

HEALTHWARE

"Standard and Interoperable satellite solution to deploy health care services over wide area"

IMPULSE STATEMENT:

**"Opportunities & Blockers for Sustainable
Satellite Telemedicine...
Lessons learned from the Healthware Project"**

- ▼ Implementation of medical pilot networks and experimentation: CNES and C2Team have gathered the evaluation feedback and the users' recommendations
 - Achievements and successes validated by the users
 - Technical recommendations
 - Change Management Needs and accompanying measures

- ▼ Telemedicine in the future in Europe : Based on position paper and European paradigms for sustainable telemedicine, supported by EHTEL and users feedback:
 - Blockers
 - Opportunities
 - ▼ Synthesis of these feedback and inputs:
 - *Industrial recommendations*
 - *Institutional recommendations*

Industrial Recommendations

▼ Security:

- Medicine is the most demanding field in terms of security of networks
- Confidentiality , authentication, and security of data are guaranteed
- High level quality of security applicable to medical and personal data

▼ Interoperability:

- Between terrestrial and satellite networks
- Between different service platforms
- Between different heterogeneous networks and applications and at trans-national scale

▼ Connectivity to isolated areas:

- High rate network and added value service made available and performing where no other technology can provide connectivity except phone lines - limited in bandwidth
- Islands - mountain areas – interconnection of separate networks – cooperation networks for share of expertise and training

- ▼ Autonomy and conviviality requirements for a turn-key solution :
 - Users claims for a more easy to install, set-up and run system, accessible for non ICT specialists like medical professionals or patients
 - Up-to-now, collaborative work sessions are always supported by a technical team on premises:
 - Costs in personal and mobilization of technical staff
 - Organizational constraints and preparation time
 - Reduces the volume of usage and number of sessions
 - Training of trainers and continuous training necessary
- ▼ Robustness, stability and reliability for a plug and play system :
 - Integration in the daily practice requires a full confidence in the reliability and stability
- ▼ *Next steps in the industrials efforts for the up-grades on the System:*
 - *internet model :, friendly and didactical ergonomics, interfaces adapted to the low level of medical staff's knowledge in ICT*
 - *Efforts required on the reliability and stability of the connection and access to the platform for a deeper trust in the system*

- ▼ *A certain number of additional functionalities and up-grades have been expressed by the users :*

- ▼ Second opinion and tele-consultation and home-care:
 - DICOM images processing application
 - Acquiring patient exam software and equipment: captor, processing software integrated in the Marratech tool
 - Image naming, additional titles out of filename and tags)
 - Integrated Medical file management system

- ▼ Tele-training:
 - Dynamic pages and powerpoint animations display

- ▼ For all FTO:
 - Automated recording of a session
 - Image naming, additional titles out of filename and tags)
 - Exit from full screen should be easier

Technical recommendations : Change Management & Accompanying measures



- ▼ *A certain number of accompanying measures and support to change management have been strongly required by the users :*

- ▼ Support :
 - High claim for more support and solutions for the troubleshooting process to reinforce confidence and autonomy of users:
 - *On-line troubleshooting and user manual guides , detailed FAQ*
 - *Fully available and reactive on-line human support, via chat, mail and phone*

- ▼ Training:
 - High claim for more- advanced training and training for trainers sessions and materials:
 - *Need for dedicated training on the usage features, addressing the professionals end-users of the system: booking, launch and use of applications*
 - *Need for specific training on technical features of the satellite system and platform management: addressing the local technical teams, for the better technical integration and troubleshooting process: network, security , interconnection, etc...;*

Technical recommendations :

Change Management & Accompanying measures



- ▼ Maintenance and on-site trouble shooting process :
 - Some failure and incident occur at the equipment or connection levels:
 - Terminal disconnection: need for full re-boot or replacement
 - Antenna's pointing troubles: in case of bad weather , like wind, or mishandling
 - *Maintenance and replacement of defaulting material shall be quick and on-site*
 - *Need for a quick and competent expertise on premises when necessary*

- ▼ Satellite offers connectivity for isolated area..but they are all the more isolated in case of system failure: Proximity issue...
 - The isolated sites do not dispose of the resource not time to repair the system :
 - required variety and volume of expertise, material and time,
 - Rehabilitation shall occur in acceptable delays.. ASAP!!
 - The service provider shall be able to react and provide all necessary support in very short delay to maintain the **quality and continuity of service**:
 - *Cooperation schemes to dispose of a network of LOCAL partners and necessary equipment for reparation, replacement, on-site support and training, troubleshooting and maintenance , in SHORT delay....*

