Applications relating to health

Fifth research and development framework programme 1998—2002

Final report
April 2004 edition

Information Society Technologies

European Commission

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Applications relating to health

Fifth research and development framework programme 1998—2002

5th Framework Programme:

Information Society Directorate-General
Directorate B – Information Society Technologies: Systems and Services for the Citizen
Unit B1 – Applications relating to Health

Head of Unit:
Jean-Claude Healy

Scientific staff:
Ilias Iakovidis (deputy Head of Unit)
Andreas Lymberis
Diane Whitehouse
Jean-Marie Auger
Octavian Purcarea
Sigurd Von Ingersleben
Silas Olsson
Sofie Norager
Yves Paindaveine
Former scientific staff members involved in FP5 activities
Alphons Vermorken
David Guedj
Frédéric Loeurng
Luciano Beolchi
Marcel Hugen
Mary Fitzgerald
Olavi Luotonen
Peter Fatelnig
Pierrick Fillon
Petra Wilson
Rogelio Segovia

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Foreword

This new edition is the occasion to recall the major contributions and developments in eHealth, which were launched by the European Commission since April 2003.

The Fifth Framework Programme was a key milestone in the last fifteen years of research and development in the use of information and communication technologies for health. The European Commission activities in this field now have two components. The first one is the definition and implementation of a new round of research topics and programmes, which started with the first call of the Sixth Framework Programme. The second one is the support and coordination, at a European level, of the deployment of the results from past research programmes.

On the research side, the first FP6 call for proposals included an opportunity for submissions under the strategic objective eHealth. The evaluation of proposals and the negotiation with the consortia took place between May and December 2003. This strategic objective covered the following three thematic areas: ubiquitous personal health management systems, new reliable software tools supporting health professionals, and biomedical informatics i.e. synergy between medical informatics, bioinformatics and neuroinformatics.

A total of 175 proposals were received, requesting a total grant of €914 million which represented 13 times the available budget. Finally, 20 proposals were selected for funding. The high oversubscription reflects the high level of interest and expectation that is placed on the new eHealth tools for both health professionals and citizens/patients, as well as on the new research domain of biomedical informatics.

On the deployment side the Commission, in collaboration with the Greek Presidency, organised a high level ministerial conference on eHealth on the 22nd and 23rd May 2003 in Brussels, in support of the objectives of the eEurope 2005 Action Plan for Health(*). The Conference, which marked a turning point from the prioritisation of research issues in eHealth to active implementation of the outcomes of that research, provided an important opportunity for Ministers and other key decision-makers to see the full potential of eHealth solutions. The Ministers underlined their support for co-ordinated implementation of eHealth solutions through a Ministerial Declaration on eHealth.

Following this first conference and with the support of the European Commission, the Irish Presidency is organising a high-level conference and exhibition on eHealth, to be held in Cork, Ireland on 5-6 May 2004. The event will identify the eHealth tools and services for citizens currently available, and illustrate how European citizens will benefit from such service provision today and in the years ahead.

In addition, the Commission continues to develop policy in the area of eHealth, and is working to present a complete picture of the different issues involved in the European eHealth Area to the major stakeholders, especially the Member States. This work aims at an accelerated and coherent implementation of the European eHealth Area.

In the last year there was further confirmation that the vision of future healthcare delivery behind the European Commission support to eHealth is being realised. The eHealth area is now mature enough for implementation, and is confirmed as the third pillar of the health industry behind the pharmaceutical industry and the medical equipments industry; from 0.7% of the European healthcare expenditure in 1996, eHealth today represents 2.5% and is expected to reach 5% of this amount within the next five years.

As a conclusion, it can be said that eHealth is growing in policy, scientific and technological importance and that this is now recognised not only throughout Europe but also increasingly worldwide.

Jean-Claude Healy, Brussels, April 2004

Head of Unit
European Commission
Directorate General Information Society - eHealth Unit

(*) eEurope 2005 Action Plan for Health, http://europa.eu.int/information_society/eeurope/ehealth/index_en.htm

Foreword

Our objectives for the Information Society in the European Union are to ensure that Europe's citizens, governments and businesses continue to play a leading role in shaping and participating in the global information society. In this context, the eEurope([1]) action plan drives the understanding, development and uptake of information and communication technologies and their applications within the European Union.

The Information Society Directorate General contributes to these objectives by stimulating research into the development and deployment of new information and communication technologies; establishing and maintaining a framework of regulation and standards designed to generate competition; and stimulating the development of applications and content while supporting initiatives that encourage and enable all European citizens to benefit from, and participate in, the information society.

After four years of research and development of the 5th Framework Programme, information technologies for *applications related to health* have supported citizens, patients and health professionals in their activities, at any time, anywhere. The societal challenges based on the principle of citizen-centred care have been addressed in the 135 projects financed by the 'Applications Relating to Health' Unit for a total of €174 million.

The portfolio of projects has covered a complementary set of activities, ranging from Research and Technological Development to Take-up actions. It has brought together a wide range of researchers, engineers and users from some 750 different organisations spread between industry, with a large participation of small and medium-sized enterprises, and academia, from over 35 countries, building therefore a research community of more than 3500 persons.

This report provides factual information. It will help projects to work better in co-operation and synergy with others in the research programmes and in further stages of implementation and deployment that support regional health authorities. I certainly hope that the eHealth conference to take place on May 22-23, 2003 would be an ideal vehicle for a wide dissemination of the best eHealth solutions across Europe.

This report will also serve as background information for the evaluation and selection of further proposals submitted in response to the first Call for proposals of the 6th Framework Programme of Research and Development.

This report will be updated and re-issued as the projects finish. It is available in printed form and from the Internet Web site for the IST programme([2]).

Erkki Liikanen
European Commissioner
for Enterprise and Information Society

([1]) eEurope *http://europa.eu.int/information_society/eeurope*

([2]) IST Programme *http://www.cordis.lu/ist/ka1/health/*

Table of Contents

1. INTRODUCTION 7

2. THE USER FRIENDLY INFORMATION SOCIETY TECHNOLOGY (IST) PROGRAMME 9

2.1. Building the technology base for the information society 9

2.2. Key action 1: systems and services for the citizens 9

3. 'SOCIETAL NEEDS' APPROACH 11

3.1. Intelligent systems for the health professionals 11

3.2. Intelligent systems for the patients 13

3.3. Intelligent environment for the health of citizens 15

3.4. Common strategic tasks 16

4. SUPPORT TO COMMISSION POLICIES OTHER THAN RTD AND ACTIONS RELEVANT FOR eHEALTH 18

4.1. Public Health and IST 18

4.2. eEurope 18

4.3. eTEN 19

4.4. International dimension 19

5. THE FUTURE: FROM FP5 TO FP6 21

5.1. Implementation and exploitation of research results 21

5.2. Future research activities 22

6. PROJECTS 23

6.1. 'Applications Relating to Health' projects 25

6.2. EUMEDIS projects 151

6.3. Examples of projects managed outside the 'Applications Relating to Health' Unit 157

ANNEX 1 - THE PORTFOLIO OF PROJECTS IN FIGURES 167

Distribution of the EC contribution 169

Geographic distribution of co-ordinating organisations 170

Distribution per country 171

ANNEX 2 - TECHNOLOGY HIGHLIGHTS 173

ANNEX 3 - INDEX OF PARTICIPANTS 179

1. Introduction

The Fifth Framework Programme([3]) for Research, Development and Demonstration (FP5, 1998-2002, allocated funds: €14.96 billion), was approved by the European Parliament and the European Council in 1998.

FP5 had a multi-theme structure, consisting of seven Specific Programmes, of which four are Thematic Programmes:

- Quality of Life and management of living resources;
- User-friendly information society (IST([4]) Programme);
- Competitive and sustainable growth;
- Energy, environment and sustainable development.

Within FP5, the IST Programme focused on research and development activities targeted at '*societal problems and needs*'. The objective was to realise the benefits of the information society for Europe both by accelerating its emergence and by ensuring that the needs of individuals and enterprises are met. The programme's inter-related research objectives focused both the technology developments of the information society and enabled the close articulation between research and policy needed for a coherent and inclusive information society.

The research areas addressed in the IST Programme were organised in four key actions:

- Key action 1: *Systems and services for the citizen*. The aim of this key action was to meet policy and user needs and to ease access at the lowest cost to quality general-purpose services, to boost the industry providing these services and to pave the way to 'digital communities'.
- Key action 2: *New methods of work and electronic commerce*. The aim of this key action was to develop technologies to help companies operate more efficiently and to make commerce in goods and services more efficient and to facilitate improvements in working conditions and the quality of work.
- Key action 3: *Multimedia content and tools*. The aim of this key action was to facilitate lifelong learning, to stimulate creativity, to enable linguistic and cultural diversity and to improve the functionality of future information products and services, taking account of user-friendliness and acceptability.
- Key action 4: *Essential technologies and infrastructures*. The aim of this key action was to promote excellence in the technologies which are crucial to the information society, to speed up their introduction and to broaden their field of application.

Within Key action 1, five priority areas were defined: *applications relating to health*; persons with special needs, including the disabled and the elderly; public administration; environment; and transport and tourism.

Within the area of '*Applications relating to Health*', three main '*societal needs*' have been clearly identified:

- for *health professionals*, the key needs are the optimisation of the human, technical and financial resources allocated to the healthcare systems;
- for *citizens*, the key needs are the requirement to stay healthy and to protect general well being;
- for *patients*, the key needs are to receive the best possible quality of care.

Accordingly, a formal model has been developed depicted as a '*Flower with 3 Petals*' (see figure 1). Each petal is representative of one the three main societal needs described above. In the centre of the flower are elements common to all three groups such as eEurope, info-ethics and legal regulation issues. Common strategic tasks, referred to as 'industrial affairs', include standardisation and certification, as well as implementation and exploitation of research results.

The annual calls for proposals, described in the work programme 1999, 2000, 2001 and 2002, launched through the Official Journal were based on this '*flower with 3 Petals*' model.

Some 750 organisations, mainly from large and small industry, research centres, and universities, from over 35 countries have been involved in a complementary set of activities, ranging from Research and Technological Development to Take-up actions in some 135 projects for a total of €174 million. A detailed statistical description of the projects portfolio structure is given in annex1.

This report concentrates on the projects managed by the 'Applications Relating to Health' Unit of the DG Information Society. In other Units of the same Directorate-General, some 60 projects which had a content or potential applications related to Health have also been financed for a total of about €85 million. Examples of such projects are given in section 6 of this document.

The Fifth Framework Programme is a key milestone in the last ten years of research and development activities

([3]) FP5 *http://www.cordis.lu/fp5/about.htm*

([4]) IST Programme *http://www.cordis.lu/ist/overview.htm*

in the domain of the use of Information and Communication Technologies for health. This research has succeeded in:

– providing useable products (systems, services, instruments);

– providing products that have been successfully evaluated as cost efficient;

– providing products that have been gradually put in place by the regional/national decision makers; and

– establishing a real European health telematics industry with its specific codes of conduct, reimbursement processes, administrative procedures, etc.

It is satisfying to see that the 'Information Society Technologies for health' developed within the framework of the Information Society Programme are the *right technologies* at the *right time*. They provide the *right solutions* to the demands of Member States and applicant countries and enable methods for improving their respective national health systems.

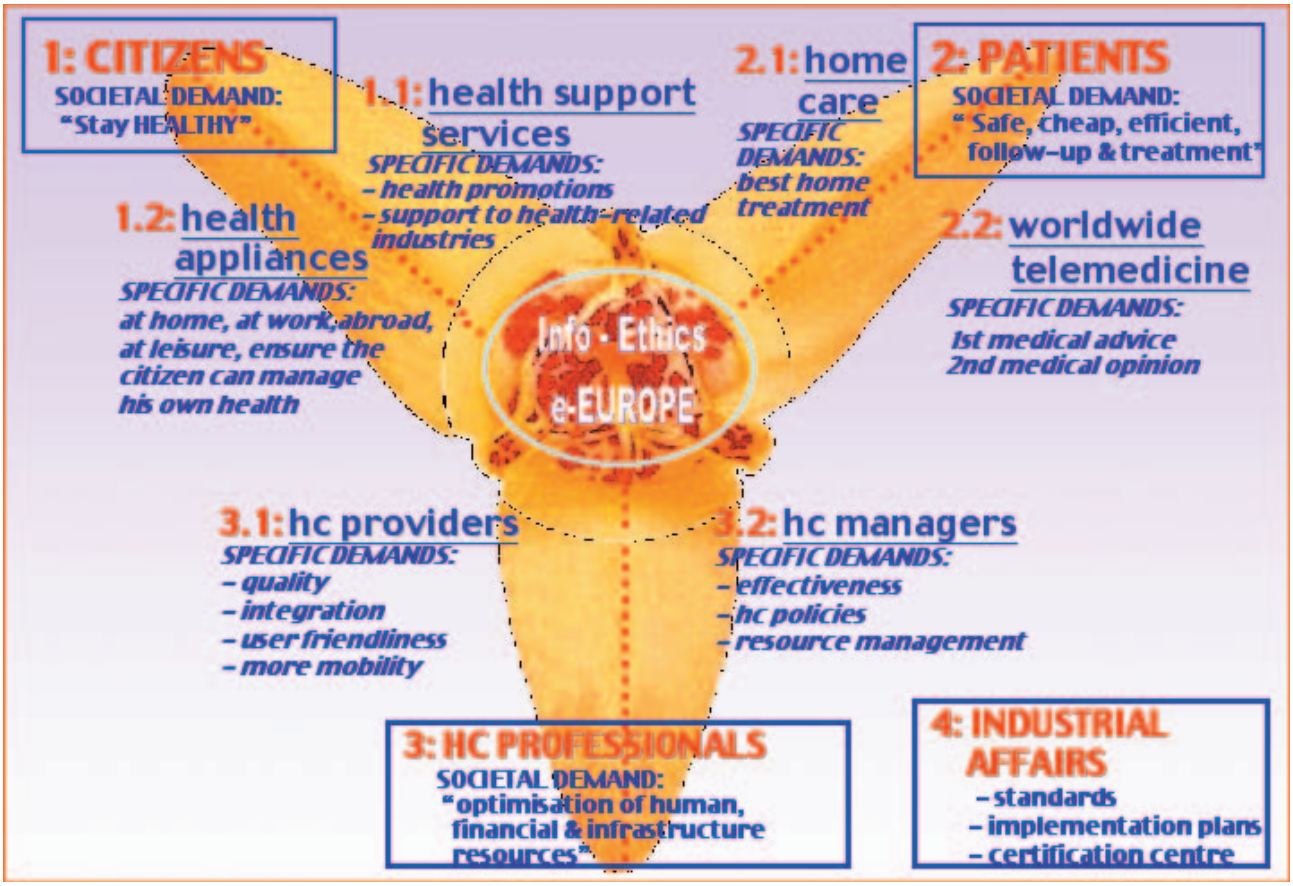


Figure 1. Flower model – translating societal needs into actions

2. The user friendly information society technology (IST) programme

2.1. Building the technology base for the information society

The strategic objective of the IST programme was to increase the benefits for Europe of the Information Society, both by accelerating its emergence and by ensuring that the needs of individuals, businesses and society were met.

Due to tremendous advances in areas such as micro-electronics and broadband Internet technologies, communication and computing are becoming ubiquitous. Progress in human machine interface technology increases the usability of the technology for the citizen and dramatically expands the application domain. An 'ambient intelligence paradigm' - '*having our surroundings act as the interface to a universe of integrated intelligent services*' - that will revolutionise the world in which we live at the beginning of the 21st Century is emerging. Soon all objects whether around us, on us and even in us will be intelligent and able to communicate at our service and to our benefit.

As these changes take place, it must be ensured that the Information Society that is developing is inclusive, for *all*. Key targets for this successful development therefore centred around ubiquity (to allow access anywhere and at anytime to services), user-friendliness, and included the creation of trust and confidence in technology.

The realisation of this vision presented many technical challenges, required intense research co-operation by industry and the research community, and a strong direct linkage between technology development, applications and policy.

2.2. Key action 1: systems and services for the citizens

Guided by this new paradigm, research work carried out under the IST 5th Framework Programme in Key Action 1 'Systems and Services for the Citizen – Applications relating to Health' aimed at researching the technologies and applications that will fuel the future generation of IST systems for Health and their integration into places of work, home and leisure.

Research in the Information Society presents many opportunities to enhance the competitive position of Europe. It will bring major social and economic benefits and will contribute to the quality of life of individuals, whether at home, at work or on the move. On the economic side, the health telematics market is expected to grow from less than 1% of the health expenditure in Europe to some 5% by 2005. This would make it a major industrial sector comparable to the pharmaceutical industry. More significantly, this would be achieved while containing the total cost of health([5]).

Health-related societal demands have been the subject of three successive Eurobarometer surveys in 2000, 2001 and 2002. These demonstrated a steady rise in the rate in Internet connection by general medical practitioners. The 2002 findings showed that Internet connection by medical general practitioners reached an EU average penetration of 78% with 100% connection of general medical practitioners in the UK and 98% in the Nordic countries.

Further analysis of the use of the Internet by general medical practitioners in their professional capacities showed a good level of passive use of the Internet for the purposes of continuing medical education (72%) and reading medical journals (68%). The use of the Internet to deliver patient care would appear to be growing, but still at slower rates, with an average of 48% medical practitioner using an Electronic Health Care Record, 46% using the Internet to transmit patient data to other care providers for the purposes of continuity of care.

A fully interactive use of the Internet to deliver care to patients through the provision of, for example e-mail consultation (12%) or allowing patients to book appointments on line (2%) would appear to be in its very early stages.

Within the domain of Health, emphasis was therefore put on developing technologies for the seamless delivery of the best health care at the point of need. Equally, research explored how IST can help citizens with illness prevention and health promotion.

Other areas within KA1, such as the area of Persons with Special Needs, including the disabled and elderly, concentrated its efforts on developing an inclusive society, in which *all* can participate. In the field of Administrations there was a strong need to focus on smart government, exploring ways in which technology can support direct democracy. The area of Environment researched how IST technology can be used to help manage the environment actively rather than merely monitor changes. In the domain of Transport and Tourism technologies for safety, security, comfort and the provision of efficient means of transport and of infrastructure were key.

([5]) Market Analysis *http://www.cordis.lu/ist/ka1/health/publications/publications_main.htm*

Such research in applications has built on, and was consistent with, past activities in the Telematics Applications Programme([6]) (TAP) that was carried out in the third and fourth Community RTD Framework Programmes. This research is essential for an eEurope that aims to stimulate the broad adoption of such results in society.

([6]) TAP programme *http://www.cordis.lu/telematics/home.html*

3. 'Societal Needs' approach

In order to maximise the impact of the individual projects and the set of projects as a whole, projects have been grouped into three clusters according to the three main user groups and societal needs. Co-operation between these projects within each cluster was strongly encouraged.

The main objective of clustering was to improve the performance of the individual projects in a given cluster by maximising the possibilities for interaction with other projects and stakeholders in the domain.

Specifically the aims of a cluster are to:

- maximise technological, industrial and societal relevance,
- foster standardisation, inter-operability, benchmarking and best practice,
- facilitate assessment and technical validation of results,
- create synergy with national research activities and other European programmes,
- stimulate user awareness,
- identify common dissemination activities and routes for commercialisation,
- stimulate exploitation, and
- identify future RTD requirements.

The following sections outline a description of the clusters and the main focuses of the projects in each of them. For each cluster the importance of the work undertaken and the critical role of research in IST is highlighted. The core text is complemented by boxes in which particular topics are described in more details. Further information on relevant technological topics can be found in Annex2.

3.1. Intelligent systems for the health professionals

This cluster of projects was aimed at assisting health professionals to cope with major challenges, including enhancement of health services provision and continuous learning and training, through innovative, user-friendly, fast and reliable IST technologies and systems.

The main research work of the projects has covered:

- new generations of computerised clinical systems;

Non-invasive and minimally invasive systems

Over the last few years, many changes have occurred in the practice of diagnostic and therapeutic medicine, and in particular in the economics impacting on the use of non-invasive and minimally invasive devices. Non-invasive devices are those devices that provide diagnostic or therapeutic benefits without entering the body except through naturally occurring openings, such as the nose, throat or alimentary system. Minimally invasive devices provide diagnostic or therapeutic benefits with minimal entry into the body.

The trend towards greater use of non-invasive and minimally invasive devices has recently gained further momentum. Most of these devices offer alternatives to traditional procedures, while others offer methods providing additional information or therapy in ways far superior to the previous status quo. The diagnostic portion of this market includes medical imaging equipment, patient monitoring devices and audiological testing devices. Therapeutic and mixed-use devices include lasers, lithotripters, devices for pain suppression and endoscopes.

Patients have benefitted from the use of these devices by feeling less pain or discomfort while experiencing more rapid diagnosis. The result of this more rapid diagnosis allows for the elimination or shortening of hospital stays and often avoids the need for extensive surgery. According to the study 'Trends in Non-invasive and Minimally Invasive Diagnostic Equipment' published by Business Communications Inc. (USA) the total market for non-invasive and minimally invasive devices is poised to top $8.0 billion by 2003.

The research and development of advanced minimally invasive diagnosis and treatment systems in Europe has been greatly supported by the IST programme. The major societal objective is to result in a treatment which is less painful and more cost effective as well as to significantly decrease treatment and waiting time. Various technologies and disciplines are involved in this research and development e.g. image based diagnosis and treatment (e.g. U/S, NMR, CT, brachytherapy), micro-nanosystems, robotics, wireless and satellite communications, virtual reality, Human computer interaction (see box), computer supported collaborative work and decision support analysis.

Future challenges for the group and the sector is to gain visibility in terms of common qualitative and quantitative indicators e.g. (i) clinical indicators (diagnosis: accuracy-specificity, treatment: effectiveness-safety-risk management); (ii) patient indicators (patient acceptance and comfort, cost); and (iii) healthcare management indicators (cost savings, time savings, work flow, physician acceptance, information management, simplification and objectivation of procedures, legacy related subjects and components).

– advanced interactive environments for remote and timely access of available best medical practice and patient's medical files from anywhere;
– collaborative healthcare provision;
– evidence-based medicine;
– systems supporting continuous education.

The added value of the cluster is centred around interoperability, standardisation, clinical validation, awareness and dissemination.

Among the large number of projects regrouped in the cluster, two main thematic sub-clusters have been identified and reached critical mass and visibility:

– Intelligent systems for minimally invasive diagnosis and treatment planning;
– Intelligent systems for mobility of health professionals.

Intelligent systems for minimally invasive diagnosis and treatment planning

Projects in this sub-cluster have developed and validated advanced *Non-invasive and minimally* invasive systems (see box) for diagnosis and treatment of major disease e.g. cancer and heart failure.

The final goal was to reduce invasiveness and increase accuracy and effectiveness of diagnosis and treatment, as well as reduce treatment and waiting time. The outcome is expected to have significant impact on lives saving, but also on the public health domain by reducing health expenses as well as reinforcing the European medical equipment industry.

The projects cover various topics e.g. software visualisation techniques for treatment and surgery planning, like IERAPSI, TELEPLAN and MI3; medical image processing for diagnosis, like ADEQUATE, DYNCT and INTERPRET; decision support system for antibiotics treatment, TREAT; remote diagnosis with robotics, like OTELO; image guided tumours therapy and biopsy, like AMIT and MITTUG; intracorporeal videoprobe for gastrointestinal examination and 'electronic nose' for wound assessment and monitoring, WUNSENS.

The majority of the projects have developed and implemented advanced image processing e.g. 3D imaging, contour detection, co-registration and segmentation algorithms, data fusion and soft copy reading environments. Examples include IERAPSI, MI3, MITTUG, ADEQUATE, SCREEN and SCREEN TRIAL.

Beyond research and development the projects strive to comply with the existing legislation on medical devices, address ethical issues relating to the use of IST and meet the challenges of clinical validation.

Intelligent systems for mobility of health professionals

The projects in this sub-cluster have aimed at enabling health professionals to access remotely the best available medical advice and consult patient medical files whether

Human computer interaction

Some of the leading researchers in this field describe Human Computer Interaction (HCI) as 'a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them' (Hewett, et al([7])). Varying the interpretations of interaction, human, and machine leads to a rich tapestry of possible topics and themes. HCI is a huge interdisciplinary area that is emerging as a speciality concern within several disciplines that include computer science, psychology, sociology and anthropology, industrial design, and ergonomics. Each has its different emphases of topic and orientation. The goal of most HCI work is to provide users with a high degree of usability.

The means by which users interact with computers continues to evolve rapidly. HCI research and development is in the future likely to cover such issues as: ubiquitous communication; high functionality of systems; mass availability of computer graphics; mixed media (handling images; voice; sounds; text; formatted data); high-bandwidth interaction; and a wide diversity of display mechanisms. The increasingly widespread use of computers by health professionals and by citizens and patients who experience a wide range of health conditions is also likely to lead to questions relating to access, accessibility, usability, and design (including design-for-all).

HCI is a contributing element to several eHealth projects; it underpins much of the work that is undertaken. One project that particularly explores this aspect of the design and use of systems is IS4ALL. This project supports the design of products and services that are accessible, usable, and ultimately acceptable by potentially everyone, everywhere, and at any time. It has set up a working group to advance the practice of universal access in the domain of eHealth. This interdisciplinary and collaborative network of experts is consolidating existing knowledge in the eHealth area, translating this information into concrete recommendations in order to demonstrate its validity and applicability.

([7]) 'ACM SIGCHI Curricula for Human-Computer Interaction' by Hewett, *et al*. Copyright © 1992,1996 *http://sigchi.org/*

Advanced mobile and wireless systems for health

Rapid advances in information technology and telecommunications, and in particular mobile and wireless communications, converge towards the emergence of a new type of infostructure that has the potential of supporting a large spectrum of advanced services for healthcare and health. Currently the ICT community produces a great effort to drill down from the vision and the promises of wireless and mobile technologies and provide practical application solutions. Research and development activities include exploration of the use of wireless networking in medical settings, including advanced technologies for data gathering and omnidirectional transfer of vital information.

The ongoing evolution of wireless technology, and mobile device capabilities is changing the way healthcare providers interact with information technologies. The growth and acceptance of mobile information technology at the point of care, coupled with the promise and convenience of data on demand, creates opportunities for enhanced patient care and safety. From wireless Local Area Network healthcare applications to wearable sensors/computing, like EPI-MEDICS, to emergency wireless telemedicine, to remote personal healthcare monitoring, like AMON, and drug delivery, the possibilities are unlimited.

A significant research and development effort has been placed on systems that make use of Personal Digital Assistants (PDA) at point-of-care and agent in a wireless distributed computing environment. This enables access to a myriad of remotely based information systems. From checking medical references to working with electronic medical records systems, a growing number of physicians are making handheld computers part of their daily life. Today, 19% of physicians own personal digital assistants, and that number was expected to exceed 40% in 2000 (Cyber Dialogue Inc., New York).

The development of the areas relating to 'mobile systems and applications for health professional' as well to 'portable and wearable health monitoring' is strongly supported by the European Commission through the IST programme.

In the first area representative projects are MOBI-DEV, mobile devices for healthcare applications; WARD IN HAND, mobile workflow support and information distribution in hospitals via voice operated, wireless networked hand-helds PCs; SMARTIE, smart medical applications repository of tools for informed expert decision; and MEMO, an EU Accompanying Measure for medical mobile devices.

In the second area of portable and wearable health monitoring, EPI-MEDICS, enhanced personal, intelligent and mobile system for early detection and interpretation of cardiological syndromes; AMON, advanced care and alert portable telemedical monitor; LIFEBELT, intelligent wearable device for health monitoring during Pregnancy; WEALTHY, wearable healthcare system; and MOBIHEALTH, mobile health care, are the most representative projects.

from the surgery room, the hospital, the patients' home or site of accident. The work is mainly based on the integration of advanced interfaces (voice recognition, natural language understanding, etc) and novel mobile multimedia workstations with embedded means of communication referred to as *Advanced mobile and wireless systems for health* (See box).

A large part of the research in this sub-cluster has been centred around the development of Medical Digital Assistants and ensuring their interoperability e.g. with respect to information exchange, communication means and application software. Furthermore, work in the domain of Medical Digital Assistants is concerned with the implementation and validation of state-of-the-art speech recognition technologies in specific clinical environments, like WARD IN HAND, the use of natural language understanding systems in health care, like MOBIDEV, evidence based medicine and decision support tools, like SMARTIE.

Finally, projects involving mobile and wireless technologies to support intelligent collaborative environments, like CHILDCARE and TELELOGOS, and patient healthcare, like MOBIHEALTH, are also included in the group. Special consideration is given to the market of Medical Digital Assistants and business models for making a success of these applications; the MEMO project is co-ordinating these activities.

In addition to the above mentioned two sub-clusters of projects, some strategic thematic areas and technologies for the future have been addressed e.g. biomedical informatics, BIOINFOMED and INFOGENMED; Health Grid, like MAMMOGRID; health knowledge infostructure and knowledge management, like HKIS, HEALTH MEMORY and DICTATE; health information networks, like HIN-EUROPE, IHE-E; user-centred models for accessing health information, like IS4ALL; and visual interfaces, like INFACE. It also includes specific support actions to SMEs, like LIFELINGER, INHALE, PHARMDIS-E+ and PRE-HIP, as well as accompanying measures to Health Telematics and Electronic Health Record, like EHTEL, PRO-EHTEL, WIDENET, PRO-ACCESS and WEBLINC, and best practices, such as E-SCOPE and STEMNET.

During the FP5, 75 projects have been financed in this cluster for a total of €76.5 million of European funding.

3.2. Intelligent systems for the patients

A revolution is underway in healthcare. Faced with an ageing population and rapid innovation in medical treatments, healthcare providers are looking for cheaper and more responsive ways of delivering services than through large, centralised institutions. Healthcare services have to be accessible to everyone, at low cost, wherever and whenever they

need them. In many cases this is best achieved through home-based healthcare, which can be both more comfortable and convenient for patients and less costly for healthcare providers.

Hospital treatment is actually the most expensive component of health care. In addition, patients often find prolonged hospital stays distressing. The cluster has aimed to improve patient care by researching technology that will give the opportunity for patients to be treated at home without any reduction in the quality of treatment. This will improve the quality of life of patients and will save on hospital resources. Moreover, research in the cluster aimed to increase the efficiency of health delivery by improving the communication between the many professionals involved in the treatment of a patient, thus leading to 'continuity of care'.

After four centuries of delivering health care in hospitals, industrialised countries are now shifting towards treating patients at the point of need. The 'Intelligent Systems for Patients' cluster was a response to this evolution in health.

Home care can be defined as a component of medical care where patients unable to reach physically a healthcare provider receive evaluation and treatment in their homes or more extensively at the point of need. This concept can have a tremendous impact for healthcare in developing countries, where the close-to-clients concept is one of the major objectives proposed by the World Health Organisation([8]) (WHO) in order to promote and radically improve health in those countries.

([8]) WHO *http://www.who.int*

The cluster was divided into two sub-clusters, one dealing with the delivery of *home care* and the other on fostering *co-operation between health professionals* that delivers such home care. The best interests of the patient were at the heart of all these projects. The participation of patients and family associations was encouraged.

Delivery of home care

The sub-cluster on *delivery of home care* was concerned with telematic environments for monitoring and exchanging information. Personal health systems was also an important feature. These included systems for personal health monitoring, and fixed/portable prevention systems such as advanced sensors, transducers and microsystems. Other possibilities were personal medical advisors able to supervise prevention and treatment, and certified information systems to support health education and awareness (see box).

The project U-R-SAFE has developed a wireless network, using UWB and GSM, to enable patients to move freely both inside and outside their home while being continuously monitored. The project AMON has developed a device, worn on the wrist but linked via GSM to a care centre, for continuous health status monitoring. KARMA2 is a project that has developed a system to coordinate the activities of the many types of carers, both health professionals and family members, who are often involved in the provision of long term chronic care. These are examples of projects in this sub-cluster.

Collaboration between health professionals

The second sub-cluster was concentrating its efforts on improving the *collaboration between health professionals* for better home care delivery. It has touched on several aspects, from drug delivery, like PHARMA, to co-operative work in clinical labs, like D-LAB, and to care at the point of need such as MTM and MOEBIUS. Technologies researched included IST for quality assessment, remote

Home telecare

After many years of research and development in Information and Communications Technologies, it is now feasible to provide a level of clinical care to patients at home comparable to what can be provided in hospitals for the treatment of many illnesses. Many physiological parameters, such as ECG data, blood pressure and oxygen levels, and temperature can be reliably measured outside a hospital environment and sent securely to healthcare professionals, enabling them to remotely monitor a patient's health. The information sent can be either basic data, such as ECG signals, or processed data, such as alarms alerting the clinician that action may be required. The benefits can include an improved quality of life for the patient and their family (as they can convalesce at home in a familiar environment) while needing fewer healthcare resources, such as hospital beds.

Current research is seeking solutions to two types of obstacles preventing more widespread implementation of home telecare: legal/administrative and technical. The legal/administrative problems concern the attribution of clinical responsibility for patients recovering at home, and mechanisms for the reimbursement of treatment costs. The technical challenges include the development of more unobtrusive, mobile, comfortable monitoring devices (eg wearable systems), the development of sensors and treatment devices to cover a wider range of illnesses, and further integration of home telecare systems into mainstream clinical care.

Health promotion and disease prevention

A core group of projects were directly dealing with health promotion and disease prevention and are supported by the ACTIVE-HEALTH cluster. The ACTIVE-HEALTH cluster encompasses: BEPRO, a collaborative environment dedicated to oncology; BODY-LIFE, monitoring system of body composition; HEALTHY-MARKET, a virtual marketplace for healthy nutritional plans; H-LIFE, a personal health assistant; INFO-GENE, an interactive platform for deriving personal genetic information; SALUT, an environment for diagnoses, treatment and prevention of eating disorders; WEIGHT-INFO, a personal information support for weight control; and WRAPIN, a platform for reliable advice to individuals. The ACTIVE-HEALTH cluster aims to enable citizens to implement appropriate lifestyle changes for better health and illness prevention and support information flows between the citizens, the medical (and paramedical) professions and the health-lifestyle industry. The three main axes of action of the cluster are: (i) promoting interoperability of integrated intelligent portable health devices; (ii) developing generic and coherent approaches in the use of IST tools which help reduce risk factors related to lifestyle; and (iii) staging common and coherent dissemination activities.

maintenance of medical equipment and workflow issues in the health chain.

During the FP5, 30 projects have been financed in this cluster for a total of €48.5 million of European funding.

3.3. Intelligent environment for the health of citizens

This cluster of projects was aiming at supporting European citizens to stay healthy by researching IST technologies and systems for health promotion and disease prevention. In particular the cluster targets citizens, including those predisposed to diseases, to respond to risk factors (such as high cholesterol level, high blood pressure or, if appropriate, genetic profile) by actively facilitating lifestyle changes. To illustrate, three out of four Europeans die as a result of cardiovascular diseases or of cancer. Both diseases can be prevented to a significant extent by adopting appropriate lifestyles.

Unfortunately, a number of barriers impede widespread implementation of the relevant lifestyle changes. Examples of these barriers are that relevant information about risk factors or lifestyles is unavailable to the citizens and the food producers or about the products and services to health professionals.

To facilitate the citizen to implement the appropriate lifestyle changes, research in the following areas is needed:

- innovative, secure and portable health systems which will provide personalised health information and guidance at home, at work or on the move;
- health lifestyle related products and services (in domains such as nutrition and physical exercise) that provide/incorporate advice, either embedded or online, from the medical and paramedical professions.

As mentioned above, two diseases are responsible for a vast majority of deaths in Europe, some of which could be avoided through appropriate lifestyle changes. Although both diseases can be prevented with the implementation of almost the same lifestyle, assessment of the effectiveness of the appropriate lifestyle response to cardiovascular diseases can be more easily and quickly performed.

The socio-economic challenge is therefore to reduce the number of avoidable deaths due to cardiovascular diseases. The factors related to lifestyle, which a citizen can act upon, can roughly be categorised into (1) smoking cessation, (2) nutrition, (3) physical exercise, (4) social relationships and (5) environment. Each project had chosen to focus on a particular factor and through the cluster it has been ensured that the technologies and systems developed act in harmony. Within the limit of the cluster budget, it was envisaged to design a skeleton generic enough to accommodate other types of risk factors and a response to them. The expected impact was the ability to use this result as a lever for other health programmes to join in.

Sensors and wearable devices

Other citizen-related projects focussed more on developing sensors and wearable devices to monitor health conditions. Among these projects, ADICOL, wearable device coupling sensor, sugar cycle modelling and insulin pump for diabetic citizens; DROMEAS, monitoring platform for athletes; LIFEBELT, health monitoring during pregnancy; PREVENTIVE, wearable monitoring platform for outdoor sport conditions; and WEALTHY, integrating sensors in textiles. This research topic will be further developed in the FP6 as a research priority of its own.

Security and privacy

Finally, the protection of the personal health information forms an important prerequisite for building confidence of citizens in the use of personal information systems. The use of Open Source software can foster earlier adoption of the needed security techniques and the relevant methodologies of risk assessment (see box).

Provision of health information

The provision of health information to citizens, is among the top three most searched for topics on the Internet, was particularly important during FP5. The citizens search indeed for trustful health information. To that aim, the Commission has published a Communication about the 'quality criteria for health related web sites' (see section 4.2.2). The code of ethics produced by Health on Net (WRAPIN) has been influential in this context. In addition to ACTIVE-HEALTH, other projects also facilitated the access to health information: ASTHMAWEB, a community building platform for chronic diseases; HEALTHSAT, a health interactive satellite channel; PANACEIA-ITV, life style management through interactive TV; and WOMAN II, a network of services for women's health management.

The work performed demonstrated that the provision of personalised health information to the citizen should be mediated through a health professional (assuming the liability) and that viable business models for health-related web sites, while keeping a sufficient independence to build citizen confidence, were still to be found. Interesting progresses were also made in the health knowledge management for citizens, showing that more research was needed in easier and more natural interfaces, in semantics and more globally health knowledge extraction and representation.

Security and privacy issues in eHealth applications

In this context, the projects dealing with building trust and confidence were CORAS, a platform facilitating IT risk analysis; HARP, harmonisation for the security of the web technologies and applications; MEDITRAV, health passports for the European citizen; PRIDEH, privacy enhancing techniques and pseudonymisation and RESHEN, regional secure health networks. The PRIDEH project, through the PRIDEH-GEN cluster, encompasses privacy enhancement in genomic medicine.

Technological advances to implement parts of the recent legal framework, especially electronic signatures, were performed by projects such as HARP or RESHEN:

HARP is a project that meant to provide secure documents, allocating different roles to the persons reading or modifying these documents. The first telemedicine application is clinical trials, which have strict compliance to regulations, such as FDA([9]). Another use is for online electronic patient records.

RESHEN aims at providing interoperable regional health networks in three countries, enabling a full digital management of electronic health records through the use of digital signatures. RESHEN also addressed partially the legal issues in the EU. The most advanced pilot was to be found in Finland with a process re-engineering which allowed health professionals to fully benefit from the introduction of information technologies. Digital archives remain, however, still an issue.

Privacy and identities management are being investigated by two projects: PRIDEH and PRIDEH-GEN. PRIDEH is a take-up measure to foster the use of privacy-enhancing techniques, such as pseudonymisation. A cluster project, PRIDEH-GEN, extends the research performed by PRIDEH to cover privacy-enhancing techniques related to the use of genomic data in electronic health data which would otherwise allow to uniquely identify a person.

See also the more detailed section 'Security and privacy issues in eHealth applications' in Annex2.

([9]) FDA *http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=11&showFR=1*

Open Source software in eHealth

Open Source software is a licensing model which has been made popular by GNU/Linux or Apache. Some projects went beyond the use of Open Source software and actively developed software which they released under an Open Source license: SPIRIT, inventory of Open Source health software and fostering its use; PICNIC, regional health network services; SMARTIE, applications for portable devices, PDA; OpenECG, for ECG standardisation; CORAS, open framework for risk analysis; HARP, security policies embedded in applications.

See also the more detailed section 'Open Source eHealth development' in Annex2.

During the FP5, this activity has financed 29 projects for a total of 48.9 M€ of European funding.

3.4. Common strategic tasks

In parallel with the three petals of the '*Flower*' model, common strategic tasks, referred to as 'industrial affairs' in figure1, have included standardisation and certification, as well as implementation and exploitation of research results.

3.4.1. Standardisation and certification

EU funded projects are expected to adhere to standards and to contribute to the development of European and world-wide standards if relevant. Beyond the standards of the Internet (ISO X. serie, IETF, W3C, OMG([10]), WSI, ...) or the international health informatics standards (HL7, DI-

([10]) OMG *http://www.omg.com/*

COM, CorbaMed, ASTM) or codes for medical data (SNOMED, ICD-9, ICD-10, LOINC, ...), there is a specific technical committee dedicated to health informatics within the CEN: CEN-TC-251([11]). This technical committee (mirrored in ISO as TC215) is composed of 4 working groups.

Working Group I - Information models

Models of electronic healthcare records as well as general message descriptions. Subdivision into task forces for different fields of healthcare e.g. blood transfusion, physiology, pharmacology, psychiatry and nursing.

Working Group II - Terminology and knowledge bases

The semantic organisation of information so as to make it of practical use in the domains of healthcare informatics. The actual work items focuses on interrelationships of concepts and on structures for concepts systems.

Working Group III - Security, safety and quality

Techniques for technical protection of confidentiality, integrity, availability and accountability as well as guidelines for security management.

Working Group IV - Technology for interoperability

Work on middleware and most of the work on medical imaging and multimedia (although the focus in this area is on international standards) and medical device communication in integrated healthcare.

Only one accompanying measure, WIDENET, aims specifically at fostering standardisation of the Electronic Health Records (through the PROREC centres). Other projects such as OpenECG want to achieve similar standardisation in the medical equipment for ECG capture. At this stage, it is nevertheless too early to evaluate the different contributions to standards by the FP5 projects.

3.4.2. Implementation and exploitation of research results

Implementation and exploitation of research results, were supported in the IST programme through projects activities. In particular take up projects - both best practices actions and trial actions - accompanying measures and demonstration projects have focused on these aspects. Other activities such as eEurope (see 4.2) have also supported implementation of research results.

In the field of health promotion and disease prevention, ACTIVE-HEALTH is an accompanying measure which has created a collaborative environment, and focused on improving the medical and business approaches, the generation of trust and confidence for on-line medical data, and the support to interoperability and portability. HIN-EUROPE is another accompanying measure which aimed at providing market information to help all players develop new models of healthcare using ICT. MEMO is an accompanying measure on medical mobile devices. It included the elaboration of business models for making a success of these applications, and dissemination activities. PRO-ACCESS is an accompanying measure aimed at improving the access of associated states to advanced concepts in medical telematics. PROEHTEL is an accompanying measure which aimed at bringing together in a forum the different actors concerned with healthcare delivery and analysed the problems which are inhibiting the development of telematic solutions in healthcare. Finally, WIDENET is an accompanying measure in the domain of Electronic Health Record already mentioned in section 3.4.1).

Among the best practice actions, the following projects can be mentioned: WRAPIN, for on-line reliable advice to patients and citizens; BEPRO, best practices in the field of oncology; IHELP, best practices in electronic remote assistance in the operating room; RESHEN, best practices in secure healthcare information exchange in regional networks; SPIRIT which aimed at accelerating the uptake of healthcare networks through dissemination of open source software solutions; STEMNET, best practices in stem cell donor database.

The following trial actions, the following projects can be mentioned: WOMANII, combination of a web portal and electronic patient record application in the field of women health; DIAFOOT, remote monitoring of diabetic feet; IDEAS, trial implementation of ASP business models in the healthcare domain; MOBIHEALTH is a trial about continuous healthcare over public 2.5 and 3G networks, based on wireless sensors and actuators integrated in a generic Body Area Network; PRIDEH, trial on privacy enhancement in data management in eHealth; SCREEN-TRIAL, screening mammography soft-copy reading trial.

Finally, CHARM is demonstration project on a regional health network which drew on previously funded EU research projects.

All these projects have paid particular attention in creating reproducible and quantifiable evidence demonstrating the importance in terms of quality and efficiency of ehealth systems.

([11]) CEN-TC-251 *http://www.centc251.org/*

4. Support to Commission policies other than RTD and actions relevant for eHealth

One of the strategic objectives of the Fifth Framework Programme was to promote research activities in support to other EU policies. This chapter present the main contributions to other policies of the research activities in the domain of the use of ICT for health.

The period 1998-2002 was characterised by close co-operation with several other Directorates General of the European Commission, notably DG Health and Consumer Protection, Employment and Social Affairs, Enterprise, and Internal Market. This co-operation was facilitated by a joint work in the context of eEurope 2002 and its Health Online chapter.

4.1. Public Health and IST

Public Health is the science and art of preventing diseases, prolonging life and promoting health through organised efforts of society. Public Health includes studies and efforts regarding e.g. health support, preventive measures, as well as assessments and organisation of health care delivery systems.

In 1993 the Commission presented a Communication on the Framework for Action in the Field of Public Health as an initial strategy document to develop work on public health. On this basis, eight action programmes on health promotion, cancer, drug dependence, AIDS and other communicable diseases, health monitoring, rare diseases, accidents and injuries, and pollution-related diseases, were agreed. All of these have now been replaced by the new public health programme.

Challenging areas to tackle with regards to Public Health and eHealth, include IST based support systems for individuals to keep healthy as well as support to individuals who experience chronic diseases and for public health services and institutions to develop the health delivery system for better cost-efficiency, access and quality.

There is a particular concern to promote the use that can be made of information and communication technologies to enhance the health care provision surrounding such diseases as cancer, cardio-vascular disease, metabolic conditions, and diabetes. Just as an example, diabetes is the fourth to fifth leading cause of death in most developed countries, and there are more than 150 million people with diabetes world wide. Telemedicine and eHealth have the potential to reduce the burden of those with diabetes. A number of such projects have been supported by the EU.

For example, the project TOSCA has examined how vascular and eye complications of diabetes mellitus can be avoided by optimising opthamological services through an improved information and communication structure.

Other projects have covered a wider public health brief. Of interest is CHRONIC, which has developed an alternative personal home-based health monitoring system that includes sensors, intelligent devices, and decision support systems. All are connected to a central management centre via interactive TV and the Internet.

Nourishment and healthy eating is a major and growing public health concern, and the EU co-finances a number of projects that concentrate on problems relating to diet: SALUT is a project that has focused on the design of expert systems to provide diagnostic and decision support in relation to the treatment and prevention of eating disorders. While PANACEIA-ITV is another project that aimed to provide a citizen-centred health and lifestyle management - again via the development of interactive television, set-top boxes, and their related programming.

Public health development can be well supported by a type of 5FP project called an accompanying measure. ACTIVE HEALTH is a good example. This project has created a collaborative environment in which there is a general improvement in the trust and confidence of the general public in on-line medical and healthcare data. It aims to enhance the quality of the information offered by health information providers.

Finally, on a more strategic front, TM-ALLIANCE is presenting a vision for a personal medical network - Telemedicine 2010. It has concentrated on developing a wider use of technology developed by and for the European Space Agency in monitoring the health status of citizens in such remote locations as Greenland and Antartica and - even more remotely and just as challenging for the future - in space.

4.2. eEurope

The principle targets of the eEurope 2002 Health Online Chapter were twofold:

- to encourage Member States to set targets for the use of information technologies within healthcare;
- to develop a basis for supporting citizens in identifying high quality health care information on the Internet.

4.2.1. Member States use of ICT for health

In co-operation with High Level Committee on health (Telematics Group) an analysis of the Member States'

plans for the implementation of IT in healthcare service provision was undertaken. It showed that all Member States have adopted detailed plans to implement information technology in the provision of healthcare.

4.2.2. Supporting citizen's use of the Internet

The initiative to support citizens in obtaining good quality health information on the internet was based on the recognition that European citizens are avid consumers of health related information. Accordingly, an action was adopted in the eEurope 2002 Action Plan for the development of a core set of Quality Criteria for Health Related Web Sites

Working on the material developed through a workshop with 60 representatives from government, industry and Non Governmental Organisations as well as an on line public consultation, the Health Online Co-ordination Group, which comprises representatives from Directorates General Information Society, Health and Consumer Protection, Enterprise, Internal Market and Employment and Social Affairs developed a Communication on Quality Criteria for Health related Websites.

The Communication([12]) outlines 6 quality criteria: *transparency and honesty*, *authority*, *privacy and data protection*, *updating of information*, *accountability*, and *accessibility*. It states the need to tailor these criteria according to particular audiences and describes the methods of implementing quality criteria including codes of conduct, self applied codes or quality labels, user guidance tools, filtering tools, and third party quality and accreditation systems.

The Communication invites Member States and national and regional health authorities to implement the quality criteria, develop information campaigns, localise available information, and exchange information on how quality standards are implemented.

As a final conclusion, the Communication notes that within the context of the Information Society activities and as part of the implementation of the European Union *Public Health Programme*, consideration will be given to the possibilities of establishing a system of recognisable Community seals of approval for Internet sites.

4.3. eTEN

eTEN, previously known as the TEN-Telecom([13]) programme, is the European Community Programme designed to help the deployment of telecommunication networks based services (e.services) with a trans-European dimension. It focuses strongly on public services, particularly in areas where Europe has a competitive advantage. The new eTEN Work Programme tries to achieve a strong alignment of eTEN with the goals of eEurope 2005 and to establish eTEN as one of the main instruments in realising the ambitions of eEurope 2005. The eTEN programme finances mainly business validation and service deployment.

The TEN-Telecom and eTEN programmes have financed so far about 25 projects dealing with health. A first group of projects aimed at developing telemedicine services for information to the citizen: CITRON and EUROPANET for psycho-pedagogical assistance; MEDICATE for asthmatic patient home monitoring; MELIC for multimedia health information; TEN-CARE for home care; and TEN-HMS for business assessment of telecare. A second group of projects focused on ubiquitous access to health information for health professionals: AIDMAN and GALENOS using satellite communications for remote areas; C-MONITOR for compliance monitoring; DIADEM for diabetes management; MEDASHIP for medical assistance on board of ships; MEDISIGNAL and MEDSALUS for collaborative working; TELE-REMEDY for congenital heart disease diagnosis; TEN-TELEMED for european-wide telemedicine service organisations; VIRTUS for virtual hospital set-up; EURODONOR for organ transplantation network; EURAD for teleradiology services; and MedContiNet for medical collaboration. Two projects focused on allergy management: IREMMA with a focus on allergy-induced asthma and SPRING for pollen-related allergies. Finally E-MED focused on e-reimbursement and NETC@RDS on health cards.

4.4. International dimension

4.4.1. MEDA - EUMEDIS

The South and East Mediterranean and the Middle East is an area of strategic importance to the European Union. Both the EU Council and the European Commission have identified the area as a key external relations priority for the EU.

The EU's proximity policy towards the Mediterranean region is governed by the Euro-Mediterranean Partnership launched at the 1995 Barcelona Conference between the European Union and its 12 Mediterranean Partners. Policy issues and programming of aid are the responsibility of External Relations Directorate General, while EuropeAid Co-operation Office is managing the projects from identification to evaluation.

The MEDA([14]) programme is the principal financial instrument of the European Union for the implementa-

([12]) COM(2002) 667 from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions (29.11.2002).

([13]) TEN-Telecom *http://www.ten-telecom.org/*

([14]) MEDA *http://europa.eu.int/comm/europeaid/projects/med/fw_medin_en.htm*

tion of the Euro-Mediterranean Partnership. The Programme offers technical and financial support measures to accompany the reform of economic and social structures in the Mediterranean partner countries.

EUMEDIS([15]) is a regional MEDA initiative which aims at developing regional applications with user communities and at delivering immediate benefits for the target user communities. It is an application oriented initiative. One of its objectives is to fund regional pilot information society projects in five sectors of application. Health Care is one of these five sectors where the objective is the deployment of network based solutions to interconnect – using user friendly and affordable solutions – the actors at all levels of the 'health care system' of the Euro-Mediterranean region.

In this context, support has been given by the 'Applications relating to Health' Unit, in managing the scientific evaluation, monitoring and audit of several EUMEDIS projects in the health care sector representing an EU funding of close to €9 million. The administrative and financial management remained under the responsibility of EuropeAid – Co-operation Office. A description of these projects is given in section 6 of this document.

([15]) EUMEDIS *http://www.eumedis.org.dz/*

4.4.2. @lis

@LIS is a programme to reinforce the partnership between Latin America and the European Union. Launched on December 6th 2001, it has a total EU funding of €63.5 million in the area of Information and Communication Technologies. €40 million is dedicated to demonstration projects in four thematic areas of which one is public health. In brief, the objective is to finance projects of Information and Communication Technologies in order to demonstrate their role in the support of public health with local content. A unique call of proposals was finished which has seen the submission of 18 health proposals dealing mainly with emergency, education of health professionals, epidemiological surveillance and information to citizens. Collaboration with other programmes or international organisations was strongly encouraged, such as WHO, ITU([16]), UN ICT Task Force, G8 DOT Force or IADB([17]) 'Programa Piloto de Difusión de Tecnologías de Información en Programas Sociales'.

At the time of publication, the eHealth proposals retained for negotiation are not yet known.

([16]) ITU *http://www.itu.int/ITU-D/treg*

([17]) IADB *http://www.iadb.org/ict4dev/pilotplan/web/html/index_e.html*

5. The future: from FP5 to FP6

The Fifth Framework Programme is a key milestone in the last ten years of research and development activities in the domain of the use of Information and Communication Technologies for health.

Figure 2 illustrates in a synthetic way the past evolution over the last ten years of Research and Technological Development (RTD) activities in the eHealth domain in terms of objectives and approaches as well as in terms of budget and results. It also highlights the future foreseen developments in the domain.

After ten years of research and development, two main avenues are open to us. On one hand, there is a need to deploy and implement the achievements of the past research programmes. One the other hand, a research programme finds its motivation in its capacity to innovate.

5.1. Implementation and exploitation of research results

The final impact of the FP5 projects depends on the extent to which the new knowledge output is translated into commercial products and services, and more broadly will have an impact in areas such as employment, quality of life and environment. At the Programme level, activities to improve commercialisation have been undertaken such as requesting clearer identification of commercialisation in proposals and greater emphasis in evaluation, encouraging Intellectual Property Rights agreements between partners and the elaboration of a Technological Implementation Plan.

In order to better understand how to operate future projects, to increase transparency of EU activities and to provide evidence of the impact and effectiveness of EU funding, an impact assessment of the projects will be undertaken at a project and programme level in the context of the evaluation activity of the Commission. However some time is needed to have exploitable results as many projects are still running and an implementation perspective needs time to be translated into profit, company or job creation. The outcome of the evaluation exercise will be reported in the next edition of this publication.

In this context, a new assessment methodology, developed within the 'Applications relating to Health' Unit, has been proposed([18]). This methodology provides a con-

([18]) Submitted to the 'American Journal of Telemedicine'.

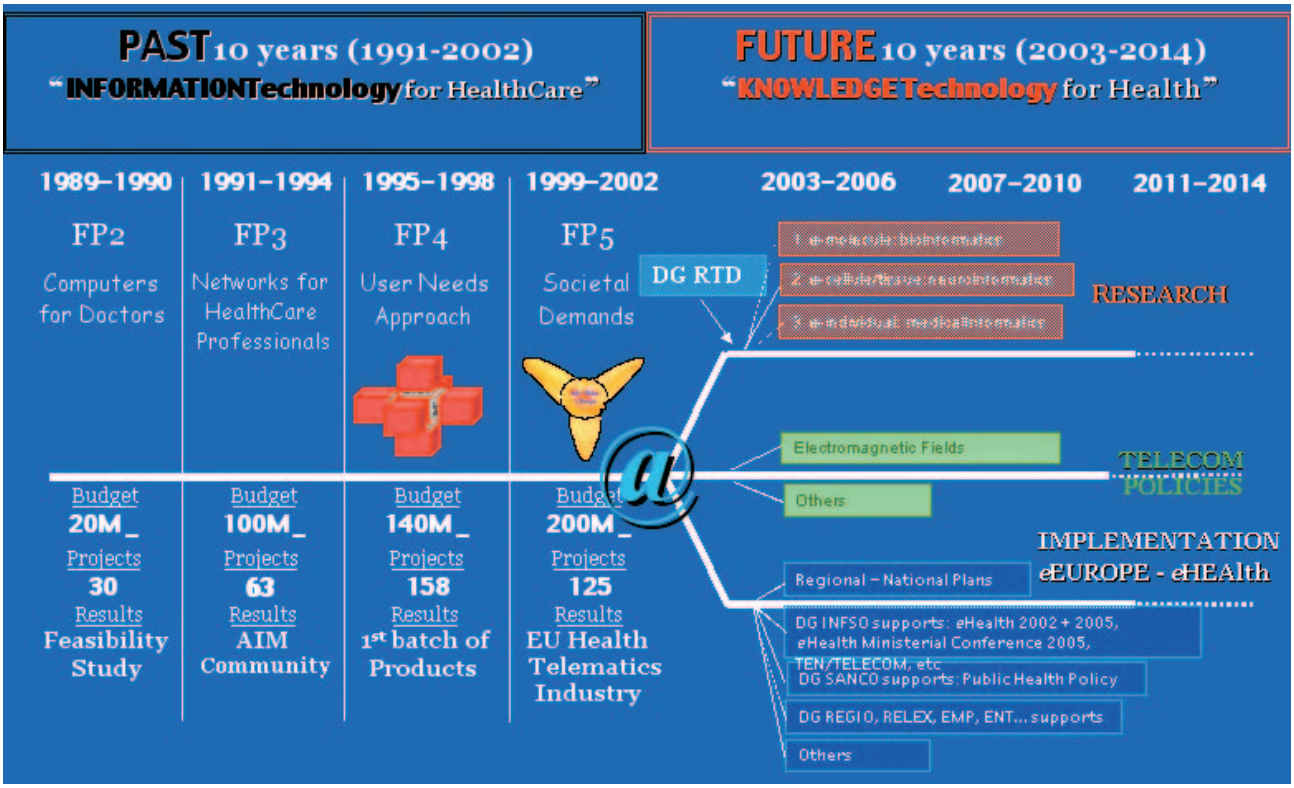


Figure 2. The Fork: Health Telematics RTD Activities

crete basis for the crossover where various visions, interests, needs, dimensions of activity and prospective reflection can meet and articulate. It is based on three complementary quantitative and qualitative criteria – Access, Quality of care and Economic aspects (AQE).

The FP5 eHealth projects impact assessment, based on AQE methodology, combining access to care, quality of care and economic aspects criteria, could help draw a clear picture of the benefits brought by eHealth applications and could provide an answer to the present need to support the wide acceptance of IT health applications by all users, decision-makers, health professionals and citizens.

Research in Europe has so far been largely fragmented and national activities are in general weakly linked to the IST programme. In this context, the Sixth Framework Programme, whose main objective is to contribute to the creation of the European Research Area, will improve significantly the co-ordination and integration of research in Europe.

As already mentioned, technological solutions and methods now exist which can respond to the demands of Member States and applicant countries to improve their respective national health systems.

The competitiveness of the European Union in the domain of Information Technologies for Health will not be maintained without simultaneously creating clear and strong national plans for implementation and additional EU research initiatives.

5.2. Future research activities

In the 6th Framework Programme, the formal model structuring the research activities will be 'Knowledge for Health'. This knowledge is presently shared between:

- the molecular level ('e-molecule', represented by the *bio-informatics* sciences)
- the cellular level ('e-cell', represented by the *neuro-informatics* sciences), and
- the classical medical information level ('e-individual', represented by the medical data in alphanumerical and images).

An important effort, in the next ten years of RTD activities, will be in the combined domain of 'Biomedical Informatics' in order to promote the citizen centred-approach of 'Integrated Intelligent Environment for Health'.

More precisely, research activities in Information Society Technologies for health will focus on intelligent systems aimed at supporting health professionals, at providing patients with personalized health care and information, and at stimulating health promotion and disease prevention in the general population (following the indications already present in the Internal Reflection Group report on 'Major Societal Challenges in the IST Programme', May 2002).

Health professionals need the creation of a 'Health Knowledge Infrastructure', a network of interactive and secure medical and health systems allowing timely interaction with heterogeneous, distributed, medical and other health-related databanks, for decision support, research (including collaborative research among the bio-informatics, neuro-informatics, and health informatics sectors), and continuous on-the-job training of health professionals.

Care for *Patients* requires research to target intelligent *biomedical sensors* and communicating micro- and nano-technologies based on systems which are wearable, implantable or embedded in everyday objects, for health status monitoring and personalised support. These systems together with terrestrial and space-based telemedicine and ehealth systems will improve the quality of care and access to care at the point of need.

Patients require user-friendly technologies such as interactive television, portable or smart wearable healthcare systems, personal monitoring and information systems for the management of health determinants at individual, family, work or community levels.

Such systems should bring quantum leaps in medical therapies and support the efficiency and effectiveness of future health delivery systems. Common to all these groups will be the need for seamless, mobile networks and systems, capable of delivering personalised health information and health status both on the move and in remote and variable locations. Such personalisation could be based on factors such as genetics, habits, environmental issues, background, and education. A strong and active collaboration among bioinformatics, neuroinformatics, and medical informatics is implied and identified under the term 'biomedical informatics'.

In addition to these highly personalised applications, and as indicated by Information Society Technologies Advisory Group, one should give attention to the needs of developing workforce health and safety programmes through bio-metrics, tagging, sensors, self-monitoring, and smart buildings. Examples that research and technological development in this area should cover include mobile applications, open source software, security and trust of information, HealthGRID applications, epharmacology and wearable textiles.

6. Projects

The following pages list all the projects which have been selected within the IST programme on the health theme. They contain research and development projects, accompanying measures (including thematic networks), take-up actions (in the form of trial actions, best-practice actions), subventions (also known as grants) and SME-specific actions (such as the SME exploratory award and CRAFT).

The Exploratory Awards are presented in a very brief way as this type of project has been used for short feasibility studies which do not need to be presented in length.

A presentation of the 5 EUMEDIS projects on health care is also included.

The majority of the projects has been selected according to the action lines in the health area. Some cross-programme projects, however, cover more than the health area and have been selected according to the cross-programme action lines (CPA).

There are IST projects outside the action line in the health area which nevertheless had a component related to health or potential application in the health domain. They have been selected and managed outside the health action line because their main focus or 'centre of gravity' was not health. A few examples of such projects are also presented. This is by no means an exhaustive list.

For each project, additional information can be obtained from the project fact sheets([19]) via the Cordis web-server, via the project web-site if available, or via the contact person.

The projects are sorted in alphabetic order.

([19]) Project fact sheets *http://www.cordis.lu/ist/ka1/ehealth/home.html* and *http://www.cordis.lu/ist/projects.htm*

‘Applications Relating to Health’ Unit Projects

Index of projects sorted by cluster

Intelligent systems for health professionals

ADEQUATE	ICOTEL	MEMO	SME AWARD (EA)
AMIT	ICUST	MI3	STEMNET
BIOINFOMED	IERAPSI	MITTUG	STRESST (EA)
C-CARE	IFG	MITTUG-DEMO	TEAM-HOS
CHILDCARE	IHE-EUROPE	MOBI-DEV	TELELOGOS
CLEANWORLD (EA)	IHELP	MOBIHEALTH	TELE-PLAN
DEVASPIM	IMAGUM	MONITORHEALTHCARE (EA)	TREAT
DEVASPIM (EA)	IMP-ART	NISAN	TTOOL (EA)
DIAPOLE	INFACE	NUCLEO (EA)	USBONE
DICTATE	INFOGENEMED	OHM (EA)	VALIDON (EA)
DOCMEM	INHALE	OPENECG	WARD-IN-HAND
DYNCT	INTERPRET	OTELO	WEBLINC
E-CARE	IR-BOSS (EA)	PHARMDIS-E+	WIDENET
EDISCIM	IS4ALL	PLACEBO	WUNSENS
E-SCOPE	IVP	PRE-HIP	
GLANCE (EA)	JUST	PRO_ACCESS	
HEALTH MEMORY	LIFELINGER	PROEHTEL	
HEARTS	LIQUAMO (EA)	SCREEN	
HIN-EUROPE	MAMMOGRID	SCREEN-TRIAL	
HKIS	MEDINFO	SMARTIE	

Intelligent systems for citizens

ACTIVE-HEALTH	GEMSS	PANACEIA-ITV	SPIRIT
ADICOL	HARP	PICNIC	WEALTHY
ASTHMAWEB	HEALTHSAT	PREVENTIVE	WEIGHT-INFO
BEPRO	HEALTHY-MARKET	PRIDEH	WOMAN II
BIOGRID	H-LIFE	PRIDEH-GEN	WRAPIN
BODYLIFE	INFOGENE	REHAROB	
CORAS	LIFEBELT	RESHEN	
DROMEAS	MEDITRAV	SALUT	

Intelligent systems for patients

@HOME	D-LAB	IDEAS	TELECARE
AMON	EPI-MEDICS	INCA	Telemedicare
CEMAT	E-REMEDY	KARMA2	TOPCARE
CHARM	GAIT	M2DM	TOSCA
CHRONIC	H-CAD	MOEBIUS	U-R-SAFE
CHS	HEALTHMATE	MTM	VEPSY UPDATED
DAPHNE	HOMEY	PARREHA	
DIAFOOT	HUMAN	PHARMA	

TM-ALLIANCE (This project has not been assigned to any of the three clusters)

@HOME

Number: IST-2000-26083

Cluster: Patients

Type of Action: Research

Project Participants:

ATB	UK
FHG/IGD	D
KCL-IOP	UK
NEW VALUE	P
EBIT	I
HITECH	GR
INST. DO CORACAO	P

Contact person:
Dr. Frangou Sophia
King's College London - Institute of Psychiatry
United Kingdom
Tel.: +44 207 848 0903
Fax: +44 207 8480 903
Email: s.frangou@iop.kcl.ac.uk

Project web site:
http://www.at-home-medic.net

Budget:
total cost: 3,179,236 €
EC contribution: 1,885,000 €

Timetable:
start date: 01/Jan/01
duration: 27 months

Keywords:
disease management, telemonitoring, service development

Remote Home Monitoring of Patients

Objectives

The @HOME project aims at the creation of a commercially viable telemedicine platform to supports real-time, wireless, remote monitoring of patients by their doctors. The platform makes use of state of the art technologies from the medical bio-sensors, data management, automated workflow, risk management and telecommunication domains. Collection of patients' vital parameters and medication adherence and their safe transmission to a medical expert is simple and effortless. The program focuses on patients suffering from chronic disease as well as those recovering from hospital treatment and ultimately strives for improvement of patients' Quality of Life.

The direct Benefits to Patients are lower relapse rates, shorter hospitalisations, improved quality of life and better disease management.

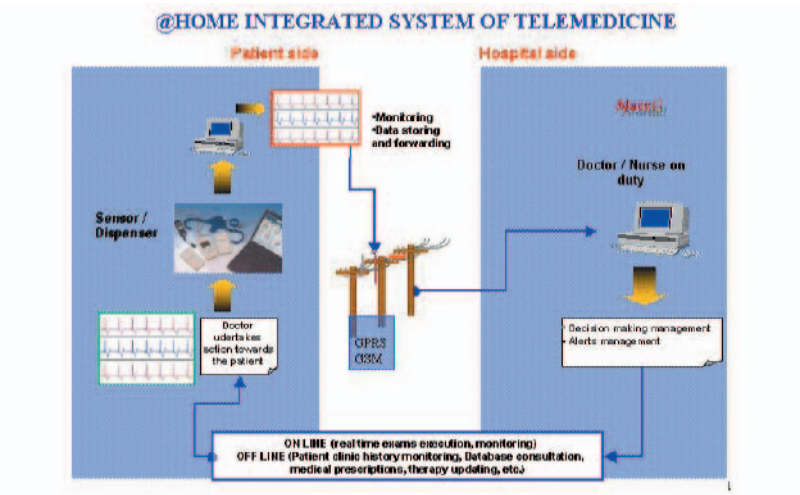
The benefits to Health Services are lower treatment costs per patient, increase capacity for the services and increased cost-effectiveness.

Results

The outline of the @Home platform is as follows:

1. @HOME Wireless Medical Sensors: ECG (3 or 12 lead) measurement, blood pressure measurement, blood oxygen saturation measurement, medication adherence measurement, PDA interface optional, open architecture for future expansion.
2. @HOME Patient Monitoring Module: customised analysis and alarm generation per patient, Bluetooth™ and RadioLink from sensors, GSM/GPRS to Clinic.
3. @HOME Clinic Monitoring Module: medical parameter registration, workflow and risk management, customised analysis and alarm generation per patient, interfaces to doctors over web or with e-mail & GSM, information depository.

The @HOME platform is currently piloted in cardiac and psychiatric patients. Initial results suggest that it can provide a real-life solution for the integration of medical services with telecommunication platforms. It can lower the cost of patient treatment through reduction of hospital use and by monitoring of appropriate use of medication. It is acceptable to patients and carers who value the benefits to their quality of life that the platform provides by its flexibility. The ultimate aim is for ehealthcare services for the citizens provided through the National or Private Health Institutions and centres.



ACTIVE HEALTH

Active Environment for Health Promotion and Disease Prevention

Number: IST-2001-37857

Cluster: Citizens

Type of Action: Accompanying measures

Project Participants:

VITAMIB	F
RSINFO	I
Greengage	UK
ITACA	E
AOP	I
FORTH	GR
P&S	B
NETUNION	CH
HON	CH
ATKO	GR

Contact person:
Mr. Sergio Guillen Barrionuevo
Instituto de Aplicaciones de las Tecnologias de la Informacion y las Comunicaciones Avanzadas - ITACA
Spain
Tel.: +34 96 387 7278
Fax: +34 96 387 7279
Email: sguillen@itaca.upv.es

Project web site:
http://www.active-health.info

Budget:
total cost: 889,268 €
EC contribution: 500,000 €

Timetable:
start date: 01/Sep/2002
duration: 18 months

Keywords:
public health, health promotion, information to citizens, security and privacy, interoperability

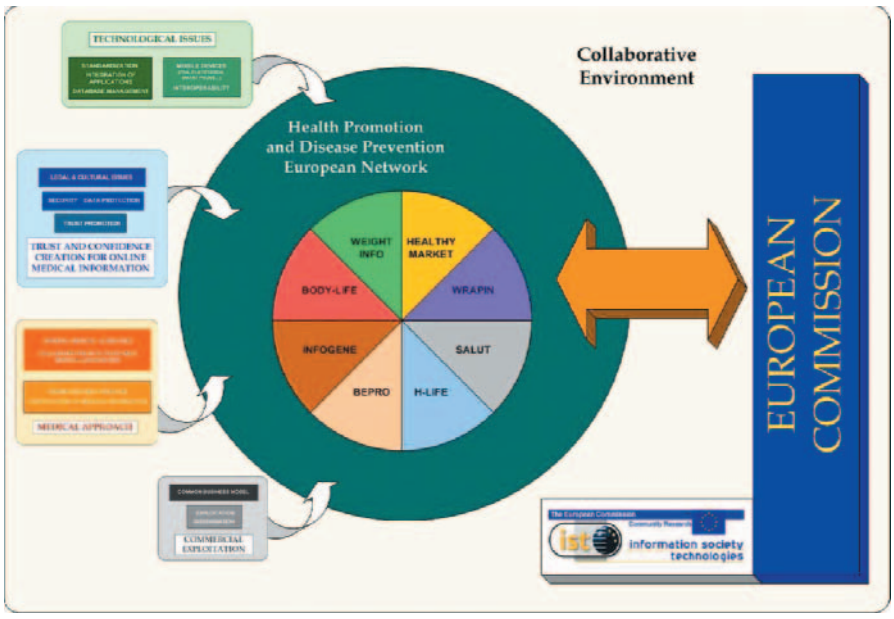
Objectives

The role of IT in Health Promotion and Disease Prevention (HPDP) is to transfer information to individuals or groups and to help them take advantage of that information (advices). Any information flow requires the active participation of people to ensure sharing of meaning and proper use in the activities of the recipient. Information offer has to be both appropriate and acceptable. ACTIVE HEALTH (AH) proposes a global strategy that covers both categories of problems and methods grounded on the management of conversations. AH identifies the components of IT-supported HPDP, links, related problems and interactions. It investigates the specific issues resulting from the use of IT, including the legal, ethical, cultural conditions that have to be fulfilled and the criteria for trustworthiness of information. It proposes recommendations in critical areas and a framework to guide the development of IT applications for HPDP, derived from the expertise of the cluster members, in the perspective of a network creation.

