DELTASS

Telemedicine/Emergency Consultation via Satellite

“DELTASS, a satellite communication based system to help healthcare emergency operations particularly in critical situations as disaster context and a solution to improve search, diagnosis and therapeutic intervention on victims in medical emergency situations.”

Malecka Saleman, Project Manager, CNES

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Alcatel Space Industries (France)  EADS Systems and
SPACEBEL (Belgium)  Defence Electronics (France)
CHARITE SRU OP 2000 (Germany)

PROFILE:

DELTASS (Disaster Emergency Logistics Telemedicine Advanced Satellites System) is a mobile telemedicine demonstrator designed to improve the efficiency of the management of rescue, first aid and emergency operations in Disaster Telemedicine contexts such as earthquakes or large explosions. The project, developed under the ESA Telecom User Segment, aims at demonstrating the capability of satellite-based systems to answer basic requirements of Disaster Telemedicine with effective and affordable solutions.

The different components of the DELTASS system are:

• **Mobile Teams**, deployed at the disaster site for search, first triage and victim evacuation. They are equipped with portable telephones and PDA’s and/or Portable Telemedicine Workstations (PTW) for the transmission of locally recorded data to the Permanent Centre (PC) or to the Mobile Field Hospital (MFH) operators. MT’s are equipped with GPS for real-time localisation and data transfer to PC’s and MFH’s. Equipment allows phone communication between them and the PC or MFH and other hospitals.

• **A Permanent Centre (PC)**, possibly located in a region providing humanitarian help. It receives voice and data communications from MT’s, manages and redirects this to a Reference Hospital (RH) and MFH. The PC carries out co-ordination and medical functions while the MFH is deploying.

• **A Mobile Field Hospital (MFH)**, deployed at disaster sites providing co-ordination of MT’s on disaster site, triage, reception, first aid treatment, conditioning for transportation, management of victim evacuation, medical expertise for patients through access to external medical databases or videoconferences between MFH’s and Reference Hospital’s (RH). The MFH is equipped with medical means, databases and telecommunication systems.

• **A Reference Hospital (RH)**, located in a region or foreign country which acts as a medical knowledge centre for the MFH providing further medical expertise, triage and medical treatment, by interactive telemedical services. Healthcare services of the MFH are improved by: tele-services, telemedical and database applications installed at both sites.

The DELTASS system shows that satellites systems are indeed very well adapted to disaster situations, where usually ground infrastructures are partly or even totally destroyed. Even in a large geographic or isolated area, space based services can easily and quickly be deployed in a cost-effective way. DELTASS was run in the period July 2001 – December 2002. ESA is currently running the co-funded project I-DISCARE (as part of the ARTES 3 Line 1 programme element) to get the concept developed in DELTASS into the hands of real users for actual emergency cases.

http://telecom.esa.int/deltass  e-mail: telecom@esa.int
Telemedicine/Medical Education Services

“This project is very interesting and seems more effective than only doing research with the help of magazines and books. The satellite transmission worked very well, is user friendly and more effective than standard transmission by internet or post.”
Carsten Lüdke MD.

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PROJECT PARTNERS: European Medical Network EMN (Switzerland)
Deutsche Telekom (Germany)
UEMO (Switzerland)
UEMS (Germany)
Karger Libri (Switzerland)
Health Stream (United States)
Reuters Health (United Kingdom)

PROFILE:
The European Medical Network (EMN) was formed to create a distance-learning service for the medical professions in Europe. The system consists of 100 sites installed throughout Western Europe, each with its own Internet access and equipped with pre-configured notebooks, satellite dishes and receiver boxes. Interactive course modules can be effortlessly downloaded from satellite broadcasts.

