Memory of activities of the CATAI Association

Period of activity: SEPT. 2003 - SEPT. 2004

Report established by: PROF. DR. O. FERRER-ROCA

Function / Title: M.D. PhD. FULL PROF. IN PATHOLOGY(ANATOMIA PATOLOGICA)

Summary

I. Address

	Address of the Host Institution	Address of the Coordinator
Name	Prof. Dr. O. Ferrer-Roca	Prof. Dr. O. Ferrer-Roca
Function/Title	Chair of Pathology	Chair of Pathology
University/Institution	University of La Laguna	University of La Laguna
Faculty/Department/Centre	Faculty of Medicine	Faculty of Medicine
P.O.Box	La Cuesta	La Cuesta
Street	La Laguna	La Laguna
Postal Code	38071	38071
City	Santa Cruz de Tenerife	Santa Cruz de Tenerife
Province	Canary Islands	Canary Islands
Country	Spain	Spain
Phone	+34 922-319321	+34 922-319321
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E-mail	catai@teide.net	catai@teide.net
Web Site	http://www.teide.net/catai	http://www.teide.net/catai

II. Available resources

Please specify for each item, when available, **total cost** and **funding sources**
(for guidelines see Annex 3)

1. Human resources

1. For the administration of the UNESCO Chair or Network
   Lawyer Margarita Suárez Delgado
   Partial time support Secretary Candelaria Padilla Padilla
   Partial time support Secretary Elisabet Almenar Hernández
   Partial time support Secretary Ana Cristina Oliver Hidalgo
   Partial time support Luz Marina Lo Cascio García
2. For the teaching/training/research activities
   Please specify number of full professors , researchers, visiting professors, lecturers, others
   Prof. Dr. O. Ferrer-Roca
   Electronic Engeeniering Prof. Dr. José Miguel Vidaurrazaga Álvarez
   Informatics Engeeniering Maida Morales Hernández
   Computer Science Pablo Pulido Lorenzo
   Electronic Engeeniering Álvaro Cárdenas Maldonado
   Telecomunication Engeeniering Álvaro Díaz-Cardama
   Informatics Engeeniering Elsa Delgado Montelongo
   Informatics Engineer Karin Franco Burbano
3. For the information and documentation activities:
   Secretary Simón Sananes

4. For other activities