Results

ACTIVE HEALTH will produce (i) guidelines and recommendations for the development of IT-supported HPDP, for a medical framework for HPDP, (ii) research reports on trustworthiness, on legal implications, on ethical issues and on culture-dependent issues, (iii) survey reports on the use of IT in HPDP, for HPDP online services, (iv) terms of reference for the creation of a Network of HPDP and (v) information contents and container as a Project Web site and as a report on the dissemination activities of the cluster.

In this framework, Active Health can help the European Union to fulfil the objectives stressed in the Programme of Community Action in the field of Public Health, covering the next five years, from 2001 to 2006, in certain areas. As a general idea, a cluster on IT systems supporting Health Promotion and Disease Prevention matches directly two of the issues covered in the EU health policies, the health promotion as a way of empowering people and communities to make healthy choices to improve their health and the enhancement of the efforts in tackling the underlying causes of ill health.



ADEQUATE

Assessment and Diagnosis in Echocardiography using Quantitative Techniques

Number: IST-1999-10837

Cluster: Health Professionals

Type of Action: Research

Project Participants:

HGUGM	E
MIRADA	UK
UOXF.DF	UK
ELEKTA	S

Contact person:
Dr. Wilson Max
Mirada Solutions
United Kingdom
Tel.: +44 1865 81 11 25
Fax: +44 1865 724890
Email: max.wilson@mirada-solutions.com

Project web site:
http://mirada-solutions.com/adequate-intro.html

Budget:
total cost: 1,045,468 €
EC contribution: 744,946 €

Timetable:
start date: 01/Mar/00
duration: 30 months

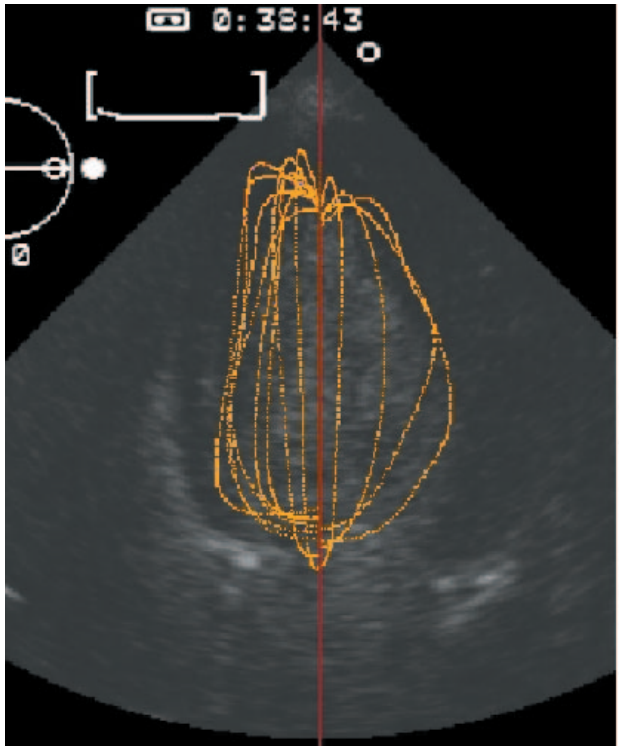
Keywords:
echocardiography, automatic diagnosis, object tracking, ischaemic heart disease

Objectives

The ADEQUATE technological objectives include the development of innovative segmentation and tracking technology for echocardiography in two and three dimensions and the development of novel visualisation tools for ultrasonic imagery. The ADEQUATE system will be validated statistically by comparison with human observers and other imaging techniques (MR/X-Ray angiography). The benefits of ADEQUATE will be demonstrated clinically in the context of stress echo diagnosis of cardiac ischaemia.

Results

The Adequate project brought together the expertise of Mirada Solutions a software start up and the Medical Vision Laboratory of the University of Oxford to design a prototype for the automatic diagnosis of echocardiography data. This involved development of novel algorithms for feature extraction and object tracking in noisy ultrasound images, and their integration in a clinician friendly diagnostic system. The resulting QUAMUS system was tested at the Hospital Gregorio Marañon in Madrid and the University of Oxford Cardiovascular Medicine Department at the John Radcliffe Hospital. Successful results have been obtained from the validation of the system against human scoring of stress echo data, magnetic resonance and on a preliminary study of angiographic findings. The tool has proven to provide reliable quantitative information on cardiac function of great relevance in the diagnosis of ischaemic heart disease. LTU Technologies also joined the project as a subcontractor to explore the use of Content Based Image Retrieval (CBIR) technologies in the analysis and classification of echocardiographic data to explore its application to the tracking and diagnostic problem. Further clinical trials and extension to 3D ultrasound continue.



ADICOL

Advanced Insulin Infusion using a Control Loop

Number: IST-1999-14027

Cluster: Citizens

Type of Action: Research

Project Participants:

FHG/ISIT	D
DMS	CH
UP	I
City	UK
JUDEX	DK
SENSLAB	D
UNI Graz	A

Contact person:
Dr. Dudde Ralf
Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.V.
Germany
Tel.: +49 4821 174212
Fax: +49 4821 174250
Email: dudde@isit.fhg.de

Project web site:
http://www.adicol.org/

Budget:
total cost: 5,156,514 €
EC contribution: 2,505,548 €

Timetable:
start date: 01/Jan/00
duration: 36 months

Keywords:
personal health systems, diabetes, PDA, biosensors, continuous glucose monitoring

Objectives

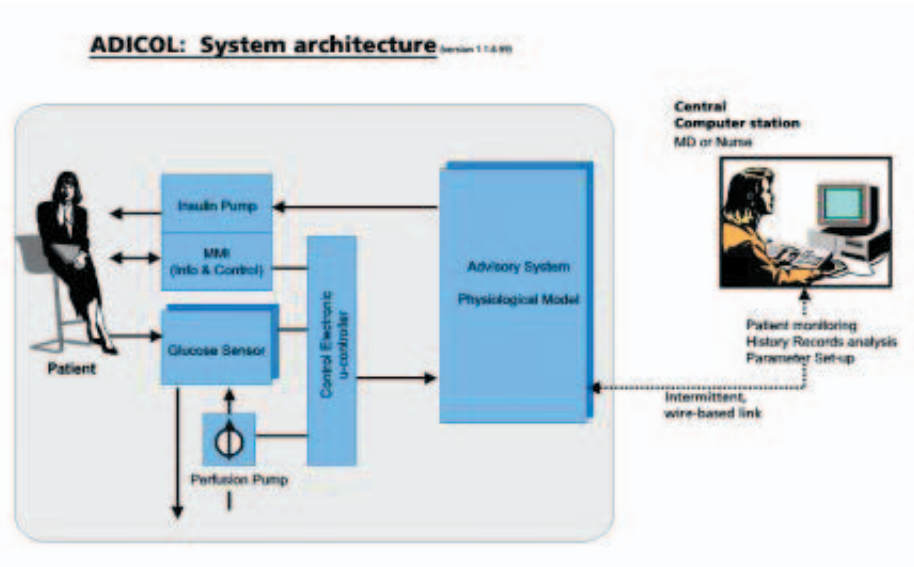
The objective of the project is to considerably improve the personal medication of people suffering from diabetes. One objective is to measure glucose levels continuously over a long period and reliably to improve treatment of insulin dependent diabetes substantially. Better adjustment of insulin dosage reduces significantly diabetes-related complications like eye, kidney and nerve damage. Additionally, data records will produce much better evidence to be used by research institutions for better models and improved statistical evaluations of diabetes and diabetes treatment.

Results

The complete set-up comprises three independent portable devices for the personal diabetes treatment with the following functionality: glucose monitoring (glucose sensor, perfusion pump, control electronic); modelling and computation of insulin infusion (physiological model, advisory system with a backup to a central computer); and finally insulin pump. For convenient wireless communication, RF technology according to the Bluetooth standard is being employed.

Thorough component test under clinical conditions as well as expert system assessments have been undertaken. The original project goal of a system for advanced infusion making use of a continuous glucose measurements has been accomplished. Moreover, the complete functionality for a closed-loop has been developed. During the clinical tests and pilot studies in the clinical centres, the developments were very well received by the patients. According to the patients, progress is desirable and reliable automatic solutions are welcome.

Product development for industrial result exploitation starts once the project has been finished. The highly promising results of the ADICOL project is expected to have major impact on the product specifications targeted to meet user needs with innovative products.



AMIT

Number: IST-1999-11412

Cluster: Health Professionals

Type of Action: Research

Project Participants:

Daum	D
OUH	SF
PHILIPS	SF
ICSTM	UK
Uoulu	SF
ASCENDIA	S

Contact person:
Mr Lasse Jyrkinen
Oulu University Hospital
Finland
Tel.: + 358 40 5408843
Fax: +358 8 3152112
Email: lasse.jyrkinen@oulu.fi

Project web site:
http://www.amit.oulu.fi

Budget:
total cost: 1,508,899 €
EC contribution: 1,162,440 €

Timetable:
start date: 01/Jan/00
duration: 36 months

Keywords:
medical imaging for surgical planning and intervention, minimally invasive systems, magnetic resonance imaging, interventional radiology

Advanced Minimally Invasive Therapy by Using MRI

Objectives

Magnetic resonance imaging (MRI) is the most sensitive non-invasive diagnostics imaging method. Its use is widening towards visualisation of the minimally invasive therapeutic procedures. Some procedures have been done under MRI guidance. However, the current technology has many problems that have to be faced and overcome before MRI can realise its big potential.

The goal of the AMIT (Advanced Minimally Invasive Therapy by Using MRI) project is to focus on the development of the required key technologies. The concrete objectives are:

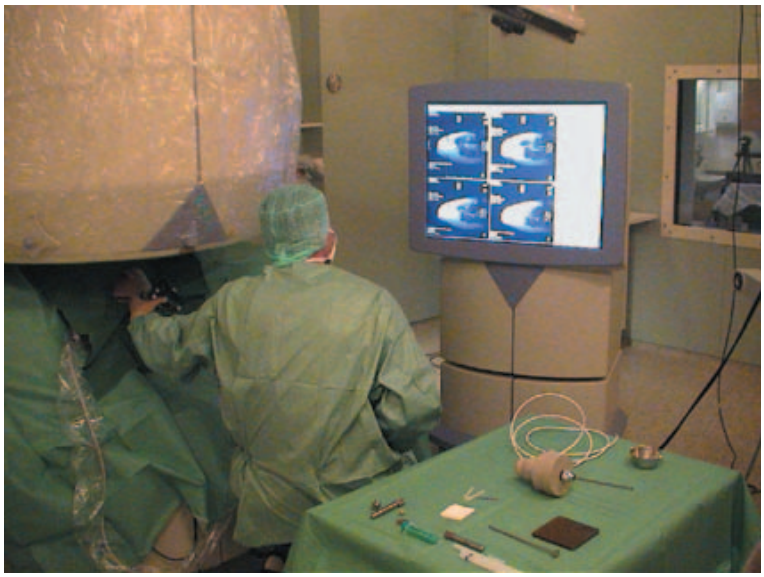
1. to develop more accurate and reliable instrument localisation,
2. to provide more adequate visualisation of the operation by using MRI,
3. to develop more interactive and intuitive user interface that can be used by the interventionists themselves, and
4. to enhance the surgical decision making by joint visualisation of preoperative and intraoperative images.

Results

Project will provide the following concrete key improvements to the current state of the art:

1. more accurate needle tracking technology will allow new and more demanding clinical interventions to be performed,
2. the improved instrument localisation accuracy makes the surgical operations safer and quicker to perform,
3. the needle tracking technology is expected to be less expensive than the currently used navigation systems.

In general, the project will hasten the development of the applications and help reducing the costs of the magnetic resonance imaging guided procedures. We foresee that MRI guided procedures will significantly improve the possibilities of imaging guided therapy in the near future. However, successfully implemented key technologies are required and AMIT project is an answer to that demand.



AMON

Number: IST-2000-25239

Cluster: Patients

Type of Action: Research

Project Participants:

TADIRAN	ISR
MDIRECT	ISR
MOON	UK
AURELIA	I
ETHZ	CH
AoT	CH
SAMU	F

Contact person:
Mr. Shklarski Dror
Tadiran Spectralink Ltd.
Israel
Tel.: +972 3 5573127
Fax: +972 3 5577726
Email: shklarskid@tadspec.com

Project web site:
http://www.medictouch.net/AMON

Budget:
total cost: 3,726,414 €
EC contribution: 1,414,532 €

Timetable:
start date: 01/Jan/01
duration: 27 months

Keywords:
biomedical sensors, wearable medical systems, home telecare, mobility of patients, advanced mobile systems, security and privacy, telemedicine

Advanced care and alert portable telemedical MONitor

Objectives

The main objective of the AMON project is to perform the necessary research, development and validation for an advanced wearable, personal health system. The system is designed to monitor and to evaluate human vital signs using advanced bio-sensors. The Wrist Monitoring Device (WMD), the wearable component of AMON, will gather vital information from the sensors, analyse it using a built-in expert system. The WMD will transmit the data to a remote telemedicine centre, for further analysis and emergency care, using GSM/GPRS cellular infrastructure.

The WMD will include sensors of key parameters such as: heart rate, heart rhythm, 1-lead ECG, blood pressure, O2 blood saturation and skin temperature. Future optional sensors may include: 12 lead ECG, EEG, a non-invasive glucose meter, and respiratory peak flow sensors.

AMON will enable European patients, who are not confined to a hospital, to monitor and continuously analyse their vital signs. This will help them to participate actively in their on-going care. AMON will provide monitoring of health status at the point and time of need, which will give patients the freedom of movement and will enhance their quality of life. AMON will ensure continuity of patient care by providing continuous medical monitoring to them.

Results

The expected results are:

- a Wrist Monitor Device for high-risk patients that is integrated enough to be useful, yet small enough to be wearable,
- an expert system that analyses and diagnoses the condition of the patient and alerts the telemedical centre when there is a need. The algorithms integrate data from different sensors, analyse it, initiate additional measurements, report and alert of abnormal medical conditions that are related to the data integration,
- a cellular data link between the WMD and the telemedical centre taking into account the European legislation and regulation on personal data privacy,
- a user-friendly, multi-lingual interface in the WMD display for easy European-wide use,
- validation of the results in a hospital setting where it is possible to compare the data generated by the AMON personal health system with data generated by hospital measurements.

The main benefit is that the European user will be able to have medical monitoring 24 hours a day 7 days a week, while having a normal life at home, at work and at leisure places.

ASTHMAWEB

Number: IST-2001-33296

Cluster: Citizens

Type of Action: Research

Project Participants:

STRATIS	HU
META	D
MARAC	GR
SSM	CY
ENET	UK

Contact person:
Dr. Glykas Michael
EFA NET (UK) Ltd
Greece
Tel.: +30 977 483370
Fax: +30 210 3894122
Email: mgathens@hotmail.com

Project web site:
http://www.telelogos.gr/asthma

Budget:
total cost: 3,400,001 €
EC contribution: 1,700,000 €

Timetable:
start date: 01/Aug/01
duration: 24 months

Keywords:
asthma care, personal digital assistant for patients, Internet solution for patients and health professionals.

ASTHMA Public Awareness Enhancement and Collaboration Management over the WEB

Objectives

More than 150 million people world-wide live with the burden of asthma, with almost half experiencing symptoms that disrupt their everyday lives. In addition, prevalence is rapidly increasing on a global basis, particularly in children and young adults. Shockingly asthma still claims 180 000 lives each year.

Asthma patients are aware that their condition is a chronic disease with symptoms that vary in severity. They are addressing themselves by adjusting their treatment – either by increasing the use of their reliever or preventer or both. Recent research suggest that patients want to take fewer drugs and use less inhalers to treat their condition. For this reason healthcare professionals need to provide patients with easy to understand, personalised action plans that advise on effective, simple, self management and dosing based on a clear understanding of the patient's attitudes. They also need to monitor patients continuously and act fast on critical conditions.

The ASTHMAWEB project aims at developing an asthma internet site that will bridge the aforementioned gap and be used continuously by both health professionals and patients-caregivers.

The three main objectives of ASTHMAWEB are the following:

- to present information that will increase public awareness and support illness prevention in the causes of asthma,
- to increase the level of asthmatic patient personalised care,
- to develop an Internet server for collaboration through teleconsultation which will be accessed for diagnosis, treatment and groupworking purposes.

Results

The project has already developed the first prototype that contains an asthma care solution for asthma patients and health professionals. Very recently the project finalised the full prototype that includes a more complete internet version and a PDA solution connected to a portable inhaler that allows the patient to get instant measures about its asthma condition. This measurement is sent to the internet server and patient history can be examined by the doctor. The doctor can change treatment plans online and monitor remotely patient behaviour and be informed about critical situations online via alerts.

The project has already developed, marketing, sales and dissemination plans based on the results from a continuous market watch activity which has revealed that ASTHMAWEB is the most innovative remote continuous asthma care solution both in Europe and Internationally.

BEPRO

Number: IST-2000-25252

Cluster: Citizens

Type of Action: Best Practice

Project Participants:

MAXIM	NL
ME-ESSEN	D
SAMBA	F
VITAMIB	F
VARIMED	HU
INFERMED	UK
UJF	F
NKI	NL
MRC	UK
IGR	F

Contact person:
Prof. Brugal Gérard
Université Joseph Fourier,
Grenoble I
France
Tel.: +33 4 7654 9400
Fax: +33 4 7654 9549
Email: gerard.brugal@imag.fr

Project web site:
http://bepro.vitamib.com/

Budget:
total cost: 1,469,150 €
EC contribution: 865,000 €

Timetable:
start date: 01/Jan/01
duration: 18 months

Enabling Best Practices For Oncology

Objectives

The BePrO project fosters appropriation of *communication technologies* to demonstrate their added value for *dissemination of best practice* in medicine.

The medical domain selected for demonstration is *Oncology*. Five influential centres - each at the heart of a Regional, National or European network of cancer specialists - will experiment heterogeneous telematics applications and integrate them within their working environment. The co-operative services to be implemented in the framework of the project will allow medical practitioners to *easily share experience* and to *rapidly reach consensus* as a result of technology appropriation.

Results

The expected results of the project are:

- Inter-application DTDs for XML-based communication candidate to standardisation;
- medical evaluation of the integrated XML communication technology;
- prospective for medical domains other than Oncology (cardiology, dermatology, rheumatology, ...).

It can be anticipated that any medical portal will have, soon or later, to find compatibility with XML/DTD formats which standardisation is not yet completed. Concertation in this domain may save redundancy and efforts among very different projects.

Results will be disseminated to the relevant medical community and will be submitted to standardisation bodies whenever applicable.

The BePrO project deals with data exchange procedures based on XML and DTD kept at the most generic and re-usability levels. Consequently, the project may further collaborate with other projects also dealing with state-of-the-art medical data exchange technologies (involving laptop, PDA, UMTS mobile Phone) connected to medical portal independently of the medical applications concerned.

BIOGRID

Biotechnology Information and Knowledge Grid

Number: IST-2001-38344

Cluster: Citizens

Type of Action: Trial

Project Participants:

RUG	NL
ZRO	NL
City	UK
UCY	CY
MRC	UK

Contact person:
Mr. Stalknecht Bram
ZooRobotics b.v.
Netherlands
Tel.: +31 72 514 3695
Fax: +31 72 514 3546
Email:
Stalknecht@zoorobotics.com

Project web site:
http://www.bio-grid.net

Budget:
total cost: 1,107,467 €
EC contribution: 834,445 €

Timetable:
start date: 01/Sep/2002
duration: 24 months

Keywords:
biomedical informatics, health GRIDs, knowledge visualisation, concept recognition, pattern matching

Objectives

The purpose of the BioGRID project is to conduct a trial for the introduction of a Grid approach in the biotechnology industry. This trial consists of two major steps: (i) the integration of three existing technologies and (ii) the production of a working prototype.

The project is focused at the development of an information and knowledge Grid allowing knowledge discovery and access to multiple types of unstructured data, effectively visualised and accessible in a structured data model.

The existing technologies to be integrated are: PSIMAP: Protein structural domain interaction map; Classification Server for Automatic model classification and; Space Explorer for Knowledge visualisation technology.

This Biotechnology information grid will change the perspective of biologists from a single, partial view of biological data towards a holistic view based on data found in document seamlessly integrated with expression and interaction data to model the whole biological network. This constitutes the basis of a next generation research infrastructure for large proteomics and genomics databases.

The scientific objectives are:

- effective long-term concepts in ontology recognition, pattern matching algorithms, intelligent data sourcing agents and tagging technology;
- algorithms for automated categorisation and tagging in a metadata hierarchy of the specified biotechnology research domain.
- Detailed functional knowledge management interoperability methodology design;
- bio-technology domain knowledge mapping, building a logical domain structure (ontology) required for pattern discovery;
- effective integration of agent, classification logic and visualisation technology

The business objectives are:

- biotechnology information Grid supporting a next generation classification research infrastructure for large proteomics and genomics databases;
- efficient transnational enterprise collaboration at research and drug discovery programmes;
- faster time to market bio-tech innovation.

Developments in this project are targeted at the organisation, classification, management and distribution of unstructured information. This includes the functional imaging of logical structures (hierarchies) of the bio-tech domain (genomic and proteomics data).

Collaborative R&D project teams will be able to use the BioGRID infrastructure in order to work efficient and accelerate life science discovery. The infrastructure platform will have a broad access throughout the EU research and development community, e.g. scientists, developers, students, supporting life science information resources (genomic and proteomics databases, images, high throughput data, taxonomic, biodiversity, internet and intranet content).

Results

The end result is a working prototype of a next generation classification research infrastructure for biotech knowledge interoperability. This consist of an automatic classification in a hierarchy metadata repository, an intelligent agent sourcing system and accessible visualisation user interfaces.

BIOINFOMED

Number: IST-2001-35024

Cluster: Health Professionals

Type of Action: Accompanying measures

Project Participants:
ISC E

Contact person:
Dr. Martin-Sanchez, Fernando
Instituto de Salud Carlos III
Spain
Tel.: +34 91 5097027
Fax: +34 91 5097917
Email: fmartin@isciii.es

Project web site:
http://bioinfomed.isciii.es

Budget:
total cost: 198,000 €
EC contribution: 198,000 €

Timetable:
start date: 01/Mar/2002
duration: 12 months

Keywords:
biomedical informatics, health professionals knowledge, medical informatics, bioinformatics, synergy

Prospective Analysis on the Relationships and Synergy between Medical Informatics and Bioinformatics

Objectives

BIOINFOMED is a study that reviews and outlines some of the main issues related to the role that informatics should play to facilitate the advancement of both the new approaches of genomic medicine and functional genomics research. These new areas promise the development of new diagnostic and therapeutic solutions adapted to the genetic traits of patients and molecular causes of disease.

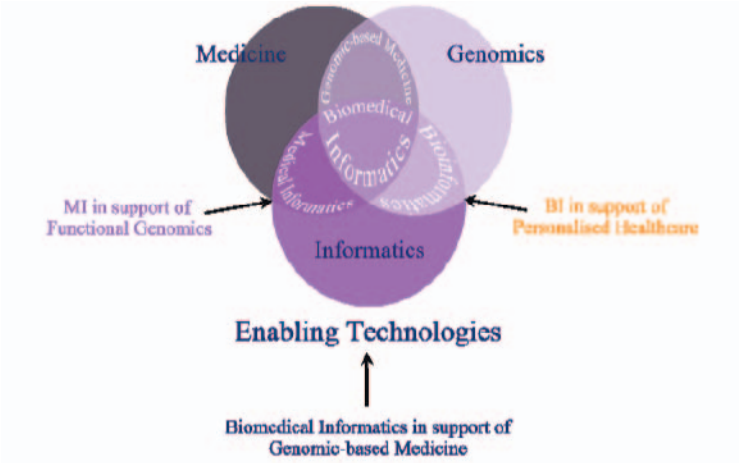
This project is an exploratory study related to the intersection between two areas of great interest in Health Informatics: Medical Informatics and Bioinformatics. The core of the study is to advance in the definition of common areas of interest between these disciplines, identifying which are the opportunities for collaboration, how synergy can be originated, which are the main issues that require further research, and how standardisation can help in the integration of genetic and clinical information.

Results

The project group wrote a questionnaire that was sent to be filled by several experts in the areas of study of the BIOINFOMED project. Thirty of these experts were invited to collaborate in the writing of a White Paper. The 'Instituto de Salud Carlos III' (ISCIII) has coordinated this work. Through our analysis we have seen the potential that both disciplines, Bioinformatics and Medical Informatics, pose for an interaction. Not only do they share many interests, methods and tools but also each presents some complementary needs for the other.

There are still a number of gaps to be bridged for these interactions to take place, therefore a research agenda is proposed for the development of the different areas of synergy. A total of 18 proposed solutions, divided into medical informatics in support of functional genomics, bioinformatics in support of individualised healthcare, biomedical informatics in support of genomic medicine and enabling technologies, were identified and described and each of the lines is given a priority and risk of implementation. The White Paper also mentions the impact foreseen in the different areas of society that will be affected by the integration of genetic and clinical data.

The work group at the ISCIII has co-ordinated a workshop (Valencia, Spain, Nov. 2002) for the presentation of the first draft of the White Paper. We have also created the BIOINFOMED web page where the work carried out by the team is presented.



BODY LIFE

Number: IST-2000-25410

Cluster: Citizens

Type of Action: Research

Project Participants:

ULANC	UK
SOFTEC	I
CNRS DR 01	F
IXTREM	F
ATKO	GR
DIFE	D

Contact person:
Ms. Maria Arabatzoglou
ATKOSoft s.a.
Greece
Tel.: +30 10 6772 500
Fax: +30 10 6772 501
Email: mara@atkosoft.com

Project web site:
http://www.atkosoft.com/bodylife

Budget:
Total cost: 2,950,238 €
EC contribution: 1,786,542 €

Timetable:
Start date: 01/Jan/01
Duration: 36 months

Keywords:
body composition measurements, electromagnetic sensors, information & decision support systems, portable systems, health monitoring, continuity of care, healthy lifestyle.

Intelligent system monitoring the body composition for better healthy life style and illness prevention

Objectives

The first objective is to develop a new generation of flexible belt electromagnetic and/or ultrasonic sensors to monitor body composition, and a friendly user software to provide appropriate representation of the results more attractive and comprehensive for non-expert users (patients and citizens)

The second objective is to validate the new device considering a population of healthy and obese subjects in comparison with different reference methods

The third objective is the development of a medical information software platform having an informatic link with the equipment developed for the body composition for analysing and providing information between doctors and patients.

The fourth objective is to research and realise new, non-invasive and non-hazardous measuring techniques for assessing the composition of the human body.

The fifth objective is the development of a medical knowledge based information system providing medical information, recommendation, best practice in the domain (nutritional, health, sport medicine...), as well as different kind of medical on-line services (tele-medicine, tele-health prevention, publications for health professionals, partnerships ...).

The last objective is to implement a database to correlate body composition data to the health and well being of the subject estimated by other clinical analysis and psychosocial methods (interview), including the benefit or negative impact of different physical exercise programs and lifestyle.

Results

A first version of the equipment using electromagnetic and ultrasonic sensors constructed with user software is available. Demonstration trials on above constructed equipment is completed. Training on the device is under way and validations trials has started. Ethics Committee Agreements with tested population is in place. A software platform for control of the acquisition signal of the device, display of data to the user, and their local storage is available. The design of the integrated body composition monitoring equipment (cubical) included EMT and a camera system still needs further development. The medical knowledge based information system functional specifications is in place and a first mock up of the system is under development. Finally, the draft functional specifications of the database are available.

C-Care

Number: IST-1999-10217

Cluster: Health Professionals

Type of Action: Research

Project Participants:

KAVA	B
Telepolis	B
MB	B
Progea	I
CNR	I
Olisan	I
Reglom	I
SEMG	I
Stacks	E
HIM sa	B
ENGISAN	I
Intrasoft	L
DATMO	B

Contact person:
Mr. d'Angelantonio Marco
Health Information Management sa
Belgium
Tel.: +32 475 34 11 38
Fax: +32 2 738 81 13
Email: mdange@attglobal.net

Project web site:
http://www.telepolis.be/c-care

Budget:
total cost: 2,689,690 €
EC contribution: 1,360,701 €

Timetable:
start date: 01/Jan/00
duration: 30 months

Keywords:
eHealth networks and architectures, health promotion, continuous care, ubiquitous access to care, appropriateness of care.

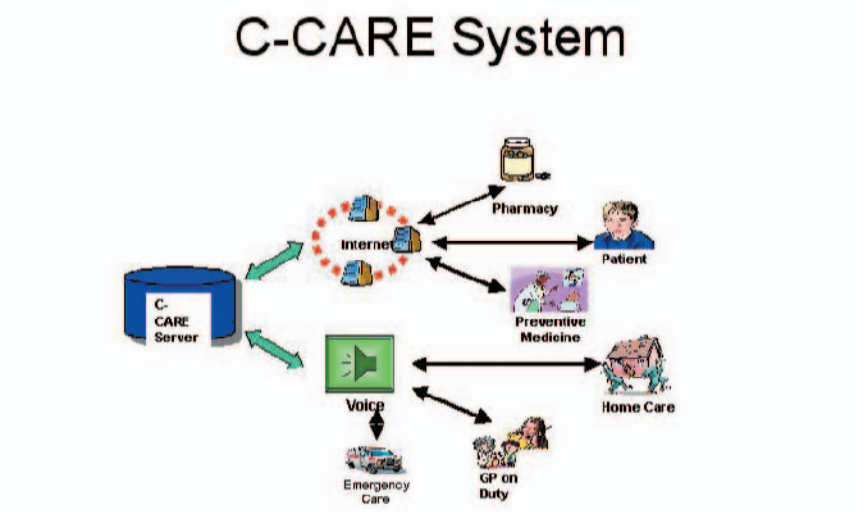
Continuous Care

Objectives

The main objective of C-CARE was to enhance the quality of life of European citizens, through improved care appropriateness in unpredicted and emergency situations, by ensuring that essential medical data are always available to authorised healthcare professionals. In order to achieve such goals, C-CARE has developed tools able to support the continuity of care by collecting and storing essential, relevant and up-to-date patient health-related information accessible to authorised users, any time anywhere (e.g. from the patient's home, from a vehicle on the road or from a hospital emergency department). C-CARE has thus created a set of tools and a service which substantially contribute to enhance appropriateness and therefore overall the Quality of Care and, through the latter, Quality of Life of European citizens. which is an essential element of Quality of Life in general. Beside In addition this C-CARE has proved its value also plays a role in the promotion of the following EU strategies: the improvement of employment competitiveness of European SMEs, the improvement of work processes and the improvement of research knowledge through use of state-of-the-art technologies in new application areas.

Results

C-CARE has developed, implemented and validated the prototype of the service. Three servers are currently operational and clinical patients' data have been uploaded in reasonably large numbers (almost 9,000 patient in Belgium, 1,500 in Spain, 150 in Italy). Data are retrieved at a good rate (over 100 inquiries a week for Belgium and from 50 to 80 inquiries a day for Spain). Due to these initial figures, in the long run, we are confident C-CARE will help reduce expenditure on healthcare, especially in terms of those technical examinations patients entering an emergency department today have to undergo to determine the patient's medical condition/status. As a matter of fact, a significant percentage of these tests are needed simply because of the total lack of information at the time a patient is admitted. C-CARE renders this up-to-date information (patient health status – allergies – contra-indications…) available at a single place, accessible by authorised healthcare professionals and patients. Once the C-CARE service will be fully operational, the avoidance of unnecessary and/or duplicated tests will have an immediate impact on the healthcare budget and will allow to re-direct the financial resources currently deployed for these tests towards medical and IST research which, in turn, would provide further benefits to European citizens.



CEMAT

Number: IST-2001-33389

Cluster: Patients

Type of Action: Research

Project Participants:

MOULINEX	F
MOULINEX ESPANA	E
GERATHERM	D
IMHE	D
SILWAY	F
SSC	BG
A.T.C.	B

Contact person:
Dr. Frank Gert
Geratherm Medical AG
Germany
Tel.: +49 63 5796 4083
Fax: +49 63 5796 4031
Email: info@geratherm.com

Budget:
total cost: 2,899,500 €
EC contribution: 1,468,323 €

Timetable:
start date: 01/Sep/01
duration: 30
Terminated

Contactless Environment for Medical Advanced Telediagnose

Objectives

The public health services are confronted with an increasing problem: maintain a high quality level of care delivered in central hospitals and widen it to a scattered population, which asks to benefit from by equity. In this context, deteriorated by the increase of the life expectation and the number of persons with reduced mobility, two axes turn out particularly promising: the electronic surveillance (to develop maintaining patients at home and the remote diagnosis (to reduce intervention costs). These challenge proceeds by large-scale development and low-cost production of instruments of measure and remote control of the physiological parameters. These should be simple, reliable and convivial to guarantee their acceptance, their use and finally their success.

CEMAT will develop new medical applications for temperature monitoring in the field of telediagnosis and telemedicine. These are based on two developments: an innovative methodology for over-skin temperature measurements and a teleplatform for contactless measurements and teletransmission of physiological parameters that supports medical requirement and patient comfort. These developments are driven by medical and people needs in Europe.

CHARM

Comprehensive Health Assistance and Resource Management

Number: IST-2000-25389

Cluster: Patients

Type of Action: Demonstration

Project Participants:

CUP 2000	I
AZOV	I
SYSLINE	I
ASL3	I
SMS IT	I
ICS	E
C.S.C.	E
ALAMO	E
NEHB	IRL
REGLOM	I
HIM SA	B
TSD	I
OMEGA	I

Contact person:
Ms. Fiori Carla
CUP 2000 srl.
Italy
Tel.: +39 051 276 511
Fax: +39 051 237 016
Email: carla.fiori@cup2000.it

Project web site:
http://www.charm.cup2000.it

Budget:
total cost: 2,760,272 €
EC contribution: 966,071 €

Timetable:
start date: 01/Jan/01
duration: 26 months

Keywords:
public health, information to citizens, health accessibility, Regional healthcare networks, integration of existing standalone applications

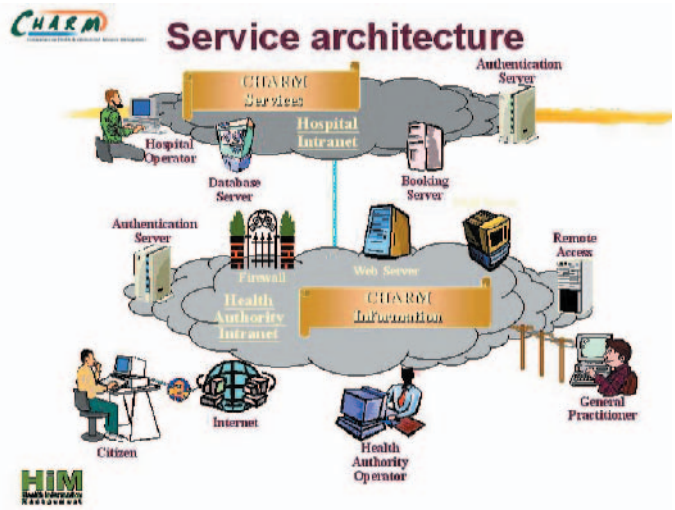
Comprehensive Health Assistance and Resource Management

Objective

The European context is currently experiencing a high atomisation of regional healthcare providers and this leads to several difficulties in the communication with the patients. To tackle this issue, new models of health care are emerging to boost and enhance the co-operation among the patients and the different health agents involved. CHARM aims to develop an innovative approach to offer to citizens a global view of healthcare and social services in their region, cutting across the barriers between the healthcare and the social sector, and the internal fragmentation of each of these sectors. Through CHARM, citizens will be guided through the complex organisation of healthcare and social services to find an adequate answer to their needs. Stand-alone applications working independently from one another will be enabled to co-operate through the network and to provide a solution to the demand for swift and smooth information flow among different organisations caring for the same citizen. Moreover CHARM, by helping a representative group of European regions to converge towards a uniform level of services to citizens thus offering similar environments as regard healthcare and social environments, will facilitate indirectly the freedom of movement of European citizens within the Union. By bringing together partners from different sectors and different countries, CHARM encourages multinational co-operation of public administrations and industrial companies, so it also stimulates social and economic integration within the Union. As regard to the IST goals, CHARM promises an optimisation in the usage of healthcare and social resources to achieve a noticeable impact not only on direct healthcare and social assistance costs, but also on hidden or consequential costs caused by unnecessary bottlenecks in the information flow.

Results

As a matter of fact the attitude of citizens towards the medical service offering is taking on the connotation of a competent consumer, who wants to compare what it is on offer before deciding where to go and whom to entrust with his/her health. The only way to guarantee such demand is through Regional Health Care Networks which are permanently fed by health care providers with information about the waiting list for the various medical services. As final output CHARM will thus implement four operational regional networks, in three EU countries, able to encompass both the social and healthcare sectors and to give a precise answer to a clear citizens' demand.



CHILDCARE

Number: IST-2001-33383

Cluster: Health Professionals

Type of Action: Research

Project Participants:

ATLANTE	E
IDS SCHEER	D
HMC	ISR
MHMC	UK
AUSLM	I
EMPHASIS	GR
VIS	CY
UOI	GR
UHI-PAED	GR

Contact person:
Mr. De Teresa Jorge
Indra Sistemas S.A.
Spain
Tel.: +34 91 480 95 10
Fax: +34 91 480 95 55
Email: jdeteresa@indra.es

Project web site:
http://www.childcare-eu.com

Budget:
total cost: 3,570,001 €
EC contribution: 2,025,000 €

Timetable:
start date: 01/Sep/01
duration: 24 months

Keywords:
home telecare, telemedicine, collaborative platform, child's health status monitoring, collaborative services

Intelligent collaborative environment for out-of-hospital children healthcare

Objectives

The goal of the CHILDCARE project is to introduce an ample system for collaborative work of health professionals, which is designed to promote national and international collaboration in order to improve home care of children, especially those with chronic health problems. The system will also allow medical follow-up of new-borns, while at the same time facilitating access to best medical practice regardless of the child's location.

The aim is to develop an Intelligent Collaborative Healthcare Platform to facilitate and improve communication and co-operation between parents, paediatricians and other health professionals, through telecommunication and collaborative tools, reducing unnecessary visits to the hospital and doctors. CHILDCARE will also provide a continuous updated monitoring of the child's medical records accessible world-wide and from different access devices.

CHILDCARE concentrates in bringing together telemedicine sessions and collaboration services and enhance this combination with intelligent features such as knowledge management techniques, data retrieval and multifunctional interfaces.

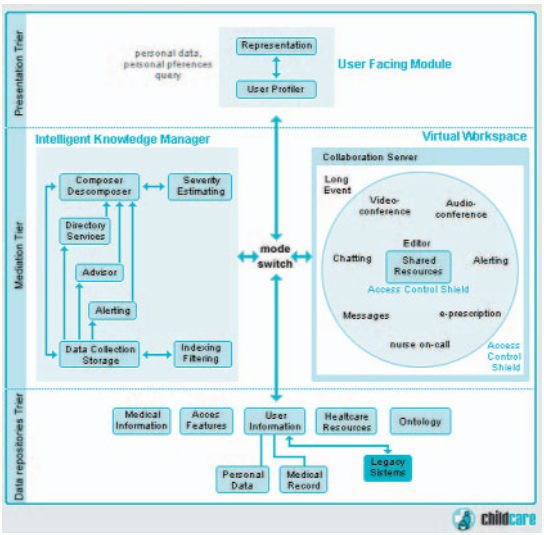
CHILDCARE is conceived as a system for helping parents to monitor the child's medical condition. Its intelligent features, such as the alerting system, will allow parents to develop better control and awareness in the treatment and monitoring of their child's health care.

Results

The demand for improved healthcare is world-wide, and growing rapidly. A significant part of that demand can be met using telemedicine expertise, services and products developed with the aim to improve quality of life for the European citizens.

CHILDCARE system supports continuity of care, because its services are available regardless the distance to the care system and the time when access is necessary. Therefore CHILDCARE system will be especially useful for those families with children suffering from chronic health problems living far from the medical facilities. The system will allow them to monitor the child's health at home and avoid unnecessary periodic visits to the doctor, saving money, time and uncomfortable travelling.

The CHILDCARE project aims at contributing to the economic development of the Community by exploiting the potential of the new generation intelligent technology solutions. This approach will create enormous opportunities for manufacturers and service providers in the healthcare industry, by enabling them to enhance their traditional offerings and exploit entirely new market spaces.



CHRONIC

An Information Capture and Processing Environment for Chronic Patients in the Information Society

Number: IST-1999-12158

Cluster: Patients

Type of Action: Research

Project Participants:

ALAMO	E
TmW	E
UB	E
C.S.C.	E
CESTEL	E
UPM	E
CSIC	E
SMS-IT	I
ICP	I
MC	I
TILAB	I
KUL	B
EW	F

Contact person:
Dr. Roca Josep
Corporació Sanitària Clínic
Spain
Tel.: +34 93 227 5540
Fax: +34 93 227 5455
Email: jroca@clinic.ub.es

Project web site:
http://www.chronic.cestel.es

Budget:
total cost: 3,378,722 €
EC contribution: 1,881,848 €

Timetable:
start date: 01/Jan/00
duration: 36 months

Keywords:
home telecare, continuum of care, chronic care model, distributed health care provision, telemedicine.

Objectives

The current difficulties for a wider deployment of telemedicine services are in their coupling to proper models of health care provision. The CHRONIC project focuses on establishing the balance between organisational issues and technological resources in the frame of a continuum of care health model for patients suffering from chronic conditions. The CHRONIC Integrated Care Platform consists of a health care provision model that uses information and communication technologies to support care activities.

The health care model is based on a comprehensive home care approach of the management of chronic patients. Under this approach CHRONIC is not conceived as an alternative to hospital based services; rather it is seen as a part of a continuum of care within a regional healthcare network. Thus, the model emphasises the relationships across healthcare levels (primary care, hospitals, social institutions, etc..).

The CHRONIC technology includes the following components:

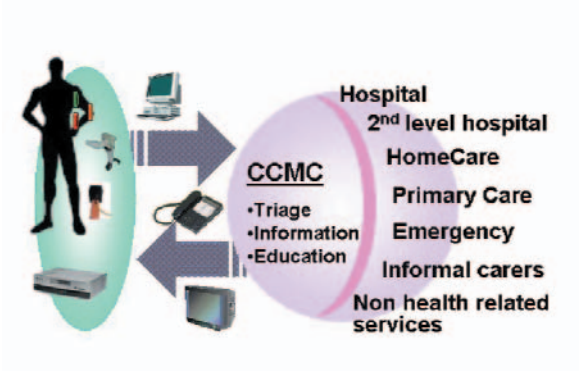
- Chronic Care Management Centre: The real core of the system, allows co-ordination of the different actors, centres and tasks..
- Home patient unit or Home hub, featuring monitoring of vital signs, videoconference services and access to educational material.
- Sensors for remote monitoring, connected either to patient's unit or to the portable one. Currently the system incorporates sensors for the respiratory function, ECG and pulse.
- Portable units: Portable PC's used by health professional to support home care visits.

Results

The CHRONIC Integrated Care Platform has been successfully validated in patients with chronic diseases (respiratory, cardiac and neurological conditions). Technical feasibility has been demonstrated and the pilot studies performed have shown clinical improvements and economic savings. Tele-collaboration among professionals working at different health care levels has proved to be efficient and clusters of risk factors defining patterns of care have been identified.

These results enable health care organisations to take advantage of information technologies as a key supporting tool in the transition to new models of health care for chronic patients, as recently proposed by the Word Health Organisation.

Furthermore, the Integrated Care Platform can also be used in other scenarios: acute patients after surgery, patients requiring regular monitoring of treatment, oncology, etc… The system can also evolve as a platform to support knowledge management tools useful for the development of new methods for continuous professional development required to face the rapidly evolving requirements of health care.



CHS

Distance information technologies for home care

Number: IST-1999-13352

Cluster: Patients

Type of Action: Research

Project Participants:

AT	I
AUTH	GR
UNI REGENSBOURG	D
CATAI	E
POULIADIS	GR
DIST	I
BAUMER-CURAVITA	D
AMD	USA
CARDGUARD	ISR
PHILIPS	I

Contact person:
Ms. della Torre Elena
Philips Medical Systems
Italy
Tel.: +39 039 203 6564
Fax: +39 039 241 9476
Email:
elena.della-torre@philips.com

Project web site:
http://lomiweb.med.auth.gr/chs/

Budget:
total cost: 2,874,392 €
EC contribution: 1,784,656 €

Timetable:
start date: 01/Jan/00
duration: 42 months

Keywords:
home telecare, telemedicine, teleconsultation, telemonitoring, educational messages.

Objectives

CHS develops a new generation of telemedicine services for home care that improves quality of health care and creates a large new IT market by involving every single home and every single health care provider.

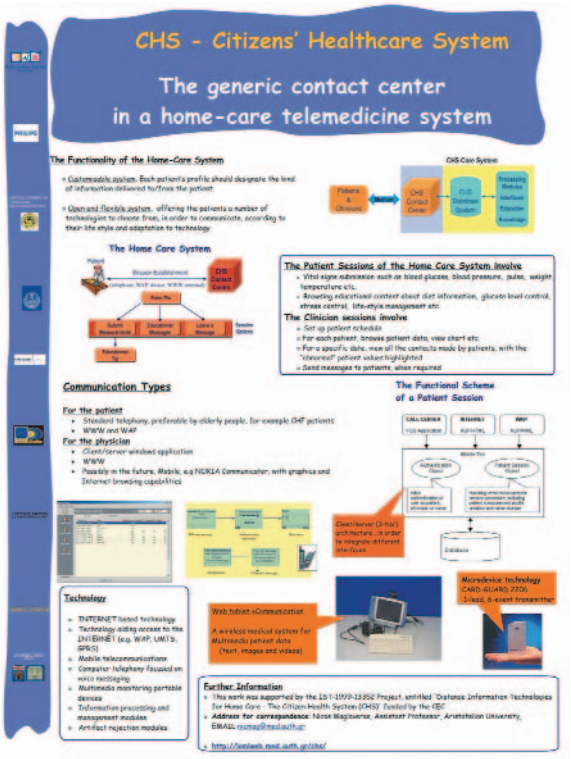
CHS develops electronic home care stations bringing the health care to the home of the patients and giving a new meaning to house environment in the information age. Thus CHS aims to enhance patient participation in their own health care and create tools that empower patients as co-producers of quality health care.

CHS brings IT health care solutions closer to the citizen, and let the citizen be an active part of the health care monitoring and delivery. This is why the use of biosensors, easy-to-use Man Machine Interfaces, coupled with neural network based systems to filter out artefacts integrated with off-the-shelf solutions for teleconsultation, can open new highways for health care.

Results

The CHS clinical trials have been running since July 2001 with more than 150 patients in Greece, Germany, Spain and USA. The clinical trials that are in progress are:

- *AHEPA Hospital (GR)* – Congestive Heart Failure clinical trial. Results show that hospitalisation rates have significantly dropped for the home monitored patients. The positive users' feedback has lead to the expansion of the trial to cover the Radio Frequency Ablation follow-up procedures as well.
- *Hippocrateion Hospital (GR)* – Obesity & Diabetes clinical trials. As far as the obesity clinical trials are concerning, the results show that intense, home-centred care seems to have a favourable impact in body weight and body mass index in overweight and obese patients.
- *Univ. of Regensburg Medical Centre (D)* – Post-trauma clinical trial. Results show that the hospitalisation days have been reduced with a significant saving in the costs.
- *CATAI (ES)* – Diabetes trial. The contact centre is WEB based and the trial is in progress
- *Boonville (USA)* – Diabetes trial. The contact centre is WEB based and the trial is in progress.



In the last two cases the objective is to improve the service given to patients providing a 24 hours access to hints, tips, inquiries for educational messages.

CORAS

Number: IST-2000-25031

Cluster: Citizens

Type of Action: Research

Project Participants:

TN	N
ICOM	GR
IFE	N
NR	N
SINTEF	N
UNN	N
CCLRC	UK
QMW	UK
CTI	GR
SOLINET	D
FORTH	GR
TELENOR 2	N

Contact person:
Mr. Price Tony
Telenor Communication II AS
Norway
Tel.: +41 21 801 9993
Fax: +41 21 803 7530
Email: price@transtrad.com

Project web site:
http://www.nr.no/coras

Budget:
total cost: 4,870,478 €
EC contribution: 2,499,196 €

Timetable:
start date: 01/Jan/2001
duration: 30 months

Keywords:
security and privacy, telemedicine, model-based risk assessment, reference model for open distributed processing, data and system integrity

A Platform for Risk Analysis of Security Critical Systems

Objectives

The objectives of CORAS are: (i) to develop a practical framework, exploiting methods for risk assessment, semiformal methods for object-oriented modelling, and computerised tools, for a precise and efficient risk assessment of security critical systems; (ii) to apply the framework in security critical application domains; (iii) to assess the applicability, usability and efficiency of the framework; and (iv) to promote the exploitations potential of the CORAS framework.

Results

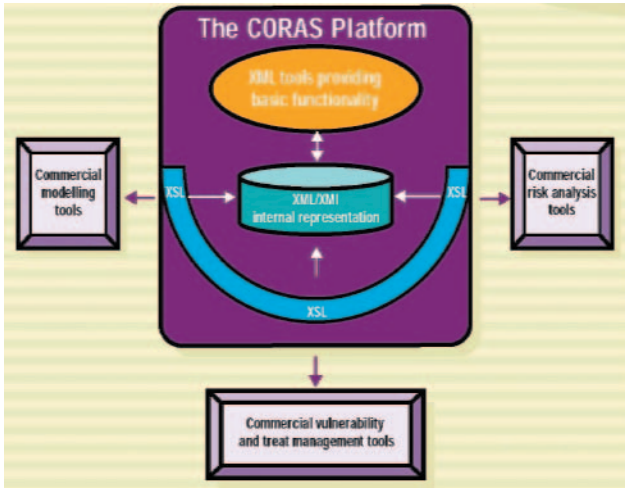
The project is expected to produce a tool-supported framework ready for commercialisation, which will provide:

- application owners with more reliable risk assessment results at reduced costs,
- risk analysts with improved risk assessment effectiveness, by integrating widely-used risk assessment techniques into a single, tool-supported framework,
- system designers with an improved capability for the early discovery of vulnerabilities, and with support for the tracing of causes behind security faults.

The CORAS platform and methodology will have been subjected to a series of iterative, practical field trials in the domains of tele-medicine and e-commerce, involving the participation and feedback of prospective users, and thus the tailoring of some of the system's finer features to consumers' real needs.

The CORAS technology will comprise a model-based risk assessment methodology including:

- unified modelling language (UML) techniques,
- a risk documentation framework, based on the ISO standard Reference Model for Open Distributed Processing,
- a risk management process, based on the international security risk management standards AS/NZS 4360 and ISO/IEC 17799,
- an integrated risk management and systems development process, based on the Unified Process (UP),
- a platform for tool-inclusion, based on extensible Mark-up Language (XML) technology



DAPHNE

Number: IST-2000-25107

Cluster: Patients

Type of Action: Research

Project Participants:

JUMP	UK
UNIMI	I
POLIMI	I
AGILENT	NL
STM	I
PHILIPS	I

Contact person:
Dr. Cuce Antonino
STMicroelectronics s.r.l.
Italy
Tel.: +39 373 282 088
Fax: +39 373 282 040
Email: Tonino.Cuce@st.com

Project web site:
http://www.crema.unimi.it/presenze/st/daphne

Budget:
total cost: 1,506,639 €
EC contribution: 809,716 €

Timetable:
start date: 01/Jan/01
duration: 24 months

Keywords:
neuro-motory pathology, Parkinson, health, sport

Detection of Activity Performances for Health with New Equipment

Objectives

The main objective of the DAPHNE project is the development of a portable and computerised instrument that measures some fundamental parameters of citizen's reactive capabilities.

The aim is to give the possibility of performing continuous and autonomous monitoring of the health state at home assuring, thanks to a telecommunication system, a constant remote control. Therefore on one hand, the patient affected by a neuromotory pathology (like Parkinson disease) can be daily assisted by clinicians who can intervene if the parameters are out of range or change the therapy. On the other hand, the healthy citizen can prevent any possible illness by constantly screening his/her health state acquiring awareness on how the life style can influence the psychophysical soundness.

Results

An innovative system has been developed, allowing the instrumental and quantitative analysis of the neuro-psychophysical condition of neuromotory pathologies affected patients and healthy people. This device with high technological and medical value has been reached through different intermediate steps: determination of the functional and technological specifications; system design and components development; system integration and first prototype delivery; testing at the end user site with assessment of user requirements and evaluations collections; final product realisation with clinical validation after the system revision by means of end user feedback.

DEVASPIM

Devaspim

Development of a tool based on new technologies for the design and evaluation of spine implants

Number: IST-1999-57446

Cluster: Health Professionals

Type of Action: CRAFT

Project Participants:

ADAPTING	E
PRAXIM	F
SURGIVIEW	F
LAFITT	E
SALGADO	P
IBV	E
SERAM	F

Contact person:
Dr. Lafuente, Rubén
ADAPTING s.l.
Spain
Tel.: +34 961 318 244
Fax: +34 961 318 246
Email: r.lafuente@adapting.es

Project web site:
http://www.devaspim.com

Budget:
total cost: 1,001,639 €
EC contribution: 499,670 €

Timetable:
start date: 01/Sep/02
duration: 24 months

Keywords:
biomedical informatics, telemedicine, expert systems, finite element analysis, biomechanics

Objectives

In order to give an impression of the magnitude of this problem, we can estimate the number of spine operations in the EU per year at 30,000. About 25% of these operations are re-operations due to failures of the spine implant and inadequate spine implant configuration chosen by the surgeon.

Besides, the expense in spine treatment is about 490 million €/year in the European Union, and each operation represents an expense of 15,000 € with an average expense per configuration of 4,658 €. A better pre-operational planning will improve the patient's quality of life and reduce the number of failures and consequently the sanitary expense on European scale.

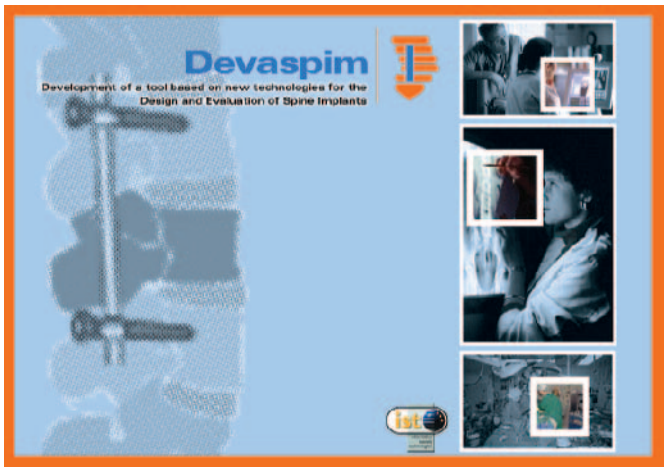
The objective of the project is to develop a 'virtual assistant' for surgeons and manufacturers of spine implants that will help to minimise the number of failures due to inadequate lumbar spine implants or configurations chosen by the surgeons. This expert system will (i) minimise technical failures due to the selection of inappropriate configurations, through a better pre-operative planning, (ii) optimise design process of lumbar spine implants by reducing failure due to bad design and improving competitiveness of the manufacturers (implant industries) in the segment of spine implants and (iii) improve the communication between surgeons and manufacturers, providing the surgeons with a better bio-mechanical knowledge of the product and the manufacturers with a deeper understanding of major clinical problems.

This web-based portal will help:

- to increase the quality of life of patients since the implant will be better adapted to their injury,
- to reduce the investment of the Health Services due to decrease of the number of re-operations needed because of implants failures,
- European manufacturing companies to decrease manufacturing cost and
- orthopaedic surgeons to accomplish a better preoperative planning.

Results

The expected results are the development of a web-based expert system validated by well-known medical specialists and bio-mechanical research centres. The portal will be accessible to spine surgeons or implant manufacturers and will have a feedback mechanism to improve its own 'intelligence' by including the results of the operations done after consulting the expert system.



DIAFOOT

Number: IST-2001-33281

Cluster: Patients

Type of Action: Trial

Project Participants:

EUROPLAN XXI	E
CGS	I
RED 21	E
UMH	E
MAMEDI	I
CLINICA VIRGEN	E
INESCOP	E

Contact person:
Prof. Montiel Enrique
Instituto Espanol del Calzado y Conexas- INESCOP
Spain
Tel.: +34 96 539 5213
Fax: +34 96 538 1045
Email: emontiel@inescop.es

Project web site:
http://www.diafoot.com

Budget:
total cost: 1,282,649 €
EC contribution: 720,802 €

Timetable:
start date: 01/Sep/01
duration: 18 months

Keywords:
biomedical sensors, footwear, remote monitoring, plantar pressure, diabetic feet

Remote monitoring of diabetic feet

Objectives

Diabetes Mellitus is a growing problem in European countries with a high impact on life quality. In 1990 there were 30 million diabetics all over the world, ten years after this figure has increased by 5, and by 2010 it can increase up to 250 millions.

Patients with diabetes mellitus lack sensitiveness in their feet (neuropathy) resulting in skin injuries and ulcers. Those patients are treated with specific insoles for pressure discharge.

This project aims to design a preventive system for remote monitoring of diabetic feet, which must be able to measure plantar pressure and temperature and then send those data to the hospital for further analysis. Clinical studies will establish the relationship between the level of daily activity of patients and the efficiency of treatments with discharge materials.

This project contributes to the IST-e-health programme with telemedicine technologies.

Results

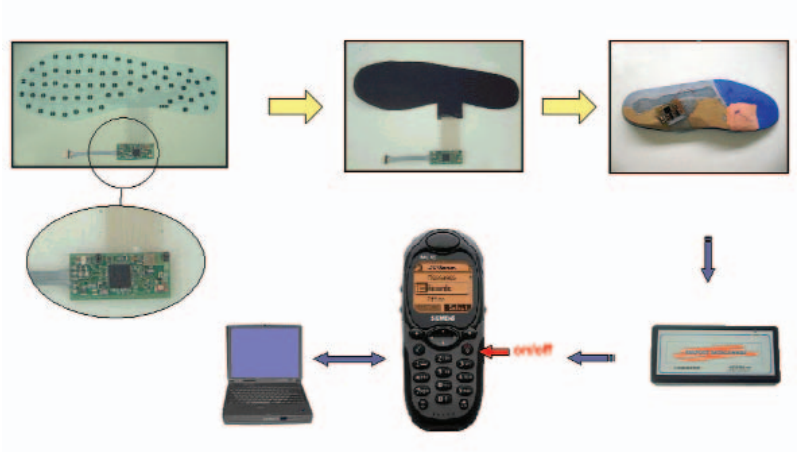
The result of this project is a wireless system for measuring plantar pressures, allowing the obtaining of data for the monitoring of the patient during the day, but also, for the diagnosis by the doctor.

The system is provided with a complete and easy-to-use software allowing the analysis of plantar pressure under dynamic and static conditions of specific areas of foot.

It has been designed in such a way that the elements are as small as possible in order to properly fit the feet shape and it avoids any physical barrier for monitoring plantar pressure.

The use of this monitoring system will allow the reduction by a half of the number of amputations and ulcers thanks to a better control of pressures over a threshold and the time of application and a specific design of orthopedic insoles according to the obtained data.

Furthermore, since orthopaedic insoles can lose their properties in a few days of use, the pressure data obtained from the Diafoot system, the chemical and physical properties of the insole polymers may be used to establish a relationship between the degradation of insoles and pressure increase in order to have a better knowledge of the use of polymers in orthopaedic insoles.



DIAPOLE

Development of a non-invasive blood glucose level monitoring technology for diabetes and clinical applications

Number: IST-2001-52126

Cluster: Health Professionals

Type of Action: CRAFT

Project Participants:

EKF	D
HET	UK
FAPERIN	E
ESIS	I
ELE	SF
AHS	UK
PERA	UK
FHG/TEG	D

Contact person:
Mr. Berthold Walter
EKF-Diagnostic GMBH
Germany
Tel.: +49 39203 7850
Fax: +49 39203 78516
Email:
berthold.walter@ekf-diagnostic.de

Project web site:
http://www.diapole.info

Budget:
total cost: 1,371,753 €
EC contribution: 684,155 €

Timetable:
start date: 01/Jan/02
duration: 24 months
terminated

Keywords:
diabetes monitoring, non-invasive glucose measurement

Objectives

The aim of this project was to develop a non-invasive, accurate, continuous blood glucose level-monitoring device. In so doing, preventing 12,272 annual diabetes related deaths and 9,000 long-term complications in diabetics. The Diapole technology contributes to the implementation of the St Vincent Declaration by preventing long-term diabetic complications.

Diapole has the potential to save the EC more than €7.23 billion per annum in the cost of health care by reducing kidney damage by 5-9% and damage to the eyes by 11% amongst the 35 million diabetics in Europe.

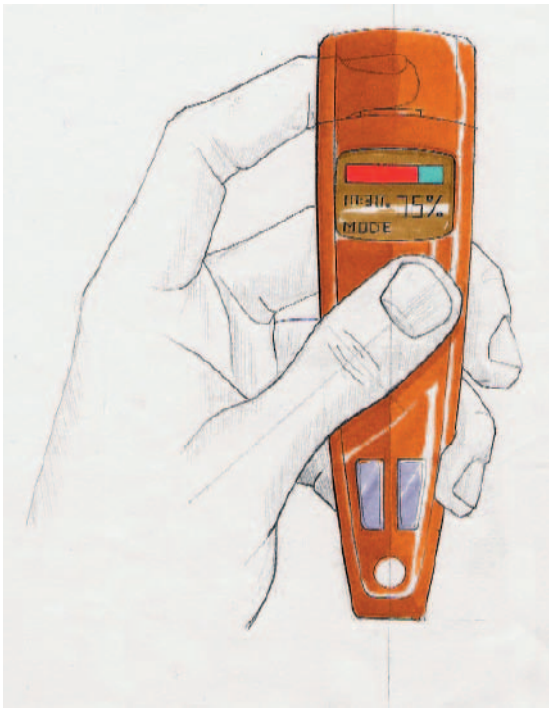
The proposed technology has the potential to also reduce a large amount of bio-hazardous steel waste from the elimination of steel lancets.

It is also expected that there will be a reduction in costs of individual patients and their families, including prescription charges, costs of travel to and from hospitals/clinics, and intangible costs such as those of pain and suffering, anxiety, guilt, and the time given up by caregivers.

Results

A large amount of testing has been completed on this project, covering magnetic susceptibility and infrared absorption of the body. The testing has shown very positive and well correlated results, which indicated that the Diapole technology was feasible and realistic. The consortium had well developed plans to test the system in a hospital on patients, with the results being analysed to determine and validate the correlation between them. This would have confirmed the algorithm (look up table) to determine the blood glucose from the different variables tested. The project was terminated before this could be progressed.

The partners considered the specification of the Diapole device at length in order to produce a product design specification and lifestyle concepts. One of the preferred lifestyle concepts is included as an image above.



The project consortium produced a web site (www.diapole.info) to disseminate the project intention and achievement, and will include the final publishable report. It was intended that the information on this site would be increased once protection in the form of patents had been sought.

The partners are interested in disseminating this technology to medical companies, associations and legislators with a view to further collaboration and licensing potential, in a confidential and commercial manner.

DICTATe

DICTATe

A voice meDIated system for struCTured entry of medicAl daTa

Project Number: IST-2001-38143

Cluster: Health Professionals

Type of Action: Research

Project Participants:

PRECISION	B
IDS-CR	CZ
AUSLM	I
CTI	GR
EURODIAGNOSI	GR
VIS	CY
PATMOS	I

Contact person:
Ing. Hrbackova Milena
IDS Scheer CR, s.r.o.
Czech Republic
Tel.: +42 5 435 24630
Fax: +42 5 435 24601
Email:
m.hrbackova@ids-scheer.cz

Project web site:
http://www.dictate-eu.com/

Budget:
Total cost: 3,549,854 €
EC contribution: 1,914,926 €

Timetable:
Start date: 01/Jul/02
Duration: 24 months

Keywords:
wearable medical systems, human computer interaction, mobility of health professionals, computer input in the natural speech.

Objectives

The project focuses on the capture of clinical narratives by supporting health care professionals with a voice-mediated system for a structured data entry. DICTATe will provide medical professionals with an essential productivity tool, an unobtrusive input device that will help them to avoid the burden of writing and dictating endless patient records and awaiting the return of documents from a transcriber. It will reduce time wastes by doctors and nurses, providing much shorter turnaround time and correspondingly increasing the amount of time they can devote to their primary goals. This way they will be able to generate more thoughtful and comprehensive notes for each patient, producing accurate records and improving patient care and quality of service.

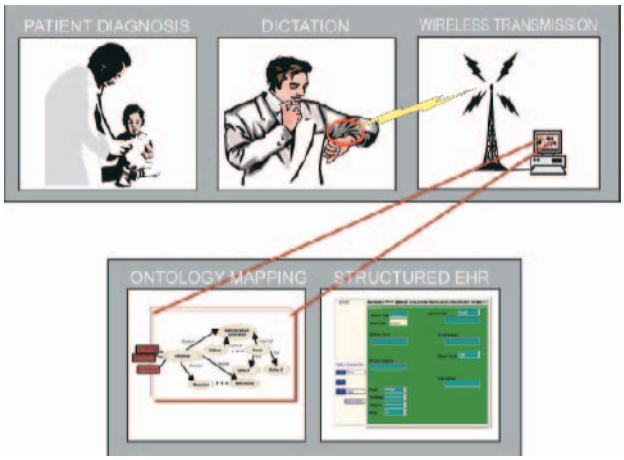
The impact of the DICTATe project could be split to the three main areas:

- *Reduced costs and time*: DICTATe will dramatically (and in an effective way) change the process for translating doctor's input into electronic format. The whole process requires approximately 30 minutes, while it should not last more than 10 minutes per visit.
- *Improved quality to the citizens:* improved treatment, since doctors and nurses will have more time to deal with their primary goals, and reduced stay in a hospital with apparent psychological effects.
- *Improved working conditions*: DICTATe will facilitate the health professionals in their job by improving the quality to their working conditions.

Results

To achieve the above objectives the project intents to design, develop and test a hand-held device, which can be used for the translation of the doctor's input in a standard format (following the available standards for disease, symptoms and drugs categorisation). The system provides speech and text input interfaces and uses mid – range communication protocols to communicate with the centralised system.

Specifically DICTATe consists of (i) a *hand-held device:* speech and text input interfaces so that the end-user can operate the device either in a hands-free or in pen-based mode, (ii) a *wireless communication infrastructure*: the wireless communication system will enable secure, reliable, real-time transmission of data from the wearable device at the point of care, to the main system server and vice versa and (iii) a *server application*: the centralised system is performing medical language processing and communication with both the wearable device and the hospital's clinical record.



D-LAB

Number: IST-1999-12502

Cluster: Patients

Type of Action: Research

Project Participants

ERGON	GR
APLITEC	E
KBIS	D
BAYER	UK
AMC	GR
ICCS/NTUA	GR
UPM	E
AUSLM	I

Contact person:
Dr. Pirini Giampiero
Azienda Unita Sanitaria Locale di Modena
Italy
Tel.: +39 059 435790
Fax: +39 059 438077
Email: g.pirini@ausl.mo.it

Project web site:
http://www.d-lab.it

Budget:
total cost: 3,030,000 €
EC contribution: 1,565,000 €

Timetable:
start date: 01/Jan/00
duration: 24 months

Keywords:
eHealth networks and architectures, telemedicine, distributed clinical testing, point-of-care testing, turn-around-time

Organising the decentralisation of clinical testing outside laboratories

Objectives

The project D-LAB has focused its research on the organisation, control and management of diagnostic tests outside the traditional Central Laboratory, in Points of Care Testing (POCT). In this area D-LAB aimed also at contributing to a paradigm shift in the organisation of the services of diagnostic testing, through the development of the concept of Virtual Laboratory to integrate and monitor all the testing activities performed inside Hospitals, at the Medical Offices, by General Practitioners, at Pharmacies and at Health Care Centres in general. This is expected to reduce the 'time to treatment' (TAT) and the quality of care delivered to patients in all cases where data from clinical tests are relevant to the diagnostic process.

Through the use of D-Lab POCT professional can have a consistent and beneficial interface to all POCT devices regardless of the manufacturer.

The D-LAB system, together with a hospital Laboratory Information System, can be considered as an integrated telemedicine service for enhancing the organisation and management of typical laboratory testing or emergency cases. The system's operation over multiple communication links and the advanced ergonomical features of the POCT device, make the system easily adaptable to several different health care contexts of use.

Results

The main two results of D-LAB are first a set of clinical guidelines for health professionals involved in the testing activity and second a software platform to implement the concept of 'Virtual Laboratory' in any pre-existing Lab infrastructure.

The main technical issues addressed by the D-LAB platform are on one hand the integration of specific drivers for medical equipment of POCTs and on the other hand the integration with pre-existing Information Systems.

In Italy, the first POCT was installed in Modena, at the S.Agostino Hospital Intensive Care Unit, to recognise and monitor the post major surgery status and related infections. A second installation of D-LAB was in the laboratory of Castelfranco Emilia Hospital (10 Miles from Modena), connected to the territorial health network, to cover the emergency needs of medical hospital, day surgery and geriatric units when the local lab is closed.

DOCMEM

Number: IST-2000-25318

Cluster: Health Professionals

Type of Action: Research

Project Participants:

DARVA	F
MACSF	F
RATIO	I
AUSL Parma	I
HITECH	GR
AMC	GR
AIRIAL CONSEIL	F

Contact person:
Benoît DRION
AIRIAL Conseil
France
Tel.: +33 1 41 02 89 20
Fax: +33 1 41 02 89 25
Email: benoit.drion@airial.com

Project web site:
http://www.docmem.net

Budget:
total cost: 3,598,316 €
EC contribution: 1,719,154 €

Timetable:
start date: 01/07/2001
duration: 24 months

Keywords:
health professionals knowledge, mobility of health professionals, public health, security and privacy.

Ubiquitous, Permanent and Intelligent access to Patients'Medical Files

Objectives

DOCMEM provides practitioners with a mobile, permanent and intelligent access to Electronic Health Records (HER). DOCMEM enables ambulatory practitioners to store on a secured server the EHR of their patients and to get access to them from their city practices or elsewhere through wireless information devices – a PDA or mobile phone. Similarly, in hospital environments, DOCMEM enables practitioners to get access to patients' medical information at the points of care – in bedrooms, in operation and service wards, etc. – through a PDA. Security of access is paramount and regardless the communication means, practitioner's authentication is ensured.

DOCMEM also offers an intuitive and flexible means for practitioners to deal with patients' medical information on wireless information devices thanks to facilities like speech recognition of a patient's body.

With DOCMEM, the ambulatory practitioner is also able to communicate patient's information with other independent healthcare professionals or with a hospital. The exchange of patients' medical data among healthcare professionals is done in a standard way, relying on the CEN 13606 pre-standard, through secured communication channels.

Results

The 4 projects milestones are (i) the definition of a global system, (ii) the specification and development of a DOCMEM, (iii) the specification and implementation of DOCMEM services for 3 European pilots and (iv) an extensive validation of both the platform and services.

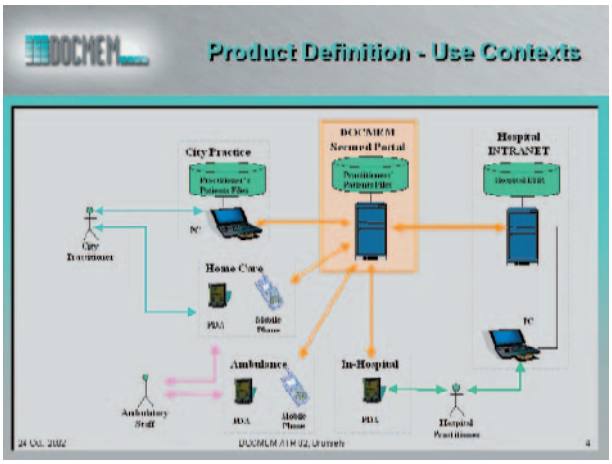
The direct impact of DOCMEM for the involved customers can be mainly gauged in two ways: *quality improvement* and *productivity improvement*.