Technical recommendations : Change Management & Accompanying measures



- ▼ Legal Issues: Service provisioning to end-users requires a clear frame
 - The medical domain is all the more demanding :
 - Any technical failure can have some substantial and lethal consequences,
 - Related risks are both numerous and very damageable for a large range of actors involved in the healthcare chain.
 - Liability of medical practitioners is deeply changed through the introduction of ICT
 - Causes of malfunctioning or mishandling are multiplied
 - Causes can be out of the practitioner 's control and knowledge

- ▼ Transparency required for all aspects of the service delivery: crucial issue of **CONTRACTS and SERVICE LEVEL AGREEMENTS:**
 - Technical performance, applications and quality commitments' definition
 - Training, Maintenance, on-site trouble shooting process and support modalities: Price, fees and delays
 - Legal responsibilities and liabilities: Unknown and unframed domain.....New legal frames and responsibilities to be defined

Frame contract to ANTICIPATE and DEFINE liability and responsibility:

- *Liability of medical practitioners is deeply changed as ICT interfere and generates more potential malfunctioning or mishandling which can be out of the practitioner 's control and knowledge*
- *Service provider shall propose a clear frame to define each actor's field and perimeter of liability: definition and modalities for:*
 - ▼ Security and confidentiality of medical and personal data
 - Collection, access, consultation, transmission, storage, archiving of personal data
 - Secure authentication for each actor: electronic certificates, etc...
 - Procedure to check the integrity of document undersigned and exchanged:
 - ▼ Liability if case of failure, mishandling, malfunctioning
 - Identification of each segment of liability in the process and system for each actor
 - Physician: obligation of check of the good state of the equipment used
 - ▼ Intellectual and industrial property rights :additional developments, etc...
 - ▼ Maintenance and monitoring: delays and scope and indemnities
 - ▼ Insurance : compulsory declaration of the telemedicine practice by the doctor

TRUST and CONFIDENCE of the users' in the service through:

- ▼ Technical Autonomy, Reliability, efficiency, conviviality, appropriation
- ▼ Legal security, safety and transparency frame
- ▼ Service' s... Proximity, transparency, availability and...
- ...
- ▼ Affordability!!!

THE crucial issue considering the medical activities' requirements :

▼ Costs analysis

- Initial costs:
 - satellite equipment purchase & installation
 - Connectivity tests and internal connection to existing networks
 - Additional software and equipment
- Recurring costs
 - Maintenance, support, training
 - Access to services platform
 - Organizational and administrative costs: personal and coordination
 - Satellite bandwidth
- ▼ Crucial issue of the medical emergency for teleconsultation and 2nd opinion: Availability of the satellite bandwidth on a permanent basis
 - 24h/24 availability
 - High bandwidth required
 - Very short acceptable delays for booking and allocation process

Institutional Recommendations

Institutional recommendations : Main Issues for The development of telemedicine



- ▼ Fragmentation and heterogeneity of:
 - Economic structures and models for Healthcare in Europe
 - Medical cultures & services, medical protocols, medical specialties,
 - Information systems, proprietary systems, applications, technologies

- ▼ Legal insecurity and absence of regulatory frame at European and national scales
 - For the medical professionals' practice and insurance
 - For the technology and service providers
 - For the patients and citizens

- ▼ Diversity of the priorities and initiatives and isolation of pilot projects
 - Lack of sharing of experience and best practice
 - Lack of integration and lack of coherence of the experimentation at local, national and European Levels
 - Lack of cooperation between Research, industries, institutions, authorities and patients & citizens

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Main institutional issues for the telemedicine take-up: Legal and Regulatory Frames



▼ Legal Framework :

- Practitioner's liability regulatory framework at European scale
- Patients rights' protection and ethics
 - Protection of data
 - Confidentiality and medical secret
 - Patient information and consent
 - Qualification and competence check for quality control and standards

▼ Implementataion and frame of the full monitoring system relying ion advanced ICT – based management at national scales in Europe :

- Characterization and reimbursement of the [telemedical Act](#)
- [Personal Electronic Health Record](#) 's implementation as first necessary driver

Main institutional issues for the telemedicine take-up:

Standardisation



▼ Standardisation and Norms :