EMN and Deutsche Telekom operate the network satellite transmissions. Clients can view educational content either on-line or off-line. It’s proved to be cost-effective and user-friendly, adding greatly to traditional Continuing Medical Education (CME) courses.
Health Information Services

Information Platform for Patients and doctors/Medical Personnel

Michael Nuhn, Managing Director, TeleSana

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PROJECT PARTNERS: Real Media – Munich- Berlin (Germany)
professionalTV – Berlin (Germany)
NDSatcom – Friedrichshafen (Germany)

PROFILE:

Health Information Services, brand name TeleSana, is a television based information platform for the distribution of medical and general information for doctors and medical personnel in surgeries and other medical sites and for the information and entertainment of patients waiting in these sites.

The basic considerations for implementation of this new service offer are:

• Health Care is one of the key topics of the global community
• An aging society has an increasing need for information in the sectors of medicine, prevention, health-system
• Doctors are facing a large and rapidly changing offer of scientific information and education
• Certification of Qualification will build further need for dedicated training and information platforms
• Market participants as Pharmaceutical Industry, Health Insurance Companies, Medical Associations and Public Services are looking for more efficient ways of communication B2B and B2C

Patients receive TeleSana live, a continuously broadcasted live-program covering selected health issues embedded in news-orientated infotainment:

For doctors and medical staff TeleSana professional provides a platform for specialized information for use on demand at any time and with interactive response possibility.

These channels can be customized to supply individual content to selected user groups with regard to such as regional demands or specialization of medical service. Health Information Services will use satellite communication to reach both target groups – patients and doctors – with a mixed content stream of DVB and IP.
I-DISCARE

Telemedicine/Emergency Consultation via Satellite

“Based on satellite technologies the I-DISCARE system allows the bringing together of viable support for medical activities in remote, mobile and disaster situations.”

Bernard Comet, Project Manager, MEDES

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PROJECT PARTNERS:

Elsacom (Italy)
Norwegian Centre for Telemedicine, NTS (Norway)

PROFILE:

I-DISCARE, derived from an earlier system called Disaster Emergency Logistics Telemedicine Advanced Satellites System (DELTASS), is one of the few possible solutions for rescue services when natural or man-made disasters destroy the telecommunications network. Medical emergency services, military medical services and humanitarian medical organizations will benefit from this system. I-DISCARE was tested in simulated disasters in Toulouse and Ulm in October-November 2002. At the end of the project the system will be commercially available on either a sale or lease basis from a new company being created.

Originally conceived as a system solely for use in disaster areas where local communications had been destroyed - such as earthquake areas - its planned range of applications has since been broadened for isolated and mobile sites.

“After the DELTASS trials it became obvious that the overall system or parts of it would also be applicable in a wide range of contexts short of full-scale disaster,” said Bernard Comet of MEDES.

The system makes full use of Personal Digital Assistants (PDAs) and Portable Telemedicine Workstations (PTWs), as well as satellite phones. Search and Rescue (SAR) workers use these for initial patient identification and triage. A patient’s vital signs such as electrocardiograms (ECGs) and blood pressure are relayed to the dispatching operator.

An I-DISCARE dispatcher can also plot rescue teams’ positions on an area map, enabling efficient ‘top-down’ management. Victims being evacuated in emergency vehicles can have their exact location and medical conditions remotely tracked by an Ambulance Terminal linked to onboard monitoring equipment.

http://telecom.esa.int/i-discare e-mail: telecom@esa.int
MAYFLOWER

Telemedicine/Medical Education Services

“Tele-education, intended as a way of delivering content as well as tutoring and evaluation to students, is one of the most suitable topics for Internet-like satellite networks.”

Fabrizio Aversa, Project Manager, Kell

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PROJECT PARTNERS:
Elsacom S.p.A. (Italy)
Norwegian Centre for Telemedicine (Norway)
University of Perugia (Italy)

PROFILE:
The Italian companies Kell, Elsacom, and the University of Perugia Italy along with the Norwegian centre for Telemedicine, have developed the e-learning platform Mayflower.