Regarding quality improvement in healthcare, the DOCMEM services will ensure that patients' medical information will be available to doctors at the time and point of need. Considering that most inadequate decisions made by practitioners are due to information lack (especially for home care), DOCMEM is expected to significantly reduce such decisions.

Regarding Productivity improvement, an ubiquitous and permanent access to patients' medical files can improve healthcare quality, it carries the risk of becoming an administrative burden. The DOCMEM service addresses this issue and will cut the needs for administrative tasks by offering an intuitive and intelligent user interaction.

These two perspectives will be assessed during the validation phase of the project in order to enable the definition of a pricing policy.

Moreover, independent practitioners will also benefit from a simple and cheap solution for fulfilling their legal obligation of long-term archiving of their patients' medical files.



DROMEAS

Number: IST-2001-33371

Cluster: Citizens

Type of Action: Research

Project Participants:

MAXIMAL	UK
HMC	ISR
SLRFC	UK
FAST FORWARD	GR
ICCS/NTUA	GR
UTH.MED.ORTHOD.	GR
INTERTECHNOLOGIES	CY
MEAP	CY
PRECISION	B
IDS-CR	CZ
H.M.C.	ISR
SLRFC	UK
ICCS	GR
MEAP PERA-CHORIOU NISOU	CY

Contact person:
Mr. Joffe Peter
International Medical Services
H.M.C. (Israel) Ltd.
Israel
Tel.: +972 9 9592539
Fax: +972 9 9592900
Email: peterj@hmc-ims.com

Project web site:
http://www.dromeas.eu.com

Budget:
total cost: 4,165,002 €
EC contribution: 2,300,000 €

Timetable:
start date: 01/Aug/01
duration: 30 months

Keywords:
biomedical sensors, wearable medical systems, advanced mobile systems, virtual reality, sport injuries.

A Wearable Platform for the Monitoring of Health Condition and Sport Performance of Athletes and the real-time Prevention of Sport Injuries.

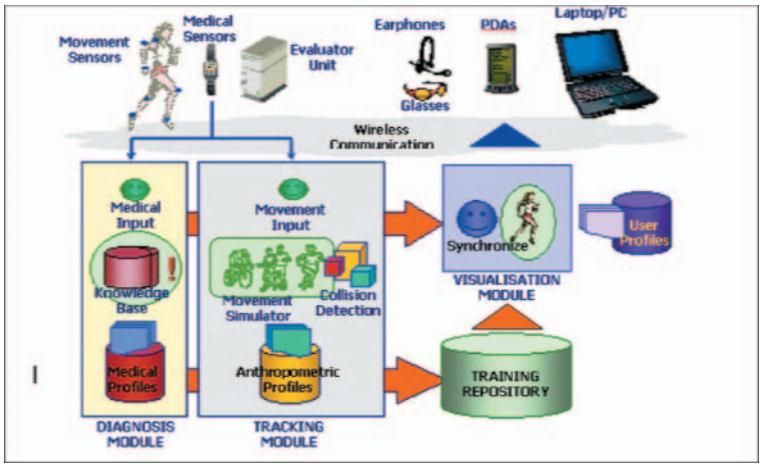
Objectives

The DROMEAS project aims at developing a wearable platform for the monitoring of health conditions and athlete performance during training in order to prevent possible sport injuries. DROMEAS will provide a portable rehab station that will collect health measurements and athlete's positioning indicators and will produce real-time simulation of the athlete movement and alert on risk factors that indicate possible health problems. The system incorporates intelligent and user-friendly user interfaces and interaction by the means of a number of wearable devices and virtual reality techniques. The results all collected and instantly communicated to the appropriate actors through figurative and oral messages. In addition, the DROMEAS portal enables the collection of health and performance indicators that can be used for research purposes from the health and sports industry.

Results

The project aims to provide a solution in the healthcare domain that is not too highly specialised or too complicated. The system produced will be cost effective and provide high quality performance and a valuable service to its target group. The end result will be multi-sectional and designed using scalable architecture giving the end-user the opportunity to choose the utilisation of a part or all of the system, according to their needs. Commercially available components will be used in order to achieve cost effectiveness and to maintain a relatively non-complex product. The final product will enable the simultaneous processing of medical data and alerting along with the real-time personalised visualisation. The result will be a portable system incorporating the provision of computer aided diagnosis, permitting its usage even when medical, or other experts, are not present.

The system will enable the collection of information that can be used for various research purposes, such as the re-assessment of the normal values of health indicators according to various anthropometric models, the relationship between several factors or the detection of new factors that indicate the possibility of certain types of injuries. The collected information on the performance of the athlete could lead to the redesign of the training plan in order to provide a personalised combination of exercises that enable fastest rehabilitation. Information on the performance of the athlete in relation with information on the athlete's diet during the training period can lead to the reassessment of the proper nutritional requirements during exercise that could enable highest performance.



DynCT

Real Time Motion Compensated Reconstruction and Visualisation for Dynamic Computed Tomography

Number: IST-1999-10515

Cluster: Health Professionals

Type of Action: Research

Project Participants:

SEMA	E
UTU	D
ELTA	ISR
CEA	F
CPH	E
UPCT	E
UMC	NL
PMS	D

Contact person:
Mr. Magnan Olivier
Sclumberger Sema - Spain
Spain
Tel.: +34 9144 08805
Fax: +34 9175 43252
Email:
olivier.magnan@madrid.sema.slb.com

Project web site:
http://dis.sema.es/projects/dynct

Budget:
total cost: 4,563,799 €
EC contribution: 2,742,455 €

Timetable:
start date: 01/Jan/00
duration: 36 months + extension of 6 months (up to 30/06/03)

Keywords:
medical imaging for surgical planning and intervention, virtual reality, computed tomography, image reconstruction with motion compensation, radiation dose reduction

Objectives

The objective of DynCT is to define and develop a novel Hardware/Software-based reconstruction and visualisation system for High-Performance Medical Computed Tomography. The two clinical fields this project is focused on are (i) 2D-RT: Organ motion-free Computed Tomography, for off-line delineation of critical zones for a Radiotherapy Planning System and (ii) 3D-CTF: Real-time motion-compensated 3D CT Fluoroscopy, for real-time interventional applications.

In the 2D-RT mode, radiotherapists count with blurred images. The quality of these images is very important because it conditions the intensity and the accuracy of the irradiation the radiotherapist will plan on the targeted zones of the body of the patient.

In the 3D-CTF, surgeons and patients are exposed to important X-Ray radiations, since they are operating/ed in the beam of the radiation. The quality of the images is not very good and increases the risk due to prolonged radiation.

This project provides the system in a highly competitive market. Philips Medical Systems, Exploitation Manager of the project provides the new scanner. UPCT and CEA-LETI, Technical Manager of the project will provide the improved algorithms to be ported by ELTA on powerful calculation engines. UTU provides new visualisation techniques and tools to assist better the surgeons. The users are two hospitals, CPH and UMC for the 2D-RT and 3D-CTF modes respectively. Sema ensures the co-ordination of the project.

Results

In the 2D-RT case the system will enable (i) to display images with an optimal resolution and overlays specific to the movements of target, (ii) to delineate the critical organs and external contour of the patient and (iii) to modify the protocol of the acquisition of images with intention of planning RT, freeing the images from the protocols of exclusively diagnostic intention.

In the 3D-CTF case the system will enable (i) to reduce the total time spent by the patient in the CT-room, (ii) to reduce the elapsed time during the intervention, (iii) to reduce the time between entry of needle to end of biopsy procedure and (iv) to reduce the skin dose for both the patient and the surgeon.

E-CARE

Medical expert system for continuity of care and healthy lifestyle

Number: IST-2001-33261

Cluster: Health Professionals

Type of Action: Research

Project Participants:

ALDIA	I
VIADELO	I
OFFENBACH	D
ATB	UK
VMW	UK
INTERSET	GR
TELETEL	GR
TECHNOGLOBAL	CY
BOCOC	CY
CAS	CY
IDS SCHEER	D

Contact person:
Dr. Devoti Mariella
Aldia Cooperativa Sociale
Italy
Tel.: +39 0382 529444
Fax: +39 0382 525614
Email:
coordinator@e-care-project.org

Project web site:
http://www.e-care-ist.net/

Budget:
total cost: 4,310,000 €
EC contribution: 2,250,000 €

Timetable:
start date: 01/Sep/01
duration: 30 months

Keywords:
biomedical sensors, wearable medical systems, eHealth networks and architectures, health monitoring, decision support, information exchange.

Objectives

The e-Care proposal presents innovative health services that will introduce new practices in health monitoring and decision support on health matters as well as healthy living.

e-Care will cater for a wide range of scenarios, from patients on short-term (1-2 months) recovery from treatment to patients with long-term illness, elderly people and people predisposed to diseases, who live a normal life but at the same time need constant attention on the state of their health.

e-Care will empower medical doctors to constantly and remotely keep track of their patients vital parameters (using medical devices with communication abilities), assisted by an intelligent automated infrastructure. Family and friends of the patients will too have access to the same information, filtered and presented in a comprehensible manner.

A sophisticated Collaboration Model will manage the whole service and will be aware of each patient's medical record, providing an information channel between the medical staff, the patients and their carers (family and friends etc).

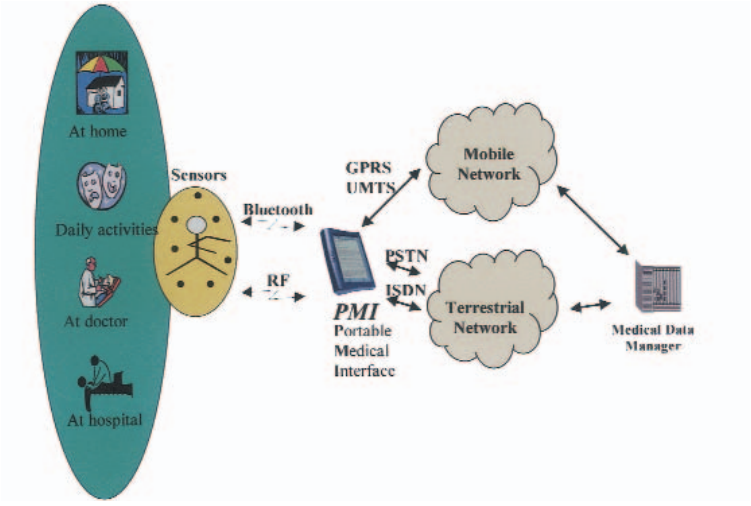
Results

e-Care will be a versatile platform, which aims to fulfil the role of the supporting foundation of the next generation healthcare services. e-Care makes best use of state of the art know-how from a wide spectrum of disciplines, ranging from medical devices (wearable and ubiquitous bio-sensors measuring vital parameters), to telecommunication hardware, to workflow management systems.

e-Care is innovative in its flexible cooperation networking implementation, adjusting the collaboration models to the actors, the actions and the interactions.

e-Care is a pioneering application in the services it will offer to the medical professionals (doctors, paramedics), the patients and their family and friends, by providing a virtual environment for remote collaboration, information exchange of patients data, while always maintaining the privacy of the medical records and the profiles of all registered actors.

e-Care, in addition to the innovative services for patients, will give the possibility of significant cost saving for the global budget of the social community.



EDISCIM

ediscim
early diagnosis of skin cancer using confocal imaging

Number: IST-1999-10100

Cluster: Health Professionals

Type of Action: Research

Project Participants:

BRESCIA	I
Projectina	CH
Siemens	D
VISITECH	UK
Samba	F
UNI REGENSBOURG	D

Contact person:
Dr. Sheblee Jafer
VisiTech International LTD
United Kingdom
Tel.: +44 1915166255
Fax: +44 1915166258
Email: js@visitech.co.uk

Project web site:
http://www.ediscon.com/

Budget:
total cost: 2,484,356 €
EC contribution: 1,461,152 €

Timetable:
start date: 01/Jan/00
duration: 42 months

Keywords:
biomedical sensors, medical imaging for surgical planning and intervention, minimally invasive systems

Early DIagnosis of Skincancer using Confocal IMaging

Objectives

In the past 15 years the number of malignant melanomas and non-melanoma skin cancer, have increased dramatically throughout the whole world, in particular among people with white skin. For example, in Germany the number of annual new cases of melanoma is an estimated 9,000 to 10,000, and the increasing rate is 5 to 10%.

There are more than 40 differential diagnoses for skin cancer which makes it difficult even for expert dermatologists to give correct diagnosis. This figure is even worse for doctors from other specialities. There is only a chance of high cure rates when skin tumours are detected at an early stage. The prognosis of skin cancer is dependent very much on the thickness of the tumour and the number of mitotic figures in the tumour. This information is also elementary for therapy planning.

The final diagnosis of skin cancer is usually done by biopsy, the sample being investigated by a specialist. This is an invasive method, which is painful for the patient and might require several cuts and samples taken before being absolutely certain. Due to the potential risk of dissemination of tumour cells, taking an incisional biopsy is obsolete in malignant melanoma. Therefore the correct diagnosis of malignant melanoma can be made only after a total removal of the lesion and consecutive histopathological examination.

The EDISCIM project intends to improve this situation by developing a system for the early diagnosis of skin cancer which:

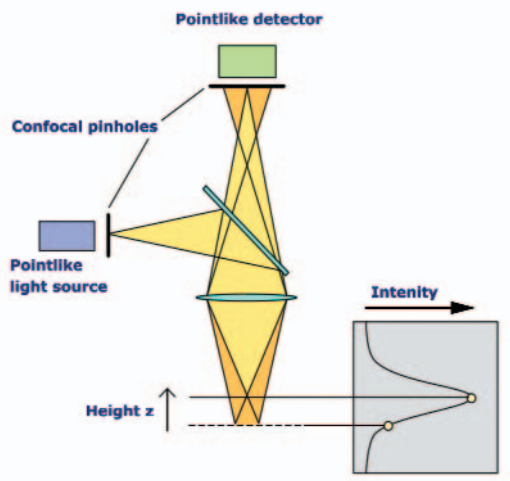
- uses confocal imaging for the non-invasive diagnosis of the upper layers of the skin;
- is as easy to use as an ultrasonic system;
- aids the Physician in the analysis of the images and therefore with the diagnosis;
- allows for potential remote diagnosis by specialist dermatologists via telediagnosis if need be.

Results

The above objectives will be achieved by a system which captures microscopic images of the skin by confocal imaging, processes and records these images in real time, compares these images against a knowledge base of known skin symptoms, and displays the results in a suitable interface to the physician performing the diagnosis.

At the end of EDISCIM the consortium will have delivered a prototype medical system with:

- an optical sensor head for confocal analysis;
- an interface hardware for real time image capture;
- an interface to visualise conditions and status of the skin;
- a database and a knowledge base for quasi-real-time diagnosis support.



EPI-MEDICS

Enhanced Personal, Intelligent and Mobile system for Early Detection and Interpretation of Cardiological Syndromes

Number: IST-2000-26164

Cluster: Patients

Type of Action: Research

Project Participants:

CMNS	I
ET	I
STM	I
BU	I
INSERM XR121	F
INSA-LISI	F
Univ-Lund	S
UNICT-CARDIO	I

Contact person:
Prof. Rubel Paul
Institut National de la Santé et de la Recherche Médicale
France
Tel.: +33 4 7235 7372
Fax: +33 4 7234 1876
Email: rubel@insa.insa-lyon.fr

Project web site:
http://epi-medics.univ-lyon1.fr/

Budget:
total cost: 2,439,502 €
EC contribution: 1,364,880 €

Timetable:
start date: 01/Jan/01
duration: 36 months

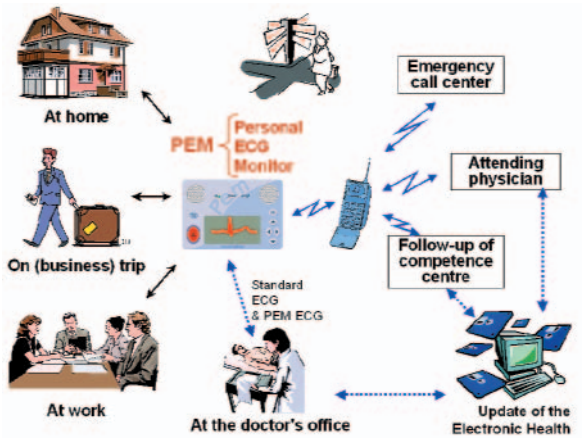
Keywords:
telemedicine, teleCardiology, wearable medical systems, self-care, ambient intelligence

Objectives

In western countries, heart disease is the main cause of early disability and premature death. Moreover, because of the ageing of the population, the number of cardiac deaths is steadily increasing, and almost two third of them occur before arriving at the hospital. Epidemiological data suggest that new strategies are needed to reduce this fatality rate. But despite many attempts to improve the management of cardiac care, only small trends to shorter time intervals before treatment have been reported. Symptoms are often interpreted incorrectly. Event and transtelephonic ECG (electrocardiogram) recorders are increasingly used to improve decision making, but this approach requires to set up new medical services that would be very expensive if adopted for every cardiac diseased citizen. The solution adopted by the EPI-MEDICS project is to develop and experiment a novel 'intelligent' Personal ECG Monitor (PEM) for the early detection and management of cardiac events. The objective is to design a very affordable, easy-to-use but powerful, professional quality level embedded device that is able to record, store and synthesize standard 12-lead ECGs, incorporate intelligent self-adaptive data processing and decision-making techniques, generate different levels of alarms, and forward without delay, but only if necessary, the alarm messages with the recorded signals and the patient's electronic health record (EHR) to the relevant health care providers by means of new generation wireless communication techniques (Bluetooth and GSM/GPRS).

Results

The project has designed robust, neural network based decision-making methods for the detection of ischemic events, and developed a set of wearable PEM devices that are being tested in different clinical settings. The ECGs acquired by the patients/citizens are interpreted by the PEM devices and locally stored together with the patients EHR on a secured personal Smart Media Card. Major alarm messages are automatically transmitted to the nearest emergency call centre by means of GSM or GPRS. Data leading to medium or minor alarms are temporarily stored on a central alarm Web Server and the health professionals are informed by an SMS. The PEM embeds itself a web server to facilitate the reviewing and/or update of the EHR during a routine visit at the GPs or cardiologists office. The first evaluation results are concretely demonstrating that progress in science and technology offer, for the first time, many new possibilities, bringing intelligence, speed, miniaturisation, sophistication, to all, at low cost. A new era has started: health systems will become citizen oriented, personalised, wearable, ubiquitous.



E-REMEDY

Tele-Medicine Platform to support Home Rehabilitation based on Internet Technologies

Number: IST-2000-25146

Cluster: Patients

Type of Action: Research

Project Participants:

AIR MACHINE	I
TXT	I
BMT	UK
EMPHASIS	GR
C.S.C.	E
MEDICA	GR
UNIBO	I

Contact person:
Ms. Fantini Francesca
AIR MACHINE s.r.l.
Italy
Tel.: +39 0547 416811
Fax: +39 0547 417294
Email:
francesca.fantini@airmachine.it

Budget:
total cost: 3,764,829 €
EC contribution: 1,999,223 €

Timetable:
start date: 01/Jan/01
duration: 24 months

Keywords:
home rehabilitation, sensors, wireless communications

Objectives

The overall objective of the e-ReMedy project is to increase the quality of the rehabilitation services provided by EU hospitals and rehabilitation centres to patients, while at the same time reducing the costs incurred. To achieve the above goals, the project intends to design, develop, test, validate in pilot installations and commercially exploit an innovative infrastructure to support rehabilitation processes with most part performed at home, without reducing, and possibly increasing, the medical monitoring level. The infrastructure will exploit a number of technological advances, among which, in particular: advanced sensors, real-time internet connections, wireless connections, tele-conferencing, decision support systems.

Results

The E-remedy project can be considered innovative under several points of view. The first innovative aspect of e-Remedy is the choice to exploit the tele-rehabilitation as a means to improve the quality of life for patients and at the same time provide a business opportunity for Healthcare organizations, that can optimize their cost structure, and for service providers. The assumptions made at the time of project proposal are thus confirmed by the widely recognized trend of outsourcing and decentralization of the healthcare delivery process. Along with the concept, the project innovation lies into the components that have been developed to implement the prototypes.

The project has brought together a wide range of technical, medical, commercial, marketing and collaboration skills which were needed to develop an internet based rehabilitation machine equipped with innovative sensors for the remote monitoring and rehabilitation of patients. In addition the project has addressed some of the legal and ethical issues that must be taken into account when considering the delivery of health services across the internet. The E-remedy application is absolutely relevant for the European Community, both in terms of numbers and in importance of the problem addressed (cardiologic, pulmonary diseases and orthopaedic rehabilitation).

In summary, the results are (i) improved quality and safety standards of the rehabilitation service, (ii) improved safety of the rehabilitation process, (iii) more strict contact between patients and physicians and (iv) reduction of the hospitalisation period.

E-SCOPE

Number: IST-2001-33294

Cluster: Health Professionals

Type of Action: Best Practice

Project Participants:

INRC	I
TELEPH	F
SAMBA	F
UJF	F
SIEMENS	D

Contact person:
Prof. Brugal Gérard
Université Joseph Fourier
France
Tel.: +33 4 7654 9400
Fax: +33 4 7654 9549
Email: gerard.brugal@imag.fr

Project web site:
http://e-scope.vitamib.com

Budget:
total cost: 1,039,509 €
EC contribution: 633,403 €

Timetable:
start date: 01/Sep/01
duration: 24 months

Fully Digital Microscopy for routine diagnostics and integration into hospital information workflow

Objectives

This last decade, many medical and technological efforts have been made to turn diagnostic pathology into a reliable medical practice taking advantage of multimedia systems for remote diagnostics, image banks, standards for images (DICOM Visible Light), reporting electronic forms, archiving systems and supporting certification and accreditation procedures. Unfortunately, these candidate materials could not be implemented on a large scale because the conventional microscope, as the central standalone imaging system, is still designed as a human viewing apparatus not suitable for the production of standardised digital images. The e-scope project thus aims at making the fully digital microscope available for routine diagnostic practice with the key advantage of actually incorporating the standards for medical imaging, archiving and communication, in addition to enabling the certification and accreditation procedures set up for by the diagnostic pathology community.

Results

The project is expected to make available the new generation of digital microscopes to leading pathology laboratories, which will integrate the microscope system into the laboratory or hospital computer based environment and, will finally assist the take-up of such technology by a voluntary dissemination and exploitation strategy.

GAIT

Number: IST-2001-37751

Cluster: Patients

Type of Action: Research

Project Participants:

CSIC	E
IBV	E
RRD	NL
OSSUR	ISL

Contact person:
Dr. Pons Jose L.
Consejo Superior
de Investigaciones Cientificas
Spain
Tel.: +34 91 8711900
Fax: +34 91 8717050
Email: jlpons@iai.csic.es

Project web site:
http://www.iai.csic.es/gait

Budget:
total cost: 1,512,347 €
EC contribution: 756,173 €

Timetable:
start date: 01/Sep/02
duration: 36 months

Keywords:
smart orthosis, gait evaluation, gait rehabilitation

Intelligent knee and ankle orthosis for biomechanical evaluation and functional compensation of joint disorders

Objectives

Functional orthoses are traditionally based upon a more or less complex design involving a series of mechanical features that intend to protect the joint from unwanted loads and/or compensate for functional loss. In order to achieve this, a careful design must consider the following issues:

(a) proper knee and ankle joint kinematics; (b) appropriate system of external forces at the limb-orthosis interface; (c) comfort, including fitting, weight, pressure distribution on soft tissues and microclimate conditions, and (d) sufficient strength to withstand activity-related loads during intended use.

The aim of the project is to provide an integrated approach to active orthotic functional compensation and biomechanical evaluation of knee and ankle joint disorders. We propose to investigate the possibilities of integrating active systems and knee-ankle orthoses aiming at providing a means for gait monitoring during real-use situations, enhancing functional performance and improving comfort.

The Gait project will approach the development of the intelligent orthoses through the following technical Objectives

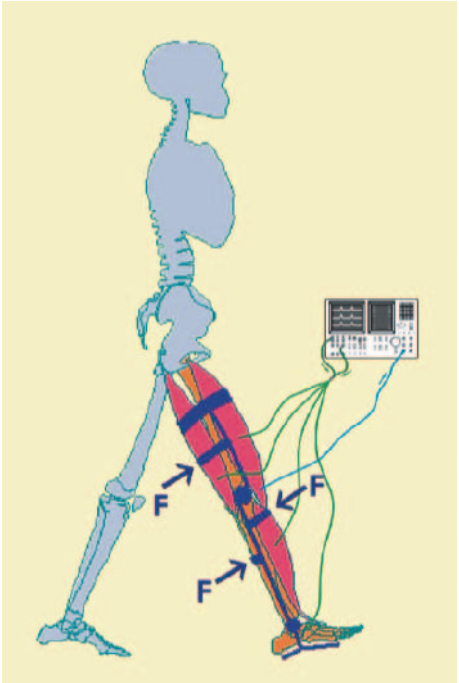
- Development of an advanced sensing system to enable gait quantification,
- Control of the human-orthoses interface to improve ergonomics and comfort through microclimate sensing and regulation,
- Development of advanced actuator systems driven by intelligent control strategies defined according to the intended performance of the orthosis,
- Autonomous operation to enable data recording for gait monitoring and diagnosis during real-use situations.

Results

The expected result of the GAIT project is a working prototype of an intelligent orthosis with the following capabilities:

- Bio-mechanical monitoring of gait parameters at knee and ankle through the integration of advanced sensors,
- functional compensation through the use of intelligent control and actuators,
- active control of the human-orthosis interface for microclimate conditioning,
- autonomous operation to enable biomechanical data recording for gait monitoring and diagnosis during real-use situations.

The GAIT prototype will be evaluated in the framework of the project by applying usability criteria for rehabilitation technologies.



GEMSS

GRID-enabled Medical Simulation Services

Number: IST-2001-37153

Cluster: Citizens

Type of Action: Research

Project Participants:

CRID	B
NEC	UK
IBMTP	A
MPI	D
USFD	UK
ISS	A
AEA	UK
IT Innovation	UK
ASD	D
IDAC	IRL

Contact person:
Dr. Fingberg Jochen
NEC Europe Ltd.
Germany
Tel.: +49 2241 92520
Fax: +49 2241 925299
Email: fingberg@ccrl-nece.de

Project web site:
http://www.gemss.de

Budget:
total cost: 3,586,409 €
EC contribution: 2,626,611 €

Timetable:
start date: 01/Sep/2002
duration: 30 months

Keywords:
health GRIDs, medical imaging for surgical planning and intervention, security and privacy, biomedical simulation, high-performance computing services.

Objectives

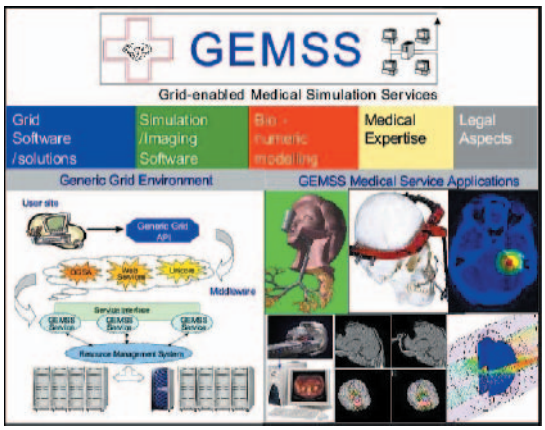
As the Internet revolutionised access to information, the Grid will revolutionise accessibility to applications. GEMSS will demonstrate how Grid technologies can be used to transform healthcare and enable Europe to lead that transformation. GEMSS will create an innovative Grid middleware that will render accessible a variety of medical computing and resource services in a clinical environment. The GEMSS test-bed will provide access to new tools for improved diagnosis, pre-operative planning and near real-time surgical support in order to create a new way for improved health care. GEMSS will build on top of existing Grid and Web technologies, maintaining compliance with standards thereby ensuring future extensibility and interoperability. The project will evaluate and validate the GEMSS framework and its embedded models, including its integration into the end-users working environments. The test-bed will provide support for sophisticated authorisation, workflow, security, error detection and recovery. Furthermore, GEMSS aims to anticipate privacy, security and other legal issues with regard to EU regulations related to providing medical services through the Internet. The GEMSS test-bed will include medical service applications, with varying performance and Quality of Service requirements targeting different medical sectors:

- Maxillo-facial surgery simulation: a virtual pre-operative planning space.
- Neuro-surgery support: prediction of the brain-shift during neuro-surgery.
- Radio-surgery simulation: improved treatment planning for cancer destruction.
- Inhaled drug delivery simulation: virtual drug delivery to the lung.
- Cardio-vascular system simulation: simulation of the entire cardio-vascular system for improved treatment plans and surgical procedures.
- Advanced Medical Image Reconstruction based on fully 3D iterative processing.

Results

GEMSS will bring high-performance computing and simulation expertise to clinical practitioners who usually don't have access to these kinds of resources in their normal working environment. The GEMSS Project will:

- develop a service-oriented framework for medical image processing and simulation,
- install an extendible, interoperable and collaborative test bed for GRID-enabled medical application services,
- demonstrate the functionality of the GRID-infrastructure,
- demonstrate the medical significance of the GEMSS models,
- create possibilities to improve current clinical practise by making available powerful image processing and simulation services for advanced diagnosis and treatment to a large medical community,
- assess legal issues on the European level that are relevant for the provision of medical services via the Internet,
- open a business model for future commercial exploitation.



HARP

HArmonization for the secuRity of the web technologies and aPplications

Number: IST-1999-10923

Cluster: Citizens

Type of Action: Research

Project Participants:

NTUA	GR
GMD	D
NR	N
UCL	UK
SOLINET	D
UHM	D
RAFAEL	ISR
KPN	NL

Contact person:
Prof. Stassinopoulos George
National Technical University of Athens
Greece
Tel.: +30 210 77222531
Fax: +30 210 77222534
Email: stassin@cs.ntua.gr

Project web site:
http://www.telecom.ntua.gr/~HARP/HARP/HARP1.htm

Budget:
Total cost: 3,318,503 €
EC contribution: 2,000,000 €

Timetable:
Start date: 01/Jan/2000
Duration: 24 months

Keywords:
security and privacy, eHealth networks and architectures, biomedical informatics

Objectives

HARP aims at instantiating medical applications with particular emphasis on security and reusability issues. The remote and decentralised conduct of clinical studies has been served through a dynamic environment, where health related information is continuously updated and processed. Actors are strictly distinguished and corresponding roles of health professionals are formally defined and controlled. As a result, HARP intimately binds all aspects of security to roles of professional users and at the same time embeds these into the medical applications. Clinical studies have been the driving force and the first application environment of the HARP approach, which however is generic enough to address web based secure database access in domains like e Banking and B2B applications.

Results

Security in web technologies embedded into the application. HARP implements a generic embedding of security into the application, so as to prevent particular and repetitious exercises for each individual medical application at hand. Security policies based on roles are mapped to attributes, which allow the display, manipulation and access of data in a fine grained fashion under the same overall design and enabling tight and well documented security and access control. The characteristics of the well-known three-tier architecture in web-based applications are maintained.

Enhancement of a typical three-tier architecture. The user interface and the database access are dynamically determined via XML, i.e. via the method, which is expected to dominate all kinds of data exchange and transactions over the Internet.

Policies in terms of access rights result from roles. Attribute certificates and corresponding access decision functions are extensively used in order to map identities to roles and to implement the security policy. HARP views these features as externally provided by upcoming Trusted Third Party services and provides the necessary interfaces to these.

Roles are assigned to users authenticated via smart cards. All cryptographic functions are provided externally to the client terminal via the use of smart cards. A solution adopted by the medical community is employed, while more open smart card environments are currently investigated.

A clearly defined development methodology. The development of each new application is considered as an instantiation of a generic architecture with few tested and validated components. Therefore a strict methodology can be adhered to. Corresponding tools to support this methodology are currently under development.

H-CAD

Number: IST-2001-33235

Cluster: Patients

Type of Action: Research

Project Participants:

PRAGMA	I
UORIN	I
FIG	E
NMSC	B
SITUS	I

Contact person:
Dr. Scattareggia Marchese Sandro
Signo Motus s.r.l.
Italy
Tel.: +39 090 355 645
Fax: +39 090 356 913
Email:
sandroscattareggia@signomotus.it

Project web site:
http://www.signomotus.it/hcad.htm

Budget:
total cost: 1,541,002 €
EC contribution: 770,501 €

Timetable:
start date: 01/Sep/01
duration: 36 months

Keywords:
telemedicine, neurological rehabilitation, upper limb impairments, home care

Home Care Activity Desk

Objectives

The Project H-cad, 'Home Care Ability Desk' deals with the design and development of a system capable to enable patients affected by Multiple Sclerosis, Stroke, or Traumatic Brain Injury to perform the rehabilitation treatment at home. A purposely designed 'Home Care Activity Desk' has been developed to monitor the exercises performed by the patient and to transmit such data to the hospital. Such apparatus will allow patients affected by upper limb impairments to continue the treatment at home under medical assessment and supervision. The main objective of the Project is the clear definition of a set of exercises to be used as a standard for home rehabilitation in the fields of occupational therapy and neurological rehabilitation. The key feature is therefore the development of a device that can decrease the assistance provided by the care and associated social costs. Such device will be equipped with clinical software for the analysis off line of parameters under investigation.

Results

The main expected result from a clinical point of view will be the clear definition of a set of exercises to be used as a standard for home rehabilitation in the fields of occupational therapy and neurological rehabilitation. Such information will be used to develop a device that is to be considered a modular sensor based activity desk for home care rehabilitation of patients affected by neurological diseases with upper limb impairments.

HEALTH MEMORY

Number: IST-2001-38181

Cluster: Health Professionals

Type of Action: Research

Project Participants:

ANCO	GR
LC SYS	F
BOEHRINGER	I
HGUGM	E
MEDTRONIC	E
UPM	E
FVG	I

Contact person:
Dr. Saraceni Nicola
Boehringer Ingelheim Italia s.p.a.
Italy
Tel.: +39 02 535 5384
Fax: +39 02 535 5402
Email:
nsaraceni@
mil.boehringer-ingelheim.com

Budget:
total cost: 4,360,000 €
EC contribution: 2,200,000 €

Timetable:
start date: 16/Nov/02
duration: 30 months

Keywords:
eHealth networks and architectures, health professionals knowledge, health promotion, knowledge management in Health, knowledge-based health system

Establising a health community knowledge management system

Objectives

The goal of HEALTH MEMORY is to provide health professionals, particularly those who are not directly connected or operating with centers of excellence for research and cure of *cardiac diseases*, with an easily and from everywhere accessible knowledge repository, where they will find useful information and direct support for the detection of illnesses and treatment of their patients. This goal will be achieved by setting up an intelligent collaborative work environment for the Management of Health Knowledge and Competence in the context of large health care systems.

The project targets medical doctors, health professionals and health organisations concerned with cardiac diseases and prevention contributing to *continuous improvement of knowledge* leading to better quality of life, health promotion and safety; *continuous promotion* of health knowledge and competence of HC professionals to support appropriate evidence-based decisions; *optimised problem-oriented* distribution of health strategies in a network-based learning environment and community memory.

HEALTH MEMORY will provide (i) *collaboration and knowledge distribution* between different actors; (ii) *secure access to a common workplace of knowledge environment* that is designed to convey sensitive medical data; (iii) *synchronous and asynchronous collaboration* as a means for knowledge interchange among the members of the network; (iv) *a patients and problem-oriented knowledge management system*, focused into he everyday clinical decision making environment of different health professionals.

A vast amount of knowledge that cardiologists and other doctors hold, comes from bibliography, so the proposed system will also be able to extract keywords from existing documents in repositories, and associate them with predefined entities (meanings) in provided *ontologies*. This process will be implemented by using intelligent agents technologies and techniques for mining and extracting this knowledge.

Results

The main results of the project relate to the implementation of a Knowledge Management system in the Medical field available through Internet and mobile communication devices, enabling a fast and easy access to specific information and medical experience by means of an 'intelligent' search environment.

An additional result is the achievement of a real diffusion of specific knowledge among the medical community, by means of a 'democratic' communication tool enabling direct interaction between healthcare operators in different places.

HEALTH MEMORY will therefore generate a common 'knowledge warehouse' and a collaborative environment designed to facilitate the knowledge and competence transactions between health care experts and operators and to support the professionals in taking evidence-based decisions at the point of need.

HEALTHMATE

Personal intelligent health mobile systems for Telecare and Tele-consultation

Number: IST-2000-26154

Cluster: Patients

Type of Action: Research

Project Participants:

APLITEC	E
KNOSOS, S.L.	E
UPM	E
BULL	F
SIEMENS	D
UPV	E
FAM	E

Contact person:
Mr. Lamas Rafael
Fundación Airtel Movil
Spain
Tel.: +34 607 513768
Fax: +34 607 132933
Email:
rafael.lamas@vodafone.com

Project web site:
http://www.healthmate-project.org

Budget:
total cost: 2,853,611 €
EC contribution: 1,426,804 €

Timetable:
start date: 01/Jan/01
duration: 30 months

Keywords:
intelligent environment for patients, tele-care, ubiquitous-care, GPRS, UMTS

Objectives

A significant proportion of the health demands will be soon satisfied through mobile networks (m-health). HealthMate is contributing to the definition of health oriented portable personal systems based on the new generations of wireless communication technologies, taking advantage of EU predominant position. HealthMate has developed four tele-care innovative platforms to cope with a large number of potential client groups and health needs:

- services to access at any time and any place the right health information;
- services to manage predictable emergency situations, based on the capture of pertinent information from the user and the environment;
- services to assess the geographical position to guide persons requiring orientation help;
- and services of tele-monitoring to assess patient status.

HealthMate is a technology innovative project to provide market-oriented wireless solutions to a variety of health problems: care of chronic patients; support of acute patients, including high-risk; and tele-assistance applications.

Main HealthMate unique characteristics are: a patient personal system that provides for health Tele-care and Tele-consultation based on innovative wireless technologies; a secure information exchange media between the personal systems and the health service providers; high usability interfaces, easy to personalise to usage context; appropriate tools for privacy and security; high reliability and robustness of the developments

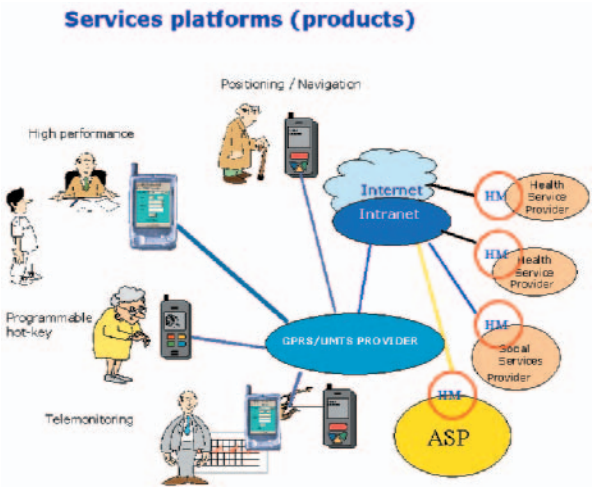
Results

As a result of the project the prototypes developed are as follows:

- programmable hot-key health support device;
- navigation/positioning health support device;
- telemonitoring health support device;
- high Performance health support device.

Moreover, these device are supported by a e-health intranet, where public and private health care providers will offer health services.

The e-health network is to be clearly identified as those software components to facilitate the connectivity and dialog between both: 1) the specific mobile terminals (hot key, positioning and monitoring) and 2) the applications supported on PDA commercial units, with the services running by the health care providers servers. The elements that provide the interoperability to the diverse variety of care services requiring the support of mobiles terminals.



HEALTHSAT

Number: IST-2000-25334

Cluster: Citizens

Type of Action: Research

Project Participants:

PLANET MEDICA	B
CHILL	UK
SESMM	L
SES	L
M.M.C. EUROPE	NL
CANALWEB	F

Contact person:
Ms. Frichet Anne
B.V. Medical Management Company (M.M.C. Europe)
Netherlands
Tel.: +31 786 117 300
Fax: +31 786 224 587
Email:
anne.frichet@mmc-europe.com

Project web site:
http://www.healthsat.org/

Budget:
total cost: 6,113,187 €
EC contribution: 3,056,592 €

Timetable:
start date: 01/Dec/00
duration: 36 months
Terminated

Keywords:
interactive media, satellite, interactive TV, health and wellness programs

Health Interactive Satellite Channel

Objectives

Healthsat uses interactive media - satellite and Internet direct-to-home digital TV, computer displays and mobile terminals for distribution of health and wellness programs, as well as personalised services, to European citizens.

The objective of Healthsat is to encourage citizens to access on-demand information necessary to implement life-style changes and to take greater care of their health. They should have direct access to the information they look for - in their own language - enriched with their cultural background. And they should be able to trust it.

Consequently health and wellbeing content will be continuously adapted to citizens' demands resulting from on-going market studies. Cultural and linguistic adaptations will be performed by local professional and medical teams. The complete production process will follow quality assurance procedures and standards of practice. Quality and relevance of programming will be regularly upgraded by medical societies and patients associations.

Finally, security and confidentiality will be guaranteed by means of the most advanced state-of-the-art techniques.

Expected Results

Healthsat intends to develop products that will be innovative in three years time:

- an open, integrated satellite + Web + WAP/UMTS platform (the SWW platform), fully compliant to all recently published standards (MPEG-4, MPEG-7, DVB-RCS), allowing simultaneous access to both interactive streamed video, and any-where, any-time access to programs and services;
- new techniques for producing programs matching the requirements of broadcasting (digital television), multicasting (satellite) and narrowcasting (Web);
- testing the SWW platform on a wide range of criteria specific to the health field: quality, credibility, security, confidentiality, plus multi-cultural and multi-lingual requirements.

HEALTHY-MARKET

A virtual marketplace for the implementation of healthy nutritional plans

Number: IST-2001-33204

Cluster: Citizens

Type of Action: Research

Project Participants:

UPV	E
IDS-CR	CZ
VELARTE	E
FAZ-UNT	AR
BARILLA	I
EMPHASIS	GR
KRONOS	GR
AOP	I
UNIPR.IG	I
RSINFO	I
TVP	EE
INTERTECHNOLOGIES	CY

Contact person:
Dr. Guillén Sergio
Universidad Politecnica
de Valencia
Spain
Tel.: +34 963 898 000
Fax: +34 963 877 609
Email: sguillen@itaca.upv.es

Project web site:
http://www.healthy-market.org

Budget:
total cost: 4,317,090 €
EC contribution: 2,100,000 €

Timetable:
start date: 01/Sep/01
duration: 30 months

Keywords:
nutrition, food, health promotion, disease prevention, health information, health advice, personalization, web portal, marketplace, eCommerce

Objectives

HEALTHY-MARKET focuses its research on the construction of a web based, agent mediated virtual marketplace to support citizens in putting into actions medical nutritional advice and in developing healthy eating practices. The project will initially address specific categories of citizens at risk, for which healthy nutrition is important for their activity, like sportsmen, and/or for preventing risk factors like high blood pressure, heart diseases, certain cancers, diabetes. The system will be tested in 3 sites in Europe: in Spain, Italy, and Estonia. An additional test, with local funding, will be performed in Argentina.

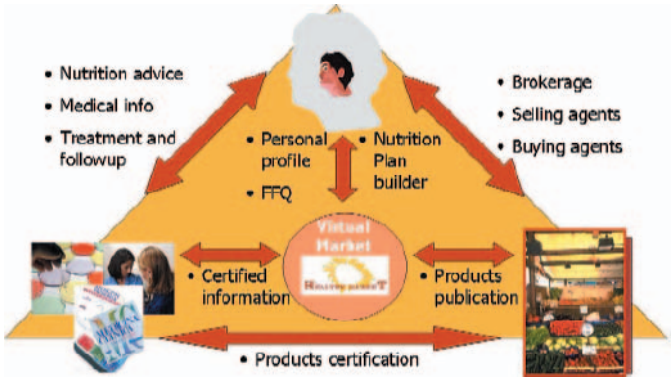
The ambition of HEALTHY-MARKET is to link the production industry, mainly in the food domain, and the consumers through the mediation of the providers of certified and trustable medical information (e.g. clinical/nutrition Centres) and of the providers of certified information about food and produce composition (e.g. certified Laboratories). The producers are expected to offer their produce with nutritional information approved by certification Centres (food+information). Based on these certified product information and on the clinical information already available for weight and nutrition control, the system will then build personalised nutritional plans (up to the construction of single menus) based on characteristics like individual health profiles, personal tastes, preferences.

Results

The main benefits of HEALTHY-MARKET are for citizens, in putting into actions medical nutritional advice and in developing healthy eating practices. This is fully coherent with the current policy of EU for the protection of the 'consumer' and for 'public health'.

In particular, HEALTHY-MARKET supports:

- *consumer education*, through the provision of certified individualised information, including self-assessment mechanisms, in order to help consumers in making informed choices and to encourage sustainable consumption behaviour,
- the dialogue between *consumer and business*, through a web portal approach, including information publishing, information sharing, Intelligent Software Agent support, etc…
- *consumer health and safety*, based on provision of the best possible scientific advice and on consistent analysis of risks through the integration of appropriate, medical level information into the HEALTHY-MARKET portals,
- *protection of the economic interests of consumers*, through the implementation of an 'accreditation' mechanism, aimed at guaranteeing an acceptable level of trustability on the product and services linked to the system,
- *public health*, by promoting healthy lifestyles and developing IT systems supporting the prevention of pathologies related to obesity and overweight.



HEARTS

Number: IST-2001-37403

Cluster: Health Professionals

Type of Action: Research

Project Participants:

DATAMAT	I
SUNDERLAND	UK
CNR - IASI	I
SILENA INT	I
ICOM	GR

Contact person
Mr. Romani Stefano
DATAMAT s.p.a.
Italy
Tel.: +39 06 50274218
Fax: +39 06 50274830
Email: stefano.romani@datamat.it

Project web site:
http://heartsproject.datamat.it/

Budget:
total cost: 2,306,002 €
EC contribution: 1,204,000 €

Timetable
start date: 01/Jul/02
duration: 24 months

Keywords:
telemedicine – wearable medical systems – mobility of patients – heart disease diagnosis and prediction – reduction of costs

Health early alarm recognition and telemonitoring system

Objectives

HEARTS has the major aim to provide support in early illness detection and intervention, through the development of a minimally intrusive personal system for prevention and monitoring heart disease, based on advanced technology. HEARTS will be conceived to satisfy the following criteria:

- non-intrusive – information will be acquired through 'wearable' sensors
- advanced and adaptive decision support capability –classical analysis techniques will be integrated with new ones, such as 'learning and evolving' (based on Artificial Neural Networks)
- open architecture – it will be possible to upgrade the system by adding or replacing components with new ones, once available on the market
- disease prediction capability, the system will include both prediction and diagnosis aspects.

The project contributes to the social objectives of the EC improving the quality of life and health. HEARTS will address both patients' needs and citizens' wishes to monitor their health status in relation to the environment, take precautions and adapt their life style to the conditions around them. Furthermore the system enables medical practitioners to obtain a more accurate and continuous view of the status of the subjects under consideration. In addition, the system capability of immediate feedback provides end users with a better awareness about their own health status. This is complemented by the possibility of an easy use, that guarantees continuity in the health service management.

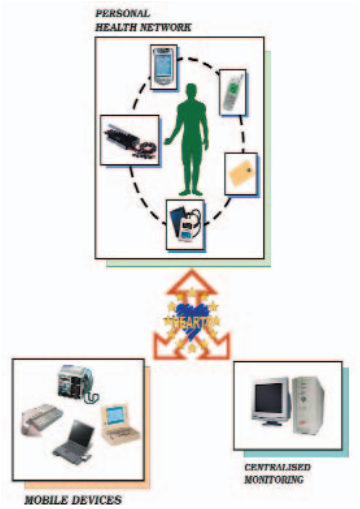
Another important aspect is the cost containment. The HEARTS architecture will be conceived for an easy right-sizing according to specific needs. The HEARTS mobility capability can improve the efficiency and effectiveness of home assistance.

Results

The research will produce a system prototype to be used for validation and demonstration of the HEARTS approach.

The prototype will be made of the following main components:

- Personal Health Network – composed by wearable and non-intrusive sensors, gathering biometric and environmental data, interconnected by means of a wireless network.
- Adaptive Decision Support Module – based on the concept of 'adaptive behavioural analysis', the module analyses data from the Personal Health Network obtaining information about health status related to the specific subject and the specific context.
- Central Server Platform – this element will provide decision support functions together with centralised control of monitored subjects.



According to potential users' needs and suggestions, the HEARTS prototype will be tested inside a hospital. The adopted approach will aim to improve patient mobility inside the structure and to reduce hospitalising costs.

Part of the developed applications will be delivered as 'open source' software.

HIN-EUROPE

HINE Health Information Network Europe

Number: IST-2000-31127

Cluster: Health Professionals

Type of Action:
Accompanying measures

Project Participants:

DTT	B
SILICON BRIDGE	UK

Contact person:
Ms. Véronique LESSENS
Deloitte & Touche Management Solutions
Belgium
Tel.: +32 2 800 2849
Fax: +32 2 800 2804
Email: vlessens@deloitte.com

Project web site:
http://www.hineurope.com

Budget:
total cost: 998,001 €
EC contribution: 798,400 €

Timetable:
start date: 01/Sep/01
duration: 25 months

Keywords:
eHealth networks and architectures, telecare, health telematics, market data, analysis and forecasts, strategic surveys

Health Information Network in Europe

Objectives

Health Information Network Europe arises from a desire to understand the challenges European health care is facing and how ICT could bring added value. The main purpose of HINE is to build a permanent networked pan-European information knowledge base, allowing industry and other actors in the healthcare delivery sector to access information useful in determining strategic action plans to increase effective use of ICT.

The main objectives of HINE:

- anticipate which health delivery systems will be in place in the future and how information and communication technologies can support these;
- provide a unique mix of market data, analysis and forecasting to enable country comparisons and benchmarking Europe with North-America and Asia-Pacific;
- build an innovative pan-European Health ICT information knowledge based network fully funded by industrial subscriptions;
- provide inputs to assist top level planning for the development of on-going access of information Services to the EU Community.

HINE is intended to support the improvement of the whole health delivery system across all its components.

Its general objective is to contribute through a set of interlocking strategic components:

- providing the citizens with an efficient Health system delivering high quality services throughout the continuum of care;
- allowing the Health professionals to work efficiently in a framework established in conformity with their needs;
- providing the political players with means to contain the expenses; and
- establishing a clear and previsible market for the Health industry.

Results

eHealth is of great importance to the whole Health care sector. HINE's main objective in this regard is to improve the current use of ICT by all stakeholders, thinking of the benefits which can be anticipated from an extended use of the information technologies for Healthcare purposes. HINE has strong support from industry through an active Advisory Board, and expects to progressively widen its subscriber base over the next few years. Action in this sense will at the same time open interesting market opportunities for industry as well as improve the quality of the Healthcare system and its financial efficiency.

Ongoing research and insights into critical European and industry-specific issues facing healthcare industry leaders will help pinpoint the way ahead. Our research will identify and analyse market forces and major strategic, organisational and technical issues shaping the dynamics in this rapidly evolving eHealth environment. Subscribers are able to access this information through the HINE web site and participate in focused special interest workshops.

The initial start-up phase of HINE will be completed in September 2003 at which time the service will be open to a wide range of additional subscribers. New subscribers will gain immediate access to the existing base of market information and will participate in a rolling programme of further work on key topic areas which reflect the changing market for health care ICT in Europe.

HKIS

Number: IST-2001-38153

Cluster: Health Professionals

Type of Action: Research

Project Participants:

IC	F
IEO.EXP	I
UPS	F
CNRS	F
ISOFT	F
NEPHARM	D

Contact person:
Mr. Boutruche Philippe
ISoft
France
Tel.: +33 1 69353737
Fax: +33 1 69353739
Email:
Philippe.Boutruche@ISoft.fr

Budget:
total cost: 1,300,000 €
EC contribution: 850,000 €

Timetable:
start date: 01/Jul/02
duration: 30 months

Keywords:
biomedical informatics, health professionals knowledge, cancer, data analysis, genetics

Integrated Software Platform for Biological and Biomedical Data Processing in Cancerology

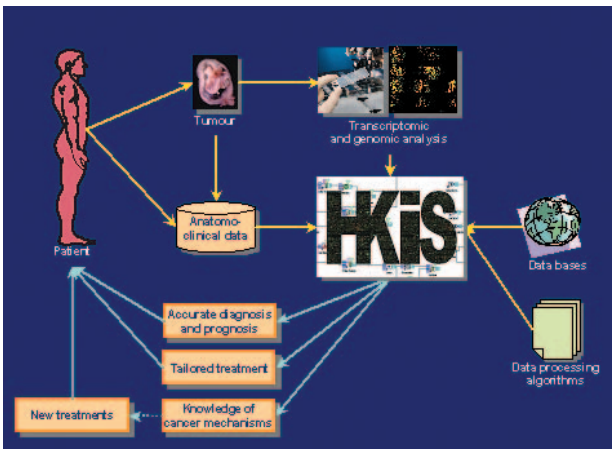
Objectives

Cancer is the second cause of death in Europe and its importance is increasing due to the population ageing. The present anatomoclinical and biological parameters are insufficient to accurately predict the aggressiveness of a tumour and to predict the response to a given treatment, therefore the most adapted therapy cannot be chosen. Also the number of possible therapeutic targets are very limited. In the very recent years, new techniques have been developed which allow a multiparametric analysis of tumours. It becomes possible to measure simultaneously, from the same sample, thousands of biological parameters on DNA alterations (genome) and on the level of expression of the different genes (transcriptome) and of the different variants of proteins. This information together with the access to the accumulating knowledge on the gene sequences, the function of proteins, the different polymorphisms (individual variations) existing in the population, the already known alterations in tumours, should have a considerable impact on cancer research and treatment. The current bottleneck for rapid progress in these fields is the integration of all the available information and its treatment. In any cases no tools are available which offer the possibility to analyse simultaneously all the different biological parameters and to correlate these parameters with the anatomo-clinical data and the data from external data bases.

Results

The HKIS platform will fill this gap and is targeted to both biological science researchers and MDs. The consortium which defines and builds this platform consists of informaticians from ISoft (Gif, France) and LRI (Laboratory of Research in Informatics, Orsay, France), and of MDs, biologists, bioinformaticians, biostatisticians from Institut Curie (Paris, France), University of Ulm (Germany), European Institute of Oncology (Milano, Italy), all three composed of an hospital, research departments and a bioinformatic support. Such structure allow to precisely define the need, to obtain the necessary data and to test the innovative HKIS platform.

HKIS platform will provide through an homogeneous easy-to-use environment, an immediate access to world-wide publicly available data bases and to all the biological and anatomo-clinical data concerning a given tumour or a group of tumours under analysis. This will lead to important progress in the knowledge of cancer, diagnosis of this disease, choice of treatment, and definition of new therapies. Although targeted to the field of cancer, as integration of heterogeneous data produce internally or available externally become a common need, this platform should be of benefit in all fields of biology.



H-LIFE

Number: IST-2000-26353

Cluster: Citizens

Type of Action: Research

Project Participants:

HCS	GR
DOCLAB	UK
FORTH	GR
VITAPLUS	GR
SYMPER	GR
SSM	CY
ELYROS	B
HMC	ISR
GREENGAGE	UK

Contact person:
Mr. Hill Michael
Greengage Computers Limited
United Kingdom
Tel.: +44 12 8354 6590
Fax: +44 12 8354 6590
Email: mike.hill@greengage.co.uk

Project web site:
http://www.h-life.org/

Budget:
total cost: 5,150,011 €
EC contribution: 2,574,999 €

Timetable:
start date: 01/Jan/01
duration: 24 months

Keywords:
health promotion and disease prevention

Intelligent personal health assistant

Objectives

It is generally recognised that health promotion and disease prevention (HPDP) is central to health strategy across the EU. The h-Life project has specifically addressed this issue and provides the possibility for citizens to modify their lifestyle based on specific dietary and lifestyle recommendations. The project contributes to the improvement of the quality of life in the EU by furthering the promotion of a healthy lifestyle and illness prevention.

The research objectives were (i) to provide IT solutions contributing to the promotion of a healthy lifestyle and (ii) to improve the prevention of illness by supporting all citizens (including those predisposed to diseases) to use new generation systems allowing them to continuously monitor their lifestyle and in time respond to risk factors.

Results

The h-Life project has created an intelligent web-based system which addresses the monitoring and improvement of health and lifestyle through the provision of customised dietary plans. Additional plan-related services including monitoring, alerting, reminding and evaluation, complement the functionality of the h-Life system. The full set of functionality constitutes a valuable assistant for users who want to follow a healthy lifestyle and for health professionals who want to provide their customers with added value services and remote monitoring.

The post project activities concern the assessment of the social impact of h-Life from the health professionals and citizens/patients point of view. The aim is to prove that the use of such system will: (i) contribute to the advancement of citizens' well being; (ii) be effective in the primary prevention of cardiovascular diseases; (iii) reduce the number of visits to health professionals; (iv) allow medical doctors to better allocate their resources, as the number of in practice visits is expected to be reduced and more medical information will be collected in less time; (v) build trust and confidence for the management of certain illnesses.

HOMEY

Number: IST-2001-32434

Cluster: Patients

Type of Action: Research

Project Participants:

CBIM	I
ITC-irst	I
ICRF	UK
L&C	B
ENGINEERING	I
SRI	UK
REITEK	I

Contact person:
Mr. Bertoncini Massimo
Engineering Ingegneria Informatica spa
Italy
Tel.: +39 06 447 4111
Fax: +39 06 446 5981
Email: massimo.bertoncini@eng.it

Project web site:
http://turing.eng.it/pls/homey/homey.home

Budget:
total cost: 4,143,260 €
EC contribution: 2,215,096 €

Timetable:
start date: 01/Oct/01
duration: 36 months

Keywords:
home monitoring, adaptive intelligent dialog systems, dialog manager, automatic speech recognition, multi-modal interaction, intelligent man-machine interfaces

Home monitoring through intelligent dialog system

Objectives

In western countries, the socio-economical burden related to the management of chronic diseases is progressively increasing.

Evidence-based guidelines should be implemented by primary care physicians and the patients conditions should be monitored and assessed more frequently by both general practitioners and specialists. A cost/effective way to improve organisation of managed care is to rely on Information and Communication technology solutions. For example, the use of the Internet may allow diabetic patients to resort to a virtual clinic for anytime assistance in revising insulin therapy, or patients suffering from hypertension may communicate their blood pressure measurements to GPs by resorting to a computerised call centre.

In particular, in this context, it seems crucial to investigate the potentials of Intelligent Dialog Systems (IDS), i.e. systems that allows a natural interaction by spoken dialogs. Their role is crucial for at least two reasons:

- voice is a natural way for people to communicate information; the chance of using (fixed or mobile) phones to monitor elder patients conditions may allow them to overcome the still existing technological barriers;
- voice interaction may be effective not only to collect formal information, i.e. measurement data, but also to keep track of informal information, i.e. messages exchanged by patients and physicians.

The use of IDS in healthcare applications promises to be a breakthrough in chronic patients home monitoring. To this purpose it is necessary to achieve a better integration between the healthcare domains and the speech recognition-understanding technology through an intelligent and adaptive dialog system.

Results

The work in the project will be conducted on the basis of well-founded theoretical frameworks from Computational Linguistics, Artificial Intelligence and Speech Technology. However, the focus of innovation will be on developing robust and efficient technology meeting the requirements of real word applications. Therefore, some speech-controlled show cases will be defined and corresponding prototypes, for telephone applications, will be developed. More specifically, two application domains refer to:

- home monitoring of type 2 Diabetes Mellitus patients, with regard to blood glucose metabolism and cardiovascular diseases prevention;
- home monitoring of patients undergoing peritoneal dialysis.

Two other show cases, that would benefit strongly from the existence of adaptive dialogue capabilities, are foreseen for developing:

- a web-based system for collecting patient information and giving advice on whether or not an urgent referral is required for a suspected cancer patient;
- a web-based graphical toolkit for creating a 'family tree'.

The IDS will be based on a Dialogue Manager (DM) controlling both speech and graphic interfaces in order to handle patient's interaction. Communication among modules will be supported by a telephone infrastructure (a Web call centre).

HUMAN

Health throUgh teleMAtics for iNmates

Number: IST-2001-33483

Cluster: Patients

Type of Action: Research

Project Participants:

SYNAP	I
PAGLIA	I
GASTRO	I
DGSPIR	E
CST	E
SEMA	E
SSSA	I
M.B.I.	I
EUTELSAT	F

Contact person:
Dr. Fontanelli Riccardo
SYNAPSIS s.r.l.
Italy
Tel.: +39 0586 426790
Fax: +39 0586 443954
Email:
r.fontanelli@websynapsis.com

Project web site:
http://www.human-project.ws

Budget:
total cost: 2,737,547 €
EC contribution: 1,500,000 €

Timetable:
start date: 01/Sep/01
duration: 36 months

Keywords:
biomedical informatics, telemedicine, domotic services, prison healthcare, eLearning.

Objectives

The HUMAN Project aims at improving the quality and continuity of patient-prisoner care by designing, developing and validating in two different European sites an umbrella of health telemedicine and domotic services, tailored to the inmates' needs, as well as to the requirements of the health professionals operating in the detention centres. A satellite connection has been used to guarantee communications between the sites.

The identified services are focused on people, in particular inmates, suffering from diabetes, hearth arrhythmia, blood pressure problems, pathologies related to drug use and disabled and elderly persons. The project also addresses cost effectiveness and sustainability of health care in the correctional sector, since telemedicine enables teleconsultations, that can substitute direct visits, thereby reducing some direct and indirect costs and enhancing security and quality of care.

In general, the implementation of a new generation of healthcare applications will impact on the prison population as well as on the enlarged population of European citizens.

Results

The expected outcome of the project is represented by: i) a Web-enabled decision support system, to be used by clinicians in order to snapshot the 'current case history' of the inmates, based on a Digital Patient Record, namely a Digital Inmate Diary (DID), and ubiquitous access to the DID, using palm-sized PC and UMTS technologies; ii) a core set of customised set-ups for smart environments (prison cells), tailored on the health requirements of inmates; iii) a Web based platform for supporting the provision of remote consulting from specialists, as well as second opinions from clinicians operating outside the prison environment in a safe and secure environment, being the only way to improve drastically the quality of the care provided to the prisoners, recognised as such by all the professionals in charge; iv) a Web based platform for supporting distance learning (eLearning) of in-house clinicians.

Secure access to information will be guaranteed, both at software (by utilising HTPPS and SSL protocols) and hardware levels, the latter accomplished through the use of an open standard architecture, thereby implementing secure, satellite, TCP/IP based, Intranet communications.

Concerning the exploitation of project results, the identification of modern and economically sustainable management approaches of social and healthcare service provision is a must of the HUMAN project. In this context, industrial project partners will produce a detailed feasibility analysis for the exploitation of project results, by the means of the definition of business plans for developed services and integrated systems.

ICOTEL

Number: IST-1999-90159

Cluster: Health Professionals

Type of Action: Subvention

Project Participants:
CRP SANTE L

Contact person:
Mr. Schroeder Jo
Centre de Recherche Public de la Santé
Luxembourg
Email: jo.schroeder@crp-sante.healthnet.lu

Project web site:
http://www.telemedicine.lu

Budget:
total cost: 374,732 €
EC contribution: 47,552 €

Timetable:
start date: 01/Apr/02
duration: 6 months

Keywords:
telemedicine, telecare

International Conference on Telemedicine and Telecare

Objectives

Organisation of the 'Telemedicine & Telecare International Trade Fair', Luxembourg, 10-12 April 2002. The aim of this event is to bring together exhibitors and visitors from around the world, creating a unique opportunity for supplier of telemedicine-related products and services to meet with users, policy makers, and distributors.

Results

The 'Telemedicine & Telecare International Trade Fair' was the first Telemedicine dedicated exhibition organised in Europe. Over 500 attendees, 36 exhibitors from 13 countries and high level speakers from 26 countries around the world presented more than 50 presentations in telemedicine applications, diagnostics and information exchange, education, home care, information technology and satellite communication.

The positive comments and feedback received during and after the fair, strongly confirmed the true value of this event which is now planned to be organised on a yearly basis.

ICUST 2001

Number: IST-1999-90130

Cluster: Health Professionals

Type of Action: Subvention

Project Participants:
ADERA SERVICE F

Contact person:
Mr. Chevalier Christian
ADERA Service
France
Tel.: +33 5 5615 1199
Fax: +33 5 5615 1160
Email:

Project web site:
http://www.adera.fr/icust2001/

Budget:
total cost: 94,030 €
EC contribution: 10,000 €

Timetable:
start date: 01/Apr/01
duration: 6 months

Keywords:
human computer interaction, health professionals' knowledge, eHealth networks and architectures, telemonitoring, telemedicine

3rd International Conference on Uses and Services in Telecommunications

Objectives

The telecommunication sector keeps evolving in a complex and uncertain environment characterised by fast-paced changes in the technological, economical, reglementary and international contexts. The explosive growth of mobile and internet-based services, the increasing network of service providers, innovative marketing and pricing are changing the way we communicate and our whole behaviour. How deeply? How does the individual user, companies, the public service sector react to this new environment? What determines the success or failure of new services? What are the new practices, uses, customs in the Information Society?

If the conferences devoted to new information services from the standpoint of technology and market issues are many, there are few opportunities to consider in depth the true human dimension of new (or not so new) behaviours and practices. The International Conference on the Uses and Services in Telecommunication is an international forum of interdisciplinary exchange for researchers in social and cognitive sciences, and various actors in the field professionally interested in this issue of new practices and behaviours, whether from businesses or representatives of users or the public sector, etc.

Papers will rely on cognitive, ergonomic, sociological, economical analyses to empirically investigate actual case studies in the uses of information services, on the one hand to learn from them and on the other to anticipate future evolutions in services and their uses.

Results

The two first editions of ICUST took place in Gironde – Aquitaine. It had been decided that in order to give a more European and International scope to the conference it would be held in Paris. The chosen venue was the ENST located right in the centre of Paris, which proved to be a good move and the conference was very successful attracting 190 delegates over a three day period. The conference was able to offer plenary as well as two running parallel sessions. The only difficulty encountered was attracting NAS delegates despite major efforts of dissemination in these countries.

The Programme Committee regrouped 34 members of whom over two third were from either European or International origins. They finalised a very convincing programme selecting 55 communications out of 100 abstracts received.

The topics covered were extremely varied, such as creating seamless service chains through ICT, the impact of the new technology of information on the uses within the Universities/hospitals, the impact of telemedicine on training and qualifications of health professionals.

Combined excellent and very good answers from the evaluation form seemed to be justified as it expressed real satisfaction of the delegates. This satisfaction encompassed the programme content, the 600 page proceedings, the location and the organisation.

IDEAS

An Integrated Distributed Environment for Application Services in e-Health

Number: IST-2001-34614

Cluster: Patients

Type of Action: Trial

Project Participants:

APLITEC	E
UPV	E
HOSP90	E
HOSPFE	E
BAAN	NL
UNINOVA	P
COMPUTAS AS	N
GRAISOFT	F
FORMULA	I
IC FOCUS	UK
EADS CCR	F
UNIV BDX I	F
ICOM	GR
SAP	D
CRF	I
AIDIMA	E

Contact person:
Prof. Vicente Hernández
Universidad Politecnica
de Valencia
Spain
Tel.: +34 96 387 7356
Fax: +34 96 387 7359
Email: vhernand@dsic.upv.es

Project web site:
http://www.ideas-eHealth.upv.es

Budget:
total cost: 474,418 €
EC contribution: 271,998 €

Timetable:
start date: 01/Apr/2002
duration: 18 months

Keywords:
eHealth networks and architectures, home telecare, mobility of health professionals, telemedicine, teleradiology.

Objectives

Telemedicine technologies have been evolving very rapidly in the last years. The availability of broad band communication lines have enabled to transmit more information faster to a wider area. Telemedicine technology transfer is being reduced by the disparity of requirements of different applications, the difficulties in the installation and maintenance and the business models. The objective of the IDEAS in e-Health project is to provide a new concept of telemedicine provision. IDEAS in e-Health project will develop a general multimedia platform for the set-up of a large variety of telemedicine applications through the ASP (Application Service Provider) model. This model permits the users to rent the service rather than buying the whole application. The project will validate the business model in two different areas: telehomecare and teleradiology.

Results

The IDEAS in e-Health project will produce three main results.

The first result is a universal ASP platform for the development of telemedicine applications. This platform will provide the means for user authentication, efficient transfer, videoconference, secure transfer and data storage. The platform will provide both data storage capacity and computational power by means of a parallel computing cluster.

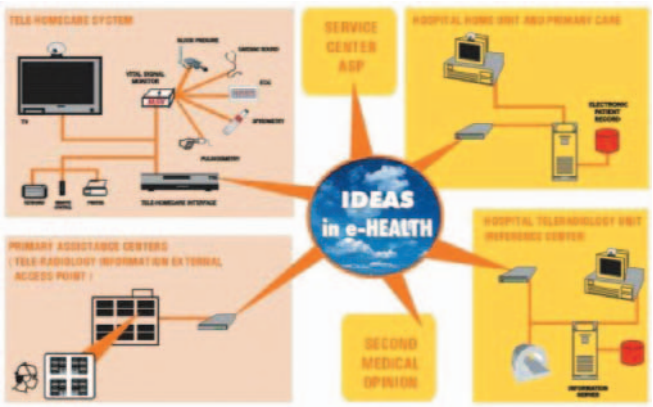
The second result is a telehomecare application developed on top of the ASP platform. This application will provide capture and recording of patients' data when they are at homecare regime, access to medical data from patients' home (both using wireless connection) and videoconferencing support for tele-visiting. It will also support practitioners' information management.

The third result is a teleradiology application developed on top of the ASP platform. This application will enable radiologists to share data, flow control for remote examination and reporting and efficient transfer of radiology information. It will provide access to 2D and 3D image processing tools available on the ASP server.

Benefits of the ASP platform are mainly focused on reducing time-to-market for new telemedicine applications and on standardising the requirements. The ASP model enables to reduce up to the minimum (just an internet browser) the user requirements. It can also ensure the automatic update of software versions and higher availability.

The telehomecare application will provide practitioners with more information for performing diagnosis when they are at patients' homes. This will end up with more accurate diagnoses and thus higher quality healthcare provision.

Finally, the teleradiology application aims at reducing the time required for obtaining a diagnostic report. This can help to react quicker in urgent cases in places where no radiologist is present, to reduce the waiting time of patients (thus reducing anxiety) and to detect earlier potential errors in diagnostic images that would force patients to come back again.



IERAPSI

Number: IST-1999-12175

Cluster: Health Professionals

Type of Action: Research

Project Participants:

UNIPI	I
Virtual Presence	UK
Genias	NL
UoM	UK
CRS4	I
UoD	D
UCL	UK
CS SI	F

Contact person:
Dr. Nigel John
Victoria University
of Manchester
United Kingdom
Tel.: +44 161 2756096
Fax: +44 161 2756800
Email: n.w.john@mcc.ac.uk

Project web site:
http://www.vmwc.org/projects/ierapsi

Budget:
total cost: 3,201,793 €
EC contribution: 2,100,000 €

Timetable:
start date: 01/Jan/00
duration: 36 months

An Integrated Environment for Rehearsal And Planning of Surgical Interventions

Objectives

The objective of IERAPSI is to provide an interactive computerised environment for the planning and rehearsal of surgical procedures in individual patients. The most important goal is to contribute to the European Community's social objectives by improving the provision of health and life through the introduction of modern science technology into healthcare. Specifically, IERAPSI will provide:

- an interactive visualisation environment to allow the production of 3D surgical planning data sets;
- image review and analysis tools to allow the surgical review of CT, MRI and angiographic examinations in an interactive 2D and 3D manner;
- an integrated suite of image segmentation and visualisation tools intended to allow rapid and accurate identification of individual structured based on their imaging characteristics;
- a physics based surgical simulation system with visual and haptic feedback for training surgeons to perform operations on individual patient data;

A further use of IERAPSI will be in patient education and consent. The simulators can be used to prepare a patient before a surgical operation to explain the procedure that they about to undergo using renderings of their own body. This can reduce patients and is an excellent example of how information technology has immediate practical benefit.