- To frame and secure the telemedicine practice: Effects on
 - Quality and reliability for professionals, insurance, patients, providers, etc...
 - Security of the patients and practitioner
 - Clarity in contracts and laws

- To boost the market and the integration in the daily practice thanks to :
 - Interoperability: flexible and extensive networks
 - Stimulation of innovation in all involved sectors of industry which can invest in R&D for specific applications, captors, interface, etc...
 - Stimulation of the smoothly integration in citizens daily life and environment: integration and continuity made possible with home, mobile and personal technologies and devices
 - Stimulation of the Usage-based R&D to develop home-care , home monitoring ...and the bottom-up appropriation of innovation in health

- ▼ Integrated vision of telemedicine : European cooperation for a common strategy
 - Common Strategic Plans, Objectives for the creation of a common vision of digitalised services in Healthcare,
 - Integrated program for telemedicine and e-health to implement the legal, regulatory, normalization and administrative frames required for an operational use.
- ▼ National implementation Plan and change management policies
 - For the technological innovation and integration of best practice adapted to national and professional constraints and requirements
 - For the national governance of the implementation of the European strategy
 - For the patients and citizens' sensibilisation and involvement for a bottom-up approach of R&D for relevance and fast appropriation of telemedicine and e-health
- ▼ Facilitation of European Cooperation and continuity in the Funding of Research and Experimentation projects :
 - To allow the implementation of the project's conclusions ' and recommendations by guarantying a certain continuity on the project's follow-on funding, to support their results and achievements on a mid-term perspective, while necessary accompanying measures (legal frame, norms, etc...) are awaited.

▼ Main Blocker: the Medical emergency requirements:

- Emergency situations require a **high bandwidth** to ensure the proper quality for teleconsultation and 2nd opinion
- Emergency situation require a **very short booking process and confirmation delay**
- Emergency situation require to have a satellite **bandwidth available 24h/24h**

▼ ...but being affordable !!! . Usage scenario of emergency requires:

- A dedicated satellite slot to guarantee the availability and performance of the necessary high satellite bandwidth
- A substantial critical mass.....:
 - No economic model can support such costs for a small volume of actual consumption of the satellite resources,
 - Lots of waste as emergencies are not foreseeable and will never get a sufficient volume to ensure a return on investment....

Specific Incentive for the development of Telemedicine by Satellite



- ▼ Creation of a joint Agency enabling all medical institutions involved in telemedicine by satellite activities to dispose of the necessary satellite resourcematching the Medical emergency requirements:
 - The European Agency :
 - gathers the membership of all interested concerned institutions active in satellite telemedicine
 - negotiates preferential tariffs with satellite operators to purchase large satellite bandwidth slot (s) over the concerned territory
 - In case of Emergency, the Agency allocates the required bandwidth thanks to an automated resource management system affecting priority to categories of telemedicine activities.
 - Minimum booking and confirmation delay
 - Continuous and guaranteed availability for emergency / Best-effort mode for other activities of the other members using the bandwidth
 - Affordable price: Tariffs are negotiated and billed at actual costs & bandwidth's consumption is mutualised

Specific Incentive for the development of Telemedicine by Satellite



- ▼ Joint Agency at European level: Under ESA and EC authority?.... in the follow-on of the UCOG's mission and membership....
 - Mutualization of the needed satellite bandwidth and relative costs
 - With medical activities of public interest : Chronicle diseases, Alzheimer, etc..
 - With extensions to other User Communities of European Public Interest: Research, science, Education, ... – contribution to the European Research Area
 - Mutualization of **User communities' and experts experience, best practice, projects...**
 - Mutualization and facilitating organ for **user-based R&D developments:**
 - automatic allocation tool, etc..
 - Usage laboratory and technological watch based on users' needs knowledge:
 - Local interconnection and interoperability latest technologies Showcase
 - Service platform and software Showcase
 - Relay for patients and citizens' representatives and for medical professionals 's needs and requirements towards institutions and projects

Conclusion for the next institutional step towards Sustainable telemedicine in Europe



- ▼ **Key words for the success of telemedicine in Europe :**
 - ▼ Standardization and Norms
 - ▼ Interoperability
 - ▼ Legal security
 - ▼ European coordination & integration and strategic Plan
 - ▼ Support for the affordability of Telemedicine via satellite for emergency situation and for activities of Public Interest

Thanks a lot for your attention!
Any further details or question?...Contact us:



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