The objective is to enable wider delivery of university medical courses. Italian nursing students and Norwegian nursing and medical students attend the courses of both universities either from home or in classrooms. Persons needing flexible scheduling, students seeking a reduction in travelling time, less developed regions and special-needs students will all benefit from Mayflower. In line with European Union objectives, one advantage of distance learning is that medical practitioners need not be reintegrated into their communities once their studies have been completed. The Mayflower service is now on-line at www.e-mayflower.org.
MIST

Telemedicine/Medical Education Services

“ESA Telecom allowed us to fully develop this project to the point where we’re considering wide scale deployment.”
Abdul Lakhani P.Eng., Project Manager, Telesat

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PROJECT PARTNERS: ColabNet (Canada)
Marine And Mount. Corp. (Canada)
Marine Atlantic (Canada)
Communication Research Centre (Canada)
TETRA/ Memorial University Faculty of Medicine (Canada)

PROFILE:

Satellite-based IP Networks have made the Marine Interactive Satellite Technologies (MIST) possible. Through the MIST concept, isolated and mobile sites like ambulances and ferries can benefit from teleconsulting. As larger planes and boats come to carry more passengers, the chance of a serious medical emergency occurring on any single trip increases.

In 2002, 23 teleconsultations and four live emergency consultations were carried out between a Canadian ferry fitted with a wireless ‘sickbay’ and Port aux Basques Hospital, Newfoundland. Oil platforms, merchant and tourist vessels can take advantage of this new technology. Even minimally trained personnel can handle medical emergencies with the aid of land-based healthcare providers, who are being kept fully informed via audio and image transmissions as well as video conferencing.
SKYMED
Telemedicine/Medical Education Services

“Continuing Medical Education (CME) is an integral part of the design and evaluation of a new model for teaching and communication for Medical Distance Learning.”
Lina Colitta, Project Manager, Alenia

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PROJECT PARTNERS:
TelBios (Italy)
Consorzio Padova Ricerche (Italy)
ITS (Italy)
Sudler & Hennessy (United Kingdom)

PROFILE:
SKYMED is an initiative launched in 2000 dedicated to developing and operating in a pilot service phase an advanced satellite based e-Learning system to support Continuing Medical Education (CME) services.

Part of the SKYMED project has been addressed to defining and developing a suitable multimedia interface for on-line and off-line training activities, also providing voice and textual chat interactions among the different client sites. Two courses (one on Medical Imaging, the other in Ambulatory Surgery) have been developed and delivered to seven classrooms in different public Local Health Authorities (ASL) and to ten single users, all in the Veneto region.

Through an IP over DVB content delivery network based on the SkyPlexNet system, the SKYMED content is directly transmitted to the satellite and the related transport stream is then multiplexed on-board with the transport stream (TS) of other content contributions originated by other providers. The multiplexed TS is forwarded in downlink as a conventional DVB-S stream which can be received by Personal Computers equipped with a DVB reception board, or by DVB receivers/routers, able to distribute the multicast traffic within the Local Area Network of the remote attendant sites.

The SKYMED system has been used since the beginning of February 2003 to support a number of actual medical education events, and in particular for the transmission of live surgical interventions, offering the possibility of remote attendance and interaction. In this context, this technology has demonstrated its validity as a good cost-benefit compromise allowing high quality video using a limited satellite bandwidth allocation (512 kbps).
SKYNURSE

Advanced Training in Nursing

“Learning is like rowing upstream: not to advance is to drop back”.

Chinese proverb

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PROJECT PARTNERS:  Didael S.p.A. (Italy)
Eukrasia Consortium (Italy)
TelBios S.p.A. (Italy)

PROFILE:
SkyNurse is a pilot project that intends to develop an operating centre for the delivery of satellite distance education and residential courses designed for nursing personnel of non-EU countries, in order to employ the trained personnel in EU hospitals and health care centres that express such a need.

The aging of the general population and the demand for increasingly qualified assistance has created a scenario in which there is a strong demand for qualified nursing staff that is difficult to satisfy with the local workforce. It is therefore crucial to recruit qualified human resources both to Italy and other EU countries in order to reduce training time and costs and to create nursing personnel with a homogenous level of knowledge, to ensure safety standards for health care and to develop standard operating procedures in nursing.