Results

The main result will be an interactive computerised environment for the planning and rehearsal of surgical procedures. The implementation will be generic in order to adapt and reuse components easily for other applications. To meet the project objectives IERAPSI will address surgery of the petrous bone - a common surgical site with complex anatomy. It requires range of surgical procedures with escalating levels of complexity: Mastoidectomy; Cochlear implantation and Acoustic Neuroma. Both surgical planning and surgical simulation are addressed. The usefulness of the IERAPSI system will be assessed by a small scale clinical trial - one for each of the 3 clinical exemplars.

IFG

Health in the Information Age

Number: IST-2001-92502

Cluster: Health Professionals

Type of Action: Subvention

Project Participants:
IFGASTEIN A

Contact person:
Dr. Leiner, Gunther
International Forum Gastein (IFG)
Austria
Tel.: +43 6432 3393 247
Fax: +43 6432 3393 271
Email: info@ehfg.org

Project web site:
http://www.ehfg.org/website01/

Budget:
total cost: 137,642 €
EC contribution: 65,749 €

Timetable:
start date: 01/Jun/01
duration: 12 months

Keywords:
telemedicine, information to citizens, implementation of telemedicine, health policy

Objectives

The development of telemedicine and eHealth solutions is progressing quite rapidly, offering significant potential for quality and service improvements, as well as cost reductions. However uptake and implementation is often lagging behind as stakeholders and decision-makers are reluctant to adopt new technologies, working practices and standardisation out of fear to loose control and/or influence vis a vis other actors. Nevertheless the implementation of telemedical solutions can be a win-win situation benefiting all actors involved including patients.

In demonstrating these benefits to the relevant actors drawing on the expertise gained and experiences made across Europe uptake and implementation can be facilitated.

The project therefore aims to facilitate the dissemination of best-practice to decision-makers representing different stakeholders in European health systems. Clarification of positions of stakeholders with respect to the implementation of eHealth/best practice solutions across Europe. Facilitation of consensus amongst decision-makers with a view to linking best practice to policy implementation.

The project is linking to: action line 'Best practice and trials in eHealth' (IST2001 – I.1.3) of the IST programme and eEurope/health online action line; new EU health strategy and action programme (COM (00) 285; COM (01) 302;), priority action one: Improving health information and knowledge; social objective of the Union to improve the standard of living and health of EU citizens. In addition it improves the knowledge base for citizens, and facilitate their involvement in the political decision-making regarding health systems.

Results

The operation is the organisation of one Parallel Forum Session ('Health in the Information Age') within the framework of the 4th European Health Forum Gastein 2001 to be carried out as follow-on action to the 3rd EHFG 2000 'Information and Communication in Health'.

The conclusions and recommendations were presented to all delegates amongst them David Byrne Member of the European Commission and were also incorporated in the Gastein Health Declaration. The Declaration was presented in Brussels to Members of the European Parliament and the press. A full scientific report was published. Other dissemination Results

- 2 mailings (16,000 decision-makers and experts in the health field across Europe) + newsletter 'Issues in European Health Policy' addressing project topics;
- 4 press conferences and media centre at EHFG 2001 resulting in 9 TV reports, 49 radio reports, 102 reports in newspapers or journals, 9 agency reports, 24 online reports;
- European Commission information point at the EHFG 2001;
- website: www.ehfg.org.

IHE-E

Number: IST-2000-29221

Cluster: Health Professionals

Type of Action:
Thematic Network

Project Participants:
COCIR D
EAR A

Contact person:
Mr. Bursig Hans-Peter
European Co-ordination Committee of the Radiological and Electromedical Industries (COCIR)
Germany
Tel.: +49 69 6302 206
Fax: +49 69 6302 390
Email: office@cocir.org

Project web site:
http://www.ihe-europe.org

Budget:
Total cost: 200,000 €
EC contribution: 200,000 €

Timetable:
start date: 01/Sep/01
Duration: 18 months

Keywords:
eHealth networks and architectures, telemedicine, system interoperability, workflow management

Integrating the Health Care Enterprise in Europe Concerted Action

Objectives

The project aims to achieve interoperability between different IT systems from different vendors that are in use in health care for the storage and communication of medical images and administrative and organisational purposes. The project will demonstrate that commercially available software and hardware products can be made interoperable, if they comply to a common technical specification based on existing international standards.

Following the technical specifications, including the standards selected, will permit to achieve an uninterrupted flow of information between existing IT structures. This will bridge existing gaps between administrative and clinical IT systems. This will constitute an essential step towards an electronic patient record. Interoperability of this kind will also support the goals of the e-Europe Action Plan in the health area.

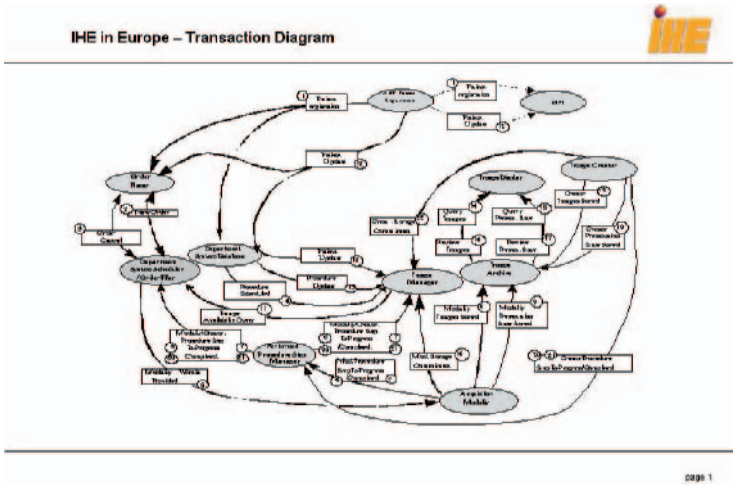
The technical specification will be based application scenarios (integration profiles), that describe actual workflows and procedures in a health care enterprise. As a result, users will be able to take an integrated approach towards the use of IT systems from patient admission to the health care enterprise to the distribution of results from medical procedures.

Results

European health care providers will be made aware of the potential benefits from integrated and interoperable IT solutions for the organisation of health care services. The project will also show, that these benefits can be achieved through the implementation of IT solutions that are commercially available already today. This will contribute to improved effectiveness and efficiency of health care enterprises, contributing to the control of health care cost. In addition, European health care providers will be provided with a possibility to influence the development of such solutions according to their needs.

The project will also contribute to the competitiveness of European manufacturers of health care IT and IT dependent systems, especially SME, through the promotion of interoperability. Especially SME will find a platform to develop interoperability solutions at world-class level, taking care of market and user requirements.

The project will not result in pilot projects or individual prototypes. Instead, the technical specification will be publicly available. Based on the technical specification, any IT vendor can achieve interoperability with any other manufacturer complying to the technical specification.



IHELP

Electronic Remote Assistance in the Operating Room

Number: IST-2001-33269

Cluster: Health Professionals

Type of Action: Best Practice

Project Participants:

ELYROS	B
C.S.C.	E
KI	S
BRAINLAB	D

Contact person:
Dr. Hartlep Andreas
BrainLAB AG
Germany
Tel.: +49 89 991 568 0
Fax: +49 89 991 568 33
Email: hartlep@brainlab.com

Project web site:
http://www.ihelp-eu.com/

Budget:
total cost: 731,707 €
EC contribution: 474,999 €

Timetable:
start date: 01/Sep/01
duration: 18 months

Keywords:
eHealth networks and architectures, Telemedicine, health professionals knowledge, on-line assistance,

Objectives

The main objective of the proposed project is to design, develop and validate a remote assistance/support application for the operating room.

By introducing next-generation, user-friendly, cost effective and interoperable general-interest health services, the iHelp proposal ensures that clinics make best use of state of the art technology in telematics and a ubiquitous e-Health system. The usability, acceptability and cost-effectiveness of this remote assistance project are among the main objectives of the iHelp application.

iHelp will empower the medical expert (eg. The neurosurgeon, the oncologist etc.) to interact with the health telematics industry, that is the developers and the engineers of the neurosurgery tools, assisted by an intelligent automated infrastructure. This interaction will lower the cost both for the users and the engineers. iHelp aims at simplifying and making more efficient the tele-collaboration methodology.

The initial trial period will involve the use of iHelp during low risk operations to establish that there are no problems during the surgical procedure. The use of iHelp will be further carried on in normal operating conditions, after the initial trial period validation. The pilot application will focus on neurosurgery, where sophisticated software & hardware are already used, and where it is anticipated that iHelp will be a most efficient innovative online assistance to the surgeon in the OR. Initial installations will be carried out in the two-user partner sites (Department of Neurosurgery, University Hospital Clinic, Barcelona and Department of Clinical Neuroscience, Section of Neurosurgery, Karolinska Institute and Hospital) combined with using the VectorVision system. The pilot aims not only at validating the technological approach but also at performing a thorough examination of the proposed process of electronic remote assistance in the OR.

Results

The system was installed at the two user sites and first tests could be performed. Data security is warranted regarding the relevant laws. Communication lines were established regarding the individual needs and restrictions of the user sites.

The tests were very promising and showed that iHelp is able to shorten the down time of surgical equipment significantly. iHelp supports surgeons in using high tech equipment during the surgery without being disturbed by malfunctions or improper usage. Technical questions about surgical equipment could be solved. The efficient intra-operative usage of the required technical equipment increases patient benefit and shortens OR-time.

IMAGUM

Number: IST-1999-55012

Cluster: Health Professionals

Type of Action: CRAFT

Project Participants:

FCD	F
QUIRIN	F
STATICE	F
IMASONIC	F
BIO SRL	I
LAMORAL	B
SPEAD	D
FHG/IBMT	D
ATYS	F

Contact person:
Mr. Denis Parzy
Atys Medical
France
Tel.: +33 4 7805 6969
Fax: +33 4 7805 6960
Email: atys@atysmedical.com

Project web site:
http://www.atysmedical.com

Budget:
total cost: 1,651,328 €
EC contribution: 825,379 €

Timetable:
start date: 01/Jan/01
duration: 36 months

Keywords:
medical imaging for surgical planning and intervention, minimally invasive systems, gum imaging, High resolution echography, Ultrasound

Development of a high resolution ultrasonography for gum imaging

Objectives

Periodontal diseases are very widespread and concern junior like senior citizens. Diagnostic and monitoring examination of oral cavity are actually performed by clinical examination and radiology. These techniques give practitioners satisfying information on teeth but do not allow them to detect periodontites in the incipient stage.

Not diagnosed periodontal diseases or identified at a late stage induce receding gums and removal of teeth. Expensive dental prosthesis have then to be implanted on patients. Regarding persons who can not acquire a dental prosthesis for financial reasons, loss of teeth works out to difficulties in their social life (nutrition, pronunciation difficulties, etc).

So there is a need for a diagnostic technique that can allow practitioners identifying gum diseases in the incipient stage and following their treatment.

The project aims to create system designed to:

- to make efficient and non invasive gum diagnostic
- to identify gum diseases in the early stage
- to accurately appreciate periodontal disease
- to monitor process of gum healing.

Results

A high resolution ultrasonography system for gum imaging will be put on the market. It is addressed to the dentists (250,000 in Europe).

The results of the project will allow to improve dental practical quality and better level of health for EU citizens.

IMP-ART

Number: IST-1999-57449

Cluster: Health Professionals

Type of Action: CRAFT

Project Participants:

CENTER	DK
AKIL	UK
PIKOSYS	SF
KPLAS	DK
ION	D
VTT	SF
PERA	UK
SARANTEL	UK

Contact person:
Mr. Dowsett Mark
Sarantel Ltd
United Kingdom
Tel.: +44 1933 670566
Fax: +44 1933 401155
Email: mdowsett@sarantel.com

Project web site:
http://www.imp-art.info

Budget:
total cost: 1,080,659 €
EC contribution: 537,689 €

Timetable:
start date: 01/Aug/02
duration: 24 months

Keywords:
wearable medical systems, telemedicine, wound management, oxygen delivery, wireless communication

Implementation of automatic remote triage for alternative site patient monitoring and care

Objectives

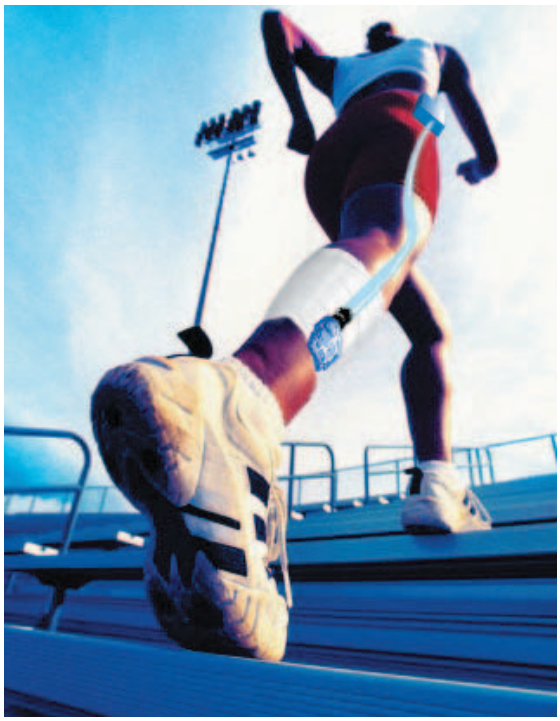
Throughout Europe there are approximately 2 million people currently suffering from chronic wounds such as ulcers and lesions that can have healing times from a few weeks to years, and in some cases do not heal at all leading to limb amputation. Despite the thousands of products available for wound and skin care physicians remain frustrated by slow healing wounds and also the growing costs of care. It is common for over 40% of a community nurses' time to be taken dressing and managing chronic wounds.

Oxygen therapy has been found to play a significant role in the healing process of such wounds and may in fact be the rate limiting step in early wound repair. Current oral methods of providing oxygen are very inefficient insofar as it is not possible to target the wound area specifically. The capillary network that supplies oxygen rich blood will have been disrupted at the site of the wound.

The objective of this project is to develop a device that delivers oxygen directly to the wound site to increase the rate of healing and repair of chronic wounds. The device will also reduce the burden on medical staff and resources by reducing the amount of time required for wound management and dressing changes.

Results

Improved healing and repair rate is achieved by providing an oxygen rich environment directly around the wound area. A lightweight, low profile delivery head is placed over the wound, and attached using conventional medical dressings. It is supplied with oxygen at a controlled rate to produce optimum healing. Oxygen supply, flow control, monitoring and telemetry devices are built into an ergonomic, compact pack that is worn by the patient and connected to the delivery head. Making the device small enough to wear enables the patient to be treated at home freeing up valuable hospital space.



By monitoring the state of the wound the correct oxygen flow rate can be set to achieve the optimum healing rate. The state of the wound is monitored by sensing devices that detect the presence of certain gasses which are given off as the wound heals. Telemetry devices, using standard wireless protocols, relay the information from the sensors to a remote monitoring station where the effectiveness of the treatment can be gauged and if necessary adjustments made to the oxygen flow rate. Remotely monitoring and controlling the healing process reduces the amount of time medical staff spend managing the wound and changing dressings.

INCA

Number: IST-2001-37632

Cluster: Patients

Type of Action: Research

Project Participants:

SCHNEIDER	D
TVS	D
EXATEL	ISR
DRI	D
DIABEM	E
FHG/ISIT	D
DMS	CH
TID	E
IFMI	D
UPM	E
CARD GUARD	ISR

Contact person:
Dr. Dudde Ralf
Fraunhofer Gesellschaft
Germany
Tel.: +49 4821 174212
Fax: +49 4821 174291
Email: dudde@isit.fhg.de

Project web site:
http://www.ist-inca.org

Budget:
total cost: 3,076,612 €
EC contribution: 1,199,772 €

Timetable:
start date: 01.01.2003
duration: 36 months

Keywords:
wearable medical systems, telemedicine, biomedical sensors, diabetes therapy, insulin infusion

Intelligent Control Assistant for Diabetes

Objectives

Efficient control of chronic diseases demand a high degree of motivation and compliance by the affected citizens. In the case of diabetes as one of the major chronic diseases, painful manual of glucose measurement are required to mostly postpone onset of complications. The main goal of the INCA project is to significantly improve today's therapy creating a personal control loop which interacting with remote control opportunities. A so called 'Smart Assistant' shall provide continuous determination of glucose and continuous application of insulin. Both continuous actions will be coupled into a personal control loop based on RF (e.g. bluetooth) as communication technology. The central control device of the loop consists of a smart phone with extended device control capabilities ('Smart Assistant').

The INCA project is designed to deploy a new system and a new care environment of optimum convenience and user-friendliness. The development will be focussed on diabetes treatment as an example for a major and wide-spread chronic disease. An intelligent telemedical system (finally based on UMTS) will allow to optimise diabetes therapy by providing best possible individual support to both people with diabetes and their diabetologists. To achieve optimal diabetes management, intensive monitoring of the blood glucose level will be combined with a continuous insulin administration. The adjustment of both will be controlled by a central smart phone ('Smart Assistant').

The most intensive therapy, the pump therapy, will be focussed in combination with a new glucose monitor.

Results

The combination of continuous measurement of the patient's glycaemia and adjustment of the insulin infusion rate implies the two following major advantages.

A better life quality for the patient. People with diabetes control their glucose concentration several times a day by finger pricking, followed by calculating the appropriate amount of insulin to infuse each time. The amount of insulin to infuse will be predicted by a computer model which also will be capable to control the insulin infusion pump. The daily life of people with diabetes will become less stringent and their disciplined way of life will improve.

Decrease diabetes related late complications and thus of global health care costs: Most of the secondary complications produced by diabetes leads to severe disorders such as cardiovascular disorders, kidney and liver dysfunction, eye diseases and nervous system disorders. The treatment of these disorders is quite costly which represent an important part of the nation's global health budget.

INFACE

Number: IST-2001-38187

Cluster: Health Professionals

Type of Action: Research

Project Participants:

GST	UK
AIRIAL	F
UJF	F
RC-AUEB	GR
OK SYSTEMS	GR
L&C	B
TECHNOGLOBAL	CY
EMC	CY
CNRS	F
INPG/TIMC	F

Contact person:
Mr. Tucker Bill
Guy's and St. Thomas's Hospital NHS
United Kingdom
Tel.: +44 207 922 8119
Fax: +44 207 261 9690
Email: anne.burridge@gstt.sthames.nhs.uk

Budget:
total cost: 3,702,476 €
EC contribution: 2,153,386 €

Timetable:
start date: 01/Sep/02
duration: 24 months

Keywords:
health professionals knowledge, human computer interaction, multimedia information retrieval, visual interfaces, visual & semantic information retrieval.

Advanced Visual InterFACEs for timely Retrieval of Patient Related Information

Objectives

INFACE is an innovative concept in the seamless provision of multimedia patient related information to healthcare professionals. It aims towards providing healthcare professionals with advanced, personalised, user-friendly visual interfaces for formulating multi-lingual search queries for patient-related information.

INFACE will implement intelligent algorithms and ontologies for locating, selecting, visualising, manipulating, analysing and presenting users with their required healthcare related information in a simple and understandable manner. This information could originate from heterogeneous, distributed, medical and other databases and from other multiple resources including web based information and PACS systems. Different approaches to visualise similarity and semantic relations among different multimedia information will be employed to achieve the above aims.

Importantly, INFACE will provide an innovative web based system that will enable a wide range of actors, including health professionals, health organisations and in the longer term, patients, to access vital, currently difficult to obtain, information from any place at any time in a personalised and seamless manner.

This will greatly contribute to improving the European health-knowledge infrastructure through direct provision of more readily accessible information which is easier and more cost effective to obtain, and is more aligned with its users' needs.

Results

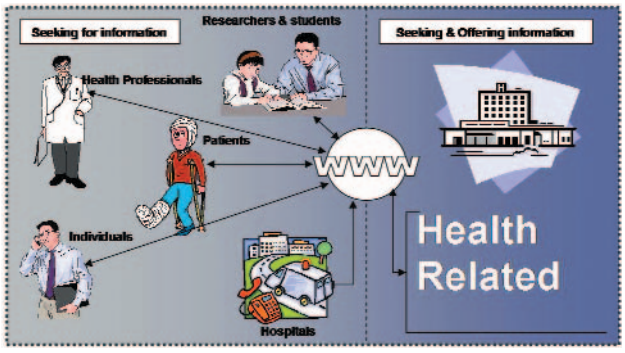
INFACE will provide healthcare professionals with a user friendly, multi-lingual web-based environment, in which distributed, heterogeneous, web-sited multimedia information can be retrieved and presented through a personalised dialogue in an easy to understand manner.

Healthcare professionals will be offered personalised (using individual user's criteria), ubiquitous, timely and secure access to medical data at the point of care. This will be provided through various communication means with delivery of information being customised to individual needs, utilising Internet technologies on portable devices and lightweight interfaces.

INFACE deployment will greatly contribute to improving the content, availability and usability of the European health-knowledge infrastructure by direct provision of more readily accessible information which is easier and cheaper to obtain, better aligned with the needs of its users, and seamless in its procurement and presentation.

Initial focus will be on breast disorders, in particular cancer, and this will be expanded to other areas later.

The INFACE consortium is confident that the project will result in a profitable European technology development and exploitation of the project's results is a key area of focus. INFACE will be targeted at providing both reductions in the costs of information procurement and qualitative improvements in the availability of healthcare related information in order to provide a comprehensive and cost effective commercially viable tool.



INFOGENE

INteractive platform FOr personal GENEtic profile construction, decision support

Number: IST-2001-33402

Cluster: Citizens

Type of Action: Research

Project Participants:

GMCD	B
INFERMED	UK
PSION	UK
HRD	F
VITAMIB SARL	F
P&S	B
DGC	GR

Contact person:
Mr. Erik Van Himbergen
Pocket and Soul B.V.B.A.
Belgium
Tel.: +32 3 213 65 50
Fax: +32 3 213 13 99
Email: erik.vh@pocketnsoul.com

Project web site:
http://lotus5.vitamib.com/HNB/INFOGENE/INFOGENE.nsf/Web/Frame?openform

Budget:
total cost: 3,430,474 €
EC contribution: 1,715,235 €

Timetable:
start date: 01/Oct/01
duration: 42 months

Keywords:
health professionals knowledge, advanced mobile systems, public health, health promotion, information to citizens

Objectives

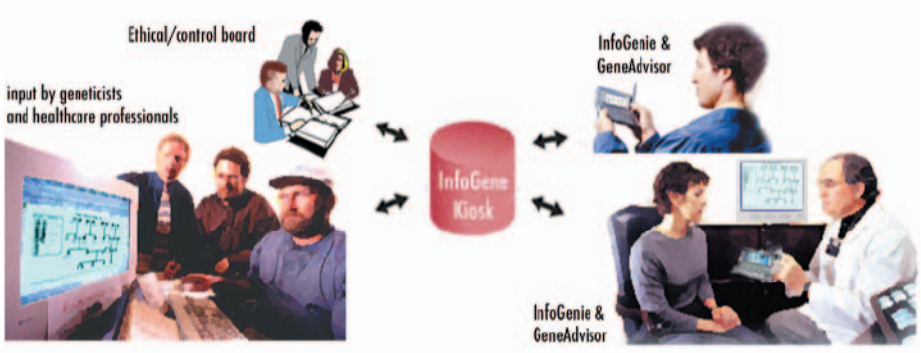
Citizens with genetic concerns often try to find answers to their questions. They are often confronted with information that is difficult to understand or are even unable to find the appropriate answers to their questions. As a result those people possibly crowd the Doctor's consulting rooms but are not necessarily at risk. Other people who could be genuinely at risk through genetic disease can remain unaware of possible risks and as a consequence they do not visit a Doctor while they maybe should.

For both categories of people, the lack of information about genetics represents a gap between the scientific world of genetic knowledge and the general public citizen. And in essence, genetics is the paradigm of differences between individuals. Therefore, citizens do not necessarily require general information but rather require relevant advice specifically tailored to themselves and their families. INFOGENE wants to fill this gap by providing general and personalised genetic information.

Results

INFOGENE will create a system capable of providing general and personalised genetic information. The system will deal with predictive genetics, especially cancer genetics, and the prenatal diagnosis of genetic diseases.

The system will contain the necessary technological components and sufficient medical content for convincing demonstrations. By the end of the project, the multilingual system can be delivered to a community willing to complete the content and to oversee future developments.



INFOGENMED

Number: IST-2001-39013

Cluster: Health Professionals

Type of Action: Research

Project Participants:

IEETA	P
UPM	E
ISC	E
CR4aka	S
GENOMICA	P

Contact person:
Prof. Sousa Pereira Antonio
Universidade de Aveiro (IEETA)
Portugal
Tel.: +351 234 370 500
Fax: +351 234 370 545
Email: asp@ieeta.pt

Project web site:
http://www.infogenmed.net

Budget:
total cost: 1,454,264 €
EC contribution: 1,008,000 €

Timetable:
start date: 01/Sep/02
duration: 24 months

Keywords:
biomedical informatics, health professionals knowledge, biomedical information hubs, rare genetic diseases, distributed information integration.

INFOGENMED: A virtual laboratory for accessing and integrating genetic and medical information for health applications

Objectives

Medical informaticians have long been providing physicians with computing aids for patient care and management, while bioinformatics experts have more recently been building and managing large databases of genetic information, as the Human Genome Project exemplifies.

The increasing availability of genetic and clinical information, both in public and in-house databases, demands for practical information technology tools, able to give clinicians integrated and comprehensive access to previously scattered and unconnected data.

INFOGENMED aims to build methods and integrated tools that enable the access to and use of dispersed, heterogeneous databases, to improve clinical and research practice. Medical information regarding diseases will be easily accessible and related genetic information, a type of valuable data the clinicians are mostly unfamiliar with, will also be located, retrieved and presented in a unified, user-friendly way.

This will empower medical practice, research, knowledge development and the collaboration between bioinformatics and medical informatics, paving the way for individualised medicine: as the understanding of the genetics base of drug action increases and genetic information is added to Patient Records, both patient-tailoring of medical action and population studies of genetic epidemiology will be improved.

The project motivation is related to both informatics and medical innovations. We propose for the former the integration of different original methods and tools to solve the problem of data integration from multiple heterogeneous sources. For the latter, we believe that integrated medical and genetic information will be increasingly needed in routine patient care. Both dimensions are included in the current (and future) EC research agenda.

Results

Having started in September 2002, INFOGENMED will reach conclusion in September 2004, producing the following results. The first result will be the design and implementation of a software system to support the search and linkage of the contents of scattered databases, including:

- development of methods and tools to locate, access and integrate distributed medical and genetic data;
- construction of a vocabulary server to bridge and relate different medical and genetic terminology;
- development of an 'assistant' to help users in resorting to such methods and tools for the benefit of their practice (e.g.: flowchart representation for clinical pathway visualisation).

The second result will be the field-validation of the entire system in the domain of rare genetic diseases.

'A web of biomedical knowledge. Currently, amazing quantities of genetic and medical information are available in the Internet. INFOGENMED is developing the tools to bring that knowledge to every day clinical practice.'

INHALE

Number: IST-1999-57447

Cluster: Health Professionals

Type of Action: CRAFT

Project Participants:

CLAREPAK	IRL
GOUDSMIT	UK
WINTHER	DK
A.G.M.	ISR
BTL	UK
BCN	E
PERA	UK
CRIC	E

Contact person:
Mr. Joyce John
CLARE-PAK Ltd
Ireland
Tel.: +353 61-923 133
Fax: +353 61-923 135
Email: john.joyce@iol.ie

Project web site:
http://www.pera.com/rndprojects/

Budget:
total cost: 1,150,542 €
EC contribution: 569,517 €

Timetable:
start date: 01/12/02
duration: 24 months

Keywords:
health professionals knowledge, information to citizens, asthmatic inhaler, self powered

The development of an intelligent crisis prevention management tool for asthmatics

Objectives

The prevalence of asthma in Western Europe doubled in the past ten years following the world-wide trend that saw the number of asthmatics increasing from 6.8 million in 1980 to 14.6 million in 1995. The seeds of allergy leading to asthma are sown early in life, it is incurable and the severity varies amongst individuals from time to time depending also on general health and the environmental condition.

There is a range of good and effective method of drug delivery and the environmental triggers of asthma can be controlled. The problem is that the management of the drug delivery aspect is severely lacking. The range of patients often severely affected consists of very old or young people who forget to take their controller medication regularly. There is also no independent way for the doctor to verify regularity and the dosage taken by the patient. Similarly the patient is unable to tell accurately how much dosage has been inhaled.

The Inhale project will contribute towards the implementation of the Global Initiatives for Asthma in line with Article 129 of the Maastricht Treaty by helping to protect public health and the associated effects. Similarly, the project supports IST 2002 I.1-1 'Intelligent systems for the monitoring of health status', IST 2002 I.1-2 'Systems for health professionals: Creating a 'Health knowledge Info-structure' and 'Quality Of Life and Management of Living Resources'. Key action 6.1

The aim of this project is thus to develop a low cost, self-powered, intelligent micro-controller based programmable inhaler that will accurately and independently verify the amount of dosage inhaled.

Results

This CRAFT project will deliver a prototype that is self-powered, incorporating an intelligent micro-controller, which will accurately verify the amount of dosage inhaled, dosage remaining and analyse how effectively the dose was taken. Whilst aiding the compliance of the treatment regime. This information will then be available for independent validation and monitoring, to assure that the treatment is being taken correctly.

Through the development of the next generation of inhalers the wider implications would be the prevention of potential 741 asthma related deaths per annum and 8550 cases of hospitalisation. The proposed technology is expected to save more than €143 million per annum in the cost of caring for hospitalised asthmatics and 5 million working days lost to asthma annually. On the commercial side this is expected to generate sales revenue of €272 million and create more than 1500 jobs.

INTERPRET

Number: IST-1999-10310

Cluster: Health Professionals

Type of Action: Research

Project Participants:

SIEMENS	D
CDP	E
UMCN	NL
UAB	E
SGHMS	UK
IDI	E
UJF	F
UOS	UK
PRAXIM	F

Contact person:
Dr. Arús, Carles
Universitat Autonoma de Barcelona
Spain
Tel.: +34 93 581 1257
Fax: +34 93 581 1264
Email: carles.arus@uab.es

Project web site:
http://carbon.uab.es/INTERPRET

Budget:
total cost: 3,068,990 €
EC contribution: 2,200,000 €

Timetable:
start date: 01/Jan/00
duration: 36 months

Keywords:
brain tumour diagnosis, decision support systems, biomedical informatics, magnetic resonance spectroscopy, human computer interaction.

International Network for Pattern Recognition of Tumours using Magnetic Resonance

Objectives

Magnetic Resonance (MR) spectroscopy allows non-invasive visualisation of the metabolic state of organs and pathologies in the human body. The technique is well established for biochemical analysis. Excitingly, proton MR spectroscopy (^{1}H MRS) can be made available on current clinical MR imaging scanners. However, since most radiologists are not biochemists, MRS is as yet used mainly as a research tool. The aim of the INTERPRET project is to extend the use of MRS into clinical routine procedures with an innovative system for diagnosis and grading the malignancy of brain tumours and planning therapy. This Pattern Recognition program and its user-friendly Graphical User Interface (GUI) will accept MR spectra from advanced MRI instruments, widely available in Europe. A large database of standardised brain tumour spectra will eventually be made accessible to specialists in European hospitals.

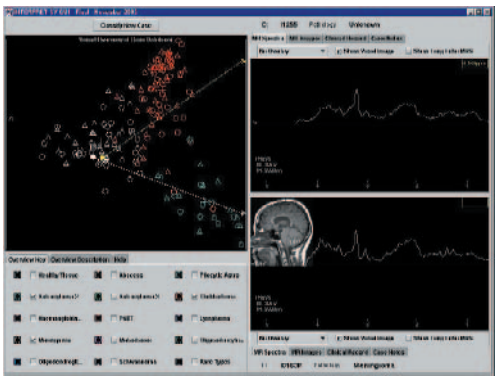
INTERPRET addresses key action 1.2.2. of the 5th framework IST programme (Clinical biological managerial and imaging systems for health professionals) and contributes to extending the benefits of the information society in Europe to health professionals knowledge based decisions.

Results

The results are:

- Consensus protocols for spectroscopic and clinical data collection, admission criteria, submission format and security/data privacy precautions.
- Database with web access for use by all INTERPRET members containing data from approximately 800 human brain tumours, other pathological brain masses and normal controls and their relevant clinical data.
- Automated data manipulation and format conversion software (real time).
- A decision support system (DSS) to assist radiologists to interpret spectra from one volume of interest (single voxel, SV) or from a grid of volumes (multivoxel, MV). New ^{1}H MRS data is automatically displayed in the GUI (see attached figure) using pattern recognition algorithms to 'cluster' the cases according to their pathology. For MV-data, the probabilities of belonging to a certain tumour, tissue type or aggressivity grade can also be transferred into so-called cluster or nosologic images showing different tissue types in different colours.
- An industrial prototype of SV DSS based in the open source software model will be submitted to the EU certification process (CE marking).

The expected benefits of the DSS developed are (i) to enable radiologists to categorise brain tumours using MRS; (ii) to aid planning of treatment and therapy; (iii) to alleviate patient distress; (iv) to facilitate the uptake of MRS by clinicians and (v) to consolidate MRS as a viable alternative to brain biopsy.



GUI for the SV prototype of the DSS. The new case suggested pathology classification after processing (yellow dot, left display) is shown to be in the midst of meningiomas (white symbols). Its ^{1}H MRS (top right display) can be compared with the spectrum and MR images of a close case from the INTERPRET database (bottom right).

IS4ALL

Information Society for All

Number: IST-1999-14101

Cluster: Health Professionals

Type of Action:
Thematic Network

Project Participants:

FORTH	GR
MICROSOFT H.U.G.E.	Int.Org.
EHTEL	B
CNR-IP	I
GMD	D
INRIA	F
FHG	D

Contact person:
Prof. Stephanidis Constantine
Foundation for Research
and Technology – Hellas,
Institute of Computer Science
Greece
Tel.: +30 2810 391741
Fax: +30 2810 391740
Email: cs@ics.forth.gr

Project web site:
http://is4all.ics.forth.gr

Budget:
total cost: 1,399,990 €
EC contribution: 1,399,990 €

Timetable:
start date: 01/Oct/2000
duration: 36 months

Keywords:
universal access and universal design, electronic patient records, human - computer interaction, information to citizens

Objectives

IS4ALL is a wide, interdisciplinary and closely collaborating Thematic Network of experts (Working Group). IS4ALL provides the European Health Telematics industry with comprehensive information detailing how to appropriate the benefits of Universal Design.

Universal Design postulates the design of products or services that are usable and acceptable by potentially everyone, everywhere and at any time.

The project develops a validated code of practice for appropriating the benefits of universal access in the Health Telematics sector and undertakes a range of outreach activities (e.g., workshops, seminars, participation in international conferences, etc) to facilitate awareness of the European Health Telematics industry.

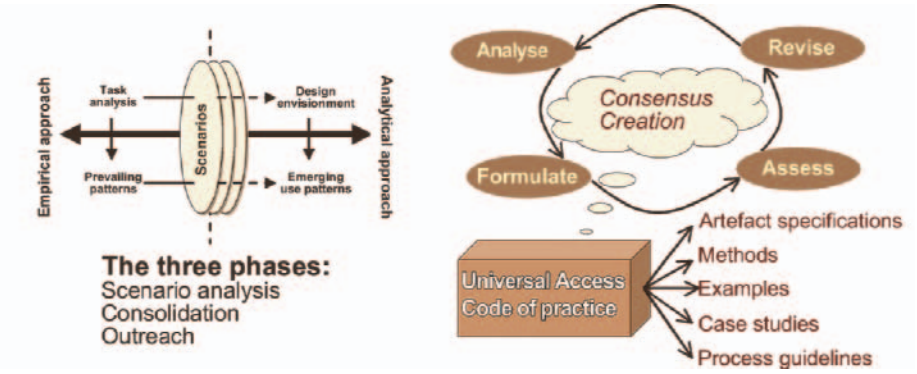
The specific objectives of IS4ALL can be summarised as follows:

- Consolidate existing, but currently dispersed knowledge on Universal Access in the context of Information Society Technologies into a comprehensive code of design practice.
- Translate the consolidated wisdom to concrete recommendations for emerging desktop and mobile platforms in the domain of Health Telematics.
- Demonstrate the validity and applicability of the recommendations in the context of concrete scenarios drawn from experimental regional Healthcare Telematics networks.
- Promote the Universal Access principles and practice in Healthcare Telematics through a mix of outreach activities, which include organisation of workshops and seminars, participation in major international conferences, concertation meetings, and project clustering events.

Results

The main results of IS4ALL will be:

- A process-oriented code of practice for introducing Universal Access principles into the lifecycle of Health Telematics products and services.
- The dissemination of its results as well as awareness and consensus on the practice of Universal Access and Design in Healthcare Telematics.
- Three workshops and six seminars, targeted to Health Telematics industry, as well as mainstream IT&T industry, are held in different European countries.
- Examples and case studies of good Universal Design practice in Health Telematics.
- A handbook of design methods for Universal Access, including principles and guidelines, Design techniques and evaluation methods.



IVP

Intracorporeal VideoProbe

Number: IST-2001-35169

Cluster: Health Professionals

Type of Action: Research

Project Participants:

IMS-CHIPS	D
KST	D
KULRD	B
UOW	UK
SSSA	I

Contact person:
Dr. Harendt, Christine
Institut fuer Mikroelektronik
Stuttgart
Germany
Tel.: +49 711 6855 928
Fax: +49 711 6855 930
Email:
harendt@ims-chips.de

Project web site:
http://ivp.ims-chips.de

Budget:
total cost: 2,439,265 €
EC contribution: 1,800,000 €

Timetable:
start date: 01/Apr/2002
duration: 36 months

Keywords:
medical imaging for surgical planning and intervention, minimally invasive systems, autonomous videoprobe, diagnostic system, CMOS image sensor

Objectives

Visualisation of the status of organs health is one major task in medical diagnosis and therapy. Endoscopy and minimal invasive surgery are techniques for this purpose, which use the miniaturisation of optical, micro-electronical and micro-mechanical equipment for medical applications. In many cases, however, treatments are still painful or at least unpleasant for the patient due to the size of equipment or wiring. Additionally the high price of the devices and risks or costs of sterilisation procedures limits the use.

Recent developments in microelectronics allow the fabrication of advanced and highly integrated image sensors and improved solutions for wireless data transmission in standard technologies. In combination with additional improvements in micro-mechanical components for medical equipment a new type of videoprobes becomes feasible: Wired and wireless probes with advanced performance for reasonable prices.

These probes are equipped with miniaturised CMOS image sensors and circuitry for data procession and transmission, which are suitable for volume production. Thus additional fields of medical applications ranging from disposable autonomous video-capsules used in gastroenterology to wired probes and short-term implants are markets for IVP products.

Results

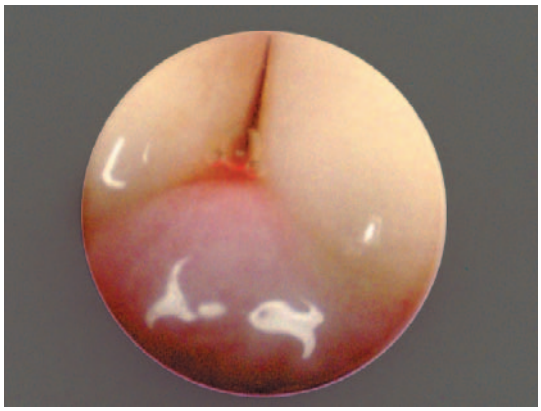
Two prototypes of IVP products will be developed and evaluated in the project:

- A wired videoprobe
- an autonomous video-capsule with a telemetric link for image data transfer to an external PC-based system.

The image sensor is fabricated in a major silicon foundry in state-of-the-art CMOS technology. The implementation of an advanced technology (Thin-film-on-CMOS) for the photo-sensor allows a reduction of the pixel size and enables miniaturised sensors. The extended usable illumination range of the logarithmic response image sensor and its high colour constancy will be additional features of the device.

The processing, compression and telemetric transmission of the image data is another important task of the development. The integration of processing and compression algorithms and the balance of power consummation and performance is a challenging issue.

The IVP probe will work with a PC-based diagnostic expert system, which manages the procession, presentation and storage of the image data. The system will use advanced image processing techniques and innovating intelligent learning algorithms in order to support medical diagnosis of abnormalities/lesions and ensure maximum efficiency and minimum risk of misinterpretation. It will provide windows based user interface and will be developed in close contact with medical users.



The probes are equipped with illumination and optics as well as with mechanical components for tilting or movements. The work-plan assures that all components and materials used for the systems are judged according to the International Standards for medical devices in order to enable a market access of the products in the near future.

JUST

Number: IST-1999-12581

Cluster: Health Professionals

Type of Action: Research

Project Participants:

FORTH	GR
UPM	E
DIST	I
EPFL	CH
FUNEN	DK
UNIGE	CH
GIUNTI Ilabs	I
SADIEL	E
SAMU	F
TSD	I

Contact person:
Dr. Tsiknakis Manolis
Foundation for Research and Technology - Hellas
Greece
Tel.: +30 281 039 1690
Fax: +30 281 039 1601
Email: tsiknaki@ics.forth.gr

Project web site:
http://www.justweb.org

Budget:
total cost: 3,629,616 €
EC contribution: 1,527,500 €

Timetable:
start date: 01/Jan/00
duration: 41 months

Keywords:
virtual reality, information to citizens, eLearning, ICT based training of health emergency operators, health promotion.

JUST-in-time health emergency interventions - Training of non-professionals by Virtual Reality and advanced IT tools

Objectives

In health emergency care, effective and just-in-time interventions of the people with a duty to respond (paramedics, non specialised medical personnel, volunteers, and several categories of citizen/workers) can reduce damages to injured citizens. Such damages are often severe and can sometimes turn into permanent disabilities, giving rise to high direct social costs for medical treatments/rehabilitation/assistance and high social indirect cost (absence from job, healthcare costs, etc.). Taking into consideration the significance of the first 60 minutes of an emergency (the GOLDEN hour) regarding long term patient outcome one easily understands the importance of *the first responder*.

In health emergency interventions both professional and non-professional health operators are involved. Available data indicates that a number close to 3 million European citizens (non-professionals) annually undergo training in first aid. In most European Countries, proper training of the involved operators (non professionals, volunteers, citizens) remains still a critical issue. Of special importance is the finding of various published scientific studies indicating a number of problems with the traditional methods of training and education. Such problems include poor retention rate (2 months after a traditional course only 36% of trainees were still rated competent, whereas 6 months after a course only 6,8% could perform competently), and significant psychological barriers to intervene.

The JUST project addresses training of non-professional health emergency operators, by using advanced information technologies (Virtual reality, Human Computer Interaction and Web technologies) so as to provide innovative tools with the objective of overcoming the aforementioned present weaknesses.

Results

The JUST Project is approaching its completion successfully.

It has developed an innovative, multilingual, multimedia Web/CD training course to support and complement the traditional learning and training approach by presenting certified intervention guidelines and multimedia content.

It has also developed a Virtual Reality platform allowing the scenario-based verification of acquired knowledge and decision-making capabilities of the trainees. Regarding the design decisions, emphasis was given in enhancing the individual's simulated 'real-scene' exposure, thus creating a sense of presence and through that reduce psychological barriers.

The extensive evaluation of the products in different European pilot sites (Greece, Italy, France, Spain) has indeed proven the positive influence that the products have on both the level and quality of knowledge as well as on the readiness and preparedness of those with a duty to respond to health emergencies.

JUST is currently finalising its exploitation plans, so as to further promote the developed technological solutions in a wide European audience.

KARMA2

Number: IST-2001-32320

Cluster: Patients

Type of Action: Research

Project Participants:

BIC	I
FTRD	F
UJF	F
QUB	I
ALS	I
TOS	I
IIL	S

Contact person:
Mr. Castiglioni Carlo
Air Liquide Sanità spa
Italy
Tel.: +39 02 40261
Fax: +39 02 48704291
Email:
carlo.castiglioni@airliquide.com

Project web site:
http://www.karma-project.net

Budget:
total cost: 3,161,212 €
EC contribution: 1,580,604 €

Timetable:
start date: 01/Sep/01
duration: 24 months

Knowledge and Augmented Reality Management Assistance

Objectives

The KARMA2 project defines an organisational model to efficiently manage and deliver home-care services to children with brain injuries. These patients, in rehabilitation treatment, need long term/non-ending care. Actually their families face the assistance problems on their own, with minimal or no guarantee for the support continuity from the health and social care services.

KARMA2 co-ordinates and manages all the persons involved in care activities performed in the patients' home, through an easily accessible, networked infrastructure:

- asynchronous communications from families to doctors (request for information and/or instructions; submission of periodic reports; etc.); and from doctors to families (information/instructions; periodic therapeutic protocols);
- synchronous communications (video-phone calls) to carry out remotely driven exams; to manage routine situations;
- automatic data collection from the remote devices installed at the patients' home; training material update; provision to the relatives of processed patient data;

KARMA2 by establishing this direct connection, enhances people proactive behaviours and improves their attitudes. The main outcome of the project is not just technological: it represents the assessment of a new organisational model. KARMA2, networking all the actors involved, introduces a global view of the Home Care Management.

Results

In e-Europe 2002 one of the primarily defined objectives was 'to develop an infra-structure of user friendly, validated and interoperable systems for disease prevention and medical care'. All the European countries have a major objective in health-care delivery: to move patients from hospital to home. It is expected that home-care and tele-health will improve quality of life while decreasing the social and economic impact of health-care expenditures. The innovation introduced by KARMA2 is completely in line with this scenario and provides a complete, flexible and dynamic infrastructure that covers the overall process related to brain-injured children home-care.

LIFEBELT

An intelligent wearable device for health monitoring during pregnancy

Number: IST-2001-38165

Cluster: Citizens

Type of Action: Research

Project Participants:

STRAND	UK
GREATER DERBY PCT	UK
AURELIA MICRO	I
AUTH	GR
INTERSET	GR
PRECISION	B
LITO	GR

Contact person:
Mr. Mather Anthony
Strand Technology plc
United Kingdom
Tel.: +44 1695 50905
Mob: (+44) 7713 065168
Fax: +44 1695 50911
Email:
tony_mather@strandtech.co.uk

Project web site:
http://www.lifebelt.eu.com

Budget:
total cost: 3,843,900 €
EC contribution: 2,134,860 €

Timetable:
start date: 01/Aug/02
duration: 30 months

Keywords:
wearable medical systems, home telecare, mobility of patients, prenatal care, pregnancy, foetal ECG

Objectives

The key objective of Lifebelt is to improve the delivery of healthcare to expectant mothers by increasing their knowledge and confidence in the progression of their pregnancy and to reduce the incidence of routine visits to the prenatal clinic for regular consultation with their obstetrician or gynaecologist.

Challenges of the project include:

- the difficulties in measuring foetal ECG, particularly in the period of 28 to 34 weeks of pregnancy, work here will be ground breaking in a world-wide context
- providing a wearable system in which pregnant mothers can have confidence and which is attractive to them, which provides secure and intelligible data to the clinical professionals remotely to allow them to monitor patients
- to use intelligent information technology to classify data received and provide early alerts of problematic symptoms and to provide a researchable information core of anonymised data, accessible through a secured portal, to provide supporting information for healthcare professionals

It will allow clinical time to be devoted in a focused way to any potentially problematic pregnancy, It will, through the classification system, ensure early warning of non-routine conditions arising which may threaten the mother and/or foetus.

In terms of the overall goals of the IST programme - improving the lives of citizens of Europe - Lifebelt is somewhat unique in that it will improve the life of the as yet unborn EU citizen and of course that of the mother.

Results

The successful Lifebelt will assure the mother of the positive condition of her pregnancy, reducing anxiety and thus improving well being. Lifebelt will transmit secured data to the clinical professional allowing them to remotely and readily provide their expertise to the patient, more frequently and for more patients.

The stresses of travelling to visit a prenatal clinic frequently will be reduced where there is need for specialist care and the patient is distant from or isolated from that care, Lifebelt will facilitate that care.

The central systems of Lifebelt will provide the means for clinics to care for many pregnant mothers and the advanced classification system will help ensure that potentially dangerous conditions are spotted at the earliest incidence. The anonymised data collected will provide a core of researchable information which will help set pathways to improved pre and post natal care in the future for European and other citizens of the world.

LIFELINGER

Number: IST-1999-57448

Cluster: Health Professionals

Type of Action: CRAFT

Project Participants:

DUVIDEO	P
EZ INGENIERIA	E
TECNOPLAN	I
DUNVENGAN	UK
ARAY	UK
ISQ	P
SINTEF	N
IAITI	P

Contact person:
Mr. Marques Martins Vitor Manuel, David Serras Pereira
DUVIDEO II - Profissionais de Imagem sa.
Portugal
Tel.: +351 21 4789600
Fax: +351 21 4783622
Email: V.Marques@mail.telepac.pt; dpereira@duvideo.pt

Budget:
total cost: 1,213,471 €
EC contribution: 606,740 €

Timetable:
start date: 01/Sep/02
duration: 24 months

Keywords:
biomedical informatics, software application for cancer diagnosis.

A new ICT-based diagnosis procedure and tool set for early detection of cervix cancer

Objectives

The LIFELINGER project specifically aims at:

- Reducing cervix cancer diagnosis uncertainty through the introduction of advances in IT supported statistical analysis, namely for the correlation between the image data and the diagnosis.
- Improving the diagnosis by use of advances in state-of-the-art IT technology in the knowledge-based system (KBS) (for specialist know-how distribution),
- Implementing data fusion concepts, integrating in a single set of complementary image and data processing mechanisms specific analysis software that also includes the KBS engine and associated database,
- Deploying means of IT based image enhancing processes, reducing the needs of chemical based human tissue contrasting substances that not only introduce additional costs but contribute to intrusive reactions as they are based on the chemical reaction of the human tissue with the substance.
- Creating and maintaining a large database of cases. This database will enable trend identification from readily available data mining processes.

Deploying the expertise and specific clinical know-how of the medical specialists to the general practitioner. Consequently a much larger population will benefit, namely in areas where expert know-how is scarce.

Results

The project will deliver three major Results

- An interrelated set of *open source* software tools, to be installed on a PC-based workstation or powerful laptop computer including additional hardware (a CCD based camera, a light emitting device covering a wide and non-biased frequency spectrum, a fixing arm for the camera/light);
- A centrally managed database system that will include an increasing number of cases and data points to cover additional cases and increase detection accuracy over the time. This system will distribute the updated database to the users of the product;
- A centrally managed open source software system that will provide for the additional functionality over the time.

The LIFELINGER results are ultimately expected to provide the standard practitioner who is performing the exam, with a tool that not only helps to better distinguish the lesion patterns and their image properties such as shapes, contrast, tone, brilliance but also makes available, during the exam itself, the best specialist know-how, thereby improving the quality of the exam and lowering the number of incorrect pathology diagnoses.

M²DM

Multi-Access Services for telematic Management of Diabetes Mellitus

Number: IST-1999-10315

Cluster: Patients

Type of Action: Research

Project Participants:

DCMB	D
RD	D
City	UK
ALL	HU
CBIM	I
UPAD.DEI	I
UPM	E
CESTEL	E
DIABEM	E

Contact person:
Prof. Stefanelli Mario
Consorzio di Bioingegneria
e Informatica Medica
Italy
Tel.: +39 0382 505 354
Fax: +39 0382 505 373
Email: mstefa@aim.unipv.it

Project web site:
http://scorpion.unipv.it/m2dm/

Budget:
total cost: 3,614,480 €
EC contribution: 2,100,578 €

Timetable:
start date: 01/Jan/00
duration: 36 months

Keywords:
telemedicine, health professionals knowledge, home telecare

Objectives

M²DM project intends to provide a sustainable service care to residential and mobile diabetic patients aiming to increase the quality of patient's care through improving communication between patients and caregivers. M²DM incorporates new telemedicine services that emphasise the provision of personal health services 24 hours a day and provides new means to information access to physicians and patients. A Multi-Access Server (MAS) has been defined in the project comprising a full range of non-expensive and widely accepted information technologies offering to users a universal, easy-to-use, on-line and cost-effective access to telemedicine and information services. M²DM also has the capability of effectively managing the knowledge necessary for the complex and distributed process of chronic disease care, providing technological instruments and infrastructures to give the right knowledge to the right people in the right form at the right time.

The Multi-Access Server has been based on Computer Telephony Interfaces and Web-based technology. A distinguished feature of M²DM is its capability of managing the knowledge necessary for Diabetes Management. Several advanced methods for data analysis, evidence and knowledge pooling and knowledge management have been investigated in the project, and finally integrated in the Multi-Access services.

Results

The M2DM service has been installed in three sites, serving five hospital centres. The evaluation of the M2DM project involved 74 active patients and 62 controls. The number of drop out from the study was 12 for the active patients and 10 for the controls. This leads to a final number of patients who finished the M2DM project of 62 active patients and 52 controls. We evaluated the system by means of a controlled study in terms of usage, usability, economical and organisational aspects, as well as in terms of its impact on the main clinical outcomes and on the quality of life. The system turned out to be well-accepted, widely used, and that the impact on clinical outcomes was positive, in particular for patients with bad metabolic control. The telemedicine intervention of M2DM was therefore clearly effective: on the one hand it gave physicians a tool to constantly monitor the metabolic situation and intervene early if there is something wrong. On the other hand it was an excellent tool to strengthen the patients motivation to self-monitor the metabolic situation. The basic assumptions of the overall M2DM project are fully confirmed by the project outcomes. This makes the project a clear success for the researchers involved, for the European Commission who funded the project, and for the European society.

MammoGrid

Number: IST-2001-37614

Cluster: Health Professionals

Type of Action: Research

Project Participants:

UNIUD	I
UCAM	UK
UNISS	I
UNIPI	I
UOXF-DU	UK
MIRADA	UK
CERN	Int.Org.
UWE, Bristol	UK

Contact person:
Prof. Amendolia Salvator Roberto
European Organisation
for Nuclear Research
France
Tel.: +41 22 767 1477
Fax: +41 22 767 3540
Email:
salvator.amendolia@cern.ch

Project web site:
http://mammogrid.vitamib.com

Budget:
total cost: 2,195,368 €
EC contribution: 1,899,983 €

Timetable:
start date: 01/Sep/02
duration: 36 months

Keywords:
biomedical informatics, eHealth networks and architectures, health GRIDs, health professionals knowledge, security and privacy

European federated mammogram database implemented on a GRID structure

Objectives

The aim of the MammoGrid project is, in the light of emerging Grid technology, to develop a European-wide database of mammograms that will be used to investigate a set of important healthcare applications as well as the potential of this Grid to support effective co-working between healthcare professionals throughout the EU. MammoGrid aims to concentrate on the application of Grid technology rather than merely focusing on its further development.

Medical conditions such as breast cancer, and mammograms as images, are extremely complex with many dimensions of variability across the population. Among the benefits of having a European-wide database are to provide:

- a larger database - statistically significant numbers of examples of conditions;
- more diverse epidemiology;
- a wider variation in quality of images and diagnosis;
- an abstract interface for accessing heterogeneous databases;
- potential knowledge discovery in the diagnosis and understanding of breast cancer.

Results

The main output of the 3-year MammoGrid project, started in autumn 2002, is a Grid-enabled software platform (called the MammoGrid Information Infrastructure) which federates multiple mammogram databases, will enable clinicians to develop new common, collaborative and co-operative approaches to the analysis of mammographic data.

The motivation for the use of Grids technology in distributed image analysis for diagnosis, quality control, education and collaborative research is clear – Grids provide the mechanism for the sharing of large amounts of geographically distributed data with appropriate security and authentication to cater for the confidential nature of patient information.

The MammoGrid project concentrates on the isolation of suitable Grids-enabling software technologies which provide the functionality for clinicians to co-operate without co-locating.

The MammoGrid project is just one of a number of Grids projects supported by the EU in the area of healthcare which are running concurrently. To support these projects and to ensure commonality of developments and cross-fertilisation of research, a so-called HealthGrids Forum has been established.

MEDINFO

Number: IST-1999-90110

Cluster: Health Professionals

Type of Action: Subvention

Project Participants:
BRITISH COMP.S. UK

Contact person:
Ms. Roberts, Jean
Phoenix Associates
United Kingdom
Tel.: +44 1538 266 944
Fax: +44 1538 266 944
Email: jean@hcjean.demon.co.uk

Project web site:
http://www.medinfo2001.org/

Budget:
total cost: 866,699 €
EC contribution: 76,258 €

Timetable:
start date: 01/Jul/01
duration: 6 months

Keywords:
health professionals knowledge, eHealth networks and architectures, open source, telehealth, information for citizens

10th World congress on Health and Medical Informatics (UK, London, 2-5 September 2001)

Objectives

The European Showcase initiatives – exhibition and congress session - within medinfo2001 presented a snapshot of key Fifth Framework Information Society projects to an international audience of academic, commercial, scientific and operational health professionals; and in addition briefed attendees on the Fifth Framework directions.

This activity promoted understanding of the significant European contribution to ICT/informatics in support of health world-wide through the MEDINFO triennial congress

The overall congress, part of a 3-yearly world-wide series, provides a forum for knowledge exchange, professional networking, comparative assessment and synergistic activities.

Results

Over 1300 delegates from 74 countries had opportunities to see the demonstrations, talk to the projects and find out more about the CEC FP5 Programme outcomes. Participants also experienced a 12-stream scientific programme, integral international exhibition, social events and prior tutorial master classes. Over 180 scientific posters and e-demos were displayed for the duration of the congress. Presenters came from 55 countries to experience contributions selected by a Programme Committee of experts from 14 countries and an extensive international refereeing panel. The Proceedings were issued contemporaneously in CD-ROM and paper form and are available through the website.

The event gave European Showcase participants the opportunity to set their work in context and explore issues with others working in their particular fields. Benefits had 2 main dimensions – for projects to tell others about what they were doing, and for projects to find out more about what was going on elsewhere. In addition participants in the European initiatives at MEDINFO identified potential collaborators for future research and development work.

The collective presence made it possible to demonstrate the context, breadth and depth of European activities with an impact that would not have been possible by projects individually.

The host organisation, the British Computer Society Health Informatics Committee, brought the medinfo congress to the UK as part of its ongoing commitment to health informatics internationally and greatly enhanced local knowledge of world-wide activity and understanding of the skills and competencies of European professionals in this domain.

MEDINFO, under the aegis of the International Medical Informatics Association, is one of the premier events of the informatics calendar and will be next held in 2004 (http://www.medinfo2004.org/).

The BCS HIC website http://www.bcshic.org contains a frequently updated snapshot of its activities and its expert commentary on national and international initiatives in informatics support to health.

The positive experiences from medinfo2001 result in a wish to promote the collective European-wide ICT/informatics development position and outcomes at future such congresses

MEDITRAV

Number: IST-1999-11490

Cluster: Citizens

Type of Action: Research

Project Participants:

RATIO	I
ICCS/NTUA	GR
DARVA	F
Hitech	GR
DATAMED	GR
AOP	I
SEMA	UK
STAKES	SF
HUS	SF
METROLIFE	D
KPNQWEST	NL

Contact person:
Mr. Bianco Antonio
RATIO Consulta
Italy
Tel.: +39 02 4481 0256
Fax: +39 02 4481 0231
Email: meditrav@ratioconsulta.it

Budget:
total cost: 3,400,665 €
EC contribution: 1,785,000 €

Timetable:
start date: 01/Jan/00
duration: 45 months

Open medical information platform for continuous healthcare services to European travellers

Objectives

The main objective of this project is to develop an integrated medical information platform, on a European level, that will ensure continuous cost-effective healthcare services to European travellers with chronic diseases, such as diabetes, cardiac disease, and asthma. The project will address not only the technical aspects of this need but also the organisational and managerial aspects of such service by involving all players interacting to provide healthcare services on a European level. The aim of this project is to address the clear need for cost-effective and continuous provision of integrated health services to European citizens, suffering from chronic diseases (such as diabetes, cardiac disease, or asthma) outside their country of residence. In order to achieve this objective, a network of healthcare service providers and payers, based on Web technologies and supporting multi-lingual utilities, will be developed and set-up on a European level.

The project objectives are to (i) identify the needs for healthcare services provision and billing to European citizens with chronic diseases outside their country of residence; (ii) describe the workflow between the involved players and services to be provided; (iii) develop an integrated, interoperable, and multilingual platform, by using health smart cards, for healthcare services provision and billing to European travellers; (iv) assess the applicability and technical feasibility of such an implementation, via field trials; (v) demonstrate the benefits of the new system based on measurable indicators; and (vi) demonstrate the feasibility by means of proposal business and exploitation plan.

Results

The implementation of the MEDITRAV project will allow:

- physicians from the traveler's country of origin and destination to cooperate for his/her effective treatment;
- healthcare players to promptly update the patient's medical record on-line;
- healthcare providers to expeditiously report medical operations to the patient's insurance company, on-line;
- insurance companies to effectively control and manage patient files, without bureaucratic procedures and with lower overheads, thus providing improved services to their customers;
- European travelers to:
  - ✓ take an active part in their personal health status support (update of their medical record, informing their personal physician);
  - ✓ Obtain high quality healthcare services, outside (or in) their country of residence, quickly and accurately, especially in cases of chronic disease problems and emergency situations;
  - ✓ be provided with a portable, up-to-date and secure medical patient folder.

MEMO

Medical Mobile Devices - Cluster Project

Number: IST-2001-35495

Cluster: Health Professionals

Type of Action:
Accompanying Measure

Project Participants:

L&C	B
INFORMA	I
HOPE	GR
UCY	CY
TXT	I
IBM CR	CZ
FIMIM	E
UHB	CH
FD	F

Contact person:
Mr. Tristram Clive
Ets Tristram Clive
France
Tel.: +33 549 489 821
Fax: +33 825 179 541
Email:
clive.tristram@libertysurf.fr

Project web site:
http://www.med-mobile.org

Budget:
total cost: 825,058 €
EC contribution: 757,553 €

Timetable:
start date: 01/May/2002
duration: 24 months

Keywords:
mobility of health professionals; mobility of patients; integrated handheld computers; supporting exploitation of existing European funded mobile computing projects; centre for knowledge of medical mobile devices; information to citizens, telemedicine, medical mobile devices, wireless health.

Objectives

This is an accompanying measure for existing European funded projects plus organisations already working in the domain of medical mobile devices (MMD). Its primary goals are:

- Create a business model to support the rapid take up and sale of mobile devices;
- Create an evaluation method for MMDs; Identify the key technologies and create an environment for their uptake;
- Create a web portal and observatory for MMDs;
- Propose actions to encourage interoperability and measure their impact;
- Share market knowledge between the partners to increase the effectiveness of their marketing and exploitation plans;
- Disseminate information about MMDs to interested parties

Results

An up to date picture of the state of the medical mobile device market and research is maintained on the web portal created by the project at http://www.med-mobile.org/. This contains links to partners and other active projects in Europe and the world. News with a strong focus on mobile medical devices, is added daily, a calendar is maintained of important events and a newsletter is sent with a summary of news on a monthly basis to registered users. Interviews with prominent figures are regularly posted as well.

The web portal also contains a set of basic tutorials and essays on the fundamental technologies relevant to the development and deployment of medical mobile devices.

Research is being undertaken into the basic drivers for the medical mobile device market.

The fundamental technologies are being analysed and tracked as part of the work to produce a technological trends report.

The partners have already made presentations at a number of international conferences and many more are planned.

Ongoing work will augment the above work with an analysis of the best methods for evaluating the impact of medical mobile devices, the interoperability issues and the work being done by funding organisations in Europe.

To support its primary objectives as an accompanying measure, contacts have been made with other European projects and commercial organisations to encourage the sharing of knowledge and marketing activities. The anticipated result will be an effective expansion in the number of partners. From this it will be possible to better inform the healthcare market and health market suppliers of the major opportunities presented by the reduction in size of computing devices, their improved connectivity, their ability to integrate medical devices, such as glucose meters, and be part of existing health care systems.

MI3

Number: IST-1999-12338

Cluster: Health Professionals

Type of Action: Research

Project Participants:

VUB	B
UJF	F
HIA	D
QR	I
Trixell	F
UOL	SI
PRAXIM	F

Contact person:
Dr. Desbat Laurent
Université Joseph Fourier
France
Tel.: +33 4 7654 9600
Fax: +33 4 7654 9555
Email: Laurent.Desbat@imag.fr

Project web site:
http://mi3.vitamib.com/

Budget:
total cost: 2,663,630 €
EC contribution: 1,510,000 €

Timetable:
start date: 01/Jan/00
duration: 36 months + 6 months extension

Keywords:
medical imaging for surgical planning and intervention, minimally invasive systems, advanced mobile systems, computer assisted orthopaedic surgery, 3D imaging

Minimal Invasive Interventional Imaging

Objectives

The industrial and technical objective of the MI3 project is to develop a Minimal Invasive Interventional Imaging system for orthopaedic and head surgery. The MI3 system is an integral and fundamental part of the next generation of Computer Assisted Surgery systems. It is based on a C-arm integrating an advanced digital x-ray detector technology and new sophisticated software for 3D image reconstruction and registration.

The medical goal is the optimisation of the patient treatment by the reduction the x-ray dose, the reduction of the invasiveness of the surgery and the improvement of the intervention precision.

The societal goal is the patient care improvement and care cost reduction.

Results

The main achievement is the creation of the second generation of Computer Assisted Surgery products by proposing attractive hardware integrated platforms and software products.

A digital x-ray detector prototype from TRIXELL has been integrated in a new motorised C-arm system by QR. This new interventional x-ray imaging system is coupled to the surgetics navigation workstation from PRAXIM. New reconstruction software from UJF and VUB based on bone shape statistical models and new registration algorithms from UOL of prior MRI to interventional X-ray acquisitions have been implemented. New orthopaedic surgery protocols have been designed by CHUG and HIA, to benefit from MI3.

This system is Minimally Invasive since a scanner examination prior to a medical intervention is no longer required but is replaced by a small number of images acquired in real time during the surgery. The surgeon is precisely guided during the surgery by the images displayed on a computer screen and consequently the operative field can be smaller.

The optimisation of surgical protocols from image and data acquisition to surgical action will have tremendous impacts for the patients and the society. With the MI3 imaging system and its navigation workstation we reduce the X-ray dose delivered to the patients and the medical staff, the invasiveness of surgery, the stress of the surgeon, the inaccuracy of surgical acts and the variability of results between different surgeons. Thus the global cost of interventions is reduced and the patient care is improvement.

MITTUG

Minimally Invasive Therapy for Tumors 3D Ultra-sound guided

Number: IST-1999-10618

Cluster: Health Professionals

Type of Action:
Research + Demonstration

Project Participants:

ESA	I
LIS	CA
LHS	CA
NUC	NL
B&K	DK
FHG/IGD	D
OFFENBACH	D
MED	D
NTE	D
RRI	CA
DCI	CA

Contact person:
Ing. Nuijten Nol
Nucletron BV
Netherlands
Tel.: +31 318 557 150
Fax: +31 318 557 270
Email: nnn@nuclint.nl

Project web site:
http://www.igd.fhg.de/igd-a7/projects/mittug/mittug.html

Budget:
total cost: 4,985,832 €
EC contribution: 1,902,545 €

Timetable:
start date: 01/Jan/00
duration: 33 months

Keywords:
medical imaging for surgical planning and intervention, minimally invasive systems, telemedicine, cancer treatment, health professionals knowledge

Objectives

Target of the project was the development of an integrated brachytherapy system for treatment of prostate cancer. The system should later be extendable on other body regions (especially breast). 'Brachytherapy' is a cancer treatment procedure where radioactive sources are entered directly in the tumour body and irradiate the cancer 'from inside'. Brachytherapy methods can therefore apply a higher, focalised dose directly in the tumour centre while minimising damages to the surrounding tissue.

Approximately 40% of men will suffer during their lives on prostate and ca. 40% of women on breast cancer. Employing technology for developing treatment methods with curative intend for these two cancer types will have immediate impact on the quality of life of European Citizens. For some types of cancer e.g. early curable stages of prostate, brachytherapy is becoming today the method of choice. If diagnosed in early stages, ca. 3/4 of the patients can be curatively treated. Further the project launched multinational clinical trials and facilitated technology and know-how transfer on an international level

Results

The system has been developed and successfully validated clinically. Within March 2003 Nucletron will start world-wide delivery to customers. As compared with the current praxis the system introduces a number of innovations:

- The system employs 3D Ultrasound imaging for acquiring the location of the organ and for the treatment procedure. Ultrasound is cheaper than e.g. CT and everywhere available.
- The implantation of needles is done under ultrasound real-time navigation. The radioactive sources can therefore be placed accurately in the tumour
- The system is supporting LDR (low dosage rate - Seeds) and HDR (high dosage rate – after loader) treatment methodologies
- A unique 'Inverse Planning' method assists the physician by automatically proposing the ideal plan for dose delivery
- The implantation and irradiation procedure can be traced and evaluated in real-time. Adaptations, chances and optimisations are possible at any stage
- An integrated Telemedicine module enables exchanging patient data, treatment plans etc. with any other expert in the world for education, training, secondary opinion, expert consultation etc.

From the application point of view, the highlights of the implemented system are:

- it enables the treatment of a significantly increased number of patients, while at the same time offers higher accuracy;
- its operation is cost effective;
- it speeds up the realisation of a world wide acknowledged cancer treatment method by applying innovative technologies to clinical trials;
- it allows brachytherapy to be performed intra-operatively and be made less operator-dependent and more reproducible;
- it produces spin-offs that will introduce innovative technologies in several application areas, e.g. breast, brain etc.

MOBI-DEV

Number: IST-2000-26402

Cluster: Health Professionals

Type of Action: Research

Project Participants:

AUTH	GR
FAM	E
L&C	B
INFORMA	I
RELATIONAL	GR
ISC	E
TV	I
INTERCERN	UK
NKUA	GR
ARAKNE	I
HOPE	GR

Contact person:
Dr. Incardona Francesca
Informa s.r.l
Italy
Tel.: +39 06 57 43 810
Fax: +39 06 57 43 830
Email: f.incardona@cds.it

Project web site:
http://www.mobi-dev.arakne.it/

Budget:
total cost: 3,101,818 €
EC contribution: 1,750,000 €

Timetable:
start date: 01/Jan/01
duration: 30 months

Keywords:
mobility of health professionals, advanced mobile systems, security and privacy, telemedicine, user-friendly interfaces

Mobi-Dev: mobile devices for healthcare applications

Objectives

Mobi-Dev is an integrated system for healthcare professionals aimed at:

1. enhancing mobility, by providing users with a light yet powerful means to access relevant information at any time from anywhere, in and out of the hospital;
2. increasing user-friendliness through vocal input, with the natural medical language understanding system, which automatically extracts structured information from natural language.
3. assuring security, by adopting digital certificates and smart cards for secure data transmission, users' authentication, certification of the paternity of data.
4. reducing the communication error rate by directly entering data in the Information System (IS).

