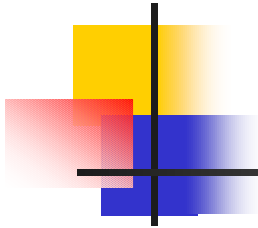




LESSONS LEARNED AND FUTURE OF E-HEALTH SERVICES

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Telecommunications Development Bureau
International Telecommunication Union

ITU-T Workshop on Standardization in E-Health, Geneva, 23-25 May 2003



- **Telemedicine** comprises all medical actions which extend the action space of health care professional beyond the face-to-face relationship with the patient in the direct surroundings.
- It is **medicine** at a distance.
This includes health care delivery, diagnosis, consultation, treatment, education and the transfer of related data.

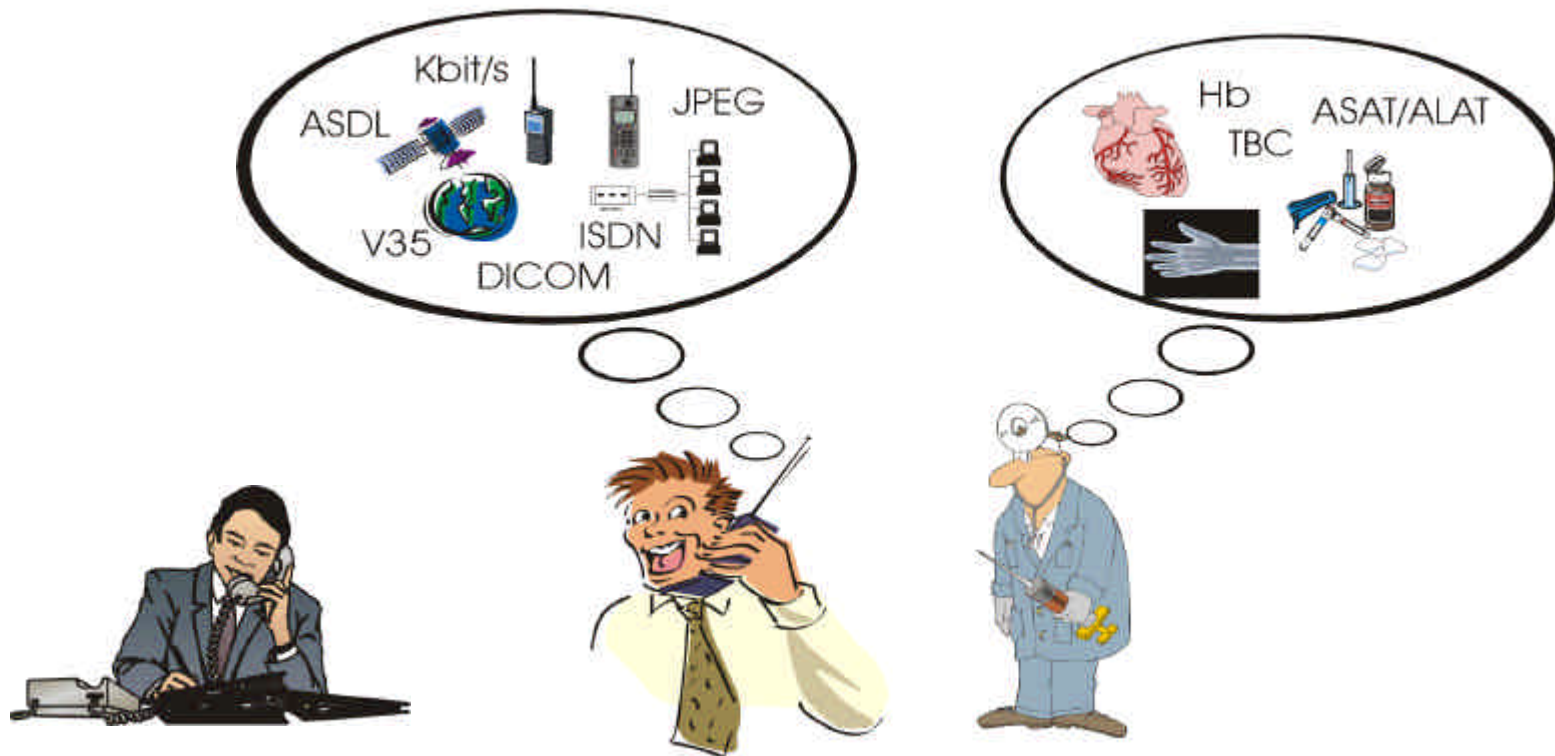


Benefits of E-Health

- Support for diagnostic (primary diagnostic, collaboration, 2nd opinion)
- Triage for evacuation of patients
- Distant education
- Enhancement of collaboration spirit
- Diminution of isolation
- Use of personal computers for health care.