SkyNurse is intended for public health organisations that need qualified nursing personnel for their staff and non-EU public health organisations who want to improve the professional qualifications of their nursing staff, bringing them up to the most advanced European standards.

The operational centre transmits the content via satellite to the users in the remote classroom, who can interact with the tutors or lecturers via Internet, using chat lines or e-mail.

The pilot project includes two training course stages:
- an intensive remote course delivered via satellite, lasting three months and taking place at the Romanian universities taking part in the project;
- a three-week residential course in Italy before the qualification exam.

To create a remote classroom, the following equipment is required: a file server PC, a number of PCs to suit the number of end users, a LAN router, a hub, an ISDN serial modem and a satellite dish 120 cm in diameter.

The SkyNurse project involves the University of Pitesti (Romania), the "Politehnica" University of Bucharest (Romania) and Padova General Hospital, which will provide a professional outlet for the non-EU nursing staff requalified as a result of the training course.
TelAny

Telemedicine/Emergency Consultation via Satellite

“An immense improvement to a patient’s quality of life while not in any way compromising quality of care.”

Fabrizio Aversa, Project Manager, Kell

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PROJECT PARTNERS:
Telespazio (Italy)
Elsacom (Italy)
Medtronic (Italy)
Norwegian Telemedicine Centre (Norway)
WELL (Norway)

PROFILE:
Telmedicne Anywhere (TelAny) allows remote assistance to be given to people who need medical care.

The system links Norwegian ferries to an onshore hospital, allowing physicians to remotely assist passengers in case of need.

TelAny is also used to monitor patients with implanted cardiac devices. Their device data is sent to a service centre with a satellite modem. It can then be read within 30 seconds by doctors thousands of miles away. Patients are free to carry on a normal life, only having to visit the hospital if their doctor requests it. TelAny enables doctors to monitor more patients than ever before and, with the proportion of elderly people in Europe due to increase, such remote monitoring of chronic patients might well become a significant element of health-care provision across the greying suburbs of Europe.
TeLeCare

User Terminals: Consumer

“Telemedicine offers a solution to one of the greatest challenges to Canada’s health system: improving access to health care for rural and remote communities while containing delivery costs. This will be feasible in North America with the launch of Telesat’s Anik F2 interactive satellite in 2004.”

Abdul Lakhani, Project Manager, Telesat

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PROJECT PARTNERS:
March Networks Corporation (Canada)

PROFILE:

This Telesat-March Networks initiative is being undertaken to broaden the delivery of this service to “remote” communities, where available healthcare services suffer from chronic shortages of healthcare professionals. In addition, remote visiting can demonstrate significant benefits in the reduction of travel time and expenses for both healthcare providers and their clients, and early intervention and disease management can have a dramatic impact on a patient’s quality of life.

Currently, the deployment of high-speed, broadband infrastructure has focused mainly on urban areas, using either DSL or cable systems. Delivery of remote-visit services to far-flung communities has lagged behind due to the lack of availability of a communications infrastructure that supports the necessary speed and bandwidth. The delivery of nursing services via two-way satellite will address these limitations, and extend access to health monitoring and disease management services for clients who may otherwise be unable to receive them due to geographic and/or distance barriers.

The interoperability of a telehealth solution with the satellite broadband infrastructure adds unique design challenges to the user terminals. The terminal design must address packet latency, quality of service, bandwidth, and availability issues. The supporting network application must provide a high degree of diagnostic and monitoring capabilities in order to support and maintain terminals being used and operated in remote locations. The level to which issues can be addressed without having to send a technician into the field will have a significant impact on the viability of a business deploying a telehealth solution over satellite.

The research and development effort will focus on development of the web-based software application, the communications interface that will allow the solution to be deployed over two-way satellite, and extension of the health monitoring kit (patient terminal) to support broader disease management capabilities.