The Mobi-Dev system has been designed specifically to answer to the needs of:

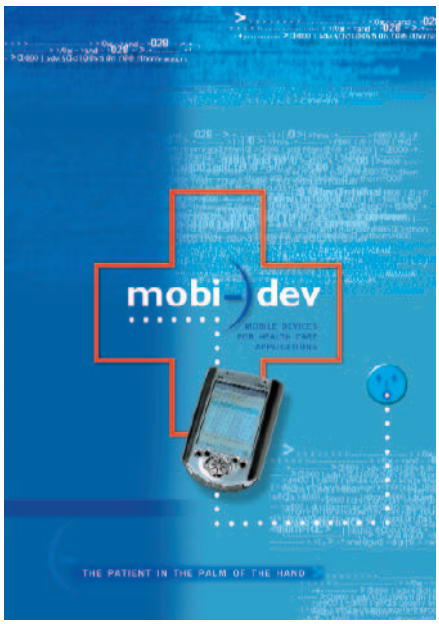
1. hospital doctors and nurses, needing to stay connected with the Hospital IS, diagnostic labs and pharmacies while working around in the hospital or in home-hospitalisation;
2. general practitioners needing to connect with diagnostic labs, pharmacies and their own clinical DBs while visiting patients at home

Mobi-Dev allows them to (i) find all the current PC facilities in a palmtop: edit electronic medical records, handle patient clinical and administrative data, e-prescribing and administering, electronically interface with labs and pharmacies; (ii)h handle electronic prescription by voice, in the most natural way; (iii) benefit from a system of 'red flags' for wrong or out-of-range values and (iv) electronically sign the input data.

Mobi-Dev meets the European strategic objective to foster the development and application of the new generation of mobile communication systems in a user-friendly, cost-effective, interoperable and ubiquitous way in the healthcare sector.

Results

Mobi-Dev is available in two different versions, adapted for distinctive usage needs. Web Mobi-Dev, consists in a PDA (palm computer) wirelessly connected (WLAN/Bluetooth technology for indoor connections and GPRS/UMTS technology for outdoor connections) to an IS via a standard Web interface. This version also offers advanced speech recognition functionality. The languages currently supported are English, Spanish and Italian. The second version, Synch Mobi-Dev, permits to retrieve, store temporarily on the PDA, modify and send back relevant data onto the IS via remote wireless synchronisation. This version is best suited for cases where network facilities are unreliable or available only discontinuously. Speech recognition is not currently supported. Both versions provide integrated modules for user authentication and data e-signing based on smart cards and digital certificates.



Benefits are expected from the adoption of Mobi-Dev in clinical practice in terms of efficiency, costs reduction and improved quality of healthcare services.

MOBIHEALTH

Mobile Health Care

Number: IST-2001-36006

Cluster: Health Professionals

Type of Action: Trial

Project Participants:

PRL	UK
UPF	E
TMSI	NL
TELIA	S
UT	NL
TME	E
CMG	NL
COMPAQ	NL
MST	NL
YUCAT	NL
LTU	S
GSCOUT	D
ECD	D
C.S.C.	E

Contact person:
Herzog Rainer
Ericsson GMBH
Germany
Tel.: +49 178 534 0067
Fax: +49 892 554 3712
Email:
rainer.herzog@ericsson.com

Project web site:
http://www.mobihealth.org

Budget:
total cost: 8,191,112 €
EC contribution: 4,949,966 €

Timetable:
start date: 01/May/02
duration: 18 months

Keywords:
biodmedical sensors, body area network, telemedicine, mobility of patients, public health management

Objectives

MobiHealth aims at introducing new, mobile value-added services in the area of healthcare based on GPRS and UMTS technologies, thus promoting the use and deployment of these technologies.

This will be achieved by the integration of biomedical sensors into a wireless Body Area Network (BAN). The sensors will continuously measure and transmit vital constants along with audio and video to health service providers and the medical profession. This will improve on the one side the life of patients and allow on the other side the introduction of new, value-added services in the areas of disease prevention, diagnostic and management, as well as in remote assistance, physical state monitoring and even clinical research. Furthermore, the MobiHealth BAN system will support the fast and reliable application of remote assistance in case of accidents by allowing the paramedics to send reliable vital constants data as well as audio and video directly from the accident site.

MobiHealth thus addresses the public health sector's increasing problems in the management of costs and resources and is able to open up new application areas for GPRS and UMTS. It will also provide the possibility for all relevant players – ranging from mobile operators and small/medium sized solution providers to hospitals – to gain access to, and experience with this new kind of services.

Results

The result of the project will be a set of large-scale trials, providing the context in which the business perspectives of the new, mobile health services can be evaluated. Apart from the technical feasibility of the services, there are a number of additional factors and requirements which will determine future business and market success, all of which will be included in the evaluation of the trials: user behaviour, requirements and acceptance, existing market structures and processes, existing value-chains, health-economic considerations and creation of sound business scenarios for the different players.

MOEBIUS

MOBILE EXTRANET BASED INTEGRATED USER SERVICES

Number: IST-1999-11591

Cluster: Patients

Type of Action: Research

Project Participants:

SWC	CH
SICN	I
UHB	CH
BMR	CH
BULL	F
UIA	B
TIT	I
UPC	E
TDC	CH
MEDGATE	CH
NTUA	GR

Contact person:
Dr. Toniatti Tiziana
Siemens
Italy
Tel.: +39 02 2733 7278
Fax: +39 02 2733 7989
Email:
tiziana.toniatti@icn.siemens.it

Scientific responsible person:
Company: University of Basel
Country: Switzerland
Last & first name:
Professor Chris Beglinger
Tel.: +41 61 265 5175
Email: cbeglinger@uhbs.ch

Project web site:
http://www.ist-moebius.net

Budget:
total cost: 7,633,163 €
EC contribution: 2,919,820 €

Timetable:
start date: 01/Jan/2000
duration: 28 months

Keywords:
eHealth networks and architectures, mobility of patients, advanced mobile systems, telemedicine

MObile Extranet Based Integrated User Services

Objectives

The major emphasis in the MOEBIUS health care applications is on innovative approaches to therapy and disease management, in which communications technology is leveraged in order to provide advantages for both patient and doctor over the course of a particular therapy.

From the perspective of the patient, one important goal is to enable patients under a given therapy to maintain their normal lifestyle as much as possible within the framework of any constraints imposed by the nature of the therapy itself. Therefore, the patient is provided with specific tools which should help him to carry out self-monitoring at home, or whenever he is away from the healthcare facility.

From the perspective of the medical professional, the possibility to access on line a centralised server with all patients' medical records is one further step towards improving the necessary therapeutic information with a potential for better long-term outcome. Such a database has to be by nature always fully up-to-date. It can assist the physician in assessing the efficacy of the treatment. In addition, it can provide information with respect a particular patient's progress, but allows at the same time to directly compare the outcome of a specific treatment regimen with those of other patients, or, if desired, to that of a group of patients. Such comparisons can also provide third parties with a useful tool to assess the quality of a specific therapy in defined patients. This information could contribute to help to achieve the goal of maintaining a high quality of medical service.

Results

MOEBIUS demonstrated the feasibility of mobile disease management programs and business applications with a good grade of acceptance for the users with RRT (Risk Reduction Trial) in young obese patients and (ACT) Anti-Coagulation Trial.

Disease Management is making the transition from episode manager to process manager. Isolated medical consultations for managing the onset of acute health problems or a deterioration in a chronic condition are being replaced by an integrated care program incorporating prevention, diagnosis, treatment, rehabilitation and nursing care.

The RRT trial was therefore designed to include diet, exercise and drug therapy on an interactive platform to achieve an integrated weight control programme. The trial was a success from a medical perspective (patients lost weight, reduced the blood pressure and showed lower blood glucose levels), but also from a technical point of view (integration of different devices on a handheld platform). 15 patients were included in the trial, 13 successfully completed the 4 month trial. All 13 patients were satisfied with trial procedures and indicated that they would be willing to pursue this line of treatment.

The MOEBIUS ACT trial, aiming to monitor the effects of anticoagulation therapy on an interactive platform, has been tested on 5 patients.

MTM

Number: IST-1999-11100

Cluster: Patients

Type of Action: Research

Project Participants:

CF	E
CR	E
CdR	I
PointerCom	I
Sirius	B
SiE	E
Matla	E
UAPV	F
UPM	E
TZMI	D
DKFZ	D

Contact person:
Dr. Marega Roberto
PointerCom Srl
Italy
Tel.: +39 06 3751 1220
Fax: +39 06 3751 1202
Email: r.marega@pointercom.it

Project web site:
http://mtm-project.com

Budget:
total cost: 4,619,548 €
EC contribution: 2,625,000 €

Timetable:
start date: 01/Jan/2000
duration: 24 months

Multimedia Terminal Mobile

Objectives

The objective is to develop an innovative Multimedia Terminal Mobile and a set of applications that use UMTS technology for outdoors wireless connection. This terminal should substitute all future generations of mobile phones and all PDAs and integrate their functionality into a single device. This solution reflects the communications strategies which many businesses are undertaking and, more generally, answers the need of tomorrow's technology market.

The MTM integrates transversal functionality. It works as a personal guide, as an instrument to communicate with the rest of the world, as a mobile office, and will provide access to a variety of services. MTM users are able to communicate using both voice and images. In effect, the unique combination of voice and image, also known as video telephony, improve communication efficiency by 80% because visual and audio data can be transmitted simultaneously, therefore reducing the loss of information through misunderstandings that usually occur in a voice-only transmission.

Results

Three applications have been addressed in the project; telemedicine, distance learning and easy city guide. For the first application, MTM will allow doctors to have access to a highly mobile, wireless 'pocket' device which will provide telemedicine functionality 'on the move'. Moreover, MTM can be used as a kind of image pager within the hospital. Junior doctors can access the senior staff for advice or a senior radiologist can watch the progress of a patient with imaging modalities from any place and advise the technicians in complicated situations.

MTM provides an extremely flexible platform capable of supporting different applications which respond to diverse market niches. Potentially, it is addressed to the mass market, and can be adapted to a wide range of sectors making it a winning idea. The added value of MTM is potentially huge.

NISAN

Number: IST-2001-38052

Cluster: Health Professionals

Type of Action: Research

Project Participants:

ERGO	GR
SiE	E
MEIR	ISR
LAMDA	GR
CSEM	CH
LODZ	PL
AFCON	ISR

Contact person:
Mr. SAGGIE Meir
Feuchtwanger Industries limited
Israel
Tel.: +972 393 92526
Fax: +972 392 29661
Email: MeirS@fil.co.il

Project web site:
http://www.afcon-inc.com/nisan/default.htm

Budget:
total cost: 3,861,961 €
EC contribution: 1,897,371 €

Timetable:
start date: 01/Aug/2002
duration: 24 months

Keywords:
biomedical sensors, telemedicine, oral anticoagulation therapy, quality of life, control of atrial fibrillation

Administered Tests with Network Diagnostics via a Non Invasive Sensor

Objectives

The objectives of NISAN are:

1. to find optical/spectral phenomena of in vivo blood that correlate with properties presently measurable in vitro - indicative of coagulation properties - and subsequently develop technology to measure said phenomena. Present state of the art is intrusive only - by drawing a certain amount of patient blood;
2. to develop technology to measure blood oxygenation level non intrusively on a not- necessarily stationary patient. Present state of the art is effective only when the patient is almost absolutely stationary;
3. to develop prototypes of the above sensors - to be integrated into the telemedicine platform described below;
4. to develop software for the telemedicine platform comprising: sensing and computing devices at the patient homes, the medical centre computing platform and the terminals used by health care professionals, and the communications protocols for the communications media interconnecting all the above;
5. to deploy the telemedicine platform and validate it with real patients and health care professionals.

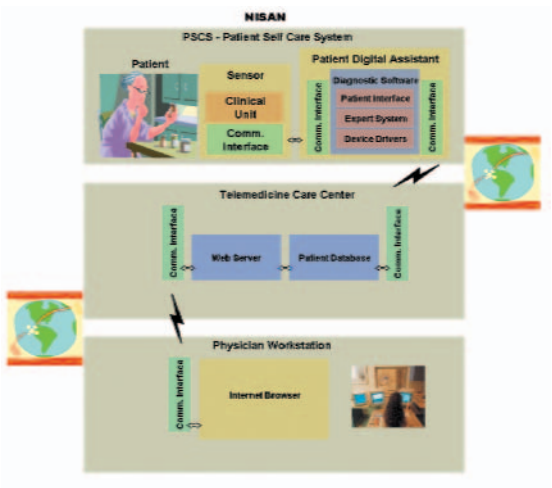
Results

The expected results of the NISAN project are in two areas - advanced biomedical sensors and telemedicine.

In the advanced biomedical sensors area, the expected results are the finding of physical principles and the development of technology to assess blood coagulation properties nonintrusively, and the development of technology to accurately measure blood oxygenation nonintrusively while the subject patient is not necessarily stationary.

In the telemedicine area, the expected results are to validate a home care platform, where patients self-administer tests and consequently regulate their medication at their friendly home environment, under the remote supervision of health professionals.

Such a platform can greatly improve the health of the chronically ill, by reducing patient discomfort presently caused by regular trips to and time spent at clinical laboratories and clinics, while at the same time increase health care quality by making specialists more available to a greater number of patients.



Health care administration per se can enjoy a two-fold benefit on the overall - have a better and more intensive record of patient medical history with less time spent on its collection, transcription and retrieval by the health care professionals involved.

OPENECG

Computerized ECG Standards Interoperability Portal

Number: IST-2001-37711

Cluster: Health Professionals

Type of Action:
Thematic Network

Project Participants:

FORTH	GR
CNR	I
R.G.B.	E
FUNEN	DK
BIOSIGNA	D

Contact person:
Ms. Chronaki Catherine
Foundation for Research and Technology - Hellas
Greece
Tel.: +30 2810 391 691
Fax: +30 2810 391 601
Email: chronaki@ics.forth.gr

Project web site:
http://www.openecg.net

Budget:
total cost: 457,895 €
EC contribution: 450,001 €

Timetable:
start date: 01/Jul/2002
duration: 24 months

Keywords:
telemedicine, home telecare, mobility of patients, wearable medical systems, interoperability of ECG devices, open source

Objectives

The growing demand for eHealth services and a multimedia Electronic Health Record (EHR) that could improve the quality of health services delivered at the point of need, places stringent requirements on the plug-in compatibility of medical diagnostic devices.

The mission of the OpenECG thematic network is to encourage and promote the consistent use of computerized Electrocardiography standards maintaining a strong association to standardisation bodies, national health, professional & patient associations as well as relevant projects and initiatives at a national, European, and International level. In this way, original ECGs may be exchanged in standard format that allows high precision presentation, analysis, processing and comparison.

The specific OpenECG objectives are:

- consolidate expertise and interoperability efforts providing best practice guidelines;
- raise community awareness regarding computerised ECG standards and the benefits of interoperability;
- assist integrators and manufacturers in the correct implementation of the standards;
- provide feedback to standardisation bodies regarding pitfalls in existing standards;
- prepare the ground for emerging standards for other cardiology examinations.

OpenECG pursues its objectives by a series of activities:

- OpenECG portal (http://www.openecg.net)
- OpenECG Certification service & Help desk: help integrators and manufacturers get feedback on the work.
- Open-source Repository: co-ordinate the collection of ECG file samples, and the construction, evaluation and promotion of tools shareware and in open-source for viewing ECG files and translating between different formats
- Programming Contest: run a contest to stimulate the creation of ECG viewing and format translation tools in open-source.

Results

1. OpenECG Portal launched at August 1, 2002, (200 visits monthly average).
2. The number of distinct references to the SCP-ECG more than doubled in the last year (search on www.google.com).
3. The 1st OpenECG Workshop 'Bridging the interoperability gap in ECG devices,' held on 10-12 October 2002, brought together more that 60 representatives of ECG-manufacturers, health associations, medical professionals, and integrators. Main conclusions of the workshop was that the increasing need for the transmission of medical data from place to place imposes a need for the standardisation of data formats and communication protocols. This is particularly true in the case of digital electrocardiograms, which can be of great diagnostic significance, especially in critical cases.
4. The OpenECG help desk operating since September 2002, has already provided feedback to integrators of portable ECG devices.
5. OpenECG-related presentations, Meetings, and information Days have been delivered and organised around the world
6. An Industrial Advisory Board comprised of 6 members of political influence and an associate board of ECG manufacturers has been formed to lead OpenECG to its full potential.

OTELO

Number: IST-2001-32516

Cluster: Health Professionals

Type of Action: Research

Project Participants:

UORL	F
EBIT	I
C.S.C.	E
KELL	I
UTOURS	F
ELSACOM	I
UBRUN	UK
CERTH	GR
SINTERS	F

Contact person:
Prof. Vieyres Pierre
Université d'Orléans
France
Tel.: +33 2 4823 8465
Fax: +33 2 4823 8471
Email: Pierre.Vieyres@bourges.univ-orleans.fr

Project web site:
http://www.bourges.univ-orleans.fr/otelo

Budget:
total cost: 3,340,499 €
EC contribution: 1,811,924 €

Timetable:
start date: 01/Sep/01
duration: 30 months

Keywords:
medical robotics, ultrasound tele-echography, advanced mobile systems, public health, telemedicine.

Mobile tele-echography using an ultra-light robot

Objectives

OTELO project will study and develop a fully integrated end-to-end mobile tele-echography system for population groups that are not served locally, either temporarily or permanently, by medical experts. OTELO project offers an alternative to medical centres, that lack ultrasound specialists, with a remotely controlled robotic system that guarantees a reliable echographic diagnosis in an isolated site away from an ultrasound expert MD. OTELO is a light weight, portable ultrasound probe holder robotic system, associated with new mobile communications technologies, that will reproduce the expert's hand movements during an ultrasound examination. Although being held by non-specialised staff on the remote site, the 'patient system' will bring, in real time, good image quality back to the expert site where force feedback control will be combined with virtual reality for the rendering of the distant environment. The main objective of the OTELO project is dedicated to the development of an advanced tele-echography system, which will bring to population groups preventive care support using the latest mobile robotic based ultrasound techniques.

Results

The OTELO system includes 3 major parts:

- An 'expert station' from which the clinical expert controls and tele-operates with a fictive ultrasound probe the distant robot. He visualises in real time the patient ultrasound images on a control screen and continuously receives information of the force exerted by the distant probe on the patient's skin.
- A 'patient station' where a six degree-of-freedom probe holder robot will reproduce the movements performed by the expert using his fictive probe. The system will be able to handle various types of manufactured ultrasound probes. It is a light weight and easy to handle structure held on the patient's skin by a paramedic.
- A 'communication link' that is chosen according to the geographical area of interest. It can be terrestrial ISDN, Globalstar-Eutelsat (mobile or fixed) satellite or 2.5/3G (UMTS) links. This link will provide the transfer of ambient images, ultrasound images and robot control data between the two sites.

With such a service, the patient at home, in a remote area or an emergency vehicle, can be in complete interaction with the specialist during the remote examination, and can request disease-specific information. OTELO is a service that will be primarily provided to hospitals, clinics, or other health institutions and physicians dealing with emergent or non-hospitalised patients. National Health Systems and Hospitals (private/public) are considered the most important 'client groups' to whom OTELO will be targeted.

PANACEIA-iTV

Citizen Centered Health and Lifestyle Management via Interactive TV: The PANACEIA Health System

Number: IST-2001-33369

Cluster: Citizens

Type of Action: Research

Project Participants:

POULIADIS	GR
ICOM	GR
CARD GUARD	ISR
BROMPTON	UK
RAMIT	B
AUTH	GR
OTE	GR

Contact person:
Ms. Danelli Vassiliki
Hellenic Telecommunications Organisation - OTE s.a.
Greece
Tel.: +30 32106111439
Fax: +30 32106178910
Email: vasdan@ote.gr

Project web site:
http://www.itv4health.org/

Budget:
total cost: 4,217,604 €
EC contribution: 2,298,464 €

Timetable:
start date: 01/Aug/01
duration: 30 months

Keywords:
home telecare, health promotion, interactive TV, healthcare, lifestyle health education.

Objectives

PANACEIA-iTV facilitates essential lifestyle changes and promotes compliance with scientifically sound self-care recommendations through the application of interactive digital television for family health maintenance through home care. The means to achieve these goals are based on technological, health services and business models driven by specific objectives.

The technology objective is to develop communication means between interactive TV and microdevices capable of recording simple, daily routine measurements, that will be achieved via the use of infra-red based devices communicating with the TV set-top box. The embodiment of this communication capability in the TV set-top box is expected to be a major technological advancement helping in the advent of ambient technologies.

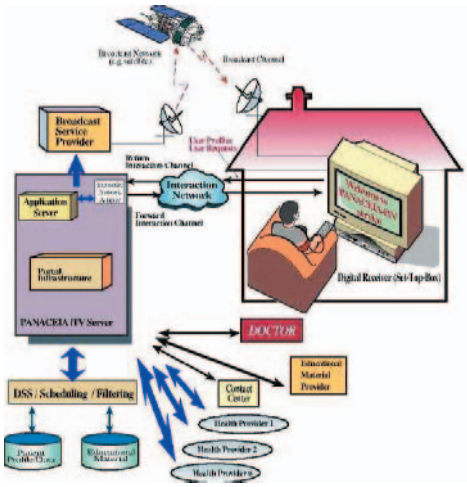
The health services objectives is, by using the interactive digital TV service component of the digital satellite platform, to provide easily accessible health prevention/information, and also a two-way interaction with the system. This service provision has the added advantage that the information exchange is effectuated through the digital TV channel stream, and can involve experts from various sectors of health care delivery and in the end, provide easily accessible, usable and cost effective health care services linked mainly with prevention and increased quality of life.

The business model objective is the creation of a business scheme that can glue together different competencies such as information coding/processing, digital TV services, microdevice manufacturers, telecommunication manufacturers, medical service provision centres, contact centres to name a few (innovation in business modelling and exploitation strategies). Also, through the use among others of satellite technology, the Application Service Provider (ASP) model is expected to be a major business model component.

Results

Family health maintenance will be supported through scheduling of essential preventive care services, encouragement for lifestyle changes, and education on issues of health and illness. Based on interactive digital television technology the following system components are under development:

- TV set- top box supporting communication with simple home monitoring devices like weight scale, blood pressure measurement, etc.
- interactive digital TV services supporting the delivery of home care;
- access to a contact centre to manage the interactive family health maintenance service of a large number of users;
- internet-based services to health professionals for the delivery of complementary health educational services and products.



Those interventions that have been substantiated in randomised controlled clinical trials as making a difference in health care outcomes include: patient education, distance monitoring, patient reminders, incentives, behavioural contracting and compliance monitoring.

PARREHA

Rehabilitation IT Aid for the Parkinsonians

Number: IST-1999-12552

Cluster: Patients

Type of Action: Research

Project Participants:

ZENON	GR
TCI	I
T&T	I
AAT	I
OCC	UK
EC-JRC-ISIS	I
EUROPARK	E
ICCS/NTUA	GR
ATB	UK

Contact person:
Dr. Boyle John
Oxford Computer Consultants Ltd
United Kingdom
Tel.: +44 1865 793077
Fax: +44 1865 793124
Email:
john.boyle@oxfordcc.co.uk

Project web site:
http://www.parreha.com

Budget:
total cost: 2,860,000 €
EC contribution: 1,680,000 €

Timetable:
start date: 01/Jan/00
duration: 36 months

Keywords:
wearable medical systems, human computer interaction, mobility of patients, virtual reality, Parkinson's disease, PD patient rehabilitation, PD, VR headset, motion tracking, 3D graphics, audio- feedback, teleconferencing.

Objectives

The project's major aim was to explore the response of patients with Parkinson's disease (PD) to telemedicine applications using virtual reality (VR). At a later stage, the use of videoconferencing was investigated as a clinical communication medium for patients and scarce PD specialists, often located miles away or in another country.

It is estimated that approximately 750,000 people suffer from PD throughout the European Union, a figure that is increasing as our population ages. Thus, the project objectives are in accordance with the remit of the IST Programme and especially the 'Systems and Services for the Citizen' Key Action, ensuring that research addresses the major socio-economic problems facing Europe.

Results

PARREHA experiments revealed that a virtual environment of visual cues such as scrolling stripes could dramatically improve the orientation and walking ability of PD patients by countering '*akinesia*', the symptom of muscular 'freezing' which severely affects mobility and speech. Dramatic, near-normal mobility, termed '*kinesia paradoxa*', was achieved using external audio-visual stimuli.

A VR head-mounted device (HMD) was developed and connected to a mobile mini computer worn on the patient's belt. This computer used specifically designed software to project images of scrolling stripes to a tiny visual monitor fixed within the HMD and worn at the side or above the eye. The monitor did not obstruct the patient's normal vision in any way. However, when the patient experienced akinesia and was unable to move, a motion-sensor device within the computer automatically projected scrolling stripes to the monitor, triggering *kinesia paradoxa* and patients were able to walk relatively normally again. Patients could adjust the origin, direction, speed and colour of the stripes to suit their individual requirements. During 'drug-resistant' phases, patients wearing the device experienced an overall easing of muscle tension and were able to rise up from chairs and walk more easily. They also experienced noticeable improvement in finger dexterity and speech.

During the PARREHA research, remote video-therapy was found to provide enormous benefit to both specialists and patients. Equipment comprised a PC with videoconference (VC) capabilities located at the patient's site (home), which transmitted images of a virtual room to the HMD worn by the patient and, at the same time, to similar equipment at the medical specialist's site. Specially designed software enabled experts to tailor physiotherapy exercises by adjusting objects within the virtual room. Both patient and specialist provided auditory feedback and a medical database was used by the specialist to track the patient's progress.

PHARMA

Number: IST-2000-26230

Cluster: Patients

Type of Action: Research

Project Participants:

ZAMB-TSZ	NL
AIRIAL	F
EXPER	I
CHU TOULOUSE	F
AUSL	I
ERGON	GR
PAGLIA	I
VIRGO	GR

Contact person:
Mr Gunnar Peroni
EXPER s.a.s.
Italy
Tel.: +39 0471 259040
Fax: +39 0471 259099
Email: gunnar.peroni@exper.it

Project web site:
http://www.PHARMA-PROJECT.net

Budget:
total cost: 3,978,208 €
EC contribution: 2,025,000 €

Timetable:
start date: 01/Jan/01
duration: 24 months

Keywords:
eHealth networks and architectures, security and privacy, telemedicine.

Re-Organising the logistic, delivery and dosing of drugs

Objectives

The PHARMA project focused its research on the re-organisation of the service structure for dispensing drugs and medications to outpatients. This implied reviewing the whole healthcare system, i.e. organisation, control, management, dosing, delivery and administration of medication.

PHARMA addressed the above mentioned issue through the development of a hardware and software platform which sustained the distribution cycle of medicines - i.e. management, organisation, logistic and delivery of medication - through patient specific unit-doses at their point of care.

A first group of objectives were centred on setting up the hardware and software basic platform infrastructure and the workflow mechanisms. This platform integrated:

- automation (hardware and software) of patient specific 'unit-dose' packaging,
- software for physician order entry,
- communication technology to support the interaction among the main users – i.e. patients, care users, general practitioners, medical specialists and nurses - with the system focusing on mobile communication,
- logistics from the central preparation area to where patients reside.

A second group of objectives were centred on setting up new services for the healthcare environment that advocate an active role of the patient. The PHARMA platform was developed on the following concepts:

- monitoring of individual patient data,
- direct interaction of the patient with the drug dispensing cycle,
- interaction with the other users involved in the cycle,
- automation (software and hardware) at the point of administration check.

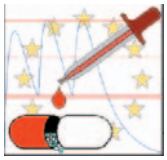
Results

The outcome of PHARMA is a generic platform which was customised and integrated in the four pilot sites involved in the project. As these represented four complementary organisational contexts, the platform running at the four sites represented the main measure of success.

Overall, the following objectives were reached:

- the development of an integrated drug distribution system, based on the unit-dose concept, that can be adapted to outpatient scenarios,
- the development and implementation of a web-application for the management of patient, prescription and administration related data,
- a total of 100 patients on the new drug distribution concept,
- evidence on those 100 patients of significant error rate reduction,
- the new drug distribution system proved to increase trace ability and efficacy in the management and distribution of medicines,
- the new drug distribution system proved to increase security and prevented misuse of medicines,
- the new drug distribution system helped to improve the logistics of drug delivery.

PHARMDIS-E+



Number: IST-2001-52107

Cluster: Health Professionals

Type of Action: CRAFT

Project Participants:

NEPHARM	D
GPNOTT	UK
HOSPOER	S
HOSPLUBL	PL
RUG	NL
DATMO	B
HOSPLUBL	PL
MEDIHEER	NL
IGESBER	D
ZUPVIEN	A

Contact person:
Dr. Devlies Jose
OMEGA Medical Soft NV/SA
Belgium
Tel.: +32 9 325 9393
Fax: +32 9 325 9395
Email: jos.devlies@omegasoft.be

Budget:
total cost: 558,486 €
EC contribution: 279,043 €

Timetable:
start date: 01/Jan/02
duration: 24 months

Pharmacokinetic & Pharmacodynamic Drug Information and Dosage Adjustment System

Objectives

The project intends to provide a validated tool to become individualised drug dosage advice, adjusted to the patient's organs functions (e.g. age, kidney and lever). The effects, efficiency as well as side effects, depends on the patient's condition and the pharmacokinetic and pharmacodynamic characteristics of each individual drug. Final goal of an individualised dosage regimen advice is to become the desired therapeutic effect with minimal side-effects, at minimal costs and based on realistic dose strength and dosage intervals. The project focuses more especially on patients with serious renal impairment. The project will extend the target group to all kind of patients.

The project builds on the results of a previous PharmDIS project (PharmDIS was a project of Fourth Framework Programme) including a larger number of medicinal products, evolving from a drug adjustment system to a real drug therapy management system. The prototype developed in the previous project and expanded and validated intensively in the actual project will be available as a service to be included in clinical information systems, as a stand alone application as well as through an ASP service.

PICNIC

PICNIC
PROFESSIONALS AND CITIZENS
NETWORK FOR INTEGRATED CARE

Number: IST-1999-10345

Cluster: Citizens

Type of Action: Research

Project Participants:

IN4TEK	UK
Macro Pilot	SF
VTT	SF
FUNEN	DK
SAS-CSJA	E
Ecomit	E
SEBT	UK
EUR	NL
FORTH	GR
UOI	GR
UHI	ISL
MINORU	F
GMS	IRL
NWHB	IRL

Contact person:
Mr. Burke Patrick
General Medical Services(Payments)Board
Ireland
Tel.: +353 1 83 43 644
Fax: +353 1 83 43 535
Email: patrick.burke@gmspb.ie

Project web site:
http://www.medcom.dk/picnic

Budget:
total cost: 6,740,642 €
EC contribution: 3,591,021 €

Timetable:
start date: 01/Jan/00
duration: 39 months

Keywords:
eHealth networks and architectures, open source, public health/health promotion, information to citizens, telemedicine.

Professionals and Citizens Network for Integrated Care

Objectives

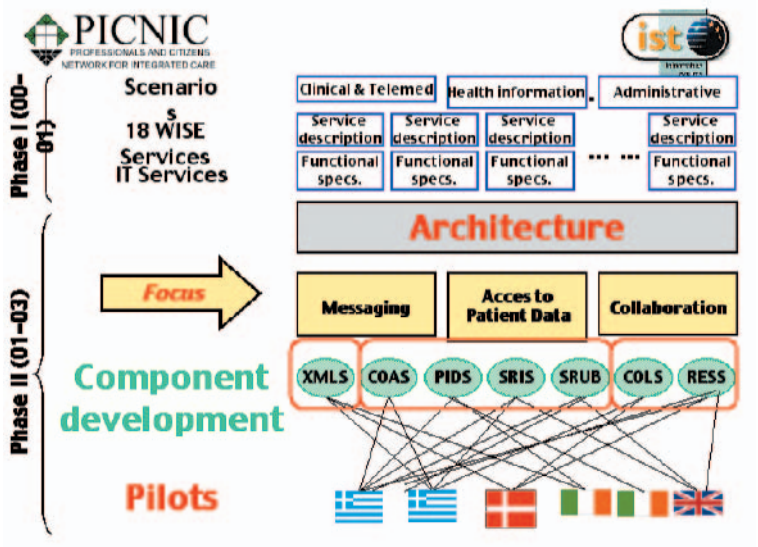
The aims of PICNIC are:

- to deliver a number of Open Source components which are used across different regions, which can be integrated into application, which deliver like services across participating regions which can be exploited by other regions and industry to provide products for a European and potentially world-wide market;
- to develop a model for the future Regional Health Care Networks and to prepare the regional health care providers to implement the next generation of secure, user-friendly health care networks;
- to make the European market for telematic health care services more cohesive and less fragmented.

Results

The main results of PICNIC are:

- a PICNIC Architecture report, setting out the standards and services/components required to achieve interoperability between Regional Health Care Networks;
- a set of 6 Open Source common components, which enable Regional Health Care Networks and industry to build systems incorporating PICNIC services. These are CorbaMed (now the health task force of the OMG) services such as patient identifier (PIDS). Components can be downloaded from http://forge.euspirit.net/projects/picnic.
- a series of 7 prototype demonstrator systems, operating in 5 European countries, incorporating the PICNIC common components;
- a Pro-active Assessment model and evaluation tools, which allow regions, and other users of PICNIC components, to prospectively evaluate the benefits of using the PICNIC components;
- a Regional & Industrial Exploitation Plan, which documents the routes to market for PICNIC products & services.



PLACEBO

Number: IST-2001-35270

Cluster: Health Professionals

Type of Action: Research

Project Participants:

FORTH	GR
SYMPER	GR
ANCO	GR
OBJECTIVE	B
TECHNOGLOBAL	CY
NEW VALUE	P
GREATER DERBY PCT	UK
TWT	D
AURELIA MICRO	I

Contact person:
Ing. Catarsi Fabrizio
Aurelia Microelettronica S.p.A.
Italy
Tel: +39 0584 388398
Fax: +39 0584 388959
Email: f.catarsi@caen.it or info@caen.it

Budget:
Total cost: 4,329,842 €
EC contribution: 2,199,921 €

Timetable:
Start date: 01/Apr/2002
Duration: 24 months

Keywords:
medical imaging for surgical planning and intervention, health professionals knowledge, human computer interaction, prosthesis selection, strain and stress in tissues

An Innovative Computational Platform For Solving Differential Equations in Modelling Biomedical Signal Processing Applications

Objectives

The major objective of the PLACEBO project is to develop an advanced high performance computational environment for solving ordinary or partial differential equations using techniques based on neural network models. It will constitute a computational framework that will assist both doctors and bioengineers into experimentally studying and analysing complex biomedical models in an easy-to-use and efficient way.

The overall platform will be accompanied with an innovative methodology, which uses the fundamental approximation properties of feed forward neural networks in order to give the solution of a differential equation in a closed analytic form.

PLACEBO aims initially in applied medical domain targeting:

- Orthopaedicians that have to make a choice among different endoprosthesis implants, which vary in shape, properties and size
- Surgeons dealing with cardiovascular diseases where a simulation of the artery and blow flow will greatly improve the efficiency of the operation.

Moreover, the tremendous potential of such system can be see in several other medical phenomena of medical science, such as stress and strain in tissues, glucose-insulin dynamics, tumour growth behaviour and drug delivery, but also in other scientific areas such as robotics, econometrics and navigation.

Placebo is in line with the key objectives of the IST programme developing an advanced computational environment of high performance to provide medical professionals with a tool that will accelerate the treatment process and will support effectively their decision making in choosing which type of treatment they will follow according to patients, problem.

Results

In this stage of the project, strong attention has been put on the orthopaedics application for the Placebo platform.

Usually an orthopaedic has to examine image data from a patient (coming from a MRI – Magnetic Resonance Imaging or CT – Computer Tomography) in order to make his decision on the selection of the most appropriate endoprosthesis or implant. At present there are image-processing techniques to extract the internal and external surfaces of the bone, 3-D reconstruction algorithms to develop a model of the bone and finite elements method to perform computations and access the bone performance with and without implant. The main drawback of this process is the very long time needed to extract the correct information.

Using the Placebo system, the procedure will be much faster and effective. The orthopaedic will be able to see the reconstruction images in real time and make a reliable selection of the endoprosthesis to implant.

This is a crucial reduction in time and the overall procedure is much faster, minimising the cost for the hospital and the risk for a patient.

PRE-HIP

Pre-Hip Project

Number: IST-1999-56408

Cluster: Health Professionals

Type of Action: CRAFT

Project Participants:

COATING	F
HITMED	I
ITWM	D
UW	UK
IOR	I
BECKER	D

Contact person:
Mr. Salomon Thomas
Coating Industries
France
Tel.: +33 4 7281 2262
Fax: +33 4 7281 2272
Email: t.salomon@coating.fr

Project web site:
http://www.3vm.it/prehip/presenta.htm

Budget:
total cost: 1,144,126 €
EC contribution: 571,061 €

Timetable:
start date: 01/Feb/01
duration: 24 months

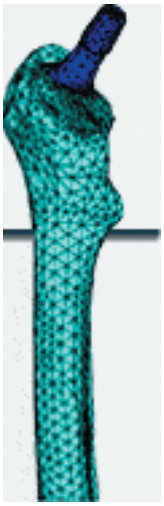
Keywords:
health professionals knowledge, health promotion, cementless hip implants, biomechanic and numerical simulation, surface modification

Predicting clinical performances of cementless-hip replacements in the early stages of the design process

Objectives

The PRE-HIP project aim is to develop a new mixed numerical/experimental methodology in order to predict the second stability (long-term) of the cementless hip implant prior to the clinical tests. The combination of computational models together with in vitro measurements will enable:

- to evaluate the device attributes (such as its endurance);
- to evaluate the performance of the device in vivo when subject to various physiological or pathological conditions (bone quality for example);
- to carry out a complete performance evaluation and risk analysis of any new design solution prior to undertaking lengthy and expensive clinical trials. (reduce time to market and increase competitiveness).



Results

To date (01/2003), the new method to evaluate hip implants has been set up. It has been applied on two cementless hip implant designs. One of them is going to be enhanced due to the results of our analysis. A new company will shortly be created in order to promote and realise these trials.

The development of this pre-clinical tool to assess the design evolution of new implants systems will allow a better understanding of the behaviour of the implants with time (long-term). Therefore, we should be able to detect and eliminate poor designs, leading to an increase of the success rate of cementless hip implants during all the patient life. Furthermore, the improved design and simulation will result also into an increased acceptance of the hip replacement and improved articulation of movements.

PREVENTIVE

Number: IST-2001-38198

Cluster: Citizens

Type of Action: Research

Project Participants:

TECHNOMERIT	CY
GASMA	GR
T.SERVICE	I
CALA LEVANTE	I
ARKE'	I
RC-AUEB	GR
OBJECTIVE	B
ANCO	GR

Contact person:
Mr. Rondena Simone
T.Service S.r.l.
Italy
Tel.: +39 02 4880885
Fax: +39 02 4883274
Email:
simone.rondena@tmtgroup.it

Project web site:
http://www.preventive-ce.org.

Budget:
total cost: 4,423,321 €
EC contribution: 2,367,060 €

Timetable:
start date: 01/Oct/02
duration: 24 months

Keywords:
biomedical informatics, biomedical sensors, wearable medical systems, illness prevention, information to citizens

An intelligent wearable platform for illness prevention related to ambient and athletic conditions at outdoor environments

Objectives

Citizens engage in a variety of daily activities at outdoor environments and are affected by the existing ambient conditions. During the day, they move through several microenvironments, which may exhibit completely different environmental parameters and risk levels.

The PREVENTIVE project targets the introduction of an integrated smart platform for mid-term research on the development of algorithms for real-time automated diagnosis and prevention of possible illnesses caused by the actual environmental conditions of the athlete's training location or working space. The system will provide individualised alerts and advises, taking into account the athlete's physical condition and personal susceptibility.

Different illnesses related to environmental conditions, often exhibit similar signs and symptoms, thus leading to possible misperceptions of the severity of a medical situation. Real-time and continuous monitoring can provide vital information, which coupled with an intelligent diagnosis system results in accurate and realistic diagnosis. Emphasis is placed in developing an Intelligent Advisor that processes in real-time the monitored medical parameters and provides accurate diagnosis and suitable advises to the athletes, in order to prevent short-term injuries and illnesses. The PREVENTIVE Intelligent Advisor combines individualised medical information with performance indicators and environmental conditions in order to provide adequate information for the athletes' capabilities in a specific environment, and guide them to adjust training according to their personal characteristics and performance goals.

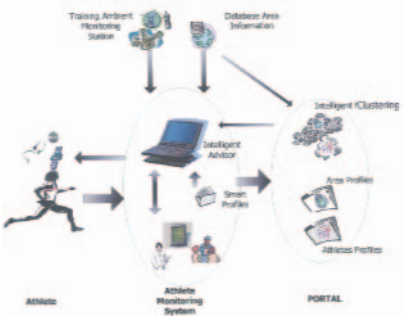
Results

The goal is to provide personalised health-care services for the prevention of illnesses and the reduction of treatment costs, involving citizens in the decisions for treatment. The PREVENTIVE system aims to provide an on-line and continuous monitoring tool for the prevention of environmental related health problems during exercise or outdoor activities. The project contributes to the improvement of the quality of life, health and safety of the Community's citizens, with an emphasis on its athletes, either professional or habitual. In case of citizens engaged in sporting activities, it enhances their safety and serves as an easy-to-use personalised health monitor. In the case of athletes and sports teams, it provides information, which is crucial to improved performance and essential in the prevention of injuries. It also provides doctors and paramedical professionals with an innovative tool that enables them to monitor medical and performance conditions, taking into account all environmental parameters.

The PREVENTIVE project aims at providing new algorithms enhancing the current European and world-wide research and contributing to an increase in competitiveness in the medical and sports sector, which could lead to additional employment opportunities.

Social objectives and goals are hard to be measured directly. Though, as the system aims to improve the quality of life, health and safety, these parameters can be measured with the use of the following indicators:

- the average reduction of health problems caused by environmental conditions during exercise;
- the average reduction of hospitalisation and treatment due to exercise injuries;
- the users satisfaction for the system's performance.



PRIDEH

Number: IST-2001-32647

Cluster: Citizens

Type of Action: Trial

Project Participants:

CUSTODIX	B
WREN	UK
E&Y	F

Contact person:
Prof. Dr. Georges De Moor
Custodix Research
Belgium
Tel.: +32 9 210 78 90
Fax: +32 9 211 09 99
Email:
Georges.DeMoor@Custodix.com

Project web site:
http://www.prideh.custodix.com/

Budget:
Total cost: 906,020 €
EC contribution: 746,620 €

Timetable
Start date: 01/Sep/01
Duration: 24 months

Keywords:
security and privacy, health GRIDs, clinic trials, privacy enhancing technology, anonymisation, pseudonymisation

Privacy Enhancement in Data Management in E-Health

Objectives

The PRIDEH project focuses on the take-up of privacy enhancing technologies (PET) within the health domain. Custodix N.V. is a Trust Service Provider that delivers e-privacy protection services. Its core services are batch and interactive Trusted Third Party (TTP)- pseudonymisation and anonymisation services. Though the current services are robust and reliable, market uptake is rather slow. The PRIDEH project aims to stimulate the take-up of PETs by targeting the reasons for the slow take-up by:

- increasing the awareness of individuals, developers, data brokers, researchers about the importance of privacy;
- demonstrating the easy integration of PET based solutions into applications;
- organising two trial applications; one to illustrate privacy protection of personal information in a sales application and another one in a clinical trials scenario;
- organising a symposium and workshops on the subject of privacy protection;
- providing input into standardisation bodies in order to formulate quality criteria for the set-up and deployment of PET services;
- co-operating with experts in the legal profession to help to create a framework that enhances the added value of privacy protection services by providing a legal basis for its use.

Results

The overall result shall be a better take-up of Privacy Enhancing Technology solutions. This will express itself on various levels.

On the technical level by lowering the threshold for software companies to incorporate PET based functionality as a default service into their applications. This will create more potential for the providers of PET services, while for application developers easier integration of standard PET functions into application software will be a bonus. The extra privacy protection functionality will provide added value to their software.

On the business level suppliers can extend their base of end users that demand PET-based services. For suppliers of PET enabled solutions there is a competitive advantage and reduced costs for privacy maintenance.

On the legal level, the availability of adequate PET based services drives the formation of a framework that is better supported by legislation and accepted by ethical and other professional groups.

Scientific progress requires the unlocking of resources that are inaccessible because of privacy restrictions. Unlocking can be done through PET-based services thereby boosting scientific research and expansion of evidence based medicine.

PRIDEH-GEN

PRIDEH-GEN
Privacy Enhancement in Data Management in E-Health for Genomic Medicine

Number: IST-2001-38719

Cluster: Citizens

Type of Action:
Accompanying Measure

Project Participants:
CUSTODIX B
VITAMIB F

Contact person:
Prof. Dr. Georges De Moor
Custodix NV.
Belgium
Tel.: +33 2 210 78 90
Fax: +33 2 210 09 99
Email:
Georges.DeMoor@Custodix.com

Project web site:
http://www.prideh-gen.custodix.com

Budget:
total cost: 302,081 €
EC contribution: 218,123 €

Timetable
start date: 01/Sep/2002
duration: 18 months

Keywords:
security and privacy, health GRIDs, genomics, privacy enhancing technology, anonymisation.

Privacy Enhancement in Data Management in E-Health for GENomic Medicine

Objectives

PRIDEH-GEN is an accompanying measure whose aim it is to cluster the objectives of two projects: PRIDEH (IST-2001-32647) and INFOGENE (IST-2001- 33402).

PRIDEH stands for 'Privacy Enhancement in Data Management in E-Health'. The PRIDEH project is itself a take-up measure that aims to increase the take-up and use of Privacy Enhancing Technologies (PET) in the domain of e-Health.

INFOGENE (INteractive platform FOr personal GENEtic profile construction, decision support) is a project that has a lot of know-how on board on genetic data.

Both, genetic testing and pharmacogenetics give rise to concerns about the proper collection, storage and use of individually identifiable genetic information. As the practice of genomic medicine develops, researchers and healthcare providers may want to store genetic profiles to determine treatment modalities as the need arises. The existence of such genetic databases will even increase the risk that unauthorised persons will obtain access. Clinicians and researchers will therefore need to safeguard the confidentiality of such sensitive patient information.

Institutional Review Boards already pay careful attention to the requirement of obtaining the informed consent from subjects. Research ethics and security guidelines demand research units to divert more and more resources and time to privacy and identity protection, but burdensome requirements governing the transmission of medical and genetic information could unnecessarily discourage research. Protecting human rights (e.g. privacy) while maximising research productivity is one of the coming challenges. Well-intentioned privacy laws should not clash with the legitimate use of information when clearly to the public's benefit.

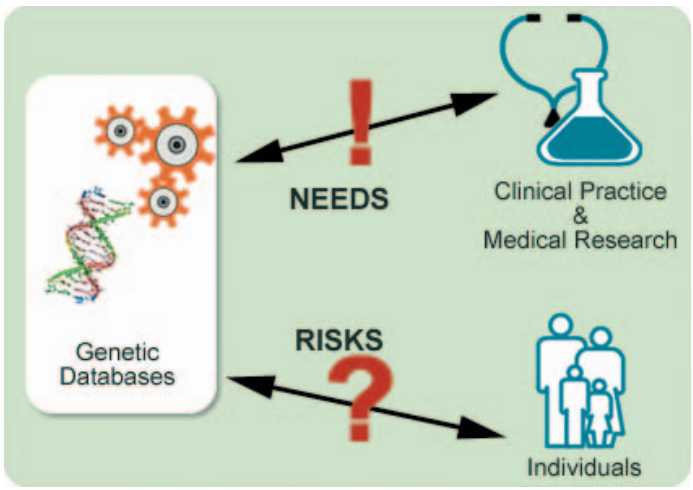
PRIDEH-GEN mainly focuses on the possible use of Privacy Enhancing Techniques for the protection of genetic data in the context of research and statistics.

Results

PRIDEH-GEN wants to examine data of a genetic nature and determine the privacy risks of the use of such data. The work carried out will consist of a study on re-identification risks. The analysis also comprises an attack model based on observations.

From the geneticist's point of view, PRIDEH-GEN will produce guidelines with good practices for the protection of privacy in relation to genetic data.

From the point of view of security specialists, the project will clarify privacy issues surrounding the use of genetic data. The methods and conclusions of this project will also be of importance to privacy protection in general in healthcare, beyond genomics.



PRO-ACCESS

Number: IST-2001-38626

Cluster: Health Professionals

Type of Action:
Accompanying Measure

Project Participants:
CYFRONET PL

Contact person:
Prof. Zielinski Krzystof
Akademickie Centrum Komputerowe Cyfronet Akademii Gorniczo-H
Poland
Tel.: +48 1261 73966
Fax: +48 1263 41084
Email: kz@ics.agh.edu.pl

Budget:
total cost: 366,990 €
EC contribution: 334,000 €

Timetable:
start date: 01/Jul/2002
duration: 24 months

Improving access of associated states to advanced concepts in medical telematics

Objectives

The PRO-ACCESS project will yield the platform for promotion, dissemination and transfer of advanced concepts in health telematics to Newly Associated States (NAS).

To achieve this, the formula of the Krakow Telemedicine Centre of Excellence, established in Poland in the year 2000, will be substantially extended and will comprise the coordination of publishing activities, events and trainings, as well as intake of solutions from cooperating partners within the European Union and NAS. The main impact of the Centre will be a substantially improved awareness of state-of-the-art e-health and telemedical technologies in countries aspiring to join the European Community.

An increased networking will strengthen the impact of activities performed in the Krakow Centre of Telemedicine. The networking will comprise the leading health telematics RTD centres in EU and NAS. A schedule for trainings for the project team will be prepared. Focused dissemination activities for diversified target groups are envisaged.

The PRO-ACCESS project will also address the issue of business opportunities in the e-health market in NAS and its potential for growth. State-of-the-art in e-health and telemedicine in chosen NAS will be investigated and best practices and costly failures properly disseminated. The accelerated transfer of concepts and experience to NAS will increase their competitive skills in the forthcoming 6th Framework Programme and stimulate the health telematics markets in NAS.

Results

The main activities performed in the PRO-ACCESS project will include:

- awareness raising events (conferences, workshops)
- publishing activities (publications, book, project web site)
- setting up a point of adaptation and dissemination of formal and de facto medical telematics standards
- networking visits, expert missions and seminars
- training visits to leading health telematics centres for professionals responsible for the dissemination and other project activities
- focused dissemination activities for target groups (policy makers, managers, medical informatics personnel, SMEs)
- technology and market analysis and organisation of a workshop on investment and business opportunities in e-health area in NAS
- establishment of advisory activities in the Krakow Centre of Telemedicine addressed to institutions preparing proposals for framework programmes or searching for cooperating centres all over Europe.

Target groups for the activities conducted in the range of the PRO-ACCESS project will encompass healthcare managers, computer scientists involved in medical informatics, research staff active in the field of health telematics, SMEs focusing on the IT solutions for healthcare, as well as local government representatives seeking for tools improving quality of medical care and well-being of population.

PROEHTEL

Number: IST-1999-29029

Cluster: Health Professionals

Type of Action:
Accompanying Measure

Project Participants:

AVIENDA	UK
EHTEL	B
AISL	UK
BT	UK
GMSIH	F
SIEMENS	D
CNOM	F
NPCF	NL
COCIR	D
HISCOM	NL
CLERT	UK
RCL	UK

Contact person:
Mr. Doaré Hervé
EHTEL Association
Belgium
Tel.: +33 1 3969 0327
Fax: +33 1 3969 0327
Email: herve.doare@ehtel.org

Project web site:
http://www.ehtel.org

Budget:
total cost: 1,000,000 €
EC contribution: 1,000,000 €

Timetable:
start date: 01/Jan/01
duration: 30 months

Keywords:
telemedicine, neutral forum, implementation, consensus, information exchange of national policies and activities.

Objectives

In the context of the strategy defined by the members of the EHTEL Association, PROEHTEL will promote the use of Telematics in Healthcare and foster the development of the European Health Telematics Industry.

To reach this, PROEHTEL will:

- implement the working groups defined by the Annual General Meeting of the EHTEL association;
- stimulate the creation of EHTEL like activities in at least 4 European countries;
- link with other EHTEL activities funded by the EHTEL Association or in the framework of other contracts and other projects.

Results

At the end of 2002, the EHTEL association represents more than 80 European institutions and opinion leaders (healthcare authorities, healthcare providers, healthcare insurers, research institutions, patients/citizens/consumers associations) coming from 19 countries.

Seven working groups are currently working on specific tasks defined by the EHTEL members.

EHTEL like organisations have been created and recognised in 6 European countries

Many reports have been published by EHTEL, including:

- Priorities for Application of ICT Standards Phase 1
- Position Paper for the development of e-Health Europe
- Green Paper on Legal and Ethical Issues
- Breaking Down Barriers:The White Paper and Action Plan 2002-2003
- Legal aspects of reimbursement in health telematics
- Legal aspects of standardisation in health telematics
- A Patient's Charter

REAL-PROF

REAL-PROF
Real World Monitoring of Prostheses and Footwear

Real World Intelligent Monitoring of Prostheses and Footwear

Number: IST-2001-38429

Cluster: Health Professionals

Type of Action: Research

Project Participants:

REMPLOY	UK
RB	NL
NMRC	IRL
USAL	UK
OSSUR	ISL
UKENT	UK
VICON	UK
TADIRAN	ISR

Contact person:
Dr. Nester Christopher
University of Salford
United Kingdom
Tel.: +44 16129 52275
Fax: +44 16129 52302
Email: c.j.nester@salford.ac.uk

Budget:
total cost: 1,860,009 €
EC contribution: 1,200,000 €

Timetable:
start date: 01/Jan/03
duration: 30 months

Keywords:
biomedical sensors, wearable medical systems, Intelligent data processing, Decision support, health professionals knowledge, information to citizens

Objectives

The problem this project seeks to address is that there is no means of scientifically monitoring the performance of therapeutic footwear and lower limb prostheses in the real world. This creates three very specific problems. Firstly, it prevents the early detection of problems under the sole of the foot or on the stump which lead to ulceration, and potentially amputation. Secondly, a clinician prescribing the footwear or prosthesis has no means of monitoring the performance of the device once fitted, and thus no means of evaluating their treatment, a prerequisite of valid treatment decisions. Thirdly, designers of footwear and prostheses receive no feedback data for these devices, data which is imperative if improved designs and clinical performance are to be achieved.

The principal objective of the Real-PROF project, therefore, is to perform the necessary research, development and validation for an advanced intelligent personal health system integrated with prostheses and footwear. The system will provide intelligent decision support systems to enable early illness detection and timely and targeted allocation of health care resources. The system will collect, interpret and visualise previously unavailable data from prostheses and footwear, and present these data to users (clinicians and designers of prostheses/footwear). The system will be built around two key elements - new micro-scale, low energy sensors mounted in, or on the prosthesis or footwear and novel data interpretation and representation tools.

Results

The expected results are an instrumented shoe that will enable us to measure forces and motion of the foot, wireless telecommunications unit to transmit data over the internet to central servers, and new software tools to interrogate the data. Data from this footwear system and the existing prosthesis system from the European IST MAPS project will be processed in new data interpretation tools. These tools will enable new data to be derived (extrapolated from the sensor data), but also enable us to decide how few sensors are required to provide the necessary information. Finally, artificial intelligence techniques will interrogate the data, looking to establish new concepts of normal and abnormal data for each individual patient, and thus predict when important clinical crises might occur, such as foot ulceration.

Major benefits will include, for patients, early detection of potential problems, for clinicians, unique clinical data and decision support systems, and for designers, new data, to inform design decisions. This will ultimately produce health, social, industry and research environment benefits.

REHAROB

Supporting Rehabilitation of Disabled Using Industrial Robots for Upper Limb Motion Therapy

Number: IST-1999-13109

Cluster: Citizens

Type of Action: Research

Project Participants:

BUTE	HU
UWC	UK
NIMR	HU
UR	BG
ZEBRIS	D

Contact person:
Dr. Arz, Gusztav
Budapest University of Technology and Economics
Hungary
Tel.: +36 146 3177
Fax: +36 146 33176
Email: arz@manuf.bme.hu

Project web site:
http://reharob.manuf.bme.hu

Budget:
total cost: 1,549,288 €
EC contribution: 1,386,000 €

Timetable:
start date: 01/Jan/00
duration: 42 months

Keywords:
biomedical sensors, health professionals knowledge, neurorehabilitation, automated patient assessment, robot mediated physiotherapy.

Objectives

This project aims at developing a Diagnostic System and a Robotic Physiotherapeutic system to support upper limb motion therapy of patients with neuro-motor impairments, first of all of stroke patients. Stroke is one of the most common major neurological disorders totaling from 150 to 400 cases for each 100,000 population in the European Union. 69 percent of stroke survivors can be rehabilitated successfully. Rehabilitation of hemiparetic patients involves very intensive physiotherapy of the limbs and the fingers among other medical treatments.

Scientific objectives of the project aim:

- To apply and develop advanced and intelligent techniques for biomechanical measurement-based patient assessment
- To identify limitations of human assisted upper limb motion therapy in neuro-rehabilitation and propose advanced solutions to overcome limitations
- To develop knowledge-based physiotherapy planning methods and robot control techniques.

Technical objective of the project aims:

- To design, build, and clinically test a robotic rehabilitation station, called REHAROB for the improved motion physiotherapy of the upper arm.

Results

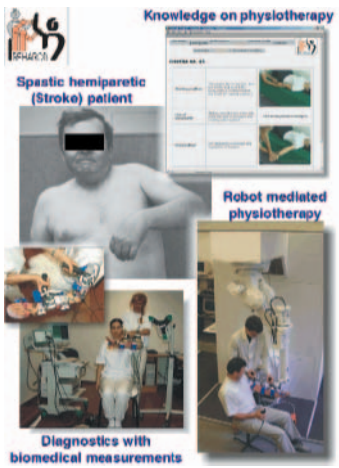
Results of the REHAROB project complete the ideal line 'from diagnosis to therapy'. Three tangible results are described in detail.

The first one is a *Multimedia Catalogue* of spastic upper limb physiotherapy exercises. It is the first catalogue of its kind in the world. The catalogue is public, its hypermedia version can be accessed at http://reharob.manuf.bme.hu/research/exercises/.

The second result is to innovate the traditional and highly subjective manual (stroke) patient assessment methods, a *Diagnostic System* was developed. It includes an ultrasound based motion analyser, EMG measurement system, and a force-torque measurement system. Health professionals can assess the patients, i.e. the efficiency of the therapy with biomechanical parameters. Health care financing organisation can also benefit form objective measurement of the therapeutic progress. The diagnostic system has been tested and medically certified. The diagnostic system is now introduced to the medical diagnostics market.

The third results regards the physiotherapy of spastic hemiparetic patients which include repetitive and fatiguing motion exercises delivered often for weeks. To relieve the physiotherapist of the physical burden and to support him/her with improved antispastic, intelligent, and automated physiotherapy a robotic *Therapeutic System* has been prototyped. In order to reduce development costs the therapeutic system is integrated fully from commercial equipment, first of all from industrial robots. The system has been designed for the maximum safety of the patient and of the physiotherapist, and is being prepared for clinical investigation in the first half of 2003.

Introduction of REHAROB products into public health services will allow more patients to be seen, assessed, and rehabilitated.



RESHEN

Regional Secure Healthcare Networks

Number: IST-2000-25354

Cluster: Citizens

Type of Action: Best Practice

Project Participants:

A'RHS CM (PESY)	GR
EXPERTNET	GR
BAC	GR
UHM	D
NKHD	SF
NTUA	GR
RCM	GR

Contact person:
Prof. Koutsouris Dimitris
National Technical University of Athens
Greece
Tel: +30 210 7722430
Fax: +30 210 7722431
Email: dkoutsou@biomed.ntua.gr

Project Web site:
http://www.biomed.ntua.gr/reshen

Budget:
Total cost: 1,142.299 €
EC Contribution: 878,614 €

Timetable:
Start date: 01/Jan/01
Duration: 24 months

Keywords:
security and privacy, best practice, PKI establishments, regional healthcare networks

Objectives

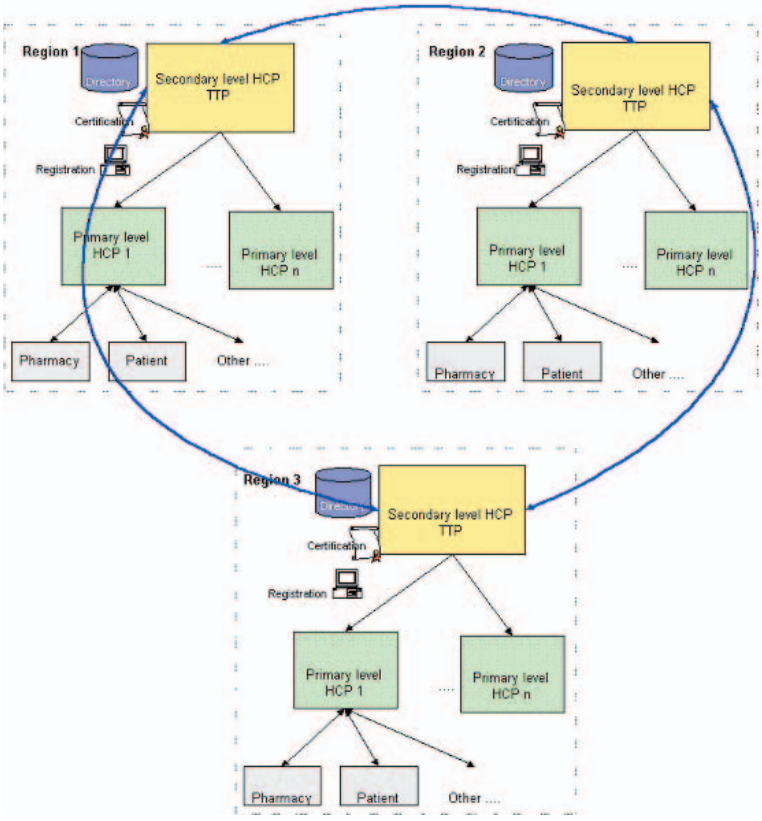
RESHEN's overall objective is to provide a best-practice action on the secure communication and information exchange between all levels of participants (primary & secondary healthcare service providers, end-users) in regional healthcare information networks within the regional networks themselves, as well as between different regional networks in Europe.

RESHEN project is important because it will contribute towards the secure communication and information trading, exchange, and processing in the healthcare sector in Europe, thus *adding value both on the security mechanisms and tools used, as well as on the healthcare service provision at local, regional and European level.*

The work-plan includes a (market oriented) survey on existing technical and organisational security practices in the healthcare sector, integration of tools and solutions, pilot operation and extended validation, as well as business assessment and exploitation.

Results

The result includes three PKI implementations in regional healthcare information networks (in Greece, Finland and Germany), interconnected in an overall pan-European PKI. Several different parameters were examined within the pilots, including technical integration, pilot organisation, legal/regulatory framework, medical involvement, and business plan formation. Following the above approach, some major conclusions are excluded, pointing out existing open issues and possible steps forward. Thus, RESHEN can provide a list of high-level recommendations for secure healthcare networks in Europe.



SALUT

Intelligent Environment for Diagnostics, Treatment and Prevention of Eating Disorders

Number: IST-2000-25026

Cluster: Citizens

Type of Action: Research

Project Participants:

UNIGE	CH
12-oct	E
MALEVOZ	CH
TIMON	F
CSIC	E
OCC	S
CONECTA	I
NETUNION	CH

Contact person:
Mr. Tony Lam
NetUnion sarl
Switzerland
Tel.: +41 21 351 5366
Fax: +41 21 351 5368
Email: lam@netunion.com

Project web site:
http://www.salut-ed.org/

Budget:
Total cost: 3,136,854 €
EC contribution: 1,191,000 €

Timetable:
Start date: 01/Jan/01
Duration: 39 months

Keywords:
e-health networks and architecture, health promotion, eating disorders, e-mental health, self-help

Objectives

SALUT uses advances in information and telecommunication technology to design, prototype and validate innovative tools and cost effective strategies for the prevention, diagnosis and treatment of eating disorders.

The project has two main Objectives to develop and validate online tools and mobile components for supporting the prevention and treatment of bulimia; to facilitate the exchange of reliable information about eating disorders between health professionals, researchers and the general public.

A main project component is the implementation of an online 'self-help' guide (SHG) for outpatient treatment of bulimia. This guide contains evaluation and treatment modules designed to lead users toward a healthier life style. The main modules of the SHG are expanded to form the basis of a more generic platform for supporting other online and mobile applications based on Cognitive Behavioural Therapy (CBT).

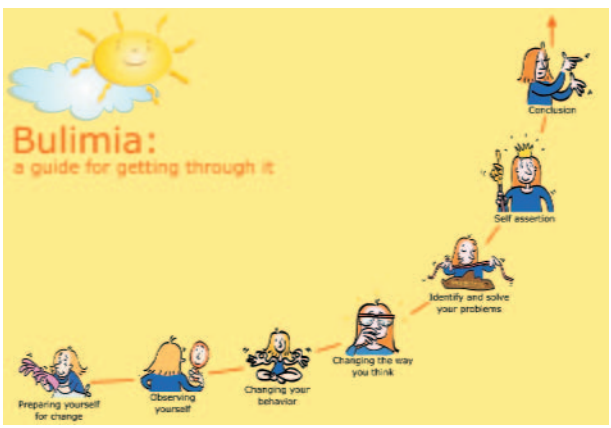
SALUT will also set up a network of regional web portals to facilitate the access and exchange of information between health professionals, researchers and the general public. These portals seek to encourage the dissemination of unbiased information about eating disorders, listing of current events, and local resources for people searching for information about eating disorders.

Results

An online version of the 'Self-Help Guide' (SHG, http://www2.salut-ed.org/), developed by *University Hospitals of Geneva* (HUG) and *NetUnion,* was released in September 2002. The SHG is currently available in French, Spanish, Swedish, and English. German and Italian versions, as well as, prototypes of mobile components, will be available first quarter 2003.

Medical partners from Sweden, Switzerland, France (*Timone Hospital*) and Spain will validate the SHG using a common research protocol. Evaluation activities were launched in October 2002 and continue throughout 2003. Final results are expected by first quarter 2004. Medical partners, *Malévoz Hospital* and the *12 de Octubre Hospital*, also developed common strategies and guidelines to coordinate prevention activities within the project.

The main project website (http://www.salut-ed.org/), developed by *Conecta Srl*, was launched in 2002. It contains general project information in English and acts as an entry point to regional language portals providing more specific information. From the main website, users can also access specialised project areas such as, the 'Eating Disorders Research Network' developed by *CINDOC* in Spain, and the website of the National Resource Centre for Eating Disorders, *NÄT*, in Sweden.



Finally, the project website received the HONcode accreditation in November 2002. The HONcode (Health On the Net Foundation: http://www.hon.ch/) is an external quality benchmark indicating compliance to prevailing best practice for the online dissemination of health related information.

SCREEN

Number: IST-1999-10246

Cluster: Health Professionals

Type of Action: Research

Project Participants:

UOXFDF	UK
MeVis Technology	D
MeVis	D
UMCN	NL
BARCO	B

Contact person:
Dr. Evertsz Carl J. G.
MEVIS - Centrum Fuer Medizinische Diagnosesysteme und Visualisierung Gmbh
Germany
Tel.: +49 421 218 4825
Fax: +49 421 218 4236
Email: evertsz@mevis.de

Project web site:
http://www.mevis.de/MeVis/projects/screen

Budget:
total cost: 2,328,060 €
EC contribution: 1,575,000 €

Timetable:
start date: 01/Jan/00
duration: 27 months

Keywords:
public health, biomedical informatics, screening mammography, breast cancer, workstation

Development of a Soft-Copy Reading Environment for Digital Mammography in Breast Cancer Screening

Objectives

Breast cancer is a leading cause of death by cancer among women in Europe. Early detection and treatment has proven to reduce mortality. On that basis Finland, Sweden, the Netherlands, UK, Iceland, Norway and Luxembourg implemented nation-wide screening mammography programmes for detecting breast cancer in their earliest stage. Other member states are following. Presently film is used for image capturing in screening mammography. Afterwards, the same film is used by the medical professional for diagnosis, and then for storage. At project start digital image acquisition for mammography just became available commercially. However, a suitable display workstation to enable radiologist to visually detect the cancers with at least the same accuracy and time efficiency as with film was lacking. This posed a significant technological obstacle hindering the transition from film-based to directly digital mammography.

The main objective of the SCREEN project was to develop a softcopy reading environment that could replace film-based reading in European screening mammography programmes. The main challenge was the size of the images (up to 5000x6000 pixels), which can add up to 1/4 GB of data per women. A new digital workflow and dataflow was needed enabling radiologist to read over 100 cases in an hour.

Results

The high demands on throughput were solved by a combination of pre-processing, exploitation of off-the-shelf hardware, and anticipation via pre-fetching of user demands. The novel workflow is reader-driven via a dedicated workflow keypad. Automatic generation of medical reports and dedicated pre-processing greatly reduce the number of user interactions. There is instantaneous display of Computer-Aided Detection (CAD) results on micro-calcifications or masses.

Via CAD, computer-aided interpretation, computer-assisted training, and reader in-service monitoring, softcopy reading presents new opportunities to increase the accuracy of the readers. A reduction of missed cancers will have a considerable impact on the effectiveness of screening to reduce mortality.

First clinical studies in the project showed that both in terms of reading speed and accuracy, softcopy reading on the SCREEN prototype system is at least as good as reading the same cases from an alternator.

The developments and know-how generated in the SCREEN project enabled the SME MeVis Technology to form with Siemens the joint venture MeVis BreastCare that led to the timely release of a state-of-the-art softcopy review station mammography now distributed by Siemens and Hologic world-wide.

The up-take of softcopy reading system in European screening programs is currently being addressed in the take-up action SCREEN-TRIAL in IST.

SCREEN-TRIAL

Number: IST-2001-33439

Cluster: Health Professionals

Type of Action: Trial

Project Participants:

MBC	D
MEVIS	D
UMCN	NL
TUH	N
PREVENTICON	NL
BBSP	D
CSPO	I
ARCADES	F
SIEMENS-ELEMA	S

Contact person:
Dr. Evertsz Carl J.G.
MeVis BreastCare
Germany
Tel.: +49 421 330 7400
Fax: +49 421 330 7450
Email:
evertsz@mevisbreastcare.de

Project web site:
http://www.mevis.de/projects/screen-trial/

Budget:
total cost: 2,580,762 €
EC contribution: 1,700,000 €

Timetable:
start date: 01/Apr/02
duration: 24 months

Keywords:
public health, eHealth networks and architectures, screening mammography, breast cancer, workstation

The Screening Mammography Soft-Copy Reading Trial

Objectives

Breast cancer is the leading cause of death by cancer in women in northern Europe. Early detection and treatment has proven to reduce mortality, and on that basis various EU states have, or plan to have, nation-wide screening mammography programmes. Every year, millions of women have film-based mammography examinations either in these programmes or on their own initiative.

Digital Mammography will have a considerable impact on radiologists' mammography reviewing process and workplace, and on overall quality of breast care. SCREEN-TRIAL's objective is to expedite the uptake of digital mammography, softcopy reading and computer-aided detection (CAD) in European screening mammography, and thus bring the benefits of these novel technologies closer to the women participating in these programs.

To this end the project investigates solutions to following challenges faced by European screening organisations:

- Validation of the equivalence or superiority of the clinical effectiveness of digital versus film-screen based screening mammography.
- Implementation of digital image archiving and retrieval.
- Conception and implementation of digital workflow.
- Training of new and existing personnel in digital screening mammography
- Organisation and implementation of the transition from film-based to digital mammography.
- Financial feasibility.

SCREEN-TRIAL's strategy is to bundle and manage existing technological, scientific, and clinical expertise to install softcopy reading, CAD and digital mammography at User Demonstration Sites at the University of Northern Norway (Tromsø, N), Preventicon (Utrecht, NL), Bremen Breast Cancer Screening Program (Bremen,D), University Medical Center Nijmegen (Nijmegen, NL), Danderyd Hospital (Danderyd, S), Centre for Oncological Study and Prevention, Tuscany (Florence, I), and ARCADES - Association pour la Recherche du Dépistage des Cancers du Sein (Marseille, F).

Results

The above sites promise to serve as role models and nucleation points for the further uptake of digital mammography in screening programmes.

Studies in the project will 1) Compare softcopy reading and film-based reading of digital mammography, 2) Analyse the impact of CAD, 3) Assess the impact of training on radiologists' performance.

