolvent, or has entered into liquidation proceedings; or

ii. has entered into composition proceedings with its creditors or has taken any action in furtherance of such proceedings or has disposed or is contemplating disposing of all or a major part of its assets; or

iii. is in material breach of Contract, and fails to cure the breach within a reasonable period of time not exceeding 30 (thirty) days or any agreed extension thereof after having received due written notice; or

iv. has claimed Force Majeure, where such a Force Majeure occurrence is of more than ninety (90) days' duration.

Cancellation shall not apply to Equipment which already have been accepted and/or subjected to commercial use by CUSTOMER according to the Contract.

21.2 Consequences of Cancellation by a Party

Cancellation of this Contract for any reason shall be without prejudice to any rights, liabilities and obligations that may have accrued to either Party hereunder prior to the cancellation.

If SERVICE PROVIDER cancels this Contract in accordance with the provisions of above Article 21.1, except in cases of Force Majeure, all amounts outstanding in respect of the Equipment and services shall be immediately due and payable and SERVICE PROVIDER shall have the right to demand payment of the Equipment set aside and/or ordered by him for the performance of this Contract at the value that can reasonably be attributed to such Equipment.

If CUSTOMER cancels this Contract wholly or partly in accordance with the provisions of the above Article 21.1, except in cases of Force Majeure, CUSTOMER shall be entitled to claim from SERVICE PROVIDER sums up to all amounts paid by CUSTOMER to SERVICE PROVIDER under this Contract prior to the effective date of the cancellation.

21.3 Consequences of Cancellation due to Force Majeure

Cancellation due to Force majeure shall not lead to any claim for compensation by either Party.

22. Applicable Law/Jurisdiction

22.1 Governing Law

The rights and obligations of the Parties under this Contract shall be interpreted in accordance with the laws and jurisprudence of Denmark.

22.2 Compliance with the Law

SERVICE PROVIDER and its employees shall abide by all applicable (_____) laws, regulations and ordinances, and shall obtain from the appropriate authorities all necessary permits, licenses and authorisations required to complete SERVICE PROVIDER's Scope of Supply.

SERVICE PROVIDER shall establish such standards and procedures on "CUSTOMER's" premises as are necessary to comply with regulations governing employment, with special reference to safety regulations issued from time to time by CUSTOMER or any competent authority in (_____) and of which a copy has been provided to .

23. Disputes

If a dispute should arise over the interpretation or legal implications of this Contract, the Parties shall seek to solve the dispute through negotiations.

If the negotiations fail the Parties agree to submit the dispute to arbitration and finally settled under the Rules of Conciliation and Arbitration of the International Chamber of Commerce.

The fact that a dispute has been referred to arbitration does not in itself relieve the Parties from fulfilling their obligations under this Contract.

The venue shall be the Chamber of Commerce in (_____).

24. Notices

All notices and other communication between the Parties regarding this Contract shall be addressed as follows:

For SERVICE PROVIDER:	**For CUSTOMER:**
SERVICE PROVIDER	**CUSTOMER**

25. Signatures

Date: xxxx, 2007	Date: xxxx, 2007
SERVICE PROVIDER	CUSTOMER
……..	…….
Signature in block letters:	Signature in block letters:
……..	……..

This Contract has been issued in two (2) originals - one for each Party.

15. Appendix B: Exploitation Interest Questionnaire

Q1. Are you engaged in commercial exploitation of eu-DOMAIN Yes/No? _____ **If No, Please go to Q2** **If Yes, please answer the following questions:**
Are you interested in providing eu-DOMAIN as a service within your own organisation?
Are you interested in being part of a joint eu-DOMAIN company that may be formed to exploit the results of the project?
Are you interested in exploiting any of the components of the eu-DOMAIN system, e.g. a communications, server or client?
If the opportunity arose would you agree to the sale of the eu-DOMAIN IPR to an interested party?
Please indicate the particular role you would be able to adopt in any of the above exploitation scenarios, e.g. operations management, sales and marketing, technical support etc.
Please indicate if you have access to any funding bodies or agencies who would be able to provide capital to take eu-DOMAIN forward on a commercial basis (please provide details).

Q2: If No, please answer the following questions:
Are you prepared to transfer any interest in the IPR to the other partners? If this is not the case what terms would you require for this?
If you are not interested in commercial exploitation what are you looking for out of eu-DOMAIN?
What do you consider to be the main opportunity for eu-DOMAIN, i.e. what is the commercial model you see as offering the best opportunity (e.g. set up eu-DOMAIN as a direct offering, sell the software as a licence to interested parties, form partnerships with other companies)?
Please indicate any other opportunities or factors you think we should consider.
Are you prepared to transfer any interest in the IPR to the other partners? If this is not the case what terms would you require for this?
If you are not interested in commercial exploitation what are you looking for out of eu-DOMAIN?
What do you consider to be the main opportunity for eu-DOMAIN, i.e. what is the commercial model you see as offering the best opportunity (e.g. set up eu-DOMAIN as a direct offering, sell the software as a licence to interested parties, form partnerships with other companies)?
Please indicate any other opportunities or factors you think we should consider.