Implementation challenge

Tele - Medicine





Medical constraints and challenges

- Need and will of cooperation between medical sites;
- Complementary function of involved institutions and organizations;
- Acceptance of technology and change of working environment;
- Interoperability issues ignored.



Telecommunication constraints

- Minimum requirement is reliable telephone line at 19.2KBit/s
- Simultaneous Internet access recommended
- ISDN permits more advanced solutions like video-conferencing
- xDSL for the future.



Few E-Health Standards applicable

- **DICOM** (Digital Communication Medicine) for medical imaging
- ITU H320/H120 for video-conferencing
- Proprietary systems for “Store-And-Forward”
- Proprietary interactive and collaborative systems



Few E-Health Standards applicable (continued)

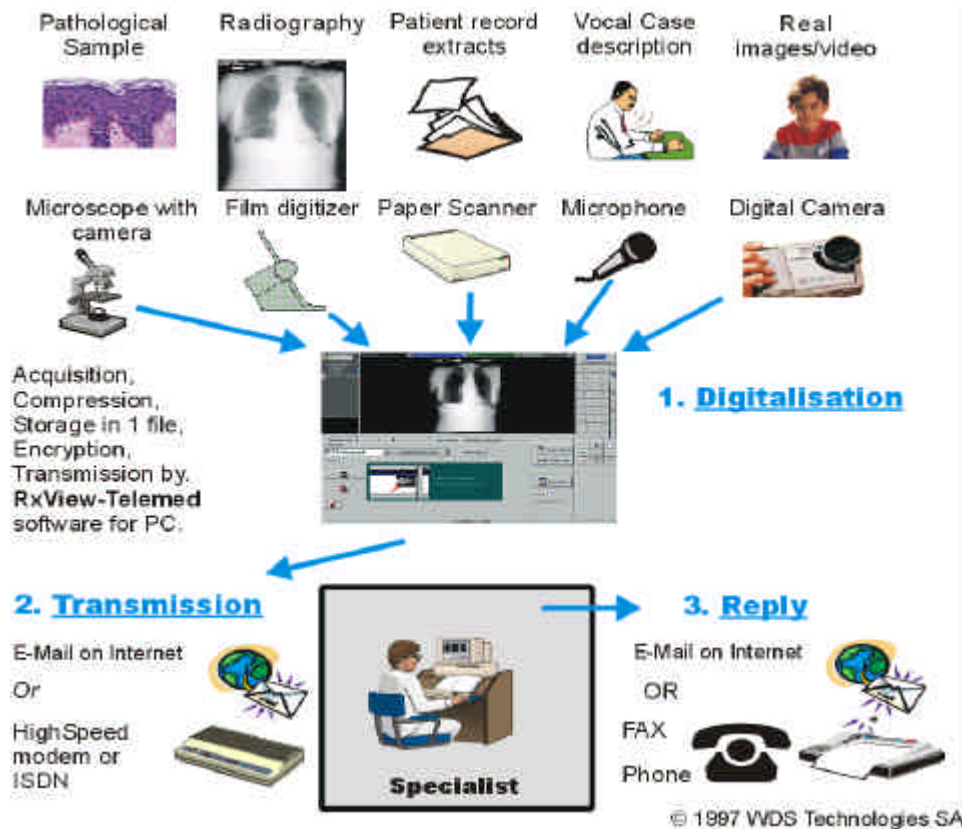
- JPEG (Joint Photographic Expert Group)
 - Lossy JPEG (<1:10)
 - DICOM Lossless JPEG (~1:2)
- Wavelett lossy compression
(up to 1:50)
Non standard and standard formats (JPEG2000)
- ITU-T V34, V90, V110 & ISDN standards for
telecommunication
- Internet standards (FTP, e-Mail)