The scientific and clinical co-ordination in the project are done by MeVis at the University of Bremen (Bremen, D) and the University Medical Center in Nijmegen (Nijmegen, NL). The industrial partners are MeVis BreastCare (Bremen, D) and Siemens-Elema (Solna, S). R2 Technology (Los Altos, CA, USA) is supplier of CAD to the project.

Through MeVis BreastCare, the work in the SCREEN-TRIAL project is disseminated world-wide through license agreements with original equipment manufacturers such as Siemens and Hologic-Lorad.

SMARTIE/ SMARTIE-CZ

Smart Medical Applications Repository of Tools for Informed Expert Decision

Number: IST-2000-25429

Cluster: Health Professionals

Type of Action: Research

Project Participants:

UK 2.LF	CZ
FIMIM	E
UNIVLEEDS	UK
ATKO	GR
SEMA	E
HHUD	D
SYMBION	F

Contact person(s):
Dr. Sancho Juan (Project Leader);
Angela Dunbar
(Project Manager)
Laboratory of Medical Informatics, Research Group on Biomedical Informatics (GRIB) - IMIM/UPF, Fundacio IMIM
Spain
Tel.: +34 93 224 03 02
Fax: +34 93 224 08 75
Email: sancho@imim.es; adunbar@imim.es

Project web site:
http://www.smartie-ist.org/

Budget:
total cost: 2,787,600 €
EC contribution: 1,676,862 €

Timetable:
start date: 01/Jan/01
duration: 30 months

Keywords:
advanced mobile systems, clinical decision support tools, health professionals knowledge, evidence based medicine

Objectives

SMARTIE provides healthcare professionals with decision support tools which are just as versatile and mobile as they are. Available in 3 languages (SP, FR, EN) on 4 different platforms (Pocket PC, Palm, Web, PC), these high quality mini-wizards generate the results of complex calculations and algorithms already published in scientific literature. MedNotes™, the SMARTIE products, are being developed in several medical specialities: Gastroenterology, Endocrinology, Emergency, Intensive Care, Paediatrics, Nutrition and Quality of Life with plans to expand to other specialities in the future. These applications are open source and are available for free from www.smartie-ist.org.

The role of physicians is -in fact- to change the prognosis of a disease. Nevertheless, few physicians actually know the prognosis of a disease affecting a particular patient. Thousands of clinically certified, evidence based calculations, scores and algorithms providing information for different therapeutic options have been published in scientific literature. However, few are used in practice by health care professionals. The practical reasons for this are mobility, usability, and complexity in calculation. Healthcare professionals require the mobile use of these tools in different languages. Before MedNotes™, a health care professional would need to identify scores, calculations, and algorithms published in journals and text books, ensure their applicability and accuracy and then perform the calculates on a calculator. Now, the selection, verification, validation, localisation and computation are integrated into MedNotes™.

Results

Three rigorous clinical trials are currently underway and focused to evaluate economic, access, and quality of care benefits. We estimate that MedNotes™ will support access to care through providing professionals tools which may otherwise not be used in clinical practice and encouraging greater use of clinical guidelines. This is illustrated through our study addressing the clinical problem of upper gastro-intestinal bleeding (UGB). In this trial, the modified Rockall score and clinical guidelines associated for each risk group are all compiled in a Palm® - based UGB package of MedNotes. The uptake of the guidelines with MedNotes™ is compared to the uptake with paper forms and the compliance to the guideline is studied.

Using an innovative transformation production-line processing technology, SMARTIE automatically produces multi-platform, multi-lingual wizard-like decision support applications designed, tested, and validated by working clinicians. This technology allows 1000s of MedNotes™ to rapidly be developed from published literature. Bringing the right information to the professional at the right time.

SPIRIT

Number: IST-2000-26162

Cluster: Citizens

Type of Action: Best Practice

Project Participants:

CONECTA	I
SISTEMA S.A.L.I	I
MINORU	F

Contact person:
Mr. Bray Brian
MINORU Development
France
Tel.: +33 6 8750 2465
Fax: +33 1 5381 0979
Email: brianbr@openhealth.com

Project web site:
http://www.euspirit.org

Budget:
total cost: 459,224 €
EC contribution: 355,480 €

Timetable:
start date: 01/Jan/01
duration: 24 months

Keywords:
open source, regional health networks

Priming the Virtuous Spiral for Healthcare: Implementing an Open Source Approach to Accelerate the Uptake and Improvement of Best Practice, Regional Healthcare Network Solutions

Objectives

SPIRIT is a pioneering initiative to accelerate the uptake of regional health network solutions. It will establish a self sustaining, profitable, and user driven best practice open source business for healthcare software and other resources. This will enable the implementation, enhancement, and propagation of regional health networks. The project will create a highly collaborative self-sustaining global community of healthcare software developers and healthcare professionals that will share, improve, and create innovative solutions for healthcare. The project will provide freely available resources that will enable better citizen-centred care both in Europe and globally.

The primary objective of the project is to implement a best practice commercial open source business model in order to accelerate the take-up of software and other resources that facilitate the implementation of economically viable, effective regional healthcare network solutions. To achieve this objective, the project will inventory and classify candidate resources from private sector, government, hospital, teaching, and care delivery organisations. An e-business web portal and CD distribution will be created. Communities of interest will be created to foster continuous improvement, further innovation, and to promote take-up. The ultimate goal is to accelerate the creation of health information networks that are so easy to use that they will become nearly transparent to both citizens and care providers alike.

Results

The project will consist of the following work:

- identification of best practice open source candidate software applications and components, including other resources from existing, ongoing and planned projects, government agencies, medical teaching institutions and other healthcare enterprises;
- classification of applications and software components into categories based on the type of open source license that can be applied to provide a framework to facilitate integration and ensure compatibility;
- selection of the most strategic best practice resources. These resources will be given more comprehensive preparation prior to distribution via CD and Web Portal;
- collection of test suites, test data, sample data, documentation, and creation of multilingual summaries and indices of health network components and solutions;
- identification of enhancements which can be made to facilitate broader take-up.
- identification of reusable resources to facilitate the enhancement, and broader implementation of regional health network solutions;
- accelerated uptake of solutions because of better access, zero license costs and improved quality;
- establish a European open source software industry;
- improves user friendliness and accessibility which will improve quality of care, citizen participation in self-care enabled through zero cost user driven software.

STEMNET

Number: IST-2000-26117

Cluster: Health Professionals

Type of Action: Best Practice

Project Participants:

EUROPDONOR	NL
HII	PL
VU	LT
CBMD/IKEM	CZ
VARIMED	HU
NIHI	HU
Eurocord-Slovakia	SK
BTC	SI
CET	NL

Contact person:
Mr. Van Der Zanden, Henk
Stichting EuropDonor Foundation
Netherlands
Tel.: +31 71568 5300
Fax: +31 71521 0457
Email: zanden@europdonor.nl

Project web site:
http://www.europdonor.nl/stemnet

Budget:
total cost: 611,483 €
EC contribution: 503,722 €

Timetable:
start date: 01/May/01
duration: 24 months

Keywords:
eHealth networks and architectures, telemedicine, donor registry, cord blood bank, stem cell transplantation

Information technology for STEM cell registries NETwork

Objectives

Bone Marrow Transplantation of hematopoietic stem cells is applied in certain malignant diseases (leukaemias) as well as for atomic power accident victims. Identity for markers of the major system of transplantation markers (HLA antigens) is critically important for good results. However the antigens of the HLA system are extremely diverse among human individuals. Only 25% of patients may have a suitable family member donor. The other patients need an unrelated stem cell donor. For transplantation of stem cells from unrelated individuals extensive donor registries are available. In particular the international Bone Marrow Donor World-wide (BMDW), the European Donor Secretariat (EDS), the European Marrow Donor Information System (EMDIS) and the organisation of cord blood banks (NETCORD) have a significant impact in Western Europe. In Central Europe suitable registries are either absent or evolving.

In order to raise the chance of finding a genetic match between recipient and potential donor, various ethnic groups must be well represented. Thus, it is of common interest to have a network of donor registries and stem cell banks in Central European countries. The STEMNET project will support the participation of national networks in Central Europe in BMDW, EDS, EMDIS and NETCORD activities. Thereby, this project will contribute to better therapy in Central Europe and contribute - by introduction of new ethnic groups - to better chances for patients worldwide.

Results

Stem cell donor registries and cord blood banks in Central Europe will become integrated participants of European Networks. Thereby the opportunity to find a suitable completely matched donor/recipient combination will increase both in western and in central Europe. Quality of mutual communication will be operational and the 'product' (stem cell) will conform to the high standards required worldwide.

TEAM-HOS

Number: IST-1999-11567

Cluster: Health Professionals

Type of Action: Research

Project Participants:

INESCA	P
ATB	D
DMR	D
HTROFA	P
KI	D
TechnologieAgentur	A
LKS	A
HFEIRA	P

Contact person:
Prof. Serrano J Artur Vale
IEETA - University of Aveiro
Portugal
Tel.: +351 234 370503
Fax: +351 234 370545
Email: serrano@ieeta.pt

Project web site:
http://www.team-hos.net/teamhos/home.nsf

Budget:
total cost: 2,087,951 €
EC contribution: 1,170,000 €

Timetable:
start date: 01/Jan/00
duration: 36 months

Keywords:
health professionals knowledge, eHealth networks and architectures, ICT introduction in hospitals, hospital information systems, team work redesign

Methodology and Tools for World-best Teamwork in Hospitals

Objectives

The modern health care system imposes high requirements upon hospitals: they have to ensure the highest quality of services to their patients, with the ongoing aim of minimising risk and costs for citizens. Therefore, the processes of specifying new, team work-oriented organisational models and selecting and implementing leading edge-ICT for team work in hospitals have to be supported in a more efficient way.

The objective of the TEAM-HOS project was to develop and verify an innovative methodology (BHP - Best Hospital Practice) and a set of tools for the redesign of hospital work models, supporting the definition, selection and implementation of appropriate ICT to improve teamwork efficiency along the treatment process.

Such a methodology was to respect the business objectives of the hospital and be based on a coaching principle, assisting the hospital from the start of the analysis up to the phase of installation and on-site operation of the new technology, including staff training and monitoring.

Project results

The main output of the TEAM-HOS project is the BHP methodology and a set of software tools to support its use. The methodology and tools developed cover the introduction of new ICT-supported team work models, including the analysis of the needs of the hospitals and their patients, the specification of requirements, the design of the supporting ICT (based on the design of workplaces and the definition of appropriate working methods and organisation) and the support of the implementation phase.

The new methodology fulfils high requirements with relation to efficiency, traceability and applicability in different medical fields and European regions. In fact, the methodology was tested at five hospitals from three different countries and a wide range of medical fields, studying and developing systems for business-cases that cover 60-80% of the general problems and needs in hospitals (resource sharing, real-time team co-ordination, innovative workplace design, knowledge sharing within teams and team inter-communication).

The methodology allowed for the efficient modelling of those hospital business processes, for the assessment of the needs of different customer classes and for the identification of new ICT-supported team work models. BHP then allowed for a reduction of at least 40% in the cost/efforts of introducing new ICT systems and for a reduction of 95% in the associated risks.

These pilot projects now serve as show cases of the world's best approaches for introducing ICT-supported team work in hospitals.

TELECARE

Number: IST-2001-33299

Cluster: Patients

Type of Action: Research

Project Participants:

UNINOVA	P
UVA	NL
RAL	UK
SYNK	UK
SKILL	E
UPD	E
SEMA	E
MICREL	GR
ICCS/NTUA	GR
FORTH	GR
CESVIT	I
UBRUN	UK
ARBO	SF
SOLINET	D
MUTUAM	E
AMC	GR

Contact person:
Mr Jose Esteban
SchlumbergerSema, Sociedad Anonima Espanola
Spain
Tel.: +34 91 440 8613
Fax: +34 91 754 3252
Email:
jfernando.esteban@madrid.sema.slb.com

Project web site:
http://www.biomed.ntua.gr/telecare/

Budget:
total cost: 3,196,318 €
EC contribution: 1,800,000 €

Timetable:
start date: 01/Sep/01
duration: 30 months

Keywords:
biomedical sensors, wearable medical systems, mobility of patients, patient and citizen health monitoring

Patient TELEmonitoring, using Ultra Low Discomfort Vital Signs Sensors over Mobile Networks for Interactive Continous CARE

Objectives

The main objective of the TELECARE project is to design and develop a system that permits the provision of a novel service of interactive continuous care aimed at large sensitive parts of the European population, the 'at-risk' citizens, who are usually patients with a stable medical condition that allow a near normal life but may suddenly deteriorate and put life at risk.

This service will increase their quality of life and their feeling of safety concerning their health. TELECARE aims to provide a modular and ambulatory secure telemedicine platform for continuous monitoring of vital parameters, affording timely intervention to avert clinical emergencies. This system will provide large healthcare corporations with the potential to offer remote monitoring services to post-surgery patients and to patients with chronic diseases.

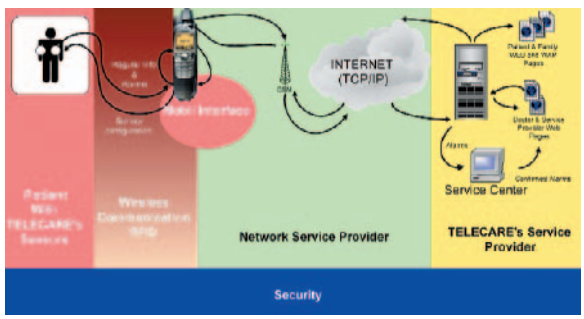
The TELECARE projects falls within the Key Action I – System and Services for the Citizen, and will mainly contribute to the action line I.1.2 Intelligent collaborative environments supporting continuity of care, and to the action line I.1.1 Intelligent environment for citizen centred health management. The project will promote the strategic objectives of the IST Programme, by developing an innovative, integrated system, which will respond to the existing socio-economic needs for cost-effective, high-quality healthcare provision, with timely and secure access. Moreover, the project will integrate and provide products and processes for the European marketplace, covering healthcare, insurance, telecommunications and IT providers.

Results

The main result will be to produce a TELECARE Service System that will be composed of the following components: 1) monitoring sensors (a finger ring pulse oximeter, and an ECG with Laplacian electrode single pad); 2) an Interface Module (a plug-in module at the bottom of the mobile phone. It collects data from all the monitoring sensors through RFID base station electronics); 3) a Mobile Phone Application (software residing into the phone); 4) a Service Centre System Application (a medical specialist/consultant may either use the Internet, or the cellular network to retrieve the most up-to-date medical data and perform diagnosis remotely. If enabled, in case of alarm, an ambulance may go straight to the place where the patient is located, guided by the GPS information the mobile device will provide)

The major benefits gained with the development of this system will be:

- continuous monitoring of at risk patients;
- optimisation of medical treatment;
- early start of therapy in acute situations and reducing the consequences;
- studies on sleep apnoea syndrome;
- increasing patient's confidentiality after hospital discharge;
- reduction of patients' care cost;
- improved patient outcome;
- triangular conference with the treating doctor and emergency services.



TELELOGOS

Number: IST-2000-26292

Cluster: Health Professionals

Type of Action: Research

Project Participants:

BILD	UK
SYMPER	GR
KAENOTOMIA	CY
BRAINSTORM	UK
PAL	GR

Contact person:
Dr. Michael Glykas
Micronics Telesystems Limited
Greece
Tel.: +30 977 483370
Fax: +30 1 3379122
Email: mglykas@agrotiki.gr

Project web site:
http://www.telelogos.gr

Budget:
total cost: 3,200,000 €
EC contribution: 1,600,000 €

Timetable:
start date: 01/Jan/01
duration: 24 months

Keywords:
telemedicine, home telecare, speech-language therapy, eHealth, e-Learning.

NExt Generation of Methods and Tools for team Work based Care in Language and Speech Therapy

Objectives

The objective of the project is to offer an alternative approach to technology-assisted speech therapy. The TELELOGOS system is an interface design package which lets its users work as a team and access and use existing VSAs (Visual Speech Aids) as well as other commercial systems and state of the art technologies.

The system is an 'easy to use' technology environment. It allows SLTs (Speech and Language Therapists) to find the optimum treatment for each patient, by incorporating different treatment actors. In addition, it also allows any non - specialist user - SLT, patient or helper (relative etc.) - to explore its creativity, by designing its own communication aid in an interactive manner, with the use of editors like: configuration and vocabulary. The first editor helps in identifying the communication elements (existing VSAs) that will be used in technology assisted treatment and link them to the communication aid under creation. The vocabulary allows the creator to select the right words for particular parts of the 'would be' user display. With the use of a third editor, layout, the creator is able to develop user friendly interfaces by linking elements from the previous two editors.

Through the created communication aid the user-creator is able to analyse treatment information from different perspectives and with more intelligence as it will be able to access and integrate different types of VSAs and other commercial systems.

Results

The project is expected to improve:

- the Usefulness of VSAs in Speech Therapy Sessions;
- the Usability by Type of Dissorder;
- the Remote and Domiciliary Therapy.

Via the final system a number of benefits emerges as the SLTs are in a position to:

- communicate with a temporarily paralysed, speech impaired patients. The SLT and the patient need a Single Switch Message Aid- a simple one-screen communication system set up for personal needs post-operative messages for a hospital ward.
- teach a profoundly physically disabled child to write. The child and the teacher need a two - switch text production and editing system - a simple word processor for special needs children.
- use the system as an interpersonal communication aid with symbol - to - speech translation. In this case the system can be used as a multiple-screen, multiple length symbolic communication aid with text and speech outputs. The system will then be able to offer single- and double-switch, and directed scan control.
- use the system as an integrator of learning aids. The patient is still learning about how to scan choices. The SLT decides that some learning aids might help, and want to relate these to the current topic. The SLT, for example, builds The Woods - a simple graphical adventure with several screens, designed for control via Single and Two-Switch Scanning, Concept Keyboard and Direct Selection.
- use the system as a facilitator for communication between two disabled children, with different communication problems. In this case the SLT would like a twin-user communication system with two users sharing common vocabulary, but with different controls, displays, and symbol sets.

In each one of the above cases the use of the system provides direct positive impact on the patient undergoing treatment.

TelemediCare

telemediCare

Number: IST-1999-10754

Cluster: Patients

Type of Action: Research

Project Participants:

SNT Hellas	GR
Alta	N
SINTEF	N
Kaunas	LT
Alcatel	N
Karolinska	S
MedIT	N

Contact person:
Winnem Ole Martin
SINTEF
Norway
Tel.: +47 7359 2993
Fax: +47 7359 2977
Email: Ole.M.Winnem@sintef.no

Project web site:
http://www.telemedicare.net

Budget:
total cost: 3,653,674 €
EC contribution: 1,877,074 €

Timetable:
start date: 01/Jan/00
duration: 30 months

Keywords:
wearable medical systems, home telecare, human computer interaction, advanced mobile systems, telemedicine

Telematic Support for Patient Focused Distant Care

Objectives

The TelemediCare system will improve the quality of home based care and medical treatment, through the development of a new generation of open platform telemedicine solutions. The project will introduce Medical Net Instruments, which implies that patients will receive 24hrs real-time medical monitoring in their own home. Advanced and reliable sensors on the body will supply high quality medical data. These data are sent to the patient's computer through wireless communication. The computer will analyse and store the data. Intelligent software will trigger medical supervision, treatment or care by establishing two-way communication over the Internet with remote, 'arrive-on-call' treatment/care providers. The system's functionality is based on profound knowledge and understanding of the health care system throughout Europe. Development and demonstration is done in close co-operation with experienced telemedicine users in Sweden, Norway and Greece.

Results

The results with respect to hardware and software are a multimodal control device, the Local Patient Computer (LPC), a Control Centre giving support to surveillance and patient planning and follow up, and a set of wirelessly connected medical sensors. The LPC is a standard laptop computer in the patient's home, responsible for storing, processing, displaying and synchronising monitored data, manual measurements and messages to and from the patients.

The finished prototype offered a set of service that enabled new practices of work and care, both for caregivers and patients. Patients can be monitored from their homes, using low weight wireless sensors at scheduled time. Patient activities like care activities, consultations, medications, surgical and others were included in a shared patient plan. A named caregiver was related to an activity as the person responsible. From this, each caregiver could extract his or her work plan for each day, week or month. As this work plan was accessible for other caregivers and administrators, resource management was improved and simplified.

New models of care have been developed to support early discharge of children. The new models have shown good results both related to quality of care and economical outcome.

TELEPLAN

Number: IST-1999-11999

Cluster: Health Professionals

Type of Action: Research

Project Participants:

DFC	I
ICCS/NTUA	GR
EPO	GR
AIAS	CY
BRAINLAB	D
Goettingen	D
AMC	GR
ELYROS	B
BOCOC	CY

Contact person:
Dr. Hartlep Andreas
Brainlab AG
Germany
Tel.: +49 89 99 1568 156
Fax: +49 89 99 1568 33
Email: hartlep@brainlab.com

Project web site:
http://www.athina.epsilon.com.gr/teleplan

Budget:
total cost: 2,755,000 €
EC contribution: 1,590,000 €

Timetable:
start date: 01/Jan/00
duration: 24 months

Keywords:
eHealth networks and architectures, telemedicine, radiotherapy, health professionals knowledge, distributed treatment planning

A distributed Telematics Environment for Treatment Planning in Stereotactic Radiosurgery

Objectives

The objective of the Tele-Plan project was to design and develop a Distributed Telematics Environment for co-operative handling of the complete dosimetric treatment-planning procedures. The following functionality toolset was planned for implementation: (i) tele-consultancy between physicians, (ii) secure transfer of data from the treatment site to the expert site within a Virtual Private Network (VPN) environment, (iii) real time synchronous tele-collaboration during the treatment planning procedures, (iv) secure transfer of data back to the treatment site within the VPN, (v) final validation of the plan by both local physician & physics remote expert, (vi) data transfer to the verification and recording system for the patient treatment.

Results

The Tele-Plan project produced innovative treatment planning software tools, coupled with Image Fusion applications, workflow management tools and real-time collaboration infrastructure during treatment planning. The project has thus contributed to EU policies and built upon social objectives by offering: (i) new Tele-Collaboration methodology and procedures, (ii) improvement of treatment quality and support of minimally invasive techniques (iii) exchange, via tele-consultancy, of medical know-how in innovative medical fields (iv) reduction in costs for the patient and improvement in quality of life (v) more treatment centres to offer advanced radiosurgery treatment to their patients (vi) potential savings in public healthcare expenditure and (vii) potential savings in existing and future radiosurgery treatment centres.

TM-ALLIANCE

Number: IST-2001-35026

Cluster: Health Professionals, Patients, Citizens

Type of Action:
Accompanying Measure

Project Participants:

ITU	Int.Org.
WHO	Int.Org.
ESA	Int.Org.

Contact person:
Dr. Elmann-Larsen Benny
European Space Agency
Netherlands
Tel.: +31 71 565 3322
Fax: +31 71 565 3042
Email:
benny.elmann-larsen@esa.int

Project web site
http://www.esa.int/export/esaMI/Telemedicine_Alliance/index.html

Budget:
total cost: 397,000 €
EC contribution: 397,000 €

Timetable:
start date: 01/Jul/2002
duration: 18 months

Keywords:
telemedicine, personal medical network, security and privacy, anywhere access, home telecare.

Telemedicine 2010: Visions for a Personal Medical Network

Objectives

The objective of this project is to formulate an overlying policy for application of telemedicine in support of the European citizen by the year 2010. Further, in support of the goals set by the WHO and the ITU, the first particularly relating to the improvement of public health and better quality of life and the latter to the use innovative telecommunication technology to provide citizens with remote monitoring capabilities, these goals shall be addressed in parallel with, and as a dependant part of definition of the primary goal.

This project will mainly be concentrating on building an overview over the present situation as a starting point, with the objective of mapping the capabilities.

Second, it will, based on the overview over the present initiatives, suggest models for telemedicine support by 2010 based on the capabilities, the developing trends in the e-health sector.

Another important aspect of the project will be to focus on data security in order to safeguard privacy and integrity for the individual. Data security is a prerequisite for confidence building in modern, IT based data transfer systems for use regarding medical, personal and confidential data. With the increasing access to and use of Information and Communication Technology for contact between the citizen and the healthcare system, it is crucial to ensure reliable and easily deployable mechanisms for authentication, privacy, integrity and non-repudiation of the data exchanged between the different actors. This must be done taking into account the emerging standardisation trends affecting both the technical and procedural aspects in the e-health world.

Results

At mid-term of the project it has become evident that a co-ordinated, pan-European co-ordination and facilitation will be needed in order to obtain any degree of internationalisation of the health care systems across borders in Europe. The field and amount of activity is so large that without direction and facilitation important and complex aspects such as standards, interoperability and reimbursement will have a very poor chance of being solved within a reasonable time.

On the technical side, the advances are expected to be seen in the approach to monitoring of home-based patients, ease of access to needed data for both citizen and health worker, sophistication of home monitoring, and citizen satisfaction and prognoses. Finally, the structuring of access and overview over patient databases, will enhance significantly the quality of causal relations between environment and disease.

TOPCARE

Implementation of a telematic homecare platform in co-operative health care provider networks

Number: IST-2000-25068

Cluster: Patients

Type of Action: Research

Project Participants:

FRESENIUS	D
GMD	D
DATAMED	GR
FHG/IBMT	D
RD	D
DRAGER	NL
ICCS	GR

Contact person:
Mr. Kiefer Stephan
Fraunhofer Institute for Biomedical Engineering
Germany
Tel.: +49 689 498 0156
Fax: +49 689 498 0400
Email:
stephan.kiefer@ibmt.fhg.de

Project web site:
http://www.topcare-network.com

Budget:
total cost: 4,058,865 €
EC contribution: 2,106,831 €

Timetable:
start date: 01/Jan/01
duration: 36 months

Keywords:
home telecare, e-homecare platform, telehealth system, home care gateway, iCare

Objectives

The overall objective of TOPCARE is to develop an e-home care platform with the corresponding telematic devices for patients at home and to lay the organisational groundwork for bringing co-operative health care services into the home of patients. Telematic communication technologies and modern vital sign monitoring is applied in order to enhance post-clinical treatment in an out-patient setting, to foster the communication between patient, practitioners and clinics, and to provide electronic assistance in documentation management for improved quality assurance. TOPCARE will address the need for reliable and safe ambulatory telematic devices and services that foster patient compliance in the home environment. Continuity of care will be achieved by integrating the home based services into a network of health care providers.

TOPCARE will provide a modular, secure and reliable telematic homecare platform which will be implemented and evaluated in European co-operative health care environments for home monitoring and treatment of patients needing infusion therapies, controlled ventilatory support and monitored medication adjustment and adherence control when treated with anti-coagulants.

Results

A telematic homecare platform has been developed which comprises a telehealth server with a webserver as a front-end and a central database with the electronic health records of the patients as well as two types of patient systems, a telematic home box and a PC based telematic home station. The data of the patients is presented in a web browser to authorised health professionals. The TOPCARE platform takes advantage of Internet technologies. Due to its high-level security concept the platform can be used not only in private but also in public networks. The system supports in particular co-operative healthcare concepts to enable continuity of care.

The TOPCARE telematic home box is a home gateway which can be connected to a set of medical devices either by serial lines or wireless by a Bluetooth connection. The home gateway collects the data of the devices and transmits it to the telehealth server by a dial-up connection over a phone line, ISDN or a GSM network. The TOPCARE homecare platform supports at the moment the three homecare scenarios home ventilation, infusion therapy support and coagulation monitoring. The system is being implemented and evaluated for each of the 3 targeted patient groups in a multiple care provider environment, involving the set-up of a 24h accessible telemedicine centre as an integral part in each of the proposed caregiver networks.

The modular TOPCARE platform can be easily adapted to new homecare scenarios.

TOSCA

Number: IST-1999-12364

Cluster: Patients

Type of Action: Research

Project Participants:

ARDI	D
ICSTM	UK
Aarhus	DK
ADAKOS	D
KCL	UK
Penarth	UK
AUTH	GR
GSF	D
Siemens	D
Erlangen	D
ISERES	F
ETUC	B
CWU	IRL
IFSI	B
SU	BG
CGT	F
ANALYTICA	UK
IRES	I
ISA-Consult	D
FOREM	E
CUS	F
TMB	E
RATB	RO
URM	CZ
ATC	I
SBU	D
INVERS	D
RC	D
POLIS	B
EUROCITIES	B

Contact person:
Dr. Gudrun Zahlmann
Siemens AG
Germany
Tel.: +49 9131 84 7944
Fax: +49 9131 84-4771
Email:
gudrun.zahlmann@siemens.com

Project web site:
http://tosca.gsf.de/

Budget:
total cost: 3,082,275
EC contribution: 2,200,000

Timetable:
start date: 01/Jan/00
duration: 36 months

Keywords:
telescreening, telemonitoring, diabetic retinopathy, glaucoma, quality assurance

Tele-Ophthalmological Services - Citizen-centred Applications (TOSCA)

Objectives

TOSCA deals with telescreening for Diabetic Retinopathy (DR) and Glaucoma and telemonitoring for the latter. The objective is to establish telescreening services in 5 European countries and to perform service feasibility as well as evaluation studies.

Results

TOSCA has successfully established telescreening services for DR in Wales, Ireland, Germany, Denmark and the Czech Republic. The service consists of management and patient handling, case data and image capture (from 5 different systems), data transfer, case grading in up to 3 grading levels, patient result information, quality assurance based on a the communication platform MedStage. All graders and photographers were trained and certified within TOSCA. 411/1474 patients were screened in the feasibility/evaluation study demonstrating that the TOSCA telescreening service is feasible in the above mentioned countries and can benefit the patients towards a cost effective way of preventing blindness. The glaucoma telescreening (and telemonitoring) service was prototypically installed in the Munich region having 1669 people (5.47% positive) screened. Telemonitoring based on self-tonometry was also successfully tested supporting the patients directly in their daily glaucoma regimen.

TREAT

Number: IST-1999-11459

Cluster: Health Professionals

Type of Action: Research

Project Participants:

Rabin	ISR
IMHE	D
AAS	DK
Judex	DK
Aalborg University	DK

Contact person:
Mr. Andreassen, Steen
Aalborg University
Denmark
Tel.: +45 96 35 88 12
Fax: +45 98 15 40 08
Email: sa@hst.auc.dk

Project web site:
http://www.treat.dk

Budget:
total cost: 1,604,034 €
EC contribution: 1,365,000 €

Timetable:
start date: 01/Jan/00
duration: 48 months

Keywords:
medical decision support systems, eHealth networks and architectures, public health, bacterial resistance, antibiotic treatment

TREAT - a system for balancing antibiotic treatment against development of drug resistance

Objectives

The purpose of the project is to develop a novel framework for the construction and testing of medical decision support systems and to demonstrate its soundness through a successful application of the framework to a clinical problem of major importance. A successful application implies that the system (1) can be integrated into the informational infrastructure of the involved hospitals; (2) is clinically acceptable from the user interaction point of view; and (3) can improve diagnosis or therapy in the medical area addressed.

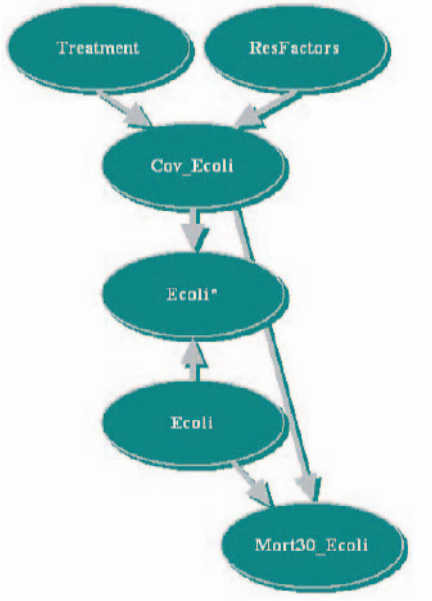
The clinical problem chosen is the selection of antibiotic therapy for the treatment of severe infections. A medical decision support system, TREAT, will be developed, that can help doctors reduce substantially the about 100,000 annual deaths in Europe associated with inappropriate antibiotic treatment of patients with severe infections, and help to curb the development of bacterial resistance to antibiotics.

TREAT will be tested to demonstrate that it can be integrated in the clinical and informational environment and that improvements in antibiotic therapy can be obtained in a large controlled multicentre clinical trial in geographic regions with widely differing patterns of antibiotic resistance.

The steps necessary to ensure that the results will be disseminated scientifically will be taken, and TREAT will be made commercially available. Widespread clinical adoption of TREAT is expected to lead to reduced mortality, improved quality of life and savings in the health care system.

Results

The results from the project are expected to show that using the novel framework for building and testing medical decision support systems can lead to successful development and implementation of these systems. Such a result will have wide ranging implications, both medically and in the branch industry developing medical informatics services. By month 36, the clinical value and acceptability of TREAT will be demonstrated, TREAT will be installed in hospitals in three different countries and a product marketing plan for two versions of the system will be available. By month 48, the clinical trials of both systems are concluded and strategic alliances for the world-wide commercialisation of TREAT are identified.



U-R-SAFE

Universal Remote Signal Acquisition For hEalth

Number: IST-2001-33352

Cluster: Patients

Type of Action: Research

Project Participants:

CHU TOULOUSE	F
TAM	F
ASPI	F
CARDGUARD	ISR
TELETEL	GR
C.S.C.	E
CSEM	CH
TELISMA	F
INPT	F

Contact person:
Prof. Castanie Francis
Institut National Polytechnique de Toulouse (INPT)
France
Tel.: +33 5 61 58 82 96
Fax: +33 5 61 58 80 14
Email:
francis.castanie@tesa.prd.fr

Project web site:
http://ursafe.tesa.prd.fr/

Budget:
total cost: 3,929,108 €
EC contribution: 1,664,109 €

Timetable:
start date: 01/Jan/2002
duration: 24 months

Keywords:
mobility of patients, advanced mobile systems, telemedicine, speech recognition, monitoring

Objectives

The U-R-Safe project addresses the growing need for efficient home care by bringing medical procedures and a related technological platform to allow patients to be treated and monitored at home. With the U-R-Safe platform patients' Quality of Life can be improved without compromising their security.

The U-R-Safe project contributes to the IST objectives by providing a service concept which can be used anywhere by patients needing continuous monitoring. Full mobility is provided by seamless interconnection between a body network formed by the sensors worn by the patient, a wireless home network, a public wireless network, a fixed access network and a satellite network. In addition, U-R-Safe is focusing on creating a user-friendly man machine interface using speech recognition, which allows patients to interact with the monitoring application in the most natural way possible.

Results

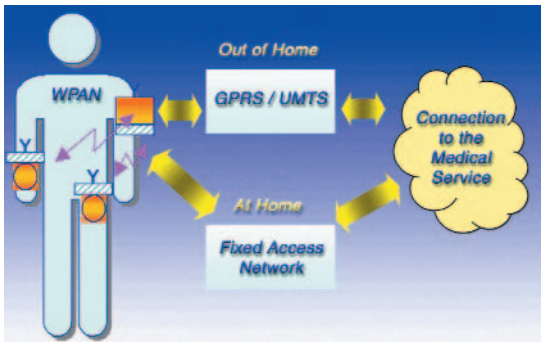
The aim of U-R-Safe is to create a telemedicine service concept and a technology platform to mainly elderly patients suffering from respiratory and/or cardiovascular pathologies. With the help of this platform patients can be discharged earlier and eventually followed-up and treated at home.

The platform includes sensors for monitoring vital signs such as respiratory rate, heart rate, oxygen saturation and ECG in addition to a fall detector and a speech recognition application, which will give additional information on the patient's condition. If the condition of the patient is deteriorating, an alarm will be raised and all the monitored data will be sent to a monitoring centre.

The Speech Recognition Engine uses DSR approach (Distributed Speech Recognition) which provides state-of-the-art speech recognition capabilities for mobile devices while minimising the processor and memory requirements normally associated with speaker-independent, unlimited vocabulary, continuous speech recognition systems.

The body network worn by the patient is connected to the wireless home network using new technology called Ultra Wide Band (UWB). If the patient is not at home, a wireless public network (GPRS) connection is used for communicating with the monitoring centre. Also a satellite network can be used if no other type of network is available.

The platform coming out of the project will be subject to further enhancement and commercialisation assuming there is sufficient market potential for this type of product at the end of the project.



USBONE

A remotely monitored wearable ultrasound device for the monitoring and acceleration of bone healing

Number: IST-2000-26350

Cluster: Health Professionals

Type of Action: Research

Project Participants:

SSM	CY
NEW VALUE	P
ELYROS	B
IBRI	GR
FORTH	GR
DATABLUE	GR
UTH.MED.ORTHOD	GR
STRAND	UK
ANCO	GR

Contact person:
Mr. Manfredi Paul
Strand Technology Plc
United Kingdom
Tel.: +44 1695 50905
Fax: +44 1695 50911
Email:
pmanfred@strandtech.co.uk

Project web site:
http://www.usbone.com or
http://www.usbone.eu.com

Budget:
total cost: 4,800,011 €
EC contribution: 2,450,000 €

Timetable:
start date: 01/Jan/01
duration: 30 months

Keywords:
wearable medical systems, biomedical informatics, bone fractures, healing acceleration & monitoring with ultrasound, health professionals knowledge

Objectives

USBONE aims to improve the lives of European Citizens through the replacement of existing methods used to monitor the progress of bone fracture healing (such as manual sensing and X-rays) with a more accurate, flexible and adaptive method, based on ultrasound signal transmission through the fractured bone. This approach allows the doctor to form better decisions, based on each individual case. It will support and enhance the competitiveness of the European Healthcare industry through the adaptation of innovative features and components in to existing medical practice.

The project's key objective is the development of a wearable device, which both monitors and accelerates bone fracture healing, linked to a centralised system. The device consists of two parts, one mounted onto an external fixator at the fracture point and a second, placed on the patient's belt. The latter handles all communication and information exchange with the responsible orthopaedician via the centralised system.

The acquired ultrasound measurements are wirelessly transmitted to the centralised system and an automated module produces an accurate diagnosis on the progress of the healing process exploiting the patient's stored medical data and the recorded medical expertise. The USBone system assists orthopaedicians to provide high quality medical services, through an innovative tool based on intelligent processing algorithms.

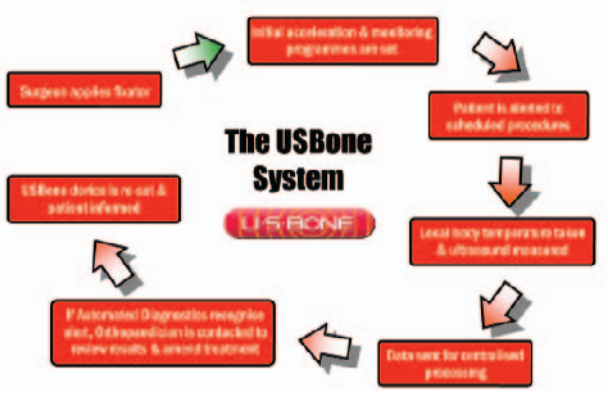
Results

USBone is a comfortable, high functionality wearable device, which provides information to both patient and orthopaedician. The device enables the acceleration of bone fracture healing and also remote monitoring through the transmission of secured data to the orthopaedician via a centralised system. This functionality allows remote monitoring of the patient's condition and in the event of complications, alert the responsible orthopaedician.

USBone reduces the need for frequent patient visits to the clinic to monitor the healing progress, which particularly benefits patients in remote geographic areas. It also enables the orthopaedicians to care for an increased number of patients and ensure that potentially dangerous conditions are dealt with at the earliest incident. The USBone system is capable of recognising the formation of new bone significantly earlier than standard techniques, and reports any possible problems during healing as soon as they appear, allowing for better decisions during therapy.

The USBone system is currently being integrated and tested in real-life practice through animal and human trials to ensure acceptance by medical professionals.

The USBone partners are confident that the project will result in a profitable exploitation of the project's results; USBone will provide a comprehensive, cost effective and commercially viable tool which will go a long way to reducing the costs of care for patients and the various governmental and private providers involved in healthcare delivery.



VEPSY UPDATED

Telemedicine and Portable Virtual Environment in Clinical Psychology

Number: IST-2000-25323

Cluster: Patients

Type of Action: Research

Project Participants:

UPV	E
VH	I
ISMRA	F
DIST	I
PR	E
TSD	I
ELSAG	I
AU	I
UC	I
UPAD.DEI	I
AMP	I
UJI	E

Contact person:
Prof. Riva Giuseppe
Università Cattolica
del Sacro Cuore
Italy
Tel.: +39 0323 514278
Fax: +39 0270 034918
Email: auxo.psylab@auxologico.it

Project web site:
http://www.vepsy.com

Budget:
total cost: 2,748,536 €
EC contribution: 1,940,101 €

Timetable:
start date: 01/Jan/01
duration: 30 months

Keywords:
virtual reality, telemedicine, mental disorders, psychotherapy, clinical protocols.

Objectives

The VEPSY Updated Project focuses on applications of Virtual Reality and Telemedicine for Clinical Psychology.

There is a growing recognition that VR can play an important role in clinical psychology. Moreover telemedicine is a promising new technique for health care with a high level of acceptance.

The main goal of the project is to prove the technical and clinical viability of using portable and shared Virtual Reality systems in clinical psychology. The project will provide both innovative VR based tools for the treatment of patients, clinical trials to verify their viability and action plans for dissemination of the results.

The selected disorders in VEPSY Updated are: panic disorder, social phobia and agoraphobia; obesity, bulimia and binge-eating disorders; male impotence and premature ejaculation.

VEPSY Updated, in joining together the major European players and researchers in the field, aims at enhancing healthcare services with new technological tools for an extended audience (according to the strategic objective of the Information Society Technologies (IST) Programme about the improving of benefits in the information society).

Results

At June 2003, VEPSY Updated will provide:

1. improved methods to prevent, diagnose and treat the selected disorders;
2. more competitive VR-based technological products and services for coping with the selected disturbances and for promoting the quality of life;

In particular VEPSY Updated has already reached these first Results

1. Designed, tuned and developed of 4 clinical modules to be used with the Virtual Reality Modular System (VRMS) defined by two previous successful EC funded projects (VREPAR and VREPAR II; IST-4 FP). To ensure the broadest user base, the developed modules is available both as shared telemedicine tools accessible through Internet by using a plug-in for the most common browsers (Explorer and Navigator) and as portable tools based on Speed-Step notebook PCs (this choice ensures low costs and wide availability).
2. Defined new treatment protocols for the use of the clinical modules in assessment and therapy. In doing this the project has followed a user-centred strategy where feedback from individual users (and from groups representing users) has played a key role in driving the design and implementation process.
3. Tested their efficacy at a scale of operation representing reality. In particular the project has planned a 9-month Demonstration phase involving a small scale clinical trials and a 15-month Validation phase involving a large scale clinical trial.
4. Disseminated the previous results to an extended audience reaching both clinicians and end users.

WardInHand

Number: IST-1999-10479

Cluster: Health Professionals

Type of Action: Research

Project Participants:

DIST	I
RELATIONAL	GR
BMT	UK
DIST	I
OFFENBACH	D
C.S.C.	E
TXT	I

Contact person:
Ing. Virtuoso Salvatore
TXT e-solutions
Italy
Tel.: +39 02 2577 1458
Fax: +39 02 2578 994
Email: salvatore.virtuoso@txt.it

Project web site:
http://www.wardinhand.org/

Budget:
total cost: 3,235,020 €
EC contribution: 1,700,025 €

Timetable:
start date: 01/Jan/00
duration: 27 months

Keywords:
human computer interaction, mobility of health professionals, handheld computers, wireless networks, workflow systems

Mobile Workflow Support and InformAtion distribution in hospitals via voice-opeRateD, wIreless-Networked HANDheld PCs.

Objectives

The problem addressed by WardInHand is to significantly reduce the inconveniences of paper handling and repeated transcriptions during the process of delivering healthcare services to patients in a hospital ward. Clinical information is often recorded on paper documents (the clinical record), notes are taken on notebook by nurses while doctors perform their visit tours and then transcribed to other paper files to plan treatments, exams, drug distribution. The result is at least inefficiency, as this activity drains valuable time from the hospitals personnel, and can introduce errors and inaccuracies, either due to the transcription process or to the fact that information is not updated in real time.

To solve this problem, WardInHand has been designed to connect to the Hospital Information system, where information about the patient is eventually stored, and to maintain on a local server any additional information collected during patient's stay. Data are then made available online to user's handheld via a wireless LAN. Users access and modify data through an icon based user interface. Navigation through the screens and data entry can be made either by tapping the screen with the handheld stylus or via voice commands.

Results

Although the technologies used in the project (handheld devices, wireless LAN, Speech recognition etc.) are by themselves innovative, the most significant advance is related to the fact that WardInHand uses these technologies to support the operational ward processes. While ICT investments in the healthcare sector are still largely concentrated in the administrative functions, the focus here is on the key issues of clinical data management and collaborative tools with the goal of improving quality, increase productivity and reduce the overall costs.

Having ubiquitous and online access to clinical information, healthcare professional can now make more efficient and accurate decisions. Data entry and transcription errors are virtually eliminated, with immediate impact on quality (in the broadest sense: level of service, better satisfaction of professionals and patients). Unnecessary work and duplications are eliminated, with immediate fallout on efficient usage of resources. As the automation of the work flows improves the communication among actors and helps action co-ordination, delays are reduced, and this can lead to shortening of the length of stays. Trials at the pilot hospitals have demonstrated that implementation of WardInHand, associated to an appropriate re-design of internal operational processes – not just automation of the existing ones – can lead to a productivity increases up to 40% and reductions of the length of stays up to 10%.

WEALTHY

Number: IST-2001-37778

Cluster: Citizens

Type of Action: Research

Project Participants:

MILIOR	I
UNIPI	I
CSEM	CH
ATKO	GR
INSA	F
HSR	I
CRSSA	F
MESSE	D
CNRS	F

Contact person:
Dr. Paradiso Rita
MILIOR s.p.a.
Italy
Tel.: +39 050 754350
Fax: +39 050 754351
Email: rita@smartex.it

Project web site:
http://www.wealthy-ist.com

Budget:
total cost: 3,859,060 €
EC contribution: 1,775,569 €

Timetable:
start date: 01/Sep/02
duration: 30 months

Keywords:
wearable medical system, biomedical sensors, fabric sensors, health monitoring, intelligent clothing

Wearable Health Care System

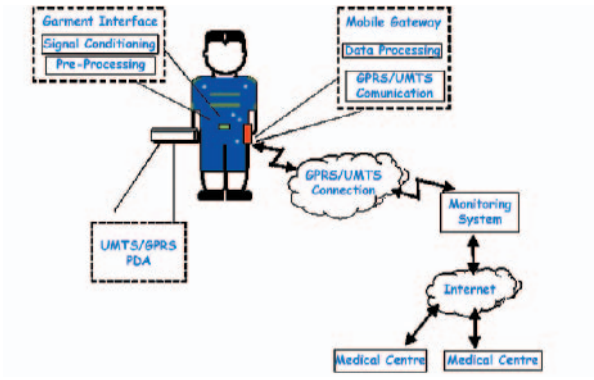
Objectives

A new concept in health care, aimed at providing continuous remote monitoring of patient vital signs, is now emerging. This paradigm shift is both socially driven-the rising cost of assistance, the need to improve early illness detection and medical intervention- and technologically driven. In particular, the advances in sensor technology, as well as in communication technology and treatment of data, constitute the basis on which this new generation of health care systems can consolidate. At the same time systems designed to be minimally invasive for health status monitoring, based on flexible and smart technologies conformable to the human body will help to improve the autonomy and the quality of life of patients. They are also cost-effective in providing around-the-clock assistance, for example in rehabilitation from cardiac disease or for the monitoring of professional workers engaged in extreme environmental conditions. Finally, by providing direct feedback to the users, they improve their awareness and potentially allow better control of their own condition. In these systems smart materials in fibre and yarn form endowed with a wide range of electro-physical properties (conducting, semiconducting, electrostrictive, piezoresistive, etc) will be integrated and used as basic elements to fabricate woven or knitted fabrics possessing distributed sensor and logic functions. The simultaneous recording of vital signs will allow parameters' extrapolation and inter-signal elaboration that contribute to make alert messages and personalised synoptic tables of patient's health.

Results

The WEALTHY system will thus:

- Assist the patient during rehabilitation
- Assist professional worker during risk activity
- Ensure intelligent monitoring of the users during, for instance, everyday tasks and physical exercise. Such a feedback can include alerts and warnings of, conversely, to provide reassurance over the situation
- Trigger automatic transmission of physiological or clinical sensitive parameters
- Alert emergency services if the situation turns critical (absence of patient response, alarming vital signs, etc.)
- Allow the interpretation and extrapolation of index related to physiological conditions by considering all simultaneous data.
- Guarantee a friendly interface for professionals.
- Ensure a high degree of freedom and let the user perform his/her normal activities.



WEBLINC

Number: IST-2001-33257

Cluster: Health Professionals

Type of Action: Best Practice

Project Participants:

T4TECH	I
GEIE-LINC	B
FNLCC	F
CLB	F
REGINA ELENA	I
DKFZ	D
INRC	I
CHARITE	D
DAP	I
AZ-VUB	B

Contact person:
Mr. Bagnoli Fabio
D'Appolonia s.p.a.
Italy
Tel.: +39 010 3628148
Fax: +39 010 3621078
Email:
fabio.bagnoli@dappolonia.it

Budget:
total cost: 533,144 €
EC contribution: 328,901 €

Timetable:
start date: 01/Nov/01
duration: 18 months
terminated

Liaison network for cancer prevention, care and diagnosis on the web

Objectives

In spite of the progress achieved in research and prevention, cancer remains the second cause of death by disease in Europe. The efficiency of cancer prevention and care is very different in the various European Regions, leading to a higher mortality for some types of tumors (specially preventable ones) in less advanced areas. The Eurocare analysis shows differences in the mortality rate between 11 and 22% for the same pathology within the same country.

A great impact in successfully fighting this disease may therefore be achieved through the use of new methodologies to improve the diagnostic phase and through the dissemination of information to citizens, including guidelines for patients on cancer prevention, diagnosis and treatment. The World Wide Web represents the easiest existing infrastructure where all the above mentioned aspects can be made accessible and integrated.

Several resources available on the web are already active in Europe. They mainly deal with information dissemination aspects to citizens. Some of them have integrated services of second opinion in radiology and pathology. These services are offered to the user as 'store and forward' ones, where the user has to send his images via mail to get a second opinion on his cases.

Nevertheless a full integrated web-site including dissemination of information facilities and comprehensive telemedicine tools, managed by the most important cancer centers, is not yet available in Europe.

The aim of the WEBLINC project is to fill this gap developing a web portal supported by the most important Cancer Research and Care Centers, gathered together into a European Economic Interest Grouping called 'Liaison Network for Cancer' (GEIE-LINC), and taking into account what has already been developed at a European level in the field.

The Grouping's objective is mainly in the area of information, training, research, treatment and care, and rehabilitation in the field of cancer and related medical disciplines.

WEIGHT-INFO

Number: IST-2000-26251

Cluster: Citizens

Type of Action: Research

Project Participants:

UPM	E
DATABLUE	GR
BORDERZONE	I
SV o.p.s.	CZ
AOP	I
VITAPLUS	GR
EP	GR
AIRIAL	F
SSM	CY
CCM	E

Contact person:
Dr. Martinelli Elena
Azienda Ospedaliera 'S. Maria Degli Angeli' di Pordenone
Italy
Tel.: +39 0434 399201
Fax: +39 0434 399398
Email: weight_info@tin.it

Project web site:
http://www.weight-info.org

Budget:
total cost: 3,733,570 €
EC contribution: 1,866,779 €

Timetable:
start date: 01/Jan/01
duration: 30 months

Keywords:
disease prevention, obesity, overweight, mobility support

Providing trustable information context and implementation support for weight control

Objectives

The objective is to improve the citizen's health by means of an intelligent on-line system that gives advice and support to improve lifestyle and to implement lifestyle changes aimed at health promotion and disease prevention.

WEIGHT-INFO could be seen as a portal adapted to one organisation (Healthcare organisations, SPAs, physical exercise companies) and its customers to:

- provide trustworthy context to the information: the system should be able to select trustable and certified information, implementing a model of 'accreditation and monitoring procedure' for goods and services providers;
- customise each user's advice: the selected information will be customised according to specific user profiles;
- support lifestyle decisions: provide services to help the citizen in implementing their choices by means of:
- links to accredited e-commerce services;
- support the search of appropriate products and services while travelling (testing the efficacy of portable communication devices as GPRS, UMTS and PDA's);
- services for monitoring recommended lifestyle changes;
- tools for an effortless self-assessment of the weight status and advice for improvement and possibility to use a personal scorecard.
- provide feedback to producers/suppliers of goods and services related to weight control (such as nutrition industry, physical exercise, health related tourism, insurance);
- maintain user information (user profiles) for medical and healthcare professionals and for statistical purposes;
- experience innovative prevention actions through an extensive validation in four pilot locations, one of which is a hospital.

Results

The main results of WEIGHT-INFO are (i) Web-based on-line customised services for medical Doctors, citizens and Healthcare operators providing information and services for the prevention of overweight and obesity, and (ii) a platform based on Internet, mobile communication systems and intelligent agents.

WIDENET

Number: IST-1999-14203

Cluster: Health Professionals

Type of Action:
Accompanying Measure

Project Participants:

ISC	E
PROREC-BE	B
PROREC-FRANCE	F
MTA SZTAKI	HU
VHK	D
SEMG	I
TNO	NL
ICHTEL	IRL
CENTIS	P
SADIEL	E
SMIS	SI

Contact person:
Mr. Canivell Mario
SADIEL S.A., Sociedad Andaluza para el Desarrollo de la Informática y la Electrónica
Spain
Tel.: +34 95 504 3600
Fax: +34 95 504 3601
Email: mario.canivell@sadiel.es

Project web site:
http://www.sadiel.es/Europa/widenet

Budget:
total cost: 972,000 €
EC contribution: 972,000 €

Timetable:
start date: 01/Dec/00
duration: 36 months

Keywords:
electronic health records, dissemination, standardisation, mobility of patients

Offering World-Wide Services through an International Network on Health Records

Objectives

Nowadays, the computerisation of clinical data, or Health Records, is a common fact. Data exchange between health care institutions and professionals is an essential component of modern healthcare delivery. However, the industry has been developing proprietary or ad-hoc Electronic Health Records Systems in a non- harmonised way.

For this reason, better integration among healthcare providers is critical for achieving the level of quality and continuity that European citizens increasingly expect. An efficient exchange of information is the key element for managing resources, evaluating quality, and raising cost-effectiveness.

WIDENET's mission is to promote the adoption and extended use of standardised Electronic Health Records (EHRs) and the creation of the necessary infrastructure for offering healthcare Value Added Services to the European market and citizens, thus, enabling the provision of high-quality healthcare to every citizen regardless of where he is, and consequently improving their quality of life.

To this aim, the project:

1. Is enlarging and strengthening the Network of National PROREC Centres.
2. Has created the European Institute for Health Records, EUROREC.

The main role of the Network of National PROREC Centres is the dissemination of information and provision of value added services related to comprehensive, communicable and secure EHRs to all the agents involved in the sector.

The EUROREC Institute represents the network of National Centres at international level, acting as a catalyst of the experiences of the different national centres. The Institute aims at being an authority and an organisation of reference in the field of Electronic Healthcare Records, compiling and spreading knowledge on national, European and international developments in medical ICT.

Results

Through its work the WIDENET project, the consortium expects to have:

- Reached concertation agreements with standardisation bodies and others institutions
- Created a critical mass among target audience
- Established a permanent set of added value services
- Set up a web-based repository information
- Enhanced the cohesion of each local centre in each member state
- Increased other cohesion between the local Centres' sites

As a result, the work performed by the Network of National Centres and the EUROREC Institute is helping to enable:

- Citizens/patients and their information to roam the member states, maintaining the quality of the records and protecting their privacy
- The industry to produce interoperable software to a higher degree
- Authorities to receive correct and useful IT information to help structure and improve the healthcare delivery process

WOMAN-II

European Network of services for women health management

Number: IST-2001-32672

Cluster: Citizens

Type of Action: Trial

Project Participants:

GYN-PL	PL
Univ-Lund	S
SYNAP	I
BONG	I
GYN-CH	CH
GYN-P	P
GYN-D	D
GYN-IL	ISR
GYN-E	E
GYN-B	B
UNIPI	I
GYN-NL	NL
GYN-I-NA	I
GYN-UK-LEICESTER	UK
GYN-I-PI	I
GYN-I-PI	I
GYN-I-MI	I
GYN-UK	UK
GYN-MT	MT
GYN-F	F

Contact person:
Dr. Majidi Darya
SYNAPSIS s.r.l.
Italy
Tel.: +39 0586 426790
Fax: +39 0586 443954
Email: d.majidi@websynapsis.com

Project web site:
http://www.womanlab.com

Budget:
total cost: 1,090,513 €
EC contribution: 774,004 €

Timetable:
start date: 01/Sep/01
duration: 18 months

Keywords:
telemedicine, eHealth networks and architectures, health promotion, information to citizens, security and privacy, European trials.

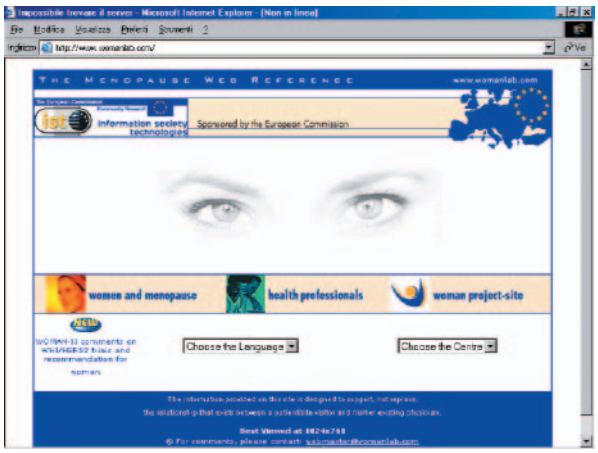
Objectives

Menopause is not a disease, but it can be associated with discomfort, reduced quality of life and increase in serious risks (osteoporosis, cardiovascular diseases, etc.). An agreed European policy is needed to offer innovative services, in this particular field, to both women and health professionals. The WOMAN project (1998-2000), a European Commission funded project, delivered an innovative solution: the combination of a Web Portal and an Electronic Patient Record (EPR) in the menopause field. The web site provides women and professionals easy access to women'shealth information; the EPR offers a European standard for data collection and exchange regarding postmenopausal data. During this first project, 4 menopause centres coming from 3 countries were involved. The objectives of WOMAN II (2001-2003) are to rapidly exploit the WOMAN solutions at European level, creating a Network of Excellence. In particular the aims are to: assess the WOMAN services and applications against an enlarged number of new validation sites; promote the usage of web technologies both to women and health professionals, produce multilingual contents; integrate a network of competencies, including expert epidemiologists, GPs and Gynaecologists, create, in future, European databases for research, scientific and economical evaluation studies.

Results

Thirteen countries are currently involved in WOMAN-II, creating a network of fifteen centres working together. The WOMAN-II project has improved the WOMAN results, creating a European Network of Excellence sharing the same technological framework for data collection and exchange and upgrading the useful multilingual portal with both information and telemedicine services. One of the main results of WOMAN-II is the new web portal: the portal is composed by a central part and a country-based one, the local Web sites. The local sites are structured in an informative section and local telemedicine services, such as the Online Advising, between women and health professionals, and the Online Consulting, between health professionals. In each local web site, users may find local specific information and services.

The WOMAN-II EPR represents a milestone in the creation of a real European standard for data collection and network of competencies. The EPR is now used by WOMAN-II partners from both local scenario (local installation at the Menopause centre) and ASP scenario (central installation hosted by technical partners). The EPR had been translated in eleven languages (including Hebrew and Polish) in order to enable European data collection and sharing in relation to women's health.



WRAPIN

Number: IST-2001-33260

Cluster: Citizens

Type of Action: Best Practice

Project Participants:

MISS	F
LERTIM	F
NICE	CH
DIM	CH
THALES	F
HON	CH

Contact person:
Mme Boyer Celia
Health on the Net (HON) Foundation
FOUNDATION
Switzerland
Tel.: +41 22 372 62 50
Fax: +41 22 372 61 98
Email: Celia.Boyer@hon.ch

Project web site:
http://www.wrapin.org

Budget:
total cost: 1,456,431 €
EC contribution: 503,862 €

Timetable:
start date: 01/Sep/01
duration: 24 months

Keywords:
biomedical informatics, eHealth networks and architectures, health professionals knowledge, public health, health promotion, information to citizens, security and privacy.

World-wide online Reliable Advice to Patients and Individuals

Objectives

WRAPIN helps solve two major problems faced by Internet citizens:

- Finding information among a large number of potentially useful documents;
- Evaluating the relevance of an online medical document.

Despite the improved access to information made possible by the Internet, it remains extremely difficult to judge the trustworthiness or relevance of online content. All categories of users, professional and non-professional, face this problem, which can be of critical importance in the case of health or medical information. Search engines, some general, some specialised, are used by all categories of users to find information but the ever-increasing number of online documents means that queries must be ever more precise.

WRAPIN is an ambitious project aiming to support the online citizen with a practical, convenient solution to the problem of large numbers of documents of uncertain quality. WRAPIN will offer a modular platform to interconnect the most trustworthy and complete information sources. To date, the following databases have been integrated in WRAPIN:

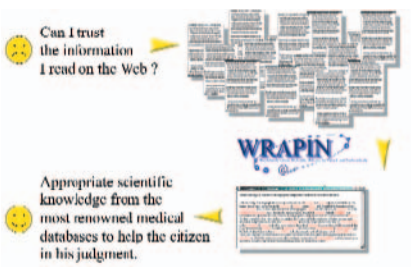
- MEDLINE, containing scientific medical articles from the 1960's through the present and constantly updated;
- Clinical Trials (clinicaltrials.org);
- OESO (new electronic database prepared by WRAPIN for the
- World Organisation for Special Studies on Diseases of Oesophagus;
- Urofrance (French urology database);
- MedHunt (medical search engine) and
- the HON Code of Conduct (http://www.hon.ch/Conduct.html) accredited Web sites.

The resulting search tool will provide citizens with a wide range of trustworthy medical and health content.

Results

The WRAPIN project makes use of new developments in the mapping of medical terms, indexing and search technologies, and natural language processing tools. WRAPIN has also incorporated and stimulated progress on ongoing projects, such as MARVIN (Multi-Agent Retrieval Vagabond on Information Network, HON's medical web spider), HONselect (the 'categoriser' which currently provides a directory of health/medical resources), ARIANE (the 'query conceptualiser' from LERTIM), and a 12-language spelling corrector. WRAPIN will use these technologies to help in query formulation, leading to accurate search results.

WRAPIN will also provide an entirely new facility enabling the comparison of health/medical documents in any format (HTML, PDF, etc.) or length with this interconnected knowledge base, to discover if the information exists in the published literature and provide a summary conclusion of the ideas contained. It will help to determine the reliability of documents by checking the ideas contained against established benchmarks, and enable users to determine the relevance of a given document from a page of search results. This exciting new tool is an important step toward the certification of quality online information.



WUNSENS

Number: IST-2001-52058

Cluster: Health Professionals

Type of Action: CRAFT

Project Participants:

FARMILA	I
PROWELLNESS	SF
GOEHNER	D
ALPHA M.O.S.	F
MICROFORGE	UK
PERA	UK
FHG/TEG	D
VISTAMED	IRL

Contact person:
Mr. Mulholland Patrick
Vistamed Ltd.
Ireland
Tel.: +35 3783 8833
Fax: +35 3783 8834
Email: patm@vistamed.net

Project web site:
http://www.wunsens.info

Budget:
total cost: 1,187,835 €
EC contribution: 590,895 €

Timetable:
start date: 01/Nov/01
duration: 24 months

A new concept for a fully integrated wound assessment and monitoring system

Objectives

Within the EU, at least 2 million persons suffer from chronic skin wounds such as venous and pressure ulcers, and diabetic lesions, which can take from weeks to years to heal (30% take over two years) costing the health services at least €8 billion a year to treat. The growth, in older populations, where these wounds are more prevalent, is expected to increase the number of ulcers by over 25% by the year 2010.

The current problem facing healthcare providers is that there is not a consistent measurement system for assessing the wounds, selecting the best treatment and monitoring the progress through management. Nor is there a consistent bank of historical evidence from the millions of cases treated, since records are not taken in a format that permits adequate sharing and comparison of results across treatment locations, health services or regions.

Results

This project is currently developing an integrated measurement, interpretation and recording system, which will provide accurate initial diagnosis of the type and healing potential for these wounds, coupled with a completely non-invasive and easy to use healing monitor for regular web-based collaboration across hospital and community healthcare settings. The prototype consists of:

- An innovative vision system for automatic wound size measurement
- A novel microbial sensor for prompt quantification of microbial status
- A practical tele-care database management system for monitoring wound status and treatment

Initial results of the vision system and the microbial sensor are very encouraging. The figure illustrates the results obtained for automatic detection of the wound boundary. Full prototype validation trials will commence shortly.

Exploratory Awards

Acronym	Number	Total Cost (€)	EC Contribution (€)	Start Date	Duration	Clus-ter	Partners		Full Title
CLEANWORLD	IST-1999-57332	30.000	22.500	Jan. 2001	6	HP	EPA ISS	I ISR	**An integrated Management Systems of Prevention for Information and Training**
DEVASPIM	IST-2001-52101	30.000	22.500	Nov. 2001	6	HP	ADAPTING PRAXIM	E F	**Development of a tool, based on new technologies for the design and evaluation of spine implants**
GLANCE	IST-2001-52102	30.000	22.500	Dec. 2001	4	HP	ACTA SERVICE ARAY LAC SIL.MONT.	I UK P	**InteGrated Analyser for ClinicAl laboratories, to eNhanCe the analyses rEliability and efficiency**
IR-BOSS	IST-2001-52100	29.000	21.750	Nov. 2001	6	HP	Ross Wood DMS	UK F	**A new portable infra-red bone scanning system allowing on-site bone damage assessment and teleradiology**
LIQUAMO	IST-2000-52003	29.200	21.900	Jul. 2001	4	HP	DKL COSMED	B I	**Contact-less monitoring of electric fields generated by living beings for life quality control.**
MONITOR-EALTHCARE	IST-1999-57303	30.000	22.500	Jan. 2001	6	HP	HUTCHEON ARRO	UK N	**Monitoring service for residents in healthcare institutions**
NUCLEO	IST-1999-57247	20.000	15.000	Jan. 2001	6	HP	JDL CENLAS	B I	**New Ultra-structural Cytometry by Laser scattering and Electronic image processing in Oncology**
OHM	IST-2001-52071	29.800	22.350	Oct. 2001	9	HP	ANOTO FMT	S ISL	**On-line Health Monitoring**
SME AWARD	IST-1999-50077	30.000	22.500	Jan. 1999	6	HP	COATING HITMED	F I	**Predicting clinical performance of cement-less hip replacements in the early stages of the design**
STRESST	IST-2001-52104	29.500	22.125	Nov. 2001	5	HP	HAS BALT ELSY-INFO	LV F	**Psychological Stress Control and Reduction Methodology and Equipment**
TTOOL	IST-2001-52099	30.000	22.500	Dec. 2001	6	HP	Reflecta MRC Systems	P D	**Target tracking Tool**
VALIDON	IST-2001-52103	30.000	22.500	Nov. 2001	9	HP	ISA KW2	P NL	**Validation of Sterilisation Equipment on-line**

EUMEDIS Projects

BurNet

Mediterranean Burn Centres Network

Number: Eumedis – 107

Contact Person:
Masellis Michele M.D.
The Mediterranean Council for Burns and Fire Disasters (MBC) – WHO Collaborating Centre
Italy
Tel.: +39 091 666 3631
666 3634
Fax: +39 091 596 404
E-mail: mbcpa@medbc.com

Project web site:
http://www.burnet.org

Budget:
Total cost: 2,062,500 €
EC contribution: 1,650,000 €

Timetable
Start date: 01 July 2002
Duration: 36 months

Keywords:
eHealth networks and architectures, health promotion, burns training information assistance network, burns training assistance teleconsultation system, burns standardisation assistance

Objectives

The goal of the project is to improve considerably the social and health-care systems of the countries involved. The general principle is that all Euro-Mediterranean countries should share a common set of quality standards in the field of prevention and health care.

These standards should be raised to a high level of sophistication, similar to that of other European countries where innovative technologies, procedures and knowledge are best applied. This will make it possible to spread innovation to other countries where the potential benefit of these tools is yet to be enjoyed.

The BurNet project aims to interconnect the Mediterranean Burn-Centres (BC) through an information network both to standardise courses of action in the field of prevention, treatment, functional and psychological rehabilitation of burn patients, and to co-ordinate interactions between BCs and emergency rooms in peripheral hospitals using training/information activities to optimise first aid provided to burn patients.

Shared procedure protocols for the prevention, care and rehabilitation of patients, both at individual and mass level, will help create an international specialised database and a Web-based Teleconsultation System.

The Burnet web-portal will be developed with the aim of interconnecting and involving all health-care providers and emergency workers involved in rescuing burn victims, transferring them or giving their contribution to fighting against fire disasters. Some pages of the web-portal will be specially designed for these people, with discussion groups, mailing lists, on-line training courses etc..

Results

to standardise the therapeutical protocols of patients admitted in the Burn Centres of the different countries;

development of common protocols on the most suitable technical and surgical methodologies, physiokinesitherapeutical procedures and psychological support to be made available during the acute stage of the disease or even later to reduce its most disabling outcomes;

new information and educational tools to be used in the different countries at different levels, with the aim of preventing burn accidents;

analysis of the different risks of fire disaster in the countries participating in the project with the aim of devising health emergency plans for first aid to mass burn victims;

adoption of the best practices and research of new techniques and methodologies to achieve a higher degree of effectiveness in first aid to victims of fire disasters;

dissemination, through the Web and through as many media as possible, of useful knowledge to all the people actively involved in the sector of fire disasters prevention, including ordinary citizens.

EMISPHER

Number: EUMEDIS-110

Contact person/
Project Co-ordinator:
Dr. Graschew, Georgi
Institution: Surgical Research Unit OP 2000, Max-Delbrueck-Centre and Robert-Roessle-Clinic, University Hospital Charité, Humboldt University at Berlin
Germany
Tel.: +49 30 9417 1630
Fax: +49 30 9406 3405
Email: graschew@mdc-berlin.de

Project web site:
http://www.emispher.org

Budget:
total cost: 2,350,101 €
EC contribution: 1,774,327 €

Timetable:
start date: 01/Sep/02
duration: 24 months

Keywords:
eHealth networks and architectures, real-time telemedicine, internet-satellite platform, medical assistance, e-learning

Euro-Mediterranean Internet-Satellite Platform for Health, medical Education and Research

Objectives

Aim of EMISPHER is to establish an equal access for many of the countries in the Euro-Mediterranean area (France, Italy, Greece, Turkey, Tunisia, Cyprus, Egypt, Algeria, Morocco) to the quality of service which is required for the delivery of on-line services for health care. The project is putting together the cutting edge European technology, developed in the frame of previous EU-funded projects, to provide an integrated internet-satellite platform, dedicated to health applications.

EMISPHER provides a hybrid internet-satellite platform (see Fig.). A network of 10 expert centres (medical faculties and leading hospitals) will be permanently interconnected and create a network of contributing medical centres, able to foster the widest long-term co-operation (contribution network). These centres will be equipped with bi-directional satellite terminals enabling a permanent connection between the various regional areas. The network will have a mesh topology and allow for a transmission bandwidth of up to 2 Mbps. It is the intention of the project to extend this network to up to 25 centres, on the basis of public regional or private initiatives.

The centres of the contribution network will work as 'hub' centres for a wider network, built on the existing co-operation in the medical assistance area, constituted of 250 medical centres (distribution network). These centres will be interconnected using a technology, enabling the exchange of multimedia patient record elements and the electronic management of the workflow in relation with medically assisted repatriations.

Results

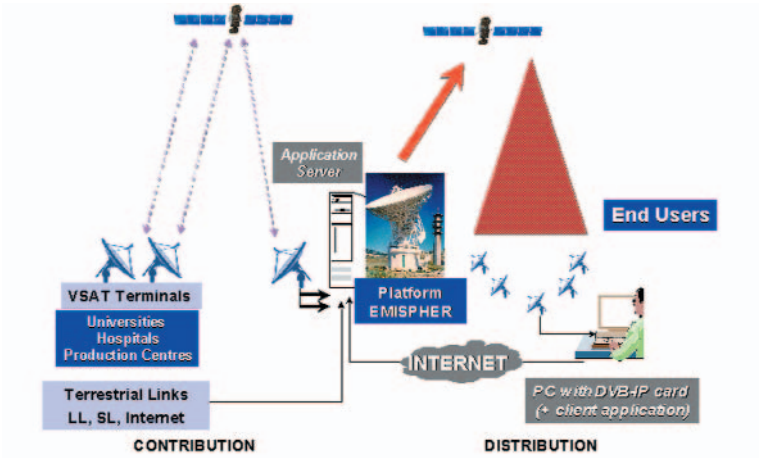
EMISPHER will host three priority applications.

First the *Cross-Mediterranean Virtual Medical University* dedicated to e-learning applications to develop and establish a permanent medical and scientific link.

Second, *Real-time Telemedicine Applications* for access to remote expertise and second opinion and foster cross-Mediterranean medical cooperation at expert level and for research.

Third, *Medical Assistance* to develop shared management of medical assistance files in case of repatriation of travellers or expatriates.

All these applications will use the EMISPHER integrated internet-satellite platform.



EMPHIS

Number: EUMEDIS-105

Contact person:
Dr. Debois Henri
Fondation Mérieux
France
Tel.: +33 4 7240 7958
Fax: +33 4 7240 7950
Email: henri.debois@
fondation-merieux.org

Project web site:
http://www.emphis.org

Budget:
total cost: 3,349,292 €
EC contribution: 2,678,434 €

Timetable:
start date: 01/Aug/02
duration: 36 months

Euro-Mediterranean Public Health Information System

Objectives

The Emphis project intends to develop Information systems within public health practice, care and education in the Mediterranean region, using as pilot projects:

1. the strengthening of disease surveillance in Tuberculosis (TB);
2. the development of a decision support tool in the control of Zoonotic Cutaneous Leishmaniasis (ZCL) based on a Geographic Information System (GIS);
3. the active exchange of data and counselling in nosocomial infections (NI).

Modern Information and communication tools (ICT) will also be used to develop distant learning modules in public health and to disseminate information among end-users. Emphis gathers major actors and institutions of public health in 6 countries of the Southern Mediterranean region and 4 countries in the Northern part.

Expected Results

On the population

Improved medical practice leads to alleviating the burden of infectious diseases. For example, a better management of TB patients decreases the risk of multi-resistant tuberculosis, thanks to a generalized compliance to an adequate treatment protocol. For ZCL, identification of high-risk areas will allow appropriate interventions to protect population from outbreaks. For NI, the increased awareness will result in a reduction of morbidity.

On the health professionals

Improved computer literacy, easy access to relevant information and life long education through ICT tools will improve the medical practice and the quality of care. Interactivity will also increase field practitioners? motivation and the global understanding of epidemiological issues.

On the Public Health system

Filling the gap in the existing communication channels, starting from the most peripheral levels up to the central one, and networking all actors, in particular data providers, will considerably improve the responsiveness and efficiency of the whole system. The demonstration of the interest of ICT tools for the management of the selected health issues could lead to a generalisation of their use for the prevention of other infectious diseases.

On other non-health sectors

Land use: the results of the activity will allow for health risks to be taken into account when planning development projects in tourism, agriculture, town planning. Education: introduction of distance learning in medical education could foster its use in other disciplines.

At the Euro Mediterranean level

A better integration of health policies, allowing reduction of the health risks, will facilitate the circulation of goods and people. EMPHIS will contribute to increase the transparency in the sharing of epidemiological information among the Med countries, in the larger context of the objectives set forward by the 'Information Society'.

Finally, it will facilitate the emergence of co-operative research projects taking advantage both of the data and of the partnerships generated by EMPHIS.

EUMEDCancer-GeMed

Number: EUMEDIS-114

Contact person:
Dr. Romeo Giovanni
Clinica Oculistica,
Policlinico S. Orsola-Malpighi
Italy
Tel.: +39 051 306 171
Fax: +39 051 306 171
Email: egf@eurogene.org

Budget:
total cost: 1,300,000 €
EC contribution: 1,040,000 €

Timetable:
start date: 01/Aug/02
duration: 36 months

EUro-MEDiterranean Cancer Genetic Medicine network

Objectives

The objective of the EUMED project is the creation of a Euro-Mediterranean network which will be sharing expertise and resources and will be aimed at improving healthcare in two priority areas: genetic medicine and cancer prevention.

The first goal of the project will be the training of health professional from the 12 MED countries through nine specialised courses, three practical workshops and twenty one individual stages of practical training. Some of the specialised courses reproduce prototypes already experimented with success by the European School of Genetic Medicine for the training in genetic medicine and cancer genetics, while other training activities will respond to specific needs identified by the MED partners participating in the project.

The second goal will be the transformation of the specialised courses in Internet courses and at the same time the establishment of a Euro-Mediterranean network of clinical geneticists who will help each other in making diagnoses on problematic cases using simple and robust internet technologies. The increase in knowledge in genetics will contribute to prevention of all genetic disorders, including cancer, in the 12 Med countries.

The third goal of the project will be the testing and comparison of new technology (in particular DNA chips) for laboratory diagnosis of genetic diseases which represent frequent health problems in Mediterranean countries (including the thalassemias and other common disorders).

Finally different activities for the public awareness of genetics in MED countries will be started in collaboration with the Genetics in Europe Open Days project financed by the EC.

PARADIGMA

Number: EUMEDIS-112

Contact person:
Dr. Mannucci Piermannuccio
Ospedale Maggiore di Milano
Italy
Tel.: +39 02 5503 5422
Fax: +39 02 5516 093
Email:
Piermannuccio.mannucci@unimi.it

Budget:
total cost: 2,311,785 €
EC contribution: 1,849,428 €

Timetable:
start date: 01/Nov/2002
duration: 36 months

PARticipative Approach to DIsease Global Management

Objectives

The PARADIGMA project applies a PARticipative Approach to Global DIsease MAnagement to develop and demonstrate, in a pilot study, an internet based reference framework to share scientific resources an findings in the treatment o major diseases. PARADIGMA defines and disseminates a common methodology and optimised protocols (clinical pathways) to support service functions directed to patients and individuals on matters like prevention, post-hospitalisation support and awareness. Focus will be on national and cross-regional priority initiatives encompassed in public health policies, and linking the activities of primary care professionals, institutes within hospitals and individual physicians. PARADIGMA will provide a platform of information services – user oriented and optimised against social, cultural and technological constraints – supporting the Health Care Global System of the Euro-Mediterranean Community in a continuous improvement process.

Results

At the end of the project, the following results are expected:

1. An Internet based network infrastructure, integrating isles of excellence in the prevention, care and follow-up of four major diseases.
2. A knowledge base related to the selected diseases.
3. A solution framework to design and implement Clinical Pathway, proved on the four selected diseases, but available for further extension to the overall system.
4. A practical support in the care delivery process which overcome traditional boundaries between medical specialists and health institutions.
5. A set of telematic services, end-user application oriented, and allowing various actors (hospital, research institute, primary care, individual physician) to communicate and interoperate in a participative approach.
6. A Euro-Mediterranean wide solution, proved and validated within the project life, optimised against organisational, technological, social and cultural needs, and able to significantly impact on the involved countries economies and care delivery processes.

Examples of projects managed outside the ‘Applications relating to Health’ Unit

SimBio

Number: IST-1999-10378

Project Participants:

Contact person:
Dr. Lonsdale Guy
NEC Europe Ltd.
Germany
Tel.: +49 2241 92520
Fax: +49 2241 925299
Email: lonsdale@ccrl-nece.de

Project web site:
http://www.simbio.de

Budget:
total cost: 2,960,000 €
EC contribution: 2,000,000 €

Timetable:
start date: 01/April/2000
duration: 36 months

Keywords:
medical imaging for surgical planning and intervention, bio-medical simulation, high-performance computing services.

A Generic Environment for Bio-Numerical Simulation

Objectives

The central objective of the SimBio project is the improvement of clinical and medical practices by the use of large-scale numerical simulation for bio-medical problems. SimBio provides a generic simulation environment running on parallel and distributed computing systems. An innovative key feature is the input of patient specific data to the modelling and simulation process. While future SimBio users will be able to develop application specific tools to improve practices in many areas, the project evaluation & validation demonstrate improvements in non-invasive diagnosis and pre-operative planning and the design of prostheses. The SimBio environment consists of components for the discrete representation of the physical problem, the numerical solution system, inverse problem solving, optimisation and visualisation. The core of the environment is the numerical solution system comprising parallel Finite Element solvers and advanced numerical library routines. The potential impact is demonstrated for specific areas through the SimBio evaluation & validation applications: electromagnetic source localisation in the brain, analysis of time-series data, maxillo-facial mechanics, knee-mechanics and prosthesis design. A key feature in the SimBio project is the possibility to use individual patient data as input to the modelling and simulation process - in contrast to simulation based on generic computational models. In order to meet the computational demands of the SimBio applications, the compute-intensive components are implemented on High Performance Computing (HPC) platforms. In addition to combining medical imaging and finite element analyses with HPC technology, the whole environment is integrated using CORBA to allow remote-site computing, thus creating an internet-based clinical and medical support tool.

Results

The SimBio environment combines medical imaging and finite element techniques with up-to-date HPC algorithms and technologies. The SimBio project provides an extensive tool for numerical modelling of human body parts. The SimBio environment includes a complete chain of tools necessary for the entire process from geometric model generation based on medical scan data (import from DICOM or other proprietary formats, segmentation, mesh generation and mesh manipulation) to computer simulation and visualisation. A major advantage of the SimBio approach is the ability to set up models of body parts of *individual* human beings based on medical scan data. The long term expectation is to improve the quality of health service that can be delivered to society by predictive computer simulations.

DRIVE

Number: IST-1999-12040

Project Participants:

FONDAZIONE CENTRO SAN RAFFAELE DEL MONTE TABOR	I
BULL Italy	I
GLAXOSMITHKLINE	I
ASTRAZENECA	I
ATOS ORIGIN	I
FAVERO HEALTH PROJECTS	I
POLITECNICO DI MILANO	I
TECHINICAL UNIVERSITY OF GDANSK	PL
KAROLINSKA INSTITUTE	S
JOINT RESEARCH CENTRE	

Contact person:
Dr. Sanna Alberto
Fondazione Centro San Raffaele del Monte Tabor
Italy
Email: alberto.sanna@hsr.it

Project web site:
http://www.e-mathesis.it/Drive/

Budget:
total cost: 4,163,717 €
EC contribution: 2,547,243 €

Timetable:
start date: 01/Jun/2000
duration: 32 months

DRug In Virtual Enterprise

Objectives

Health care is not as safe as it should be. A substantial body of evidence points to medical errors as a leading cause of death and injury. The Drive project focuses on creating a safer and smarter hospital environment.

The goal of DRIVE is set on improving the quality of patient care and guaranteeing the safety of the Patient while simultaneously reducing the supply chain costs. In other words, the objective is to demonstrate the ethical, social and industrial paybacks of the Virtual Enterprise business model on top of the public e-commerce infrastructure. The virtual enterprise business model is set up by a vertical integration of the traditional business process involved in the provision of the drug therapy in hospitals and value production is measured with respect of the final customer, i.e. the hospitalised citizen. A running pilot will demonstrate the effectiveness of Virtual enterprise business model, set up with the DRIVE project and the outcomes. The DRIVE Project focuses in three areas of healthcare:

- The Clinical process which represents the processes within the hospital that are directly or indirectly aimed at the Patient's health status changes from the admission until discharge.
- The Supply Chain which represents the flow process of the pharmaceutical products used, from the manufacturer to the point of use (Patient's bedside)
- Trust which represents the stakeholder requirements for the protection of critical assets (personal, professional, enterprise, social, and ethical) within the entire business model.

EUTIST-M

European Take-up of Essential Information Society Technologies – Technologies for Medical Applications

Number: IST-1999-20226

Principal Contractors:
Universidad Politécnica de Valencia E
ENEA I
CINECA I
University of Edinburgh UK

Contact person:
Hernández, Vicente
Universidad Politecnica de Valencia
Spain
Tel.: +34 96387 7356
Fax: +34 96387 7359
Email: vhernand@dsic.upv.es

Project web-site:
http://www.medicaltech.org

Budget:
Total Cost: 6,812,407 €
EC contribution: 4,560,887 €

Timetable:
Start Date: 01/Nov/1999
Duration: 36 months

Keywords:
biomedical informatics, biomedical sensors, eHealth networks and architectures, health professionals knowledge, medical imaging for surgical planning and intervention.

Objectives

EUTIST-M is a cluster of 11 activities aiming at the promotion of advanced information technologies applied to medicine. The objectives of clustering these activities in a single contract are:

- to centralise monitoring and management of activities
- to centralise financial administration.
- to maximise the European Dimension of Take-up actions.
- to improve the possibilities for dissemination, including organisation of joint dissemination actions, such as stands and articles,
- to increase the offer of each activity by providing a portfolio of activities,
- to increase the synergies among activities,
- to set-up common dissemination media, such as a corporative look, a web-site, flyers, brochures, etc…
- to provide with external quality assurance for the marketing interest of the activities,
- to maximise the impact and benefits of dissemination actions.

Along with the workpackages required for the development of each activity, two workpackages were set up for common actions: management and dissemination. The principal contractors take the responsibility of these two workpackages, letting the rest of the consortium concentrate on their activities.

Results

EUTIST-M project has provided the activities with larger visibility, larger dissemination actions and a better use of their resources. EUTIST-M will end-up with:

- 10 demonstrators and 1 best practice oriented to dermatology (ADAM, DERMA), cancer screening (AUTOSCREEN), radiology (CREAM, DISMEDI), intensive care units (IONIC), hearing aid (DEAF), surgery planning (VISU, AQUATICS), and orthopaedics (ISAC, FRAFEM),
- a general web-site with information on the 11 activities and common actions. The web-site is translated into three languages (English, Spanish and Italian) and offers the information in several levels, with the objective of reaching different targets,
- a corporate layout, including slide templates, success story templates, poster and flyers templates and logos,
- a press campaign at European level, addressed to medical magazines,
- organisation of stands and demonstration actions in three events (BIOMED, IST2002, MEDICA2002),

- 11 Success stories and posters describing the quantitative benefits that the activities will provide to the end-users and technology providers,
- three workshops offered to the consortium that showed them the successes of other companies in reaching the market.

All the information of EUTIST-M is available from the web-site http://www.medicaltech.org. The results of EUTIST-M project are complemented with the accompanying measure TT@MED, which main objective is to foster technology transfer.

Here follows the list of the projects part of EUTIST-M project with contact details and keywords.

ADAM

IST-1999-20226/ADAM

Automatic Data Analysis for Melanoma Early Detection

Contact person:
Calori, Luigi
CINECA - Italy
Tel: +39 051 6171411
Fax: +39 051 6132198
Email: l.calori@cineca.it

Project web-site: www.medicaltech.org/adam

Budget:
Total Cost: 338,172 €
EC contribution: 178,754 €

Timetable:
Start Date: 01/Nov/1999
Duration: 18 months

Keywords:
Health professional's knowledge, health promotion, biomedical informatics, melanoma detection, computer vision.

AQUATICS

IST-1999-20226/AQUATICS

Aneurysm Quantification Through an Internet Collaborative System

Contact person:
Giachetti, Andrea
CRS4 – Italy
Tel +39 0702796231
Fax +39 2796216
Email: giach@crs4.it

Project web-site: www.medicaltech.org/aquatics

Budget:
Total Cost: 850,899 €
EC contribution: 522,684 €

Timetable:
Start Date: 01/June/2000
Duration: 18 months

Keywords:
Biomedical informatics, medical imaging for surgical planning and intervention, virtual reality, abdominal aortic aneurysms, telemedicine.

AUTOSCREEN

IST-1999-20226/AUTOSCREEN

A Trial of the NANOSCAN System

Contact person:
Sawyer Mark
EPCC, University of Edinburgh - UK
Tel: +441 31 650 5030
Fax: +441 31 650 6555
E-mail: m.sawyer@epcc.ed.ac.uk

Project web-site: www.medicaltech.org/autoscreen

Budget:
Total Cost: 1,141,088 €
EC contribution: 936,428 €

Timetable:
Start Date: 01/Nov/2000
Duration: 24 months

Keywords:
Biomedical sensors, health professionals knowledge, machine vision, cytology, cancer screening.

CREAM

IST-1999-20226/CREAM

Component Based and Real-Time Embeddable X-Ray Image Server

Contact person:
Peri, Massimiliano
AETMed – Italy
Tel: +39 010 3774810
Fax: +39 010 3741060
Email: massimiliano.peri@aetnet.it

Project web-site: www.medicaltech.org/cream

Budget:
Total Cost: 397,442 €
EC contribution: 217,801 €
Timetable:
Start Date: 01/Nov/1999

Duration: 18 months

Keywords:
Medical imaging for surgery planning and intervention, health professionals knowledge, DICOM imaging, cardiology.

DEAF

IST-1999-20226/DEAF

Distance Hearing Aid Fitting

Contact person:
Dagri, Piero
AMPLIFON S.p.A – Italy
Tel: +39 02 57472236
Fax: +39 02 57303093
Email: dagr@amplifon.it

Project web-site: www.medicaltech.org/deaf

Budget:
Total Cost: 217,494 €
EC contribution: 143,656 €

Timetable:
Start Date: 01/Nov/1999
Duration: 13 months

Keywords:
Mobility of health professionals, mobility of patients, telemedicine, telecare, hearing impairment.

DERMA

IST-1999-20226/DERMA

Prototypal System for the Objective Monitoring of Skin Lesions

Contact person:
Coluccia, Michele
C.G.S. Sas - Italy
Tel. +39 050 573205
Fax +39 050 573854
Email: cgs@cgsgroup.it

Project web-site: www.medicaltech.org/derma

Budget:
Total Cost: 469,942 €
EC contribution: 371,264 €

Timetable:
Start Date: 01/Nov/2000
Duration: 18 months

Keywords:
Biomedical sensors, health professionals knowledge, machine vision, dermatology.

DISMEDI

IST-1999-20226/DISMEDI

Distributed Medical Imaging: A New Component in Advanced PACS

Contact person:
Hernández, Vicente
Universidad Politecnica de Valencia - Spain
Tel.: +34 963877356
Fax: +34 963877359
Email: vhernand@dsic.upv.es

Project web-site: www.medicaltech.org/dismedi

Budget:
Total Cost: 170,794 €
EC contribution: 143,541 €

Timetable:
Start Date: 01/Nov/1999
Duration: 18 months

Keywords:
eHealth networks and architectures, mobility of health professionals, medical imaging for surgical planning and intervention, 3D imaging, high performance computing.

FRAFEM

IST-1999-20226/FRAFEM

Real Time Femoral Neck Fracture Prediction

Contact person:
Testi, Debora
Istituti Ortopedici Rizzoli - Italy
Tel: +39 051 6366554
Fax: +39 051 6366863
Email: testi@tecno.ior.it

Project web-site: www.medicaltech.org/frafem

Budget:
Total Cost: 542,153 €
EC contribution: 235,398 €

Timetable:
Start Date: 01/June/2000
Duration: 18 months

Keywords:
Biomedical informatics, medical imaging for surgical planning and intervention, densitometry, orthopaedics

IONIC

IST-1999-20226/IONIC

Open Platform for Information Technology in Intensive Care Units

Contact person:
Nolasco, Esperanza
Trends in Technology, SL - Spain
Tel: +34 91 5532623
Fax: +34 91 5351674
Email: pnolasco@trendsit.com

Project web-site: www.medicaltech.org/ionic

Budget:
Total Cost: 1,086,317 €
EC contribution: 971,155 €

Timetable:
Start Date: 01/Nov/1999
Duration: 21 months

Keywords:
eHealth networks and architectures, health professionals knowledge, telemedicine, biomedical sensors, intensive care units.

ISAC

IST-1999-20226/ISAC

A Low-Cost Portable Instrument to Assess Primary Stability
During Hip Prostheses Implantation

Contact person:
Cappello, Angelo
Università di Bologna, Dipartimento di Elettronica, Informatica e Sistemistica - Italy
Tel: +39 051 2093097
Fax: +39 051 2093073
Email: acappello@deis.unibo.it

Project web-site: www.medicaltech.org/isac

Budget:
Total Cost: 226,637 €
EC contribution: 116,225 €

Timetable:
Start Date: 01/Nov/1999
Duration: 20 months

Keywords:
Biomedical Informatics, Biomedical sensors, Hip prostheses, orthopaedics.

TT@MED

IST-2001-37354

Technology Transfer of Advanced Medical Information Technologies

Contact person:
Hernández, Vicente
Universidad Politecnica de Valencia - Spain
Tel.: +34 963877356
Fax: +34 963877359
Email: vhernand@dsic.upv.es

Project web-site: www.medicaltech.org

Budget:
Total Cost: 499,992 €
EC contribution: 499,992 €

Timetable:
Start Date: 01/July/2002
Duration: 18 months

Keywords:
Biomedical informatics, biomedical sensors, eHealth networks and architectures, health professionals knowledge, medical imaging for surgical planning and intervention.

VISU

IST-1999-20226/VISU

Virtual Reconstruction of the Face after Maxillofacial Surgery

Contact person:
Lamberti, Claudio
Università di Bologna, Dipartimento di Elettronica, Informatica e Sistemistica - Italy
Tel: +39 051 2093098
Fax: +39 051 2093073
Email: clamberti@deis.unibo.it

Project web-site: www.medicaltech.org/visu

Budget:
Total Cost: 407,930 €
EC contribution: 211,950 €

Timetable:
Start Date: 01/June/2000
Duration: 18 months

Keywords:
Biomedical informatics, medical imaging for surgical planning and intervention, virtual reality, craniofacial surgery

Annex 1 - The portfolio of projects in figures

The following data are statistics describing the portfolio of projects of the 'Applications relating to Health' Unit. The FP5 and the IST Programme are over, but these statistics are due to evolve as many projects are still running at the date of publication of this report, and to be amended during their lifetime. However these data represent a fair snapshot of the different calls.

Furthermore, we would like to draw the attention of the reader to the fact that the Commission services have not yet attempted to draw any conclusion from the statistics represented.

The table below gives an overall view of proposals received, projects resulting from the RTD calls and other types of actions.

	1st Call	3rd Call	6th Call	7th Call	8th Call	Support Measures	CPA	CRAFT	Exploratory Awards	Grants	TOTAL
Date	March 1999	February 2000	January 2001	July 2001	November 2001	Open Call	All Calls([20])	SME Call	SME Call	Open Call	
Proposals submitted	202	119	109	7	186	58	-	71		14	**766**
Retained Proposals	27	24	22	1	12	12	11	9	12	4	**134**
EC Contribution (Euro)	45.965.900 26,4 %	38.292.902 22,0 %	31.417.738 18,0 %	4.949.966 2,8 %	19.463.957 11,2 %	7.225.066 4,1 %	21.338.471 12,2%	5.164.149 3,0%	260.625 0,1 %	199.559 0,1 %	**174.278.333 100,0 %**

The following tables provide a breakdown by cluster.

Citizens

	RTD([21])	AM+TN	TU	Total
Projects	20	2	7	**29**
Project Cost (€)	81.516.948	1.191.349	7.631.104	**90.339.401**
Project EC Contribution (€)	43.260.476	718.123	4.958.025	**48.936.624**
Average Duration	31,8	18,0	22,3	**28,2**
Average Number of Participants	8,8	6,0	7,3	**8,2**
Total Number of participants	175	12	51	**238**

Patients

	RTD	AM+TN	TU	Total
Projects	28		2	**30**
Project Cost (€)	93.750.887		1.757.067	**95.507.954**
Project EC Contribution (€)	47.526.940		992.800	**48.519.740**
Average Duration	30,5		18,0	**29,7**
Average Number of Participants	8,3		5,5	**8,1**
Total Number of participants	231		11	**242**

([20]) The number of proposals received in cross-programme actions for the whole IST programme was 860. Due to the nature of the cross-programme actions, it is not relevant to indicate the total number of CPA proposals: only a part of which would be related to the Unit. The proposals retained and allocated to the Unit, however, is a part of the retained CPA proposals.

([21]) RTD: Research and Technological Development project; AM: Accompanying Measure; TN: Thematic Networks; TU: Take Up project

Health Professionals

	RTD	AM+TN	TU	Total
Projects	34	9	6	**49**
Project Cost (€)	99.766.224	6.417.934	13.687.717	**119.871.875**
Project EC Contribution (€)	56.099.702	6.109.943	8.590.991	**70.800.636**
Average Duration	30,4	25,3	21	**28,3**
Average Number of Participants	7,8	5,4	8,5	**7,4**
Total Number of participants	264	49	51	**364**

	Subventions	SME specific measures		
		SME EA([22])	SME CRAFT	Total
Projects	**4**	12	9	**21**
Project Cost (€)	**1.473.103**	347.500	10.919.124	**11.266.624**
Project EC Contribution (€)	**199.559**	260.625	5.164.149	**5.424.774**
Average Duration	**7,5**	6,1	24,0	**13,8**
Average Number of Participants	**1,0**	2,1	7,9	**4,6**
Total Number of participants	**4**	25	71	**96**

	Grand Total
Projects	**74**
Project Cost (€)	**132.611.602**
Project EC Contribution (€)	**76.424.969**
Average Duration	**23,0**
Average Number of Participants	**6,3**
Total Number of participants	**464**

The following table presents the aggregated figures across the three clusters for RTD, Accompanying Measures + Thematic Networks and Take-Up contracts, including one project (TM-ALLIANCE) which was not attributed to any specific cluster. The 'Grand Total' column presents the global figures for all types of contracts including subventions and SME specific measures.

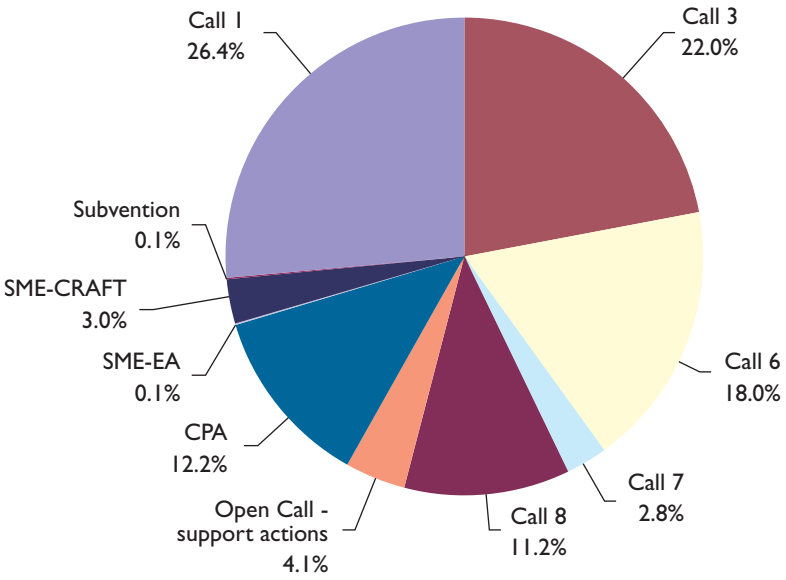
	RTD	AM+TN	TU	Total	Grand Total
Total Projects	**82**	**12**	**15**	**109**	**134**
Total Project Cost (€)	**275.034.059**	**8.006.283**	**23.075.888**	**306.116.230**	**318.855.957**
Total Project EC Contribution (€)	**146.887.118**	**7.225.067**	**14.541.816**	**166.654.000**	**174.278.333**
Average Duration	**30,6**	**23,5**	**21,2**	**28,6**	**25,6**
Average of Number of Participants	**8,2**	**5,3**	**7,5**	**7,8**	**7,1**
Total Number of participants	**670**	**64**	**113**	**847**	**947**

([22]) EA: SME specific measure, Exploratory Awards; CRAFT: SME specific measure, CRAFT initiative

Distribution of the EC contribution

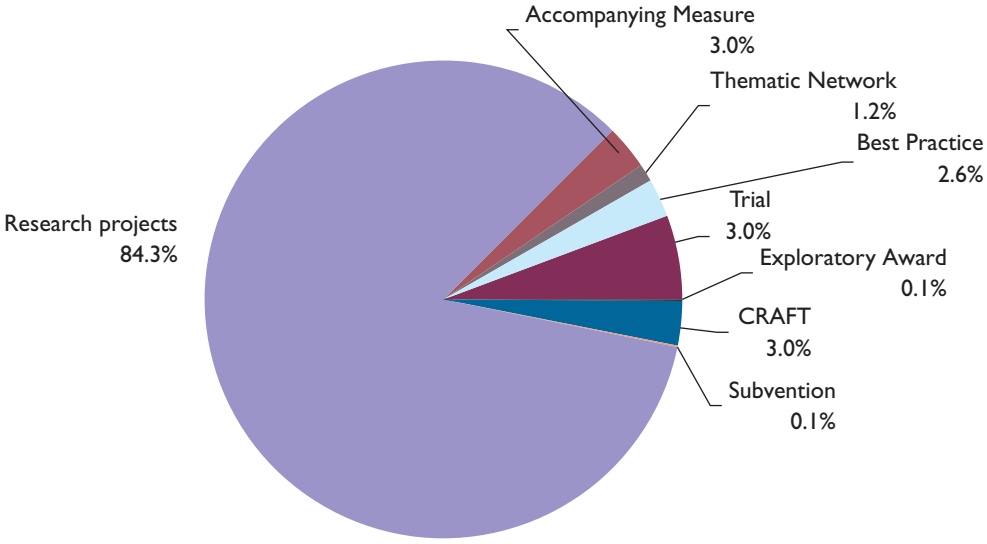
Distribution per type of calls

EC contribution per type of Calls (EURO)
April 2003, 134 projects



Distribution per type of contracts

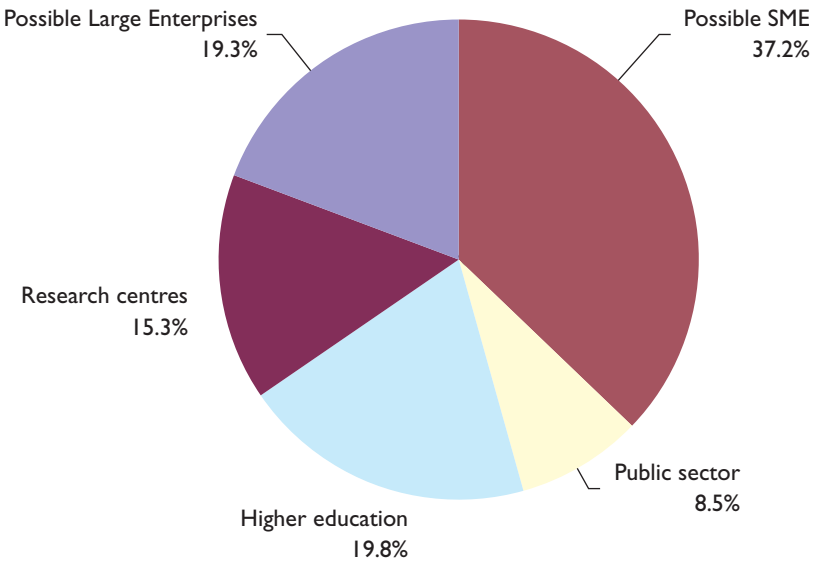
EC contribution per type of Contracts (EURO)
April 2003, 134 projects



84 % of the budget is allocated through the regular calls for RTD proposals.

Distribution per type of activity sector

EC contribution per activity sector (EURO)
April 2003, 134 projects

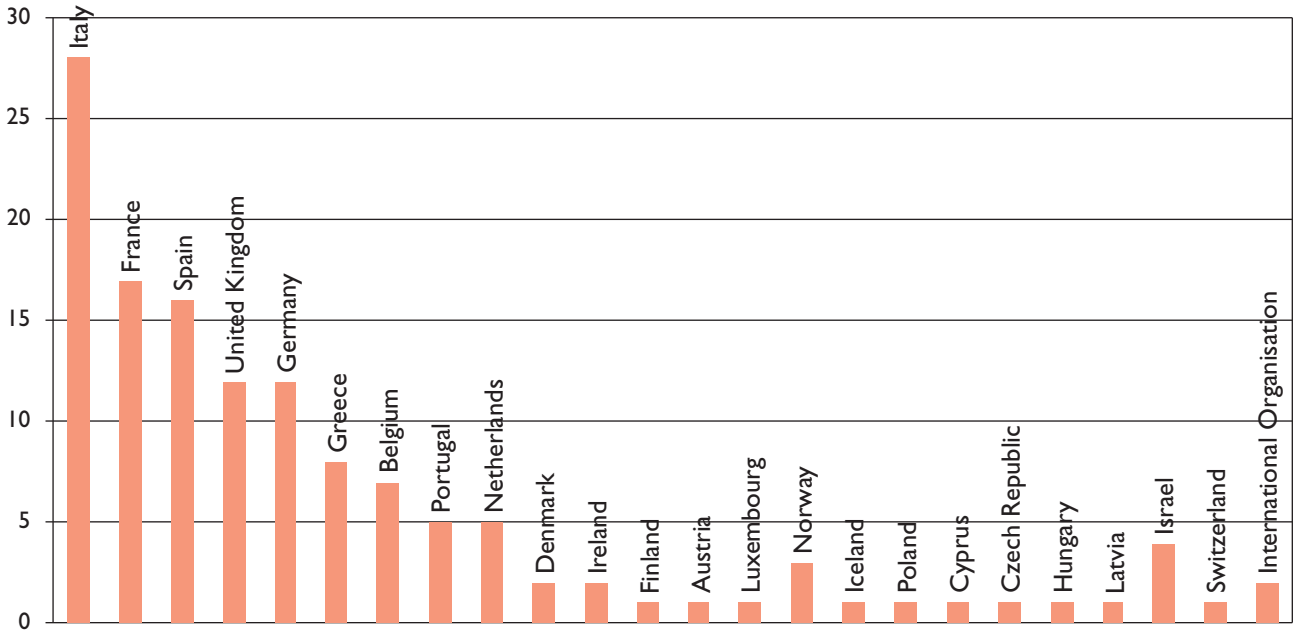


Because of the nature of the activities in KA1 and in the health domain, small-and medium-sized enterprises (SME) are very well represented (although uncertainties related to the definition of large enterprises or SME remain due to an imprecise filling-in of the statistical part of the Contract Preparation Forms). An active industrial participation is to be noted.

Geographic distribution of co-ordinating organisations

The following figure shows the geographic distribution of the co-ordinating organisations.

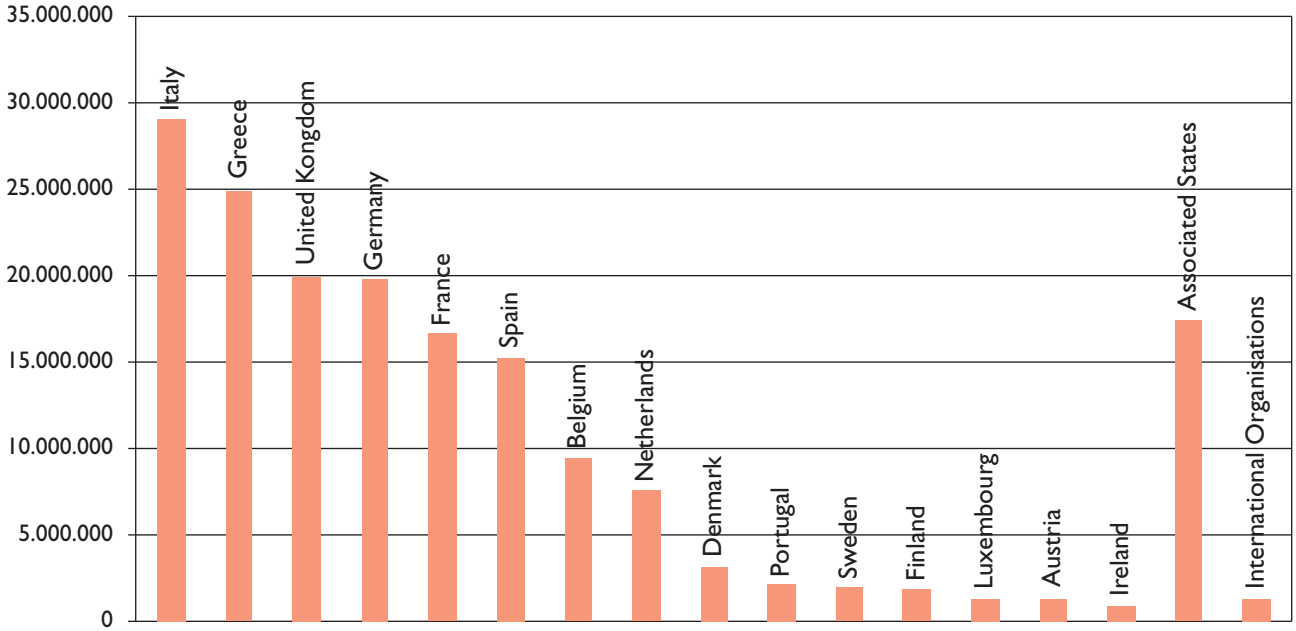
Co-ordinating organisations by country
April 2003, 134 projects



Distribution per country

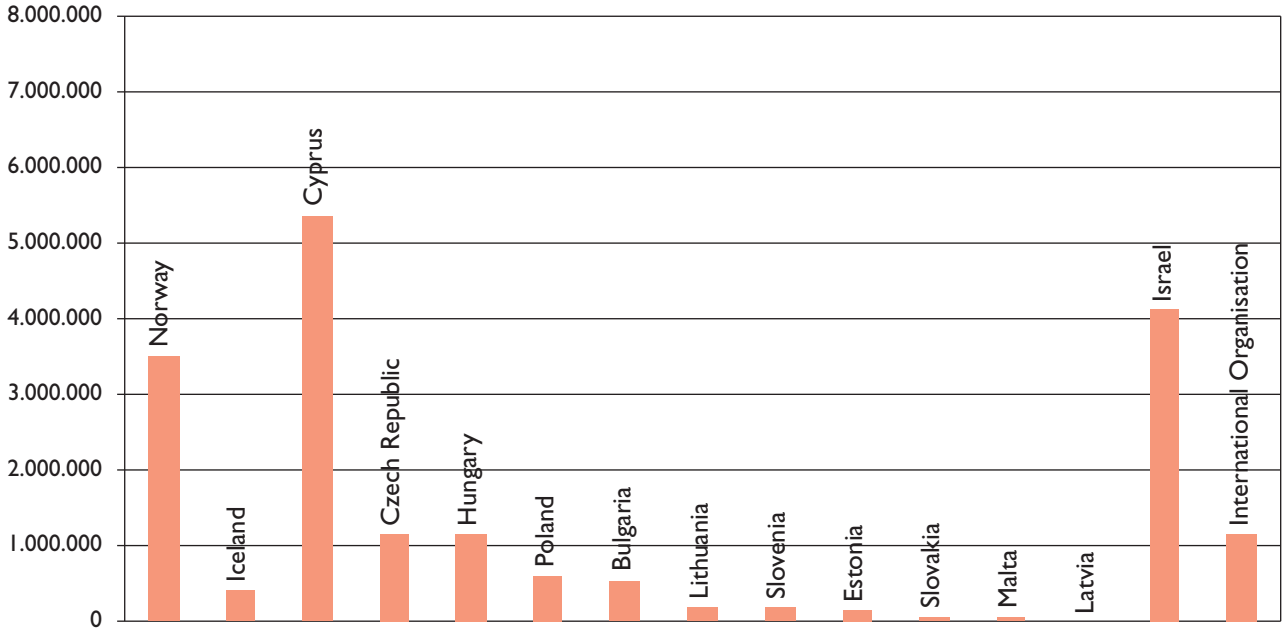
The next figure shows the total EC Contribution for partners in EU member states. Major non-EU countries include Cyprus, Israel, and Norway. More than twenty other countries receive funding.

EC contribution per country
April 2003, 134 projects



The following figure breaks the figures down for the associated states (EFTA-EEA, NAS and others).

EC contribution per country (associated states) (EURO)
April 2003, 134 projects



Annex 2 - Technology highlights

The health-related societal demands have been the structuring driver behind the different projects during the whole 5th Framework Programme. Projects therefore targeted several audiences: citizens, patients or health professionals. Some innovations have nevertheless been a common denominator across the different societal demands. In this context, this chapter aims at presenting the achievements of the 5th FP projects from the technological point of view.

Biomedical sensors have been mainly developed throughout projects dealing with societal demands for citizens and for patients, even if the use of the measurements would later have to be interpreted and validated by health professionals.

Biomedical sensors

The term 'biomedical sensor' covers all types of sensors whether physical or biological for the detection and measurement of physical or biological parameters. The same meaning is often given to 'biosensor' or 'medical sensors'.

However, a biosensor is strictly defined as a compact analytical device incorporating a biological or biologically-derived sensing element either integrated within or intimately associated with a physicochemical transducer. The usual aim of a biosensor is to produce either discrete or continuous digital electronic signals that are proportional to a single analyte or a related group of analytes([23]).

The largest application area of biosensors is the field of medical diagnostics. In particular, blood glucose monitoring of diabetics (mainly self-testing at home) is predominant. It constitutes 93 % of the world market. Other important 'medical biosensors' are just appearing on the market e.g. for cholesterol with the same handheld instrument as for glucose. They are also used in intensive care where every second counts to save lives. Biosensors integrated in a small computerised benchtop instrument could be used in every office of a general physician for immediate diagnosis results saving time and money. The European Commission has strongly supported the development of innovative biosensors through IST projects such as WUNSENS, BIOMIC, BIOSENS, MICROBIOL, PAMELA and SAMBA.

The use of biosensors in sports medicine is a recently emerging area. The most important parameter for top athletes is the lactate concentration in blood that indicates the fitness-state. First portable devices are available and the sale turnover for such a device can be very high. As an example, the market for medical diagnostic products will quickly grow, reaching €2,100 million in sales by the end of 2003 with an average annual increase of 20%. Sensors are expected to be important in every major segment of the clinical diagnostics market, including clinical chemistry, immuno-diagnostics, cellular analysis, and microbiology.

Another type of biomedical sensors is the physical devices (macro or micro devices), in direct contact the body or near to detecting physical parameters and translating them in an electric signal. These devices can be based on infrared technology (e.g. Saturated Pulse Oximetry-SpO2, Blood Oxygen Saturation, Temperature), on mechanics (Blood Pressure, Respiration Rate) or on electricity (ECG, EMG). During FP5, such sensors have been implemented and integrated in IST projects dealing with homecare and care at the point of need, like @HOME, ADICOL, AMON, BODY-LIFE, CHS, Telecare, Telemedicare and H-CAD.

Finally, special note has to be made on the implantable sensors i.e. the development of innovative technologies designed to increase the utility of a sensor in vivo. Materials science, engineering design changes, pharmaceutical adaptations, and novel transduction mechanisms are needed to improve sensor performance in vivo. Emphasis has to be placed on the validation of the sensor output to give a clinically relevant endpoint.

Going further in the world of biosensors, micro- and nanotechnologies would play an important role in the short term to answer the health professional's demand for better diagnostic tools.

Micro- and Nanotechnologies for Health

Traditional scientific disciplines such as physics, chemistry and biology are converging into a new science, where lengths are measured in thousandths and millionths of a millimetre. Micro- and nanotechnologies is understood as a concept for further integration and miniaturisation of sensing and actuating, to bring intelligence and networking in products and in their interfacing with their surroundings. It is expected that micro- and nanotechnologies will drive, in the mid long term future, major developments within several important areas, such as information technology and biotechnology.

As reported in a comprehensive study([24]) compiled in 2000 for the European Commission covering the current

([23]) Biosensors Report: JD. Newman, PJ. Warner, LJ. Tigwell, APF. Turner, University of Cranfield, 2002.

([24]) 'Microsystem- and Nanotechnologies applied for health: a 15-year perspective', Rainer Felten and Ingo Hussla, Gesellschaft für Technologieförderung Itzehoe mbH, 2000.

situation and the perspectives of the next 10 to 15 years, medical and biomedical applications represent the second biggest market, next to IT peripherals, for the use of micro- and nanotechnologies.

Micro- and nanotechnologies for health is still today an emerging field and only a few products have reached the commercial stage. Examples are pressure sensors, cardiac pacemakers, hearing aids or catheter systems. But this situation is expected to change significantly in a near future. Systems will be further developed and optimised and, for example, inexpensive sensors for blood analysing systems, biomedical diagnostic chips and drug delivery systems are expected to be available for the medical professional and the personal health care for the citizens. Futuristic concepts, such as nanomachines or smart pills, programmed to search and destroy viruses and cancer cells in the blood stream or possessing the ability to recognise and repair defective cells are under development. Early diagnosis and prevention, self-examination and diagnosing products and minimal invasive surgical procedures are some of the areas of medicine on which these technologies will have an important impact.

Due to the emerging nature of the field only two projects are currently addressing this area in eHealth. IVP is a project whose objective is the development of a autonomous videoprobe with data processing and wireless data transmission capabilities which can be used for instance for diagnosis in gastroenterology. WUNSENS deals with the problem of persons suffering from chronic skin wounds and includes the development of a novel microbial sensor for prompt quantification of microbial status in these wounds.

It is not enough to develop new biosensors or micro- and nanotechnologies if they do not benefit more widely to the European citizens. In order to reach this widespread use, integration of these technologies in every day's life objects, such as clothes, has to be achieved. Validation of this approach has been performed in the 5th FP, mainly to address the demands of chronic patients through the use of smart wearable healthcare systems.

Smart wearable healthcare systems

Smart Wearable Healthcare System (SWHS) stands for any system in contact with or near to the body, which integrates capabilities of sensing, acting, processing and communicating physiological and physical parameters. SWHS should be preferably, light weight and low power consumption, of reasonable price with a capacity of operation by totally unskilled persons, with embedded processing and alarming capability and able to keep, if necessary, an uninterrupted connection with a remote medical centre 24 hours a day. SWHS benefit today from significant progress in system integration and miniaturisation and can be applied in different body locations, e.g. wrist and abdomen. During the last few years a great effort in RTD is being put on design, integration and testing of the right hardware and software technologies e.g. biomedical sensor, medical decision algorithms, data transmission and security, as well as on user-friendly environments and scenarios of use.

Although continuous ambulatory monitoring through collection and local storage of vital signs starts emerging, e.g. the 'lifeshirt' (Vivometrics, USA), the market of remote portable/wearable personal health monitoring, offers at present, mainly single physiological parameter systems, based either on trans-telephonic transmission or on optical transmission through a handheld recording system. The storage and viewing of the data, but also the analysis, are performed mainly on the service provider side. The objective of current research is to increase autonomy with embedded decision support, enhanced user-friendliness and multi-parameter monitoring capabilities.

The European Commission, has strongly supported, through the FP5, RTD in several such systems and applications e.g. home monitoring for chronic patients, like @HOME, CHS and CHRONIC, blood composition monitoring and drug delivery for diabetic patients, like ADICOL, multiparametric monitoring for cardiovascular and pulmonary diseases, asthma and sleep disorders, like AMON, health condition and sport performance monitoring of athletes, like DROMEAS, early detection and interpretation of cardiological syndromes, like EPIMEDICS, and monitoring during pregnancy, like LIFEBELT. It also supports best practice and trials through DIAFOOT which deals with the monitoring of diabetic feet and MOBIHEALTH which is about continuous healthcare over public 2.5 and 3G networks, based on wireless sensors and actuators integrated in a generic Body Area Network.

One of the shortcomings of this kind of smart wearable is the limited number of physiological parameters collected, due to the relatively small contact area between the body e.g. wrist, chest, abdomen and the device. A possible solution to overcome this limitation could be the integration of the different sensors into a unified, user-friendly wearable platform that has a large contact surface with the body, i.e. a textile.

Ongoing cutting edge multidisciplinary research into textile fibres, biomedical sensors and mobile communication integrated with telemedicine, aims at the development of Intelligent Biomedical Clothing (IBC) that could overcome the limitations of the existing smart wearable. WEALTHY is the first IST project aiming at the RTD and validation of a smart fabric for continuous health status monitoring. The future development of IBC, based on full integration of sensors/actuators, energy sources, processing and communication within the clothes, could overcome existing barriers in the use of wearable health systems and be a key enabler technology for cost-effec-

tive disease management, disease prevention and overall life style management. This sector will be further developed and supported under the FP6.

Listening to the scientific community, biomedical informatics started to bear promises for a whole range of researchers.

Biomedical informatics

Biomedical informatics can be defined as the field in which biological information (bio-informatics) and medical information (medical-informatics, neuro-informatics) are merged and used together.

Recent progress in the field of bio-informatics, such as the completion of the human genome but also new imaging techniques using information at molecular level, increases the need to join this information with existing medical information (e.g. clinical data, patient health records) in order to provide better and more case-specific healthcare. On the other hand bio-informatics research could benefit a lot from the accessibility of clinical results in order to target the problems more effectively.

The vision for biomedical informatics is to complete and understand the living organisms from the smallest level of the molecule to the level of the entire organism.

On December 14th 2001, a meeting was held in Brussels under the Belgium presidency and co-organised by the European Commission in order to gather all possible experts from bio-informatics, medical-informatics and neuro-informatics for a first round of discussion and knowledge exchange. Three distinct communities exist, although the first level of merger has been reached through the creation of multidisciplinary teams. All communities are aware of the need to cross-fertilise each other and the main problems have been highlighted. Key points to mention are: security of anonymity of clinical data for research; combination of heterogeneous data; security and privacy of genetic profiles; and readiness to collect and share data in a valuable way.

During FP5, one study and two RTD projects have started to address these issues. The BIOINFOMED study produced a white paper([25]) on the synergy between medical- and bio-informatics, with the help of a special selected work group of experts from all the above-mentioned areas. HKIS is about a data mining and data morphing platform to enable treatment of cancer patients with respect of the molecular profile of their tumours, while INFOGENMED aims at constructing a virtual laboratory in which both medical and biological data can be accessed. This sector will be further developed and supported under the FP6.

The demand of researchers for greater computing resources and bandwidth lead the European Commission to finance GRID networks. This GRID technology has, of course, several applications in the health sector.

HealthGRID

The term HealthGRID was first used as title for a workshop held in Brussels and organised by the DG Information Society, Applications relating to Health unit on the 20th September 2002. The aim is to investigate the use of the GRID technology applied to health information. It covers all information from a molecular level, to the level of individuals, and population that should be included in healthcare systems. At the molecular level we can refer to genomics; at the individual level, to medical imaging; and for population, to epidemiology.

GRID technology represents an emerging informatics technology in which the end-user (e.g. researcher, medical staff, pharmaceutical company) can use distributed computing resources and databases with the feeling of working with a single system image.

GRID technology originated in the field of particle physics where an increasing need for computing power exists. In the domain of health, first prototypes of applications running on a GRID are now emerging both in medical imaging, medical simulation and rapid comparison of large amounts of biological data. These applications now need to be tested and improved through the feedback from users.

A HealthGRID community of technology developers and end-users is starting to form in order to use and adapt the existing technology to the requirements of the health domain as well as in the future develop new applications corresponding to the user needs. A first conference([26]) took place in Lyon in January 2003 which successfully demonstrated the commitment of different research communities to work together on this matter. It was co-organised by the CNRS, CERN and EMBNet and chaperoned by the European Commission.

Currently there is also a need for the definition of standards, establishing interoperability between different GRID technologies and solving issues regarding security and commercial exploitation of services running on GRIDs.

During FP5, four projects related to health have focused on the GRID technology. MAMMOGRID is a research project, working on the construction of a GRID on which mammograms from different hospitals can be accessed and analysed thanks to a federated model of databases. This project has close links with two other mammography GRIDs, one in Italy and on in the UK (eDiamond). The second research project is GEMSS establishing commercial available GRID services for modelling and simulation of

([25]) BIOINFOMED white paper *http://bioinfomed.isciii.es/*

([26]) HealthGRID *http://www.healthgrid.org*

medical interventions. In this context, several applications are being developed. BIOGRID is a take-up action which aim is to create a platform for the analysis of biological data using GRID technology. Finally, CROSSGRID, managed by another Unit of the Directorate General Information Society, has a work package dealing with simulation of blood flow in veins and arteries with a view to optimise the position of bias in order to perform surgery more efficiently. This sector will be further developed and supported under the FP6.

These technological innovations will hardly be accepted if they are not trusted. In the health sector, the concept of trust is probably even more important than in other sectors. The recent events and the focus of the 6th FP on ICT security demonstrate its importance.

Security and privacy issues in eHealth applications

Building trust is a prerequisite to the development of an information society, probably in eHealth more than anywhere else. It is, however, to be noted that, according to some studies the market for Internet security software was worth around €9.4 billion across Western Europe at the end of 2002 and is expected to rise to around €18 billion in 2005([27]).

Under the broad umbrella of trust, ensuring trust means to deal with several aspects such as:

- Security: availability, authentication, authorisation, accountability (audit), integrity, confidentiality, both at the logical level as well as the physical and organisational levels;
- privacy and identities in the Internet;
- safety;
- legal and ethical issues;
- dependability;
- risk analysis and assessment.

Given that trust is a broad issue that is mainly dealt with by a specific unit in the research programme, the 'secure' eHealth projects related only to few of the domains introduced above.

The technological developments, such as IPv6 and IPsec, and the legal framework play also an important role with several EU Directives([28]).

([27]) European Information Technology Observatory – EITO 2003.

([28]) Data Protection Directive, 95/46/EC; medical devices Directive, 93/42/EEC; Distance Contracts Directive, 97/7/EC; electronic signature Directive 99/93/EC or eCommerce Directive, 00/31/EC; Telecommunications Privacy Directive, 02/58/EC which replaces 97/66/EC.

Technological advances to implement parts of the recent legal framework, especially electronic signatures, were performed by projects such as HARP or RESHEN:

HARP is a project that meant to provide secure documents, allocating different roles to the persons reading or modifying these documents. The first telemedicine application is clinical trials, which have strict compliance to regulations, such as FDA([29]). Another use is for online electronic patient records.

RESHEN aims at providing interoperable regional health networks in three countries, enabling a full digital management of electronic health records through the use of digital signatures. RESHEN also addressed partially the legal issues in the EU. The most advanced pilot was to be found in Finland with a process re-engineering which allowed health professionals to fully benefit from the introduction of information technologies. Digital archives remain, however, still an issue.

Privacy and identities management are being investigated by two projects: PRIDEH and PRIDEH-GEN.

PRIDEH is a take-up measure to foster the use of privacy-enhancing techniques, such as pseudonymisation. Full anonymisation of electronic health records does not permit to link different clinical events to a person, therefore losing information for clinical researchers or epidemiologists. Pseudonymisation replaces the personal identifier with a consistent anonymous identifier through a series of operations involving a trusted third party and requiring a careful cleaning of health data (such as rare disease) to prevent re-identification.

A cluster project, PRIDEH-GEN, extends the research performed by PRIDEH to cover privacy-enhancing techniques related to the use of genomic data in electronic health data which would otherwise allow to uniquely identify a person.

Safety was indirectly addressed through risk assessment and other standards (such as IEC61508). It is to become a more important research point in the 6th Framework Programme, especially given the high number of consequences due to adverse effects (98,000 US citizens yearly put at risks according to the US programme 'to err is human, building a safer healthcare system').

Risk analysis methods were mainly financed at the occasion of the past Framework Programme and gave birth to methods such as CRAMM. International developments have also seen the replacement of the 'Orange Book' by an ISO standard, the Common Criteria (under the Council Recommendation 95/144/EC), as well as a dissemination of security practices with ISO17799. In order to ease the assimilation of risk analysis tools by

([29]) FDA *http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=11&showFR=1*

the health community, CORAS, a cross-programme research project, has performed a more theoretical project investigating the risk analysis methods to enhance security for telemedicine and eCommerce pilot sites. The use of different risk analysis techniques is further supported and combined by a generic platform.

Although not really dealing with security, WRAPIN is a project which aims at providing trust in health information published on web sites. It provides both a code of conduct and a trustmark. This project was at the basis of the communication of quality criteria for web sites published recently by the Commission.

Other projects deal also with security aspects: PICNIC should provide several CORBAMed components such as patient identifier or authentication mechanism.

MEDITRAV should work a roadmap of secure solutions. Another project (AM-SD([30]) from another Unit) already contains a scenario for eHealth dependability for 2010.

Outside the eHealth Unit, there are other projects from the IST programme dealing with smart cards([31]). In the eTen programme, the project Netc@rds([32]) aims at investigating the cross-regional use of health smart cards. Transcards([33]), which is a project from DG Employment and Social Affairs, is also worth mentioning in this matter.

From the national point of view, the Belgian initiative([34]) of creating a third party to manage the use of the social security number proved to be positively accepted and functional and is worthwhile to be mentioned.

More and more in the news, the use of Open Source software was seen in the 5th FP as an instrument to achieve the early adoption of security techniques to create confidence in technology, a societal demand of all citizens, patients and health professionals:

Open Source eHealth development

The Free Software/Open Source software approach could be compared to the introduction of a generic drug. Indeed, Open Source refers to an Intellectual Property Right model in which the license gives rights to the user to access the source code, read it, copy it, modify it, redistribute the modifications. This model is not new: it is based on a traditional use of copyrights and licensing. Open Source licenses preserve user freedom and developer authorship. It is to be noted that the freedom does not imply the obligation to read the software source code (in a car, access to the motor engine does indeed not imply that the driver has to peek and poke to understand its functioning or to repair it). Continuing the analogy with generic drugs, the design and active principles of drugs (or Open Source software) are fully known and generic drug companies (or Open Source software companies) have a higher degree of competition to acquire market shares on these non-differentiated products by offering better service and better geographical coverage, by having more effective distribution channels or production lines, etc. In order to give even a better idea of Open Source, it would be the equivalent of a generic drug which has been voluntarily introduced in the market at the time of its discovery, without using trade secret and patent laws to delay its introduction until the extinct of the associated rights and patents.

Several Open Source initiatives have been started, some of them years ago. About 10 years ago, the GEHR (Good European Health Record) and GALEN (ontology development) projects were financed by the European Commission. During the 5th Framework Programme, the use of Open Source software was favoured. One can say that almost all projects have used Open Source components in one way or another: GNU/Linux, operating system; Apache, web server, 60% of market segment; MySQL, PostgresSQL, Interbase, SAP-DB, databases; Perl, Python, scripts; Mozilla, web browser; OpenOffice, Office suite, including word processor, spreadsheet and presentation software; samba, file and printer server; Zope, PHP, active server page software; GIMP, image editor; BIND, name services; sendmail, mail servers, 90%+ of the email traffic world-wide.

Some projects went beyond and actively developed software which they released under an Open Source license: SPIRIT, inventory of Open Source health software and fostering its use; PICNIC, regional health network services; SMARTIE, applications for portable devices, PDA; OpenECG, for ECG standardisation; CORAS, open framework for risk analysis; HARP, security policies embedded in applications; OSMIA, medical imaging (OSMIA is not in the portfolio of projects of the eHealth Unit. See CORDIS for more information on this project).

The medical informatics constituency is more and more aware of the benefits of the Open Source approach. Medical associations such as IMIA([35]), Medbiquitous([36]) or OSHCA([37]) have set up working groups on the subject. On the other side of the ocean, AMIA([38]) or AAFP([39]) is about to do the same. Commercial venture is still very modest although a few SME have created an Open Source offer for health IT in France, Germany and UK mainly.

([30]) AM-SD *http://www.am-sd.org*

([31]) Smart cards *http://www.cordis.lu/ist/ka2/rptspolicyconf.htm*

([32]) Netc@rd *http://www.cordis.lu/ist/ka1/health/projectbooklet/others2.htm#eTen*

([33]) Transcards *http://www.sesam-vitale.fr/html/projets/transcards/tcd_accueil_eng.htm*

([34]) *http://ksz-bcss.fgov.be*

([35]) IMIA *http://www.chirad.info/imiaopensourcewg01.htm*

([36]) Medbiquitous *http://www.medbiq.org*

([37]) OSHCA *http://www.oshca.org*

([38]) AMIA *http://www.amia.org*

([39]) AAFP *http://www.aafp.org/x18356.xml*

Annex 3 – Index of participants

Short Name	Legal Name	Legal Status[40]	Country	Participation in projects
12-oct	HOSPITAL 12 DE OCTUBRE	GOV	E	SALUT
A.G.M.	A.G.M. COMMUNICATION & CONTROL LTD.	PRC	ISR	INHALE
A.T.C.	ADVANCED TECHNOLOGY CORPORATION S.A.	PUC	B	CEMAT
Aalborg University	AALBORG UNIVERSITET	GOV	DK	TREAT
Aarhus	AARHUS UNIVERSITY HOSPITAL	GOV	DK	TOSCA
AAS	AALBORG HOSPITAL	GOV	DK	TREAT
AAT	AAT ANALYSIS AUTOMATION TRADING SRL	PRC	I	PARREHA
ACTA SERVICE	ACTA SERVICE S.R.L.	PRC	I	GLANCE
ADAKOS	ADAKOS GMBH - ADVANCED KNOWLEDGE SOLUTIONS	PRC	D	TOSCA
ADAPTING	ADAPTING, S.L.	PRC	E	DEVASPIM
ADERA SERVICE	ADERA SERVICE	PRC	F	ICUST 2001
AEA	AEA TECHNOLOGY ENGINEERING SOFTWARE LIMITED	PRC	UK	GEMSS
AFCON	FEUCHTWANGER INDUSTRIES LIMITED	PRC	ISR	NISAN
AGILENT	AGILENT TECHNOLOGIES EUROPE BV	PRC	NL	DAPHNE
AHS	ADVANCED HALL SENSORS LIMITED	PRC	UK	DIAPOLE
AIAS	ADVANCED INTELLIGENT AUTOMATIC SYSTEMS LTD.	PRC	CY	TELEPLAN
AIDIMA	ASOCIACION DE INVESTIGACION Y DESARROLLO EN LA INDUSTRIA DEL MUEBLE Y AFINES	PNP	E	IDEAS
AIR MACHINE	AIR MACHINE S.R.L.	PRC	I	E-REMEDY
AIRIAL CONSEIL	AIRIAL CONSEIL	PRC	F	DOCMEM, INFACE, WEIGHT-INFO, PHARMA
AISL	AVEBURY INFORMATION MANAGEMENT SERVICES LIMITED	PRC	UK	PROEHTEL
AKIL	A K INDUSTRIES LIMITED	PRC	UK	IMP-ART
ALAMO	ALAMO-ON-LINE, S.A.	PRC	E	CHRONIC, CHARM
Alcatel	ALCATEL TELECOM NORWAY AS	PRC	N	TelemediCare
ALDIA	ALDIA COOPERATIVA SOCIALE	PNP	I	E-CARE
ALL	APPLIED LOGIC LABORATORY	PRC	HU	M2DM
ALPHA M.O.S.	ALPHA M.O.S. SA	PRC	F	WUNSENS
ALS	AIR LIQUIDE SANITA S.P.A.	PRC	I	KARMA2
Alta	ALTA KOMMUNE	GOV	N	TelemediCare
AMC	ATHENS MEDICAL CENTER S.A.	PRC	GR	DOCMEM, D-LAB, TELECARE, TELEPLAN
AMD	AMERICAN MEDICAL DEVELOPMENT INC	PRC	USA	CHS
AMP	ASSOCIAZIONE MEDICI PSICOTERAPEUTI	PNP	I	VEPSY UPDATED
ANALYTICA	ANALYTICA SOCIAL & ECONOMIC RESEARCH LTD	PNP	UK	TOSCA

(40) GOV: Governmental; PRC: Private Commercial Organisation; PUC: Public Commercial Organisation; PNP: Private Organisation, Non Profit; INO: International Organisation; JRC: Joint Research Centre; EEIG: European Economic Interest Group;

Short Name	Legal Name	Legal Status	Country	Participation in projects
ANCO	ANCO S.A. AGENCIES, COMMERCE & INDUSTRY	PRC	GR	PLACEBO, HEALTH MEMORY, PREVENTIVE, USBONE
ANOTO	ANOTO AB	PRC	S	OHM
AOP	AZIENDA OSPEDALIERA DI PARMA	PUC	I	HEALTHY-MARKET, MEDITRAV
AOP	AZIENDA OSPEDALIERA 'S. MARIA DEGLI ANGELI' DI PORDENONE	GOV	I	WEIGHT-INFO, ACTIVE HEALTH
AoT	ART OF TECHNOLOGY AG	PRC	CH	AMON
APLITEC	APLICACIONES TECNOLOGICAS A SERVICIOS Y MANTENIMIENTOS, APLITEC, SOCIEDAD LIMITADA	PRC	E	D-LAB, IDEAS, HEALTHMATE
ARAKNE	ARAKNE S.R.L.	PRC	I	MOBI-DEV
ARAY	ARAY LIMITED	PRC	UK	GLANCE, LIFELINGER
ARBO	OY ARBONAUT LTD	PRC	SF	TELECARE
ARCADES	ASSOCIATION POUR LA RECHERCHE ET LE DEPISTAGE DES CANCERS DU SEIN	GOV	F	SCREEN-TRIAL
ARDI	TECHNISCHE UNIVERSITAET MUENCHEN - KLINIKUM RECHTS DER ISAR	GOV	D	TOSCA
A'RHS CM (PESY)	A'REGIONAL HEALTH SYSTEM OF CENTRAL MACEDONIA	GOV	GR	RESHEN
ARKE'	COOPERATIVA SOCIALE ARKE' A R.L.	PRC	I	PREVENTIVE
ARRO	ARRO ELEKTRO A/S	PRC	N	MONITORHEALTH-CARE
ASCENDIA	ASCENDIA AKTIEBOLAG	PRC	S	AMIT
ASD	ASD ADVANCED SIMULATION AND DESIGN GMBH	PRC	D	GEMSS
ASL3	AZIENDA OSPEDALIERA LOCALE MILANO 3 - MONZA	GOV	I	CHARM
ASPI	ALCATEL SPACE INDUSTRIES	PRC	F	U-R-SAFE
AT	AGILENT TECHNOLOGIES ITALIA S.P.A.	PRC	I	CHS
ATB	INSTITUT FUER ANGEWANDTE SYSTEMTECHNIK BREMEN GMBH	PNP	D	TEAM-HOS
ATB	ADVANCED TECHNOLOGIES IN BUSINESS LIMITED	PRC	UK	E-CARE, PARREHA, @HOME
ATC	ATC AZIENDA TRASPORTI CONSORZIALI BOLOGNA	PUC	I	TOSCA
ATKO	ATKOSOFT S.A.	PRC	GR	BODY LIFE, SMARTIE, WEALTHY, ACTIVE HEALTH
ATLANTE	ATLANTE SISTEMAS S.L.	PRC	E	CHILDCARE
ATYS	ATYS SARL	PRC	F	IMAGUM
AU	ISTITUTO AUXOLOGICO ITALIANO	PNP	I	VEPSY UPDATED
AURELIA MICRO	AURELIA MICROELETTRONICA S.P.A.	PRC	I	PLACEBO, LIFEBELT, AMON
AUSL	AZIENDA UNITA SANITARIA LOCALE DI REGGIO EMILIA	PNP	I	PHARMA
AUSL Parma	AZIENDA USL DI PARMA. DISTRETTO 'VALLI TARO E CENO'	GOV	I	DOCMEM
AUSLM	AZIENDA UNITA SANITARIA LOCALE DI MODENA	PUC	I	CHILDCARE, D-LAB, DICTATE
AUTH	ARISTOTLE UNIVERSITY OF THESSALONIKI	GOV	GR	MOBI-DEV, TOSCA, CHS, PANACEIA-ITV, LIFEBELT

Short Name	Legal Name	Legal Status	Country	Participation in projects
AVIENDA	AVIENDA LIMITED	PRC	UK	PROEHTEL
AZOV	AZIENDA OSPEDALIERA 'OSPEDALE CIVILE DI VIMERCATE'	GOV	I	CHARM
AZ-VUB	AKADEMISCH ZIEKENHUIS VRIJE UNIVERSITEIT BRUSSEL	PNP	B	WEBLINC
B&K	B-K MEDICAL A/S	PRC	DK	MITTUG
BAAN	BAAN DEVELOPMENT B.V.	PRC	NL	IDEAS
BAC	BUSINESS ARCHITECTS CONSULTANCY A.E.	PRC	GR	RESHEN
BARCO	BARCO NV	PRC	B	SCREEN
BARILLA	BARILLA ALIMENTARE S.P.A.	PRC	I	HEALTHY-MARKET
BAUMER-CURAVITA	PFLEGETEAM BAUMER-CURAVITA	PRC	D	CHS
BAYER	BAYER PUBLIC LIMITED COMPANY	PRC	UK	D-LAB
BBSP	ZENTRALKRANKENHAUS ST.-JUERGEN-STRASSE	GOV	D	SCREEN-TRIAL
BCN	BARCELONA SEMICONDUCTORS, SL	PRC	E	INHALE
BECKER	DR. THOMAS BECKER GMBH	PRC	D	PRE-HIP
BIC	BRAIN INJURED CHILDREN ITALIA	PNP	I	KARMA2
BILD	THE BRITISH INSTITUTE OF LEARNING DISABILITIES	PRC	UK	TELELOGOS
BIO SRL	BIO SRL	PRC	I	IMAGUM
BIOSIGNA	INSTITUT FUER BIOSIGNALVERARBEITUNG UND SYSTEMANALYSE	PRC	D	OPENECG
BMR	BIOMEDICAL RESEARCH AG	PRC	CH	MOEBIUS
BMT	BRITISH MARITIME TECHNOLOGY LIMITED	PRC	UK	E-REMEDY, WARD-IN-HAND
BOCOC	BANK OF CYPRUS ONCOLOGY CENTRE	PNP	CY	E-CARE, TELEPLAN
BOEHRINGER	BOEHRINGER INGELHEIM ITALIA - S.P.A.	PRC	I	HEALTH MEMORY
BONG	BONG COMMUNICATIONS SRL	PRC	I	WOMAN II
BORDERZONE	BORDERZONE S.R.L.	PRC	I	WEIGHT-INFO
BRAINLAB	BRAINLAB HOLDING AG	PRC	D	IHELP, TELEPLAN
BRAINSTORM	MICRONICS TELESYSTEMS LIMITED	PRC	UK	TELELOGOS
BRESCIA	AZIENDA OSPEDALERIA 'SPEDALI CIVILI' DI BRESCIA	GOV	I	EDISCIM
BRITISH COMP.S.	BRITISH COMPUTER SOCIETY: HEALTH INFORMATICS COMMITTEE	PNP	UK	MEDINFO
BROMPTON	ROYAL BROMPTON & HAREFIELD NHS TRUST	GOV	UK	PANACEIA-ITV
BT	BRITISH TELECOMMUNICATIONS PLC	PRC	UK	PROEHTEL
BTC	BLOOD TRANSFUSION CENTRE OF SLOVENIA	GOV	SI	STEMNET
BTL	BTL MEDICAL LTD	PRC	UK	INHALE
BU	UNIVERSITA DEGLI STUDI DI BRESCIA	GOV	I	EPI-MEDICS
BULL	BULL DEVELOPPEMENT SA	PRC	F	HEALTHMATE, MOEBIUS
BUTE	BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS	GOV	HU	REHAROB
C.S.C.	CORPORACIO SANITARIA CLINIC	PUC	E	IHELP, U-R-SAFE, E-REMEDY, WARD-IN-HAND, OTELO, CHRONIC, CHARM, MOBIHEALTH