“Store and Forward” telemedicine

- => Medical “FAX” or “e-Mail”
- Convenient for routine work
- Less interactive than videoconferencing
- Works on regular phone line if no other possibilities
- Must be encrypted
- Currently no standard

Concept of "Store and Forward"



Radiograph Scanner

PC

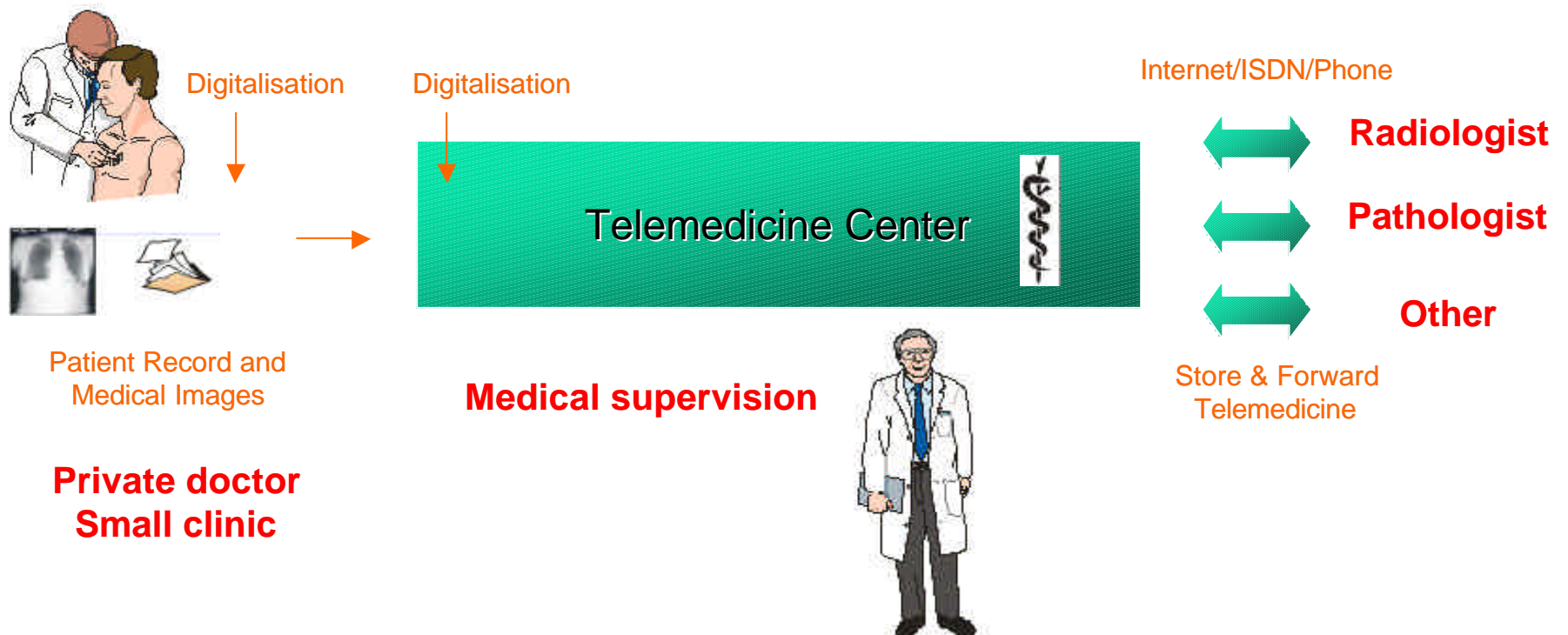
Document Scanner



Videoconferencing

- Interactive
- Well suited for seminars or special case discussion
- Less adapted and expensive for routine work
- Requires ISDN

Second opinion telemedicine concept



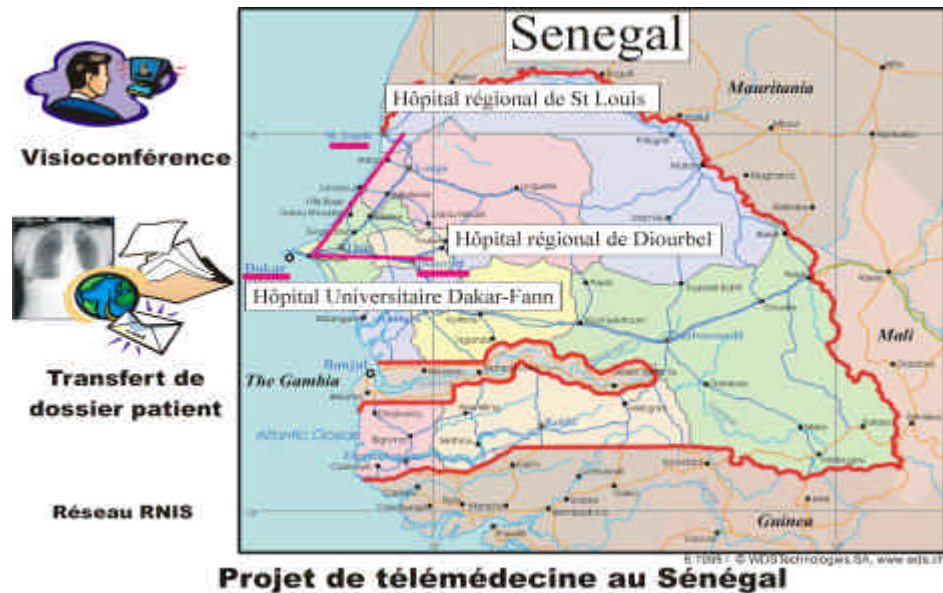
Medical information on Internet

- Gives valuable on-line access to huge medical knowledge & databases.
- Lack of quality control
-> www.hon.ch
- Language barrier.
-> www.etho.org



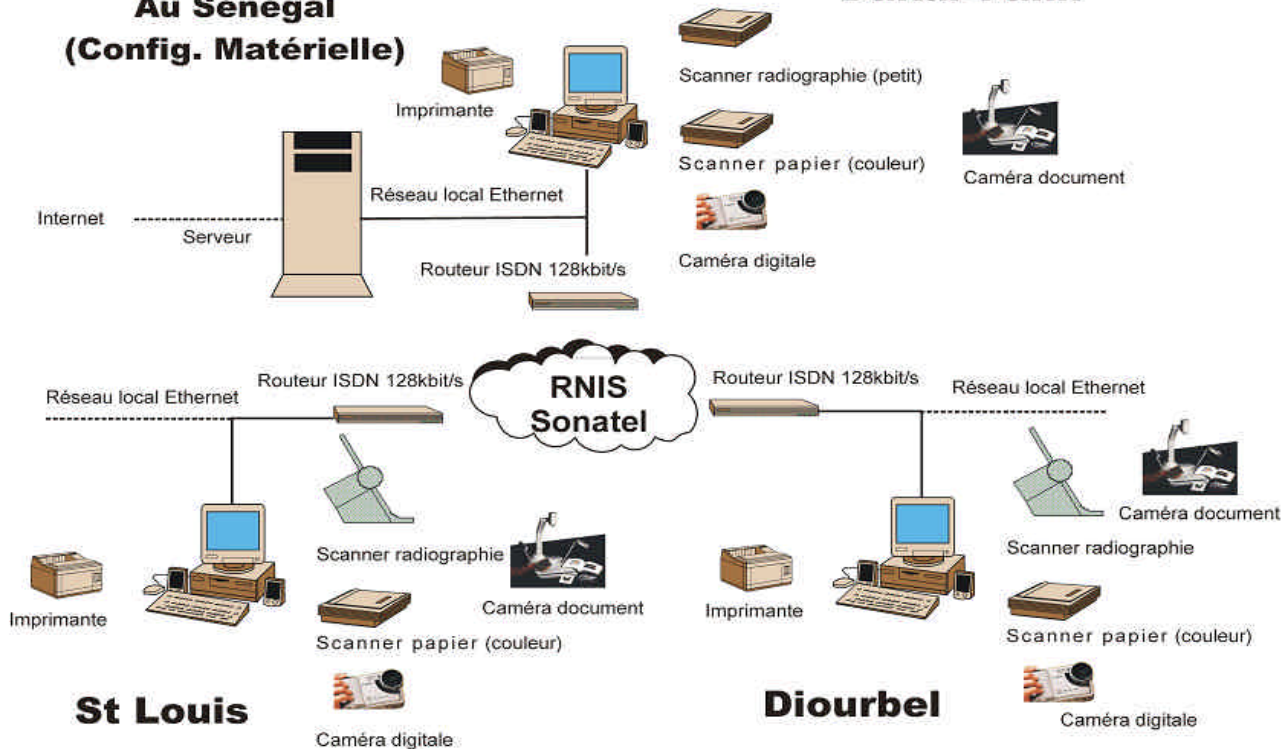
Sénégal TM Project snap-shot

- 3 hospitals connected initially:
 - Dakar
 - St-Louis
 - Djourbel
- Extended to 5 hospitals in total
- Usage of low-cost radiograph scanner



Project concept in Sénégal

Projet de Télémedecine Au Sénégal (Config. Matérielle)



6.1998 / WDS **WDS Technologies SA**
Your partner for medical imaging and telemedicine



ETHIOPIA

- **The Faculty of Medicine and the Tikur Anbessa Hospital in Addis Ababa will be connected by telemedicine links with several hospitals in the country.**
- **The introduction of telemedicine services will started with teledermatology.**
- **Transmission media-Internet.**



UZBEKISTAN

- **The Center of Emergency Medicine will be connected with the Research Centre of Surgery in Tachkent. Later on the telemedicine network will be expanded to all 12 regional branches of the Centre of Emergency Medicine.**
- **Transmission media-Internet.**



LEBANON

- **Ain Wazein Hospital, located in rural area, will be connected by telemedicine links with 12 small hospitals around.**

This will help to reduce the number of unnecessary referrals to the Ain Wazein Hospital and increase access to continuous medical education and training.

- **Transmission media-ISDN.**



POTENTIAL TELEMEDICINE APPLICATIONS

Developed countries

1. **Restructuring and enhancement of health care sector**
2. **Virtual hospitals**
3. **Home health care**
4. **Medical emergencies and disaster relief**
5. **Training**



POTENTIAL TELEMEDICINE APPLICATIONS

Developing countries

1. **Extension of primary health care delivery**
2. **Consultations with specialists (within the country and abroad)**
3. **Medical emergencies and disaster relief**
4. **Education and training**
5. **Access to specialized databases**



POTENTIAL PROBLEMS

- **Resistance from the doctor's side.**
- **The potential benefit derived from the introduction of telemedicine services is not brought to the knowledge of doctor's community and healthcare administrators.**
- **Systems must be focused on the needs of the medical profession and patients, and not forced by technology.**
- **Telemedicine may not be seen cost-effective since it often enhances the service rather than driving the process more efficient.**
- **Few insurance providers cover risks associated with telemedicine consultations.**
- **Predominantly of proprietary nature.**
- **Hardware and software compatibility, interoperability and related standards at infancy level.**
- **Systems management, organisation and maintenance. Staff refraining.**



About development work in E-Health

- **Intense development of electronics, telecommunications and IT:**
 - **Need to evaluate the operational value as well as application possibilities and limitations of new tools (quality of video image in different applications) leading to future technical development**
- **Focusing research and development work to areas in which further demand is secured**
- **Use of standards and recommendations – guarantees interoperability, compatibility and the delivery of necessary equipment after competitive bidding**
- **Interoperability enables large-scale international E-Health networks, reducing costs**



The development of telecommunications and IT will make possible . . .

- Home care and home assistance delivery;
- New tools for emergency care (ECG transfers, mobile image, patient records);
- Intranet solutions in healthcare and user-friendly interfaces;
- Live image transfer inside organizations and amongst their LANs;
- The quality enhancement in live image transfer will be as best as original video material (data transfer speed -> 3 – 6 Mbit/s);
- The quality of still images will be as good as film pictures;
- Archiving and secure patient data transfer;
- Transfer of consultation information between different medicals sectors
 - Radiology, ophtamology, neurophysiology, dermatology, ...
 - Real-time and non-real-time applications from digital and digitized sources
 - Help with workgroup tools
- Virtual assistance.



Conclusion

- Evolving technologies enhance E-Health services.
- Developing countries can benefit by using simple low-cost systems.
- Success of implementation based on close and strong cooperation between medical and telecommunication sector.
- Large scale projects and E-Health networks deployment depend on transparency, interoperability and world-wide standardization.
- Ministries of Public Health and Health Insurers have become strongest E-Health proponents because E-Health will make cheaper and more efficient the health and care services to citizens (Ref. Declaration of Minister of Health, Brussels, Belgium, 22.05.2003).
- E-Health interoperability standards are needed now!



Thank you !

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