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CALA LEVANTE	CALA LEVANTE S.R.L.	PRC	I	PREVENTIVE
CANALWEB	CANALWEB S.A.	PRC	F	HEALTHSAT
CARDGUARD	CARD-GUARD SCIENTIFIC SURVIVAL LIMITED	PRC	ISR	U-R-SAFE, INCA, CHS, PANACEIA-ITV
CAS	THE CYPRUS ANTI-CANCER SOCIETY	PNP	CY	E-CARE
CATAI	ASOCIACION CENTRO ALTA TECNOLOGIA EN ANALISIS IMAGEN	PNP	E	CHS
CBIM	CONSORZIO DI BIOINGEGNERIA E INFORMATICA MEDICA	PNP	I	HOMEY, M2DM
CBMD/IKEM	CZECH BONE MARROW REGISTRY, INSTITUTE OF CLINICAL AND EXPERIMENTAL MEDICINE, PRAGUE	GOV	CZ	STEMNET
CCLRC	COUNCIL FOR THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS	GOV	UK	CORAS
CCM	CENTRO ESTETICO MENORCA, S.L.	PRC	E	WEIGHT-INFO
CDP	CENTRE DIAGNOSTIC PEDRALBES, S.A.	PRC	E	INTERPRET
CdR	COMUNE DI ROMA	GOV	I	MTM
CEA	COMMISSARIAT A L'ENERGIE ATOMIQUE	GOV	F	DynCT
CENLAS	CENTRO LASER S.C.R.L.	PNP	I	NUCLEO
CENTER	CENTER TOOL A/S	PRC	DK	IMP-ART
CENTIS	CENTRO DE ESTUDOS DE NOVAS TECHNOLOGIAS DE INFORMACAO APLICADAS A SAUDE	PNP	P	WIDENET
CERN	EUROPEAN ORGANISATION FOR NUCLEAR RESEARCH	INO	Int. Org.	MAMMOGRID
CERTH	CENTRE FOR RESEARCH AND TECHNOLOGY HELLAS	PNP	GR	OTELO
CESTEL	CENTRO ESPANOL DE SERVICIOS TELEMATICOS S.A	PRC	E	M2DM, CHRONIC
CESVIT	CESVIT MICROELETTRONICA S.R.L	PRC	I	TELECARE
CET	CENTRAL EUROPE TRANSPLANT FOUNDATION	PNP	NL	STEMNET
CF	CLINICA FEMENIA	PRC	E	MTM
CGS	C.G.S. DI COLUCCIA MICHELE & C. S.A.S.	PRC	I	DIAFOOT
CGT	CONFEDERATION GENERALE DU TRAVAIL	PNP	F	TOSCA
CHARITE	HUMBOLDT-UNIVERSITAET ZU BERLIN - UNIVERSITAETSKLINIKUM CHARITE	GOV	D	WEBLINC
CHILL	CHANNEL HEALTH INTERACTIVE LIFESTYLE LIMITED	PRC	UK	HEALTHSAT
CHU TOULOUSE	CENTRE HOSPITALIER UNIVERSITAIRE DE TOULOUSE	GOV	F	U-R-SAFE, PHARMA
City	CITY UNIVERSITY LONDON	GOV	UK	ADICOL, M2DM, BIOGRID
CLAREPAK	CLARE-PAK LIMITED	PRC	IRL	INHALE
CLB	CENTRE LEON BERARD	PNP	F	WEBLINC
CLERT	CENTRE FOR LAW ETHICS AND RISK IN TELEMEDICINE	PRC	UK	PROEHTEL
CLINICA VIRGEN	NISA NUEVAS INVERSIONES EN SERVICIOS S.A.	PRC	E	DIAFOOT
CMG	CMG WIRELESS DATA SOLUTIONS (NETHERLANDS) B.V.	PRC	NL	MOBIHEALTH
CMNS	CONSORZIO MARIO NEGRI SUD	PNP	I	EPI-MEDICS
CNOM	CONSEIL NATIONAL DE L'ORDRE DES MEDECINS	PNP	F	PROEHTEL

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CNR-IP	CONSIGLIO NAZIONALE DELLE RICERCHE	GOV	I	IS4ALL, OPENECG, HEARTS, C-CARE
CNRS	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE	GOV	F	INFACE, BODY LIFE, HKIS, WEALTHY
COATING	COATING INDUSTRIES	PRC	F	SME AWARD, PRE-HIP
COCIR	EUROPEAN COORDINATION COMMITTEE OF THE RADIOLOGICAL AND ELECTROMEDICAL INDUSTRIES	PRC	D	PROEHTEL, IHE-E
COMPAQ	COMPAQ COMPUTER B.V.	PRC	NL	MOBIHEALTH
COMPUTAS AS	COMPUTAS AS	PRC	N	IDEAS
CONECTA	CONECTA S.R.L.	PRC	I	SPIRIT, SALUT
COSMED	COSMED S.R.L.	PRC	I	LIQUAMO
CPH	HOSPITAL UNIVERSITARIO CLINICA PUERTA DE HIERRO	GOV	E	DynCT
CR	CLINICA NUESTRA SENORA DEL ROSARIO	PRC	E	MTM
CR4aka	LINKOEPINGS UNIVERSITET	GOV	S	INFOGENMED
CRF	CENTRO RICERCHE FIAT SOCIETA CONSORTILE PER AZIONI	PNP	I	IDEAS
CRIC	CENTRE DE RECERCA I INVESTIGACIO DE CATALUNYA S.A.	PRC	E	INHALE
CRID	FACULTES UNIVERSITAIRES NOTRE-DAME DE LA PAIX (F.U.N.D.P.)	GOV	B	GEMSS
CRP SANTE	CENTRE DE RECHERCHE PUBLIC DE LA SANTE	GOV	L	ICOTEL
CRS4	SOCIETA CONSORTILE A RESPONSABILITÀ LIMITATA CENTRO DI RICERCA, SVILUPPO E STUDI SUPERIORI IN SARDEGNA	PRC	I	IERAPSI
CRSSA	CENTRE DE RECHERCHES DU SERVICE DE SANTE DES ARMEES	GOV	F	WEALTHY
CS SI	CS SYSTEMES D'INFORMATION	PRC	F	IERAPSI
CSEM	CSEM CENTRE SUISSE D'ELECTRONIQUE ET DE MICROTECHNIQUE SA - RECHERCHE ET DEVELOPPEMENT	PRC	CH	U-R-SAFE, WEALTHY, NISAN
CSIC	CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	GOV	E	GAIT, CHRONIC, SALUT
CSPO	CENTRO PER LO STUDIO E LA PREVENZIONE ONCOLOGICA	GOV	I	SCREEN-TRIAL
CST	CONSORCI SANITARI DE TERRASSA	PUC	E	HUMAN
CTI	RESEARCH ACADEMIC COMPUTER TECHNOLOGY INSTITUTE	GOV	GR	DICTATE, CORAS
CUP 2000	CUP 2000 SRL	PRC	I	CHARM
CUS	COMMUNAUTE URBAINE ET VILLE DE STRASBOURG	GOV	F	TOSCA
CUSTODIX	CUSTODIX	PRC	B	PRIDEH, PRIDEH-GEN
CWU	COMMUNICATIONS WORKERS UNION	PNP	IRL	TOSCA
CYFRONET	AKADEMICKIE CENTRUM KOMPUTEROWE CYFRONET AKADEMII GORNICZO-HUTNICZEJ IM. STANISLAWA STASZICA W KRAKOWIE	GOV	PL	PRO-ACCESS
DAP	D'APPOLONIA S.P.A.	PRC	I	WEBLINC
DARVA	DEVELOPPEMENT D'APPLICATIONS SUR RESEAUX A VALEUR AJOUTEE	PRC	F	DOCMEM, MEDITRAV

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DATABLUE	DATABLUE S.A.	PRC	GR	WEIGHT-INFO, USBONE
DATAMAT	DATAMAT S.P.A.	PRC	I	HEARTS
DATAMED	DATAMED S.A. HEALTHCARE INFORMATION SYSTEMS	PRC	GR	TOPCARE, MEDITRAV
DATMO	DATASOFT MANAGEMENT SA	PRC	B	PHARMDIS-E+, C-CARE
Daum	DAUM GMBH	PRC	D	AMIT
DCI	DEFENCE AND CIVIL INSTITUTE OF ENVIRONMENTAL MEDICINE	GOV	CA	MITTUG
DCMB	DIABETES CENTRE MUNICH BOGENHAUSEN	PNP	D	M2DM
DFC	UNIVERSITA DEGLI STUDI DI FIRENZE	GOV	I	TELEPLAN
DGC	DIAGNOSTIC GENETIC CENTER S.A	PRC	GR	INFOGENE
DGSPIR	GENERALITAT DE CATALUNYA	GOV	E	HUMAN
DIABEM	FUNDACIO PRIVADA DIABETES, ENDOCRINOLOGIA I METABOLISME-FUNDACIO DIABEM	PNP	E	INCA, M2DM
DIFE	DEUTSCHES INSTITUT FUER ERNAEHRUNGFORSCHUNG, POTSDAM-REHBRUECKE	GOV	D	BODY LIFE
DIM	LES HOPITAUX UNIVERSITAIRES DE GENEVE	PNP	CH	WRAPIN
DIST	UNIVERSITA DEGLI STUDI DI GENOVA	GOV	I	CHS, WARD-IN-HAND, JUST
DIST	DIPARTIMENTO DI INFORMATICA SISTEMISTICA E TELEMATICA	GOV	I	VEPSY UPDATED
DKFZ	DEUTSCHES KREBSFORSCHUNGSZENTRUM	GOV	D	WEBLINC, MTM
DKL	DKL EUROPE NV	PRC	B	LIQUAMO
DMR	EV.-LUTH. DIAKONISSEN-MUTTERHAUS ROTENBURG (WUEMME) E.V.	PNP	D	TEAM-HOS
DMS	DISETRONIC MEDICAL SYSTEMS AG	PRC	CH	ADICOL, INCA
DMS	DMS SA	PRC	F	IR-BOSS
DOCLAB	THE DOCTORS LABORATORY LIMITED	PRC	UK	H-LIFE
DRAGER	DRAGER NEDERLAND B.V.	PRC	NL	TOPCARE
DRI	FORSCHERGRUPPE DIABETES E.V. - INSTITUT FUER DIABETESFORSCHUNG	GOV	D	INCA
DTT	DELOITTE & TOUCHE MANAGEMENT SOLUTIONS SA	PRC	B	HIN-EUROPE
DUNVENGAN	DUNVEGAN NETWORKS LTD	PRC	UK	LIFELINGER
DUVIDEO	DUVIDEO II - PROFISSIONAIS DE IMAGEM S.A.	PRC	P	LIFELINGER
E&Y	ERNST & YOUNG AUDIT	PRC	F	PRIDEH
EADS CCR	EADS CCR	PRC	F	IDEAS
EAR	EUROPEAN ASSOCIATION OF RADIOLOGY	PNP	A	IHE-E
EBIT	EBIT SANITA S.P.A.	PRC	I	OTELO, @HOME
ECD	ERICSSON CONSULTING GMBH	PRC	D	MOBIHEALTH
EC-JRC-ISIS	EUROPEAN COMMISSION - JOINT RESEARCH CENTRE	JRC	I	PARREHA
Ecomit	ECOMIT EUROPEAN S.L.	PRC	E	PICNIC
EHTEL	EUROPEAN HEALTH TELEMATICS ASSOCIATION	PNP	B	IS4ALL, PROEHTEL
EKF	EKF-DIAGNOSTIC GMBH	PRC	D	DIAPOLE
ELE	ELE-PRODUCTS OY	PRC	SF	DIAPOLE
ELEKTA	ELEKTA INSTRUMENT AB	PRC	S	ADEQUATE

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ELSACOM	ELSACOM S.P.A	PRC	I	OTELO
ELSAG	ELSAG S.P.A.	PRC	I	VEPSY UPDATED
ELSY-INFORMATIQUE	ELSY-INFORMATIQUE SARL	PRC	F	STRESST
ELTA	ELTA ELECTRONICS+C44 INDUSTRIES LTD.	PRC	ISR	DynCT
ELYROS	ELYROS S.A.	PRC	B	IHELP, USBONE, H-LIFE, TELEPLAN
EMC	EVANGELISTRIA MEDICAL CENTRE LIMITED	PRC	CY	INFACE
EMPHASIS	EMPHASIS SYSTEMS AE	PRC	GR	CHILDCARE, E-REMEDY, HEALTHY-MARKET
ENET	EFA NET (UK) LTD	PRC	UK	ASTHMAWEB
ENGINEERING	ENGINEERING - INGEGNERIA INFORMATICA - S.P.A.	PRC	I	HOMEY
ENGISAN	ENGISANITA S.P.A.	PRC	I	C-Care
EP	EUROPEAN PROFILES S.A.	PRC	GR	WEIGHT-INFO
EPA	EPA ECOLOGIA PREVENZIONE AMBIENTE SRL	PRC	I	CLEANWORLD
EPFL	ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE	GOV	CH	JUST
EPO	EPOGRAF LTD.	PRC	GR	TELEPLAN
ERGO	ERGO S.A.	PRC	GR	NISAN
ERGON	ERGON CONSULTING AND SYSTEMS SA	PRC	GR	D-LAB, PHARMA
Erlangen	FRIEDRICH-ALEXANDER UNIVERSITAET ERLANGEN - NUERNBERG	GOV	D	TOSCA
ESA	ESAOTE S.P.A.	PRC	I	MITTUG
ESA	EUROPEAN SPACE AGENCY	INO	Int. Org.	TM-ALLIANCE
ESIS	ESIS GROUP S.R.L.	PRC	I	DIAPOLE
ET	ELETTRONICA TRENTINA S.P.A.	PRC	I	EPI-MEDICS
ETHZ	EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH	GOV	CH	AMON
ETUC	EUROPEAN TRADE UNION CONFEDERATION	PNP	B	TOSCA
EUR	ERASMUS UNIVERSITEIT ROTTERDAM	GOV	NL	PICNIC
EUROCITIES	EUROCITIES	PNP	B	TOSCA
Eurocord-Slovakia	SLOVAK PLACENTAL HAEMATOPOETIC STEM CELL REGISTRY EUROCORD-SLOVAKIA	PNP	SK	STEMNET
EURODIAGNOSI	EURODIAGNOSIS S.A.	PRC	GR	DICTATE
EUROPARK	EUROPARK	PNP	E	PARREHA
EUROPDONOR	STICHTING EUROPDONOR FOUNDATION	PNP	NL	STEMNET
EUROPLAN XXI	PROYECCION EUROPLAN XXI, S.L.	PRC	E	DIAFOOT
EUTELSAT	EUTELSAT S.A.	PRC	F	HUMAN
EW	EDELWEB	PRC	F	CHRONIC
EXATEL	EXATEL VISUAL SYSTEMS LTD.	PRC	ISR	INCA
EXPER	EXPER S.A.S.	PRC	I	PHARMA
EXPERTNET	EXPERTNET S.A.	PRC	GR	RESHEN
EZ INGENIERIA	MERINO MACDONNELL, EDUARDO DANIEL	PRC	E	LIFELINGER
FAM	FUNDACION AIRTEL MOVIL	PNP	E	MOBI-DEV, HEALTHMATE
FAPERIN	FAPERIN, S.L.	PRC	E	DIAPOLE
FARMILA	FARMILA-FARMACEUTICI MILANO SPA	PRC	I	WUNSENS

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FAST FORWARD	FAST FORWARD PLIROFORIKI S.A.	PRC	GR	DROMEAS
FAZ-UNT	UNIVERSIDAD NACIONAL DE TUCUMAN	GOV	AR	HEALTHY-MARKET
FCD	UNIVERSITE RENE DESCARTES - FACULTE DE CHIRURGIE DENTAIRE	GOV	F	IMAGUM
FD	TRISTRAM CLIVES	PRC	F	MEMO
FHG	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	PNP	D	IS4ALL, ADICOL, DIAPOLE, INCA, IMAGUM, @HOME, TOPCARE, MITTUG, WUNSENS
FIG	FUNDACION INSTITUTO GUTTMANN	PNP	E	H-CAD
FIMIM	FUNDACIO IMIM	PNP	E	MEMO, SMARTIE
FMT	FUTUREMEDTEC	PRC	ISL	OHM
FNLCC	FEDERATION NATIONALE DES CENTRES DE LUTTE CONTRE LE CANCER	PNP	F	WEBLINC
FOREM	FUNDACION FORMATION Y EMPLEO 'MIGUEL ESCALERA'	PNP	E	TOSCA
FORMULA	GRUPPO FORMULA S.P.A.	PRC	I	IDEAS
FORTH	FOUNDATION FOR RESEARCH AND TECHNOLOGY - HELLAS	PNP	GR	IS4ALL, PLACEBO, OPENECG, TELECARE, ACTIVE HEALTH, PICNIC, CORAS, USBONE, H-LIFE, JUST
FRESENIUS	FRESENIUS AG	PRC	D	TOPCARE
FTRD	FRANCE TELECOM SA	PRC	F	KARMA2
FUNEN	DANISH CENTRE FOR HEALTH TELEMATICS, COUNTY OF FUNEN	GOV	DK	PICNIC, JUST
FUNEN	FYNS AMT	GOV	DK	OPENECG
FVG	REGIONE AUTONOMA FRIULI- VENEZIA GIULIA	GOV	I	HEALTH MEMORY
GASMA	SYGXRONO IATRIKO DIAGNOSTIKO KENTRO THESSALONIKIS S.A.	PNP	GR	PREVENTIVE
GASTRO	UNIVERSITA DEGLI STUDI DI PALERMO - AZIENDA UNIVERSITARIA POLICLINICO	GOV	I	HUMAN
GEIE-LINC	EUROPEAN ECONOMIC INTEREST GROUPING 'LIASON NETWORK FOR CANCER'	EEIG	B	WEBLINC
Genias	GENIAS BENELUX BV	PRC	NL	IERAPSI
GENOMICA	STAB VIDA, INVESTIGACAO E SERVICOS EM CIENCIAS BIOLOGICAS LDA	PRC	P	INFOGENMED
GERATHERM	GERATHERM MEDICAL AG	PRC	D	CEMAT
GIUNTI Ilabs	INTERACTIVE LABS S.R.L.	PRC	I	JUST
GMCD	CLINIQUES UNIVERSITAIRES SAINT-LUC - CENTRE DE GENETIQUE HUMAINE	GOV	B	INFOGENE
GMD	GMD - FORSCHUNGSZENTRUM INFORMATIONSTECHNIK GMBH	PUC	D	IS4ALL, TOPCARE, HARP

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GMS	GENERAL MEDICAL SERVICES (PAYMENTS) BOARD	GOV	IRL	PICNIC
GMSIH	GROUPEMENT D'INTERETS PUBLIC POUR LA MODERNISATION DU SYSTEME D'INFORMATION HOSPITALIER	GOV	F	PROEHTEL
GOEHNER	AIT GOEHNER GMBH	PRC	D	WUNSENS
Goettingen	GEORG-AUGUST-UNIVERSITAET GOETTINGEN	GOV	D	TELEPLAN
GOUDSMIT	GOUDSMIT MAGNETICS (UK) LTD.	PRC	UK	INHALE
GPNOTT	THE UNIVERSITY OF NOTTINGHAM	GOV	UK	PHARMDIS-E+
GRAISOFT	GRAISOFT	PRC	F	IDEAS
GREATER DERBY PCT	GREATER DERBY PRIMARY CARE TRUST	GOV	UK	PLACEBO, LIFEBELT
Greengage	GREENGAGE COMPUTERS LIMITED	PRC	UK	ACTIVE HEALTH, H-LIFE
GSCOUT	GESUNDHEITSCOUT24 GMBH	PRC	D	MOBIHEALTH
GSF	GSF FORSCHUNGSZENTRUM FUER UMWELT UND GESUNDHEIT, GMBH	PNP	D	TOSCA
GST	GUY' S AND ST. THOMAS' HOSPITAL NATIONAL HEALTH SERVICE TRUST	PNP	UK	INFACE
GYN-B	UNIVERSITE DE LIEGE	GOV	B	WOMAN II
GYN-CH	UNIVERSITAETS-FRAUENKLINIK INSELSPITAL BERN	GOV	CH	WOMAN II
GYN-D	FREIE UNIVERSITAET BERLIN	GOV	D	WOMAN II
GYN-E	INSTITUTO PALACIOS DE SALUD Y MEDICINA DE LA MUJER	GOV	E	WOMAN II
GYN-F	UNIVERSITE PARIS 7 - DENIS DIDEROT	GOV	F	WOMAN II
GYN-IL	MENOPAUSE CLINIC, RAMAT-MARPE	GOV	ISR	WOMAN II
GYN-I-MI	H. SAN RAFFAELE RESNATI SPA	PRC	I	WOMAN II
GYN-I-NA	DIPARTIMENTO DI SCIENZE OSTETRICO GINECOLOGICHE UROLOGICHE E MEDICINA DELLA RIPRODUZIONE DELL'UNIVERSITÁ DEGLI STUDI DI NAPOLI FEDERICO II	GOV	I	WOMAN II
GYN-I-PI	DIPARTIMENTO DI MEDICINA DELLA PROCREAZIONE E DELL'ETÁ EVOLUTIVA DELL'UNIVERSITÁ DEGLI STUDI DI PISA	GOV	I	WOMAN II
GYN-MT	UNIVERSITY OF MALTA	GOV	MT	WOMAN II
GYN-NL	VRIJE UNIVERSITEIT MEDICAL CENTER AMSTERDAM	GOV	NL	WOMAN II
GYN-P	CFH - CLINICA DE FERMINOLOGIA HOLISTICA, LDA	PNP	P	WOMAN II
GYN-PL	WROCLAW MEDICAL UNIVERSITY	GOV	PL	WOMAN II
GYN-UK	BIRMINGHAM HEARTLANDS & SOLIHULL HOPSITAL NHS TRUST	GOV	UK	WOMAN II
GYN-UK-LEICESTER	UNIVERSITY OF LEICESTER	GOV	UK	WOMAN II
HAS BALT	HAS BALTIJA LTD	PRC	LV	STRESST
HCS	HELLENIC CARDIOLOGICAL SOCIETY	PNP	GR	H-LIFE
HET	HALL EFFECT TECHNOLOGIES LIMITED	PRC	UK	DIAPOLE
HFEIRA	HOSPITAL DE SAO SEBASTIAO DE SANTA MARIA DA FEIRA	GOV	P	TEAM-HOS
HGUGM	HOSPITAL GENERAL UNIVERSITARIO GREGORIO MARANON	GOV	E	ADEQUATE, HEALTH MEMORY
HHUD	HEINRICH-HEINE-UNIVERSITAET DUESSELDORF	GOV	D	SMARTIE

Short Name	Legal Name	Legal Status	Country	Participation in projects
HIA	FORSCHUNGSGESELLSCHAFT FUER BIOMEDIZINISCHE TECHNIK E.V., AACHEN	GOV	D	MI3
HII	LUDWIK HIRSZFELD INSTITUTE OF IMMUNOLOGY AND EXPERIMENTAL THERAPY, POLISH ACADEMY OF SCIENCES	PNP	PL	STEMNET
HIM SA	HEALTH INFORMATION MANAGEMENT	PRC	B	CHARM, C-CARE
HISCOM	HISCOM BV	PRC	NL	PROEHTEL
HITECH	HITECH CONSULTANTS S.A.	PRC	GR	DOCMEM, @HOME, MEDITRAV
HITMED	HIT MEDICA SRL	PRC	I	SME AWARD, PRE-HIP
HMC	INTERNATIONAL MEDICAL SERVICES H.M.C. (ISRAEL) LTD	PRC	ISR	CHILDCARE, DROMEAS, H-LIFE
HON	HEALTH ON THE NET (HON)	GOV	CH	WRAPIN, ACTIVE HEALTH
HOPE	HELLENIC COMMITTEE FOR HOPE PROGRAMME	PNP	GR	MOBI-DEV, MEMO
HOSP90	HOSPITAL 9 DE OCTUBRE, SOCIEDAD ANONIMA	PRC	E	IDEAS
HOSPFE	HOSPITAL UNIVERSITARIO LA FE	GOV	E	IDEAS
HOSPLUBL	UNIWERSYTECKA OPIEKA ZDROWOTNA SPOLKA Z OGRANICZONA ODPOWIEDZIALNOSCIA	GOV	PL	PHARMDIS-E+
HOSPOER	OEREBRO MEDICAL CENTRE HOSPITAL (REGIONSJUKHUSET)	PUC	S	PHARMDIS-E+
HRD	HOPITAL ROBERT DEBRE-UNIVERSITE PARIS V	GOV	F	INFOGENE
HSR	FONDAZIONE CENTRO SAN RAFFAELE DEL MONTE TABOR	PNP	I	WEALTHY
HTROFA	HOSPITAL DA TROFA	GOV	P	TEAM-HOS
HUS	HELSINGIN JA UUDENMAAN SAIRAANHOITOPIIRIN PERUSSOPIMUS	GOV	SF	MEDITRAV
HUTCHEON	HUTCHEON SERVICES LIMITED	PRC	UK	MONITORHEALTH-CARE
IAITI	INSTITUTO AGILUS DE INOVACAO EM TECNOLOGIA DE INFORMACAO, LDA	PRC	P	LIFELINGER
IBM CR	IBM CESKA REPUBLIKA, SPOL. S R.O.	PRC	CZ	MEMO
IBMTP	UNIVERSITAET WIEN - INSTITUT FUER BIOMEDIZINISCHE TECHNIK UND PHYSIK	GOV	A	GEMSS
IBRI	IOANNINA BIOMEDICAL RESEARCH INSTITUTE	GOV	GR	H-LIFE, USBONE
IBV	INSTITUTO DE BIOMECANICA DE VALENCIA	PNP	E	GAIT, DEVASPIM
IC	INSTITUT CURIE	PNP	F	HKIS
IC FOCUS	IC FOCUS LIMITED	PRC	UK	IDEAS
ICB	INSTITUT FUER CHEMO- UND BIOSENSORIK E.V. MUENSTER	PNP	D	ADICOL
ICCS/NTUA	INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS OF THE NATIONAL TECHNICAL UNIVERSITY OF ATHENS	GOV	GR	D-LAB, TELECARE, PARREHA, TOPCARE, DROMEAS, MEDITRAV, TELEPLAN
ICHTEL	THE IRISH CENTRE FOR HEALTH TELEMATICS	PNP	IRL	WIDENET
ICOM	INTRACOM S.A. HELLENIC TELECOMMUNICATIONS AND ELECTRONICS INDUSTRY	PRC	GR	IDEAS, PANACEIA-ITV, HEARTS, CORAS
ICP	AZIENDA OSPEDALIERA ISTITUTI CLINICI DI PERFEZIONAMENTO	GOV	I	CHRONIC
ICRF	IMPERIAL CANCER RESEARCH FUND	PNP	UK	HOMEY

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ICS	INSTITUT CATALA DE LA SALUT	GOV	E	CHARM
ICSTM	THE IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE	GOV	UK	TOSCA, AMIT
IDAC	IDAC IRELAND LTD	PRC	IRL	GEMSS
IDI	INSTITUT DE DIAGNOSTIC PER LA IMATGE	PUC	E	INTERPRET
IDS SCHEER	IDS SCHEER AG	PRC	D	CHILDCARE, E-CARE
IDS-CR	IDS SCHEER CR, S.R.O	PRC	CZ	HEALTHY-MARKET, DICTATE, DROMEAS
IEETA	UNIVERSIDADE DE AVEIRO	GOV	P	INFOGENMED
IEO.EXP	ISTITUTO EUROPEO DI ONCOLOGIA S.R.L.	PNP	I	HKIS
IFE	INSTITUTT FOR ENERGITEKNIKK	PNP	N	CORAS
IFGASTEIN	INTERNATIONAL FORUM GASTEIN	PNP	A	IFG
IFMI	TECHNISCHE UNIVERSITAET CAROLO-WILHELMINA ZU BRAUNSCHWEIG	GOV	D	INCA
IFSI	INSTITUT DE FORMATION SYNDICALE INTERNATIONALE ASBL	PNP	B	TOSCA
IGESBER	IGES INSTITUT FUER GESUNDHEITS- UND SOZIALFORSCHUNG GMBH	PRC	D	PHARMDIS-E+
IGR	INSTITUT GUSTAVE ROUSSY	PNP	F	BEPRO
IIL	STIFTELSEN INSTITUTET FOER INDEPENDENT LIVING	PNP	S	KARMA2
IMASONIC	IMASONIC	PRC	F	IMAGUM
IMHE	UNIVERSITAETSKLINIKUM FREIBURG	GOV	D	TREAT, CEMAT
IMS-CHIPS	INSTITUT FUER MIKROELEKTRONIK STUTTGART	GOV	D	IVP
IN4TEK	IN4TEK LIMITED	PRC	UK	PICNIC
INESCA	UNIVERSIDADE DE AVEIRO	GOV	P	TEAM-HOS
INESCOP	INSTITUTO ESPANOL DEL CALZADO Y CONEXAS- INESCOP	PNP	E	DIAFOOT
INFERMED	INFERMED LIMITED	PRC	UK	BEPRO, INFOGENE
INFORMA	INFORMA S.R.L.	PRC	I	MOBI-DEV, MEMO
INPG/TIMC	INST. NAT. POLYTECHNIQUE DE GRENOBLE	GOV	F	INFACE
INPT	INST. NAT. POLYTECHNIQUE DE TOULOUSE	GOV	F	U-R-SAFE
INRC	IST. NAZIONALE PER LA RICERCA SUL CANCRO	GOV	I	E-SCOPE, WEBLINC
INRIA	INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET EN AUTOMATIQUE	GOV	F	IS4ALL
INSA-LISI	INSTITUT NATIONAL DES SCIENCES APPLIQUEES DE LYON	GOV	F	EPI-MEDICS, WEALTHY
INSERM XR121	INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE	GOV	F	EPI-MEDICS
INST. DO CORACAO	INSTITUTO DO CORACAO	PNP	P	@HOME
INTERCERN	INTERCERN LIMITED	PRC	UK	MOBI-DEV
INTERSET	INTERSET S.A.	PRC	GR	E-CARE, LIFEBELT
INTERTECHNOLOGIES	INTERTECHNOLOGIES CONSULTANTS LIMITED	PRC	CY	HEALTHY-MARKET, DROMEAS
Intrasoft	INTRASOFT INTERNATIONAL SA	PRC	L	C-Care
INVERS	INVERS INNOVATIVE VERKEHRSTELEMATIKSYSTEME GMBH	PRC	D	TOSCA

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ION	ISM ION SCIENCE MESSTECHNIK GMBH	PRC	D	IMP-ART
IOR	ISTITUTI ORTOPEDICI RIZZOLI	GOV	I	PRE-HIP
IRES	ISTITUTO DI RICERCHE ECONOMICHE E SOCIALI - IRES	PNP	I	TOSCA
ISA	ISA- INSTRUMENTACAO E SISTEMAS DE AUTOMACAO, LDA	PRC	P	VALIDON
ISA-Consult	ISA CONSULT - BERATUNGSGESELLSCHAFT FUR INNOVATION, STRUKTURPOLITIK UND ARBEIT GMBH	PRC	D	TOSCA
ISC	INSTITUTO DE SALUD CARLOS III	GOV	E	MOBI-DEV, BIOINFOMED, INFOGENMED, WIDENET
ISERES	INSTITUT SYNDICAL D'ETUDES ET DE RECHERCHES ECONOMIQUES ET SOCIALES	PNP	F	TOSCA
ISMRA	INSTITUT DES SCIENCES DE LA MATIERE ET DU RAYONNEMENT	GOV	F	VEPSY UPDATED
ISOFT	ISOFT	PRC	F	HKIS
ISQ	INSTITUTO DE SOLDADURA E QUALIDADE	PNP	P	LIFELINGER
ISS	ISRAELI SOFTWARE SYSTEM LTD	PRC	ISR	CLEANWORLD
ISS	UNIVERSITAET WIEN - INSTITUT FUER SOFTWAREWISSENSCHAFT	GOV	A	GEMSS
IT Innovation	THE UNIVERSITY OF SOUTHAMPTON	GOV	UK	GEMSS
ITACA	INSTITUTO DE APLICACIONES DE LAS TECNOLOGIAS DE LA INFORMACION Y DE LAS COMUNICACIONES AVANZADAS-ITACA	GOV	E	ACTIVE HEALTH
ITC-irst	ISTITUTO TRENTINO DI CULTURA	GOV	I	HOMEY
ITU	INTERNATIONAL TELECOMMUNICATION UNION	INO	Int. Org.	TM-ALLIANCE
ITWM	INSTITUT FUER TECHNO- UND WIRTSCHAFTSMATHEMATIK E.V.	PNP	D	PRE-HIP
IXTREM	INNOVATION RAYONS-X ET TECHNIQUES REUSSAGE MAGNETOSCOPIE	PRC	F	BODY LIFE
JDL	JDL TECHNOLOGIES S.A.	PRC	B	NUCLEO
JUDEX	JUDEX DATASYSTEMS A/S	PRC	DK	ADICOL, TREAT
JUMP	JUMP STUDIOS LIMITED	PRC	UK	DAPHNE
KAENOTOMIA	KAENOTOMIA BUSINESS CONSULTING LTD	PRC	CY	TELELOGOS
Karolinska	KAROLINSKA SJUKHUSET	GOV	S	TelemediCare
Kaunas	KAUNAS UNIVERSITY OF TECHNOLOGY	GOV	LT	TelemediCare
KAVA	KONINKLIJKE APOTHEKERSVERENIGING VAN ANTWERPEN	PNP	B	C-Care
KBIS	KB IMPULS SERVICE GMBH	PRC	D	D-LAB
KCL	KING'S COLLEGE LONDON	GOV	UK	TOSCA, @HOME
KELL	KELL - S.R.L	PRC	I	OTELO
KI	KAROLINSKA INSTITUTET	GOV	S	IHELP
KI	KRANKENHAUS ITZEHOE	GOV	D	TEAM-HOS
KNOSOS, S.L.	KNOSOS, S.L.	PRC	E	HEALTHMATE
KPLAS	KNUDSEN PLAST A/S	PRC	DK	IMP-ART
KPN	KONINKLIJKE KPN NV, KPN RESEARCH	PRC	NL	HARP
KPNQWEST	KPNQWEST B.V.	PRC	NL	MEDITRAV
KRONOS	KRONOS N. KARAKITSOS SA	PRC	GR	HEALTHY-MARKET
KST	KARL STORZ GMBH & CO. KG	PRC	D	IVP

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KUL	KATHOLIEKE UNIVERSITEIT LEUVEN	PNP	B	CHRONIC
KULRD	K.U. LEUVEN RESEARCH & DEVELOPMENT	PNP	B	IVP
KW2	KW2 B.V.	PRC	NL	VALIDON
L&C	LANGUAGE AND COMPUTING NV	PRC	B	MOBI-DEV, MEMO, INFACE, HOMEY
LAC SILVA MONTEIRO	LABORATORIO DO ANALISES CLINICAS SILVA & MONTEIRO LDA	PRC	P	GLANCE
LAFITT	LAFITT, S.A.	PRC	E	DEVASPIM
LAMDA	LAMDA TECHNOLOGY LTD	PRC	GR	NISAN
LAMORAL	LAMORAL NV	PRC	B	IMAGUM
LC SYS	LC SYS	PRC	F	HEALTH MEMORY
LERTIM	LABORATOIRE D'ENSEIGNEMENT ET DE RECHERCHE EN TRAITEMENT DE L'INFORMATION MEDICAL	GOV	F	WRAPIN
LIS	LIFE IMAGING SYSTEM	PUC	CA	MITTUG
LITO	LITO HOSPITAL FOR WOMEN S.A.	PRC	GR	LIFEBELT
LKS	LANDESKLINIKEN SALZBURG	GOV	A	TEAM-HOS
LODZ	UNIVERSYTET MEDYCZNY W LODZI	GOV	PL	NISAN
LTU	LULEAA TEKNISKA UNIVERSITET	GOV	S	MOBIHEALTH
M.B.I.	M.B.I. S.R.L.	PRC	I	HUMAN
M.M.C. EUROPE	B.V. MEDICAL MANAGEMENT COMPANY (M.M.C. EUROPE)	PRC	NL	HEALTHSAT
Macro Pilot	SATAKUNTA MACRO PILOT	PNP	SF	PICNIC
MACSF	MUTUELLE D'ASSURANCE DU CORPS DE SANTE FRANCAIS	PRC	F	DOCMEM
MALEVOZ	HOSPITAL MALEVOZ	PRC	CH	SALUT
MAMEDI	AZIENDA OSPEDALIERA PISANA	GOV	I	DIAFOOT
MARAC	MARAC ELECTRONICS, S.A.	PRC	GR	ASTHMAWEB
Matla	MATLA SYSTEM, S.L.	PRC	E	MTM
MAXIM	MAXIM VOF	PRC	NL	BEPRO
MAXIMAL	MAXIMAL LIMITED	PRC	UK	DROMEAS
MB	MEDIBRIDGE NV	PRC	B	C-Care
MBC	MEVIS BREASTCARE GMBH & CO. KG	PRC	D	SCREEN-TRIAL
MC	MEDICASA S.P.A.	PRC	I	CHRONIC
MDIRECT	MDIRECT LTD.	PRC	ISR	AMON
MEAP	MEAP PERA-CHORIOU NISOU	PNP	CY	DROMEAS
MED	MEDCOM GESELLSCHAFT FUER MEDIZINISCHE BILDVERARBEITUNG MBH	PRC	D	MITTUG
MEDGATE	MEDGATE AG	PRC	CH	MOEBIUS
MEDICA	MEDICAL DIAGNOSIS & CARE	PRC	GR	E-REMEDY
MEDIHEER	MEDIWARE B.V.	PRC	NL	PHARMDIS-E+
MedIT	MEDIT AS	PRC	N	TelemediCare
MEDTRONIC	MEDTRONIC IBERICA SA	PRC	E	HEALTH MEMORY
ME-ESSEN	MEDIZINISCHE EINRICHTUNGEN DER UNIVERSITAET ESSEN	GOV	D	BEPRO
MEIR	TEL AVIV UNIVERSITY	PNP	ISR	NISAN
MESSE	MESSE FRANKFURT GMBH	PRC	D	WEALTHY

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META	META GROUP CENTRAL, EASTERN AND SOUTHERN EUROPE GMBH	PRC	D	ASTHMAWEB
METROLIFE	METROLIFE EMPORIKI S.A.	PRC	D	MEDITRAV
MeVis	MEVIS - CENTRUM FUER MEDIZINISCHE DIAGNOSESYSTEME UND VISUALISIERUNG GMBH	PNP	D	SCREEN, SCREEN-TRIAL
MeVis Technology	MEVIS TECHNOLOGY GMBH & CO. KG	PRC	D	SCREEN
MHMC	MARKET HARBOROUGH MEDICAL CENTRE	GOV	UK	CHILDCARE
MICREL	MICREL MEDICAL DEVICES S.A.	PRC	GR	TELECARE
MICROFORGE	MICROFORGE LIMITED	PRC	UK	WUNSENS
MICROSOFT H.U.G.E.	MICROSOFT HEALTHCARE USERS GROUP EUROPE	INO	Int. Org.	IS4ALL
MILIOR	MILIOR - S.P.A.	PRC	I	WEALTHY
MINORU	MINORU DEVELOPMENT	PRC	F	SPIRIT, PICNIC
MIRADA	MIRADA SOLUTIONS LIMITED	PRC	UK	ADEQUATE, MAMMOGRID
MISS	MINISTERY OF EMPLOYMENT AND SOLIDARITY - MISSION FOR INFORMATIZATION OF HEALTH SYSTEMS (MISS)	GOV	F	WRAPIN
MOON	MOON COMMUNICATION INTERNATIONAL LIMITED	PRC	UK	AMON
MOULINEX	MOULINEX S.A.	PRC	F	CEMAT
MOULINEX ESPANA	MOULINEX ESPANA S.A.	PRC	E	CEMAT
MPI	MAX-PLANCK GESELLSCHAFT ZUR FOERDERUNG DER WISSENSCHAFTEN E.V.	PNP	D	GEMSS
MRC	MEDICAL RESEARCH COUNCIL	GOV	UK	BEPRO, BIOGRID
MRC Systems	MRC SYSTEMS GMBH - MEDIZINTECHNISCHE SYSTEME	PRC	D	TTOOL
MST	STICHTING MEDISCH SPECTRUM TWENTE	PUC	NL	MOBIHEALTH
MTA SZTAKI	MAGYAR TUDOMANYOS AKADEMIA SZAMITASTECHNIKAI ES AUTOMATIZALASI KUTATO INTEZET	GOV	HU	WIDENET
MUTUAM	MUTUAM MUTUA DE PREVISIO SOCIAL	PNP	E	TELECARE
MWPHARM	RIJKSUNIVERSITEIT GRONINGEN	GOV	NL	PHARMDIS-E+, BIOGRID
NEC	NEC EUROPE LTD.	PRC	UK	GEMSS
NEHB	NORTH EASTERN HEALTH BOARD	GOV	IRL	CHARM
NEPHARM	UNIVERSITAETSKLINIKUM ULM	GOV	D	PHARMDIS-E+, HKIS
NETUNION	NETUNION S.A.R.L.	PRC	CH	SALUT, ACTIVE HEALTH
NEW VALUE	NEW VALUE NEGOCIOS DIGITAIS - TECNOLOGIAS DA INFORMACAO, S.A.	PRC	P	PLACEBO, USBONE, @HOME
NICE	NICE COMPUTING	PRC	CH	WRAPIN
NIHI	NATIONAL INSTITUTE OF HAEMATOLOGY AND IMMUNOLOGY	GOV	HU	STEMNET
NIMR	NATIONAL INSTITUTE FOR MEDICAL REHABILITATION	GOV	HU	REHAROB
NKHD	NORTH KARELIA HOSPITAL DISTRICT	GOV	SF	RESHEN
NKI	HET NEDERLANDS KANKER INSTITUUT	GOV	NL	BEPRO
NKUA	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS	GOV	GR	MOBI-DEV
NMRC	UNIVERSITY COLLEGE CORK - NATIONAL UNIVERSITY OF IRELAND, CORK	GOV	IRL	REAL-PROF
NMSC	NATIONAAL MULTIPLE SCLEROSE CENTRUM VZW	PNP	B	H-CAD
NPCF	DUTCH PATIENT CONSUMER FEDERATION (NEDERLANDSE PATIENTEN CONSUMENTEN FEDERATIE)	PRC	NL	PROEHTEL

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NR	NORSK REGNESENTRAL	PNP	N	HARP, CORAS
NTE	NTEC MEDIA GMBH - ADVANCED DIGITAL MOTION PICTURE SOLUTIONS	PRC	D	MITTUG
NTUA	NATIONAL TECHNICAL UNIVERSITY OF ATHENS	GOV	GR	RESHEN, HARP, MOEBIUS
NUC	NUCLETRON BV	PRC	NL	MITTUG
NWHB	NORTH WESTERN HEALTH BOARD	GOV	IRL	PICNIC
OBJECTIVE	OBJECTIVE S.A. - TECHNOLOGIC CONSULTING & SOFTWARE DEVELOPMENT	PRC	B	PLACEBO, PREVENTIVE
OCC	OXFORD COMPUTER CONSULTANTS LIMITED	PRC	UK	PARREHA
OCC	OEREBRO LAENS LANDSTING	GOV	S	SALUT
OFFENBACH	STAEDTISCHE KLINIKEN OFFENBACH	GOV	D	E-CARE, WARD-IN-HAND, MITTUG
OK SYSTEMS	OPTIMUM KNOWLEDGE SYSTEMS S.A.	PRC	GR	INFACE
Olisan	OLIVETTI SANITA S.P.A.	PRC	I	C-Care
OMEGA	OMEGA GENERATION S.R.L.	PRC	I	CHARM
OSSUR	OSSUR HF	PRC	ISL	GAIT, REAL-PROF
OTE	HELLENIC TELECOMMUNICATIONS ORGANIZATION S.A.	PRC	GR	PANACEIA-ITV
OUH	PPSHP:N KUNTAYHTYMA	GOV	SF	AMIT
P&S	POCKET AND SOUL	PRC	B	INFOGENE, ACTIVE HEALTH
PAGLIA	SECONDA CASA CIRCONDARIALE PALERMO - PAGLIARELLI	GOV	I	PHARMA, HUMAN
PAL	PANHELLENIC ASSOCIATION OF LOGOPEDISTS	PNP	GR	TELELOGOS
PATMOS	PATMOS S.R.L.	PRC	I	DICTATE
Penarth	UNIVERSITY OF WALES, CARDIFF	GOV	UK	TOSCA
PERA	PERA INTERNATIONAL	PRC	UK	DIAPOLE, WUNSENS
PERA	PERA INNOVATION LIMITED	PNP	UK	INHALE, IMP-ART
PHILIPS	PHILIPS MEDICAL SYSTEMS MR TECHNOLOGIES FINLAND OY	PRC	SF	AMIT
PHILIPS	PHILIPS MEDICAL SYSTEMS S.P.A.	PRC	I	CHS, DAPHNE
PIKOSYS	PIKOSYSTEMS OY	PRC	SF	IMP-ART
PLANET MEDICA	PLANET MEDICA S.A.	PRC	B	HEALTHSAT
PMS	PHILIPS MEDIZIN SYSTEME UNTERNEHMENSBEREICH DER PHILIPS GMBH	PRC	D	DynCT
PointerCom	POINTERCOM SRL	PRC	I	MTM
POLIMI	POLITECNICO DI MILANO	GOV	I	DAPHNE
POLIS	POLIS I.A.S.B.L.	PNP	B	TOSCA
POULIADIS	POULIADIS ASSOCIATES CORP	PRC	GR	CHS, PANACEIA-ITV
PR	PSICOLOGIA Y REALIDAD VIRTUAL S.L.	PRC	E	VEPSY UPDATED
PRAGMA	PRAGMA ENGINEERING S.R.L.	PRC	I	H-CAD
PRAXIM	PERCEPTION RAISONNEMENT ACTION EN MEDECINE	PRC	F	INTERPRET, DEVASPIM, MI3
PRECISION	PRECISION CONSULTING S.A.	PRC	B	DICTATE, LIFEBELT, DROMES
PREVENTICON	STICHTING PREVENTICON VOOR DE VROEGE OPSPORING VAN BORSTKANKER IN MIDDEN-NEDERLAND	PNP	NL	SCREEN-TRIAL

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PRL	PHILIPS ELECTRONICS UK LIMITED	PRC	UK	MOBIHEALTH
Progea	PROGEA	PRC	I	C-Care
Projectina	PROJECTINA AG	PRC	CH	EDISCIM
PROREC-BE	PROREC-BE VZW	GOV	B	WIDENET
PROREC-FRANCE	CENTRE FRANCAIS POUR LA PROMOTION DE SYSTEMES DE DOSSIERS DE SANTE INFORMATISES EUROPEENS DE QUALITE	PNP	F	WIDENET
PROWELLNESS	OY PROWELLNESS LTD	PRC	SF	WUNSENS
PSION	PSION DIGITAL LIMITED	PRC	UK	INFOGENE
QMW	QUEEN MARY AND WESTFIELD COLLEGE, UNIVERSITY OF LONDON	GOV	UK	CORAS
QR	QR S.R.L	PRC	I	MI3
QUB	QUBISOFT S.R.L	PRC	I	KARMA2
QUIRIN	QUIRIN DESIGN SA	PRC	F	IMAGUM
R.G.B.	R.G.B. MEDICAL DEVICES, S.A.	PRC	E	OPENECG
Rabin	RABIN MEDICAL CENTER	PNP	ISR	TREAT
RAFAEL	MINISTRY OF DEFENSE - RAFAEL, ARMAMENT DEVELOPMENT AUTHORITY	GOV	ISR	HARP
RAL	ROUNDROSE ASSOCIATES LTD	PRC	UK	TELECARE
RAMIT	RESEARCH IN ADVANCED MEDICAL INFORMATICS AND TELEMATICS	PNP	B	PANACEIA-ITV
RATB	REGIA AUTONOMA DE TRANSPORT BUCURESTI	GOV	RO	TOSCA
RATIO	RATIO-CONSULTA SPA	PRC	I	DOCMEM, MEDITRAV
RB	ROESSINGH BEHEER B.V.	PRC	NL	REAL-PROF
RC	RUPPRECHT CONSULT - FORSCHUNG & BERATUNG GMBH	PRC	D	TOSCA
RC-AUEB	RESEARCH CENTER OF THE ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS	PNP	GR	INFACE, PREVENTIVE
RCL	RICHARSON CONSULTING LTD	PRC	UK	PROEHTEL
RCM	REGION OF CENTRAL MACEDONIA	GOV	GR	RESHEN
RD	ROCHE DIAGNOSTICS GMBH	PRC	D	TOPCARE, M2DM
RED 21	RED 21, SOCIEDAD LIMITADA	PRC	E	DIAFOOT
Reflecta	REFLECTA PORTUGUESA-INDUSTRIAS FOTOGRAFICAS S.A.	PRC	P	TTOOL
REGINA ELENA	IFO - POLO ONCOLOGICO ISTITUTO REGINA ELENA	GOV	I	WEBLINC
REGLOM	REGIONE LOMBARDIA - DIREZIONE GENERALE SANITÁ	GOV	I	CHARM, C-CARE
REITEK	REITEK S.P.A.	PRC	I	HOMEY
RELATIONAL	RELATIONAL TECHNOLOGY S.A.	PRC	GR	MOBI-DEV, WARD-IN-HAND
REMPLOY	REMPLOY LIMITED	PRC	UK	REAL-PROF
Ross Wood	ROSS WOOD ASSOCIATES LTD	PRC	UK	IR-BOSS
RRD	ROESSINGH RESEARCH AND DEVELOPMENT B.V.	PRC	NL	GAIT
RRI	J.P. ROBARTS RESEARCH INSTITUTE	PNP	CA	MITTUG
RSINFO	R. & S. INFORMATICA - S.R.L.	PRC	I	HEALTHY-MARKET, ACTIVE HEALTH

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SADIEL	SADIEL, S.A. - SOCIEDAD ANDALUZA PARA EL DESARROLLO DE LA INFORMATICA Y LA ELECTRONICA	PRC	E	WIDENET, JUST
SALGADO	ARTUR SALGADO, LDA	PRC	P	DEVASPIM
SAMBA	SAMBA TECHNOLOGIES SARL	PRC	F	BEPRO, E-SCOPE, EDISCIM
SAMU	ASSISTANCE PUBLIQUE HOPITAUX DE PARIS SAMU 92	GOV	F	JUST, AMON
SAP	SAP AKTIENGESELLSCHAFT SYSTEME, ANWENDUNGEN, PRODUKTE IN DER DATENVERARBEITUNG	PRC	D	IDEAS
SARANTEL	SARANTEL LIMITED	PRC	UK	IMP-ART
SAS-CSJA	SERVICIO ANDALUZ DE SALUD SAS	GOV	E	PICNIC
SBU	FREIE HANSESTADT BREMEN	GOV	D	TOSCA
SCHNEIDER	SCHNEIDER ELECTRONICS AG	PRC	D	INCA
SEBT	SOUTH AND EAST BELFAST HEALTH AND SOCIAL SERVICES TRUST	GOV	UK	PICNIC
SEMA	SCHLUMBERGERSEMA, SOCIEDAD ANONIMA ESPANOLA	PRC	E	TELECARE, DYNCT, SMARTIE, HUMAN
SEMA	SEMA UK LIMITED	PRC	UK	MEDITRAV
SEMG	SCUOLA EUROPEA DI MEDICINA GENERALE	PNP	I	WIDENET, C-CARE
SENSLAB	SENSLAB GMBH	PRC	D	ADICOL
SERAM	SOCIETE D'ETUDES ET DE RECHERCHES DE L'ECOLE NATIONALE SUPERIEURE D'ARTS ET METIERS	PNP	F	DEVASPIM
SES	SES ASTRA	PRC	L	HEALTHSAT
SESMM	SES MULTIMEDIA S.A.	PRC	L	HEALTHSAT
SGHMS	SAINT GEORGE'S HOSPITAL MEDICAL SCHOOL	GOV	UK	INTERPRET
SICN	SIEMENS INFORMATION AND COMMUNICATION NETWORKS S.P.A.	PRC	I	MOEBIUS
SiE	SISTEMAS EXPERTOS, S.A.	PRC	E	MTM, NISAN
SIEMENS	SIEMENS AKTIENGESELLSCHAFT PROEHTEL, HEALTHMATE, EDISCIM	PRC	D	TOSCA, INTERPRET,
SIEMENS	SIEMENS HEALTH SERVICES GMBH & CO. KG	PRC	D	PROEHTEL
SIEMENS	SIEMENS AG MEDICAL SOLUTIONS	PRC	D	E-SCOPE
SIEMENS-ELEMA	SIEMENS-ELEMA AKTIEBOLAG	PRC	S	SCREEN-TRIAL
SILENA INT	SILENA INTERNATIONAL - S.P.A.	PRC	I	HEARTS
SILICON BRIDGE	SILICON BRIDGE RESEARCH LIMITED	PRC	UK	HIN-EUROPE
SILWAY	SILWAY S.A.	PRC	F	CEMAT
SINTEF	SINTEF - STIFTELSEN FOR INDUSTRIELL OG TEKNISK FORSKNING VED NORGES TEKNISKE HOEGSKOLE	PNP	N	LIFELINGER, TELEMEDICARE, CORAS
SINTERS	SINTERS	PRC	F	OTELO
Sirius	SIRIUS COMMUNICATIONS NV	PRC	B	MTM
SISTEMA S.A.L.I.	SISTEMA STUDIO ASSOCIATO DI LUCIA INNOCENTI & C S.S.	PRC	I	SPIRIT
SITUS	SIGNO MOTUS S.R.L.	PRC	I	H-CAD
SKILL	SKILL CONSEJEROS DE GESTION, S.L.	PRC	E	TELECARE
SLRFC	SOUTH LEICESTER RUGBY FOOTBALL CLUB	PRC	UK	DROMEAS
SMIS	SLOVENIAN MEDICAL INFORMATION SOCIETY - INSTITUTE OF SOCIAL MEDICINE	GOV	SI	WIDENET

Short Name	Legal Name	Legal Status	Country	Participation in projects
SMS-IT	SIEMENS MEDICAL SOLUTIONS - HEALTH SERVICES ITALIA S.R.L.	PRC	I	CHRONIC, CHARM
SNT Hellas	S.N.T. HELLAS SA	PRC	GR	TelemediCare
SOFTEC	SOFTEC S.A.S. DI CHIRCO PIERO & C.	PRC	I	BODY LIFE
SOLINET	SOLINET GMBH TELECOMMUNICATIONS	PRC	D	TELECARE, HARP, CORAS
SPEAD	SPEAD GMBH	PRC	D	IMAGUM
SRI	SRI INTERNATIONAL	PNP	UK	HOMEY
SSC	SILWAY SEMICONDUCTORS	PRC	BG	CEMAT
SSM	SSM COMPUTER SYSTEMS LIMITED	PRC	CY	USBONE, WEIGHT-INFO, ASTHMAWEB, H-LIFE
SSSA	SCUOLA SUPERIORE DI STUDI UNIVERSITARI E DI PERFEZIONAMENTO SANT'ANNA	GOV	I	IVP, HUMAN
Stacks	STACKS CONSULTING E INGENIERIA EN SOFTWARE, S.L.	PRC	E	C-Care
STAKES	NATIONAL RESEARCH AND DEVELOPMENT CENTRE FOR WELFARE AND HEALTH	GOV	SF	MEDITRAV
STATICE	STATICE	PRC	F	IMAGUM
STM	STMICROELECTRONICS S.R.L.	PRC	I	EPI-MEDICS, DAPHNE
STRAND	STRAND TECHNOLOGY PLC	PRC	UK	LIFEBELT, USBONE
STRATIS	STRATIS KFT	PRC	HU	ASTHMAWEB
SU	SOFIISKI UNIVERSITET 'SVETI KLIMENT OHRIDSKI'	GOV	BG	TOSCA
SUNDERLAND	UNIVERSITY OF SUNDERLAND	GOV	UK	HEARTS
SURGIVIEW	SURGIVIEW	PRC	F	DEVASPIM
SV o.p.s.	SPRAVNA VYZIVA O.P.S.	PNP	CZ	WEIGHT-INFO
SWC	SWISSCOM AG	PRC	CH	MOEBIUS
SYMBION	SYMBION	PRC	F	SMARTIE
SYMPER	SYMPER IT & BUSINESS CONSULTANTS S.A.	PRC	GR	PLACEBO, TELELOGOS, H-LIFE
SYNAP	SYNAPSIS - SOCIETÁ A RESPONSABILITÁ LIMITATA	PRC	I	WOMAN II, HUMAN
SYNK	SYNKRONIX INCORPORATION LIMITED	PRC	UK	TELECARE
SYSLINE	SYSLINE S.P.A.	PRC	I	CHARM
T&T	T & T TARDITO IMPIANTI S.R.L.	PRC	I	PARREHA
T.SERVICE	T-SERVICE S.R.L.	PRC	I	PREVENTIVE
T4TECH	T4TECH S.R.L.	PRC	I	WEBLINC
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TAM	TAM TELESANTE	PRC	F	U-R-SAFE
TCI	TARDITO COSTRUZIONI E IMPIANTI S.R.L.	PRC	I	PARREHA
TDC	TDC SWITZERLAND AG	PRC	CH	MOEBIUS
TECHNOGLOBAL	TECHNOGLOBAL CONSULTANTS LIMITED	PRC	CY	PLACEBO, INFACE, E-CARE
TechnologieAgentur	TECHNOLOGIE - UND STANDORTAGENTUR SALZBURG GMBH	PRC	A	TEAM-HOS
TECHNOMERIT	TECHNOMERIT CONSULTANTS LIMITED	PRC	CY	PREVENTIVE
TECNOPLAN	TECNOPLAN - TELEMATICA APPLICATA S.R.L.	PRC	I	LIFELINGER
TELENOR 2	TELENOR COMMUNICATION II AS	PRC	N	CORAS

Short Name	Legal Name	Legal Status	Country	Participation in projects
TELEPH	TELEPH (TECHNIQUE ELECTRONIQUE ET PHOTOGRAVURE)	PRC	F	E-SCOPE
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TELISMA	TELISMA	PRC	F	U-R-SAFE
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TID	TELEFONICA INVESTIGACION Y DESARROLLO SA UNIPERSONAL	PRC	E	INCA
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TIMON	HOPITAL TIMONE	PUC	F	SALUT
TIT	TELIT MOBILE TERMINALS S.P.A.	PRC	I	MOEBIUS
TMB	TRANSPORTS DE BARCELONA, S.A.	PUC	E	TOSCA
TME	TELEFONICA MOVILES ESPANA S.A.	PRC	E	MOBIHEALTH
TMSI	TWENTE MEDICAL SYSTEMS INTERNATIONAL B.V.	PRC	NL	MOBIHEALTH
TmW	TELEMEDICINE WORLD, S.L.	PRC	E	CHRONIC
TN	TELENOR COMMUNICATION AS	PRC	N	CORAS
TNO	NETHERLANDS ORGANISATION FOR APPLIED SCIENTIFIC RESEARCH - TNO	PUC	NL	WIDENET
TOS	TOSINVEST SANITÁ - SOCIETÁ A RESPONSABILITÁ LIMITATA	PRC	I	KARMA2
Trixell	TRIXELL	PRC	F	MI3
TSD	TSD-PROJECTS S.R.L.	PRC	I	VEPSY UPDATED, CHARM, JUST
TUH	TROMSOE UNIVERSITY HOSPITAL	GOV	N	SCREEN-TRIAL
TV	UNIVERSITÁ DEGLI STUDI DI ROMA 'TOR VERGATA'	GOV	I	MOBI-DEV
TVP	OU TERVISEPORTAAL	PRC	EE	HEALTHY-MARKET
TVS	FAST TV SERVER AG	PRC	D	INCA
TWT	TWT GMBH INFORMATION & ENGINEERING TECHNOLOGIES	PRC	D	PLACEBO
TXT	T.X.T. E-SOLUTIONS SPA	PRC	I	MEMO, E-REMEDY, WARD-IN-HAND
TZMI	STEINBEIS GMBH & CO. FUER TECHNOLOGIETRANSFER	PRC	D	MTM
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UAPV	UNIVERSITE DE AVIGNON - LIA	GOV	F	MTM
UB	UNIVERSITAT DE BARCELONA	GOV	E	CHRONIC
UBRUN	BRUNEL UNIVERSITY	GOV	UK	TELECARE, OTELO
UC	UNIVERSITA CATTOLICA DEL SACRO CUORE DI MILANO	GOV	I	VEPSY UPDATED
UCAM	THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF CAMBRIDGE	GOV	UK	MAMMOGRID
UCL	UNIVERSITY COLLEGE LONDON	GOV	UK	IERAPSI, HARP
UCY	UNIVERSITY OF CYPRUS	GOV	CY	MEMO, BIOGRID
UHB	KANTONSSPITAL BASEL UNIVERSITAETSKLINIKEN	GOV	CH	MEMO, MOEBIUS
UHI	UNIVERSITY HOSPITAL OF ICELAND	GOV	ISL	PICNIC

Short Name	Legal Name	Legal Status	Country	Participation in projects
UHI-PAED	UNIVERSITY HOSPITAL OF IOANNINA	GOV	GR	CHILDCARE
UHM	UNIVERSITAET HOSPITAL MAGDEBURG	PUC	D	RESHEN, HARP
UIA	UNIVERSITEIT ANTWERPEN/UNIVERSITAIRE INSTELLING ANTWERPEN	GOV	B	MOEBIUS
UJF	UNIVERSITE JOSEPH FOURIER GRENOBLE I	GOV	F	BEPRO, KARMA2, E-SCOPE, INFACE, INTERPRET, MI3
UJI	UNIVERSITAT JAUME I DE CASTELLON	GOV	E	VEPSY UPDATED
UK 2.LF	UNIVERZITA KARLOVA V PRAZE	GOV	CZ	SMARTIE
UKENT	UNIVERSITY OF KENT AT CANTERBURY	GOV	UK	REAL-PROF
ULANC	THE UNIVERSITY OF LANCASTER	GOV	UK	BODY LIFE
UMC	UNIVERSITAIR MEDISCH CENTRUM UTRECHT	GOV	NL	DynCT
UMCN	STICHTING KATHOLIEKE UNIVERSITEIT	GOV	NL	SCREEN, SCREEN-TRIAL, INTERPRET
UMH	UNIVERSIDAD MIGUEL HERNANDEZ DE ELCHE	GOV	E	DIAFOOT
UNI Graz	KARL-FRANZENS-UNIVERSITAET GRAZ	GOV	A	ADICOL
UNI REGENSBOURG	KLINIKUM DER UNIVERSITAET REGENSBURG	GOV	D	CHS, EDISCIM
UNIBO	ALMA MATER STUDIORUM - UNIVERSITÁ DI BOLOGNA	GOV	I	E-REMEDY
UNICT-CARDIO	UNIVERSITÁ DI CATANIA	GOV	I	EPI-MEDICS
UNIGE	UNIVERSITE DE GENEVE	GOV	CH	SALUT, JUST
UNIMI	UNIVERSITÁ DEGLI STUDI DI MILANO	GOV	I	DAPHNE
UNINOVA	UNINOVA - INSTITUTO DE DESENVOLVIMENTO DE NOVAS TECNOLOGIAS	PNP	P	IDEAS, TELECARE
UNIPI	UNIVERSITÁ DEGLI STUDI DI PISA	GOV	I	IERAPSI, MAMMOGRID, WEALTHY
UNIPI	DIPARTIMENTO DI INFORMATICA DELL UNIVERSITÁ DEGLI STUDI DI PISA	GOV	I	WOMAN II
UNIPR.IG	UNIVERSITÁ DEGLI STUDI DI PARMA	GOV	I	HEALTHY-MARKET
UNISS	UNIVERSITÁ DEGLI STUDI DI SASSARI	GOV	I	MAMMOGRID
UNIUD	UNIVERSITÁ DEGLI STUDI DI UDINE	GOV	I	MAMMOGRID
UNIV BDX I	UNIVERSITE DE BORDEAUX I	GOV	F	IDEAS
UNIVLEEDS	UNIVERSITY OF LEEDS	GOV	UK	SMARTIE
Univ-Lund	LUNDS UNIVERSITET	GOV	S	WOMAN II, EPI-MEDICS
UNN	UNIVERSITETSSYKEHUSET NORD-NORGE HF	GOV	N	CORAS
UoD	TECHNISCHE UNIVERSITAET DRESDEN	GOV	D	IERAPSI
UOI	UNIVERSITY OF IOANNINA	GOV	GR	CHILDCARE, PICNIC
UOL	UNIVERZA V LJUBLJANI, FAKULTETA ZA ELEKTROTEHNIKO	GOV	SI	MI3
UoM	THE VICTORIA UNIVERSITY OF MANCHESTER	GOV	UK	IERAPSI
UORIN	AZIENDA SANITARIA LOCALE N.3 UMBRIA	PUC	I	H-CAD
UORL	UNIVERSITE D'ORLEANS	GOV	F	OTELO
UOS	THE UNIVERSITY OF SUSSEX	GOV	UK	INTERPRET
Uoulu	OULUN YLIOPISTO	GOV	SF	AMIT
UOW	THE UNIVERSITY OF WESTMINSTER	GOV	UK	IVP
UOXFDF	THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD	GOV	UK	SCREEN, ADEQUATE, MAMMOGRID

Short Name	Legal Name	Legal Status	Country	Participation in projects
UP	UNIVERSITÁ DEGLI STUDI DI PERUGIA	GOV	I	ADICOL
UPAD.DEI	UNIVERSITÁ DEGLI STUDI DI PADOVA	GOV	I	VEPSY UPDATED, M2DM
UPC	UNIVERSITAT POLITECNICA DE CATALUNYA	GOV	E	MOEBIUS
UPCT	UNIVERSIDAD POLITECNICA DE CARTAGENA	GOV	E	DynCT
UPD	CAMARA NAVARRA DE COMERCIO E INDUSTRIA	GOV	E	TELECARE
UPF	UNIVERSITAT POMPEU FABRA	GOV	E	MOBIHEALTH
UPM	UNIVERSIDAD POLITECNICA DE MADRID	GOV	E	MTM, D-LAB, INFOGENMED, INCA, HEALTHMATE, WEIGHT-INFO, M2DM, CHRONIC, JUST, HEALTH MEMORY
UPS	UNIVERSITE PARIS-SUD	GOV	F	HKIS
UPV	UNIVERSIDAD POLITECNICA DE VALENCIA	GOV	E	VEPSY UPDATED, IDEAS, HEALTHMATE, HEALTHY-MARKET,
UR	UNIVERSITY OF ROUSSE 'ANGEL KANCHEV'	GOV	BG	REHAROB
URM	UTVAR ROZVOJE HLAVNIHO MESTA PRAHY	GOV	CZ	TOSCA
USAL	UNIVERSITY OF SALFORD	GOV	UK	REAL-PROF
USFD	THE UNIVERSITY OF SHEFFIELD	PNP	UK	GEMSS
UT	UNIVERSITEIT TWENTE	GOV	NL	MOBIHEALTH
UTH.MED.ORTHOD.	UNIVERSITY OF THESSALY	GOV	GR	DROMEAS, USBONE
UTOURS	UNIVERSITE FRANCOIS-RABELAIS	GOV	F	OTELO
UTU	EBERHARD-KARLS-UNIVERSITAET TUEBINGEN	GOV	D	DynCT
UVA	UNIVERSITEIT VAN AMSTERDAM	GOV	NL	TELECARE
UW	UNIVERSITY OF WALES COLLEGE OF MEDICINE	GOV	UK	PRE-HIP
UWC	UNIVERSITY OF WALES, CARDIFF	GOV	UK	REHAROB
UWE, Bristol	UNIVERSITY OF THE WEST OF ENGLAND, BRISTOL	GOV	UK	MAMMOGRID
VARIMED	VARIABLE MEDICINE LIMITED LIABILITY COMPANY	PRC	HU	BEPRO, STEMNET
VELARTE	PRODUCTOS VELARTE, S.L.	PRC	E	HEALTHY-MARKET
VH	VRHEALTH MULTIMEDIA CONSULTING SRL	PRC	I	VEPSY UPDATED
VHK	VERBAND DER HERSTELLER VON PATIENTENORIENTIERTEN INFORMATIONS- UND KOMMUNIKATIONSSYSTEMEN E.V.	PNP	D	WIDENET
VIADELO	VIADELO SRL	PRC	I	E-CARE
VICON	VICON MOTION SYSTEMS LIMITED	PRC	UK	REAL-PROF
VIRGO	VIRGO LTD.	PRC	GR	PHARMA
Virtual Presence	VIRTUAL PRESENCE LIMITED	PRC	UK	IERAPSI
VIS	VASCOS INTERNET SERVICES LTD	PRC	CY	CHILDCARE, DICTATE
VISITECH	VISITECH INTERNATIONAL LIMITED	PRC	UK	EDISCIM
VISTAMED	VISTAMED LIMITED	PRC	IRL	WUNSENS
VITAMIB	VITAMIB SARL	PRC	F	BEPRO, PRIDEH-GEN, INFOGENE, ACTIVE HEALTH
VITAPLUS	VITA PLUS LTD AG PARASKEVI	PRC	GR	WEIGHT-INFO, H-LIFE
VMW	VMW SOLUTIONS LTD	PRC	UK	E-CARE

Short Name	Legal Name	Legal Status	Country	Participation in projects
VTT	TECHNICAL RESEARCH CENTRE OF FINLAND	GOV	SF	IMP-ART, PICNIC
VU	VILNIAUS UNIVERSITETAS	GOV	LT	STEMNET
VUB	VRIJE UNIVERSITEIT BRUSSEL	PNP	B	MI3
WHO	WORLD HEALTH ORGANIZATION - REGIONAL OFFICE FOR EUROPE	INO	Int. Org.	TM-ALLIANCE
WINTHER	A/S KENNETH WINTHER-VAERKTOJSFABRIK	PRC	DK	INHALE
WREN	WREN COMPUTING LTD.	PRC	UK	PRIDEH
YUCAT	YUCAT B.V.	PRC	NL	MOBIHEALTH
ZAMB-TSZ	TWEESTEDEN HOSPITAL, TILBURG	GOV	NL	PHARMA
ZEBRIS	ZEBRIS MEDIZINTECHNIK GMBH	PRC	D	REHAROB
ZENON	ZENON S.A. ROBOTICS AND INFORMATICS	PRC	GR	PARREHA
ZRO	ZOOROBOTICS B.V.	PRC	NL	BIOGRID
ZUPVIEN	DIPL. ING. ZUCKERMANN & PARTNER KEG	PRC	A	PHARMDIS-E+

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DANMARK

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SUOMI/FINLAND

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Akademiska Bokhandeln**
Keskuskatu 1/Centralgatan 1
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FIN-00101 Helsinki/Helsingfors
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F./fax (358-9) 121 44 35
Sähköposti: akatilaus@akateeminen.com
URL: http://www.akateeminen.com

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Tel. (354) 552 55 40
Fax (354) 552 55 60
E-mail: bokabud@simnet.is

NORGE

Swets Blackwell AS
Hans Nielsen Hauges gt. 39
Boks 4901 Nydalen
N-0423 Oslo
Tel. (47) 23 40 00 00
Fax (47) 23 40 00 01
E-mail: info@no.swetsblackwell.com

SCHWEIZ/SUISSE/SVIZZERA

Euro Info Center Schweiz
c/o OSEC Business Network Switzerland
Stampfenbachstraße 85
PF 492
CH-8035 Zürich
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Fax (41-1) 365 54 11
E-mail: eics@osec.ch
URL: http://www.osec.ch/eics

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CYPRUS

**Cyprus Chamber of Commerce
and Industry**
PO Box 21455
CY-1509 Nicosia
Tel. (357-22) 88 97 52
Fax (357-22) 66 10 44
E-mail: stalo@ccci.org.cy

EESTI

Eesti Kaubandus-Tööstuskoda
(Estonian Chamber of Commerce and Industry)
Toom-Kooli 17
EE-10130 Tallinn
Tel. (372) 646 02 44
Fax (372) 646 02 45
E-mail: einfo@koda.ee
URL: http://www.koda.ee

HRVATSKA

Mediatrade Ltd
Strohalov Prilaz 27
HR-10000 Zagreb
Tel. (385-1) 660 08 40
Fax (385-1) 660 21 65
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MAGYARORSZÁG

Euro Info Service
Szt. István krt.12
III emelet 1/A
PO Box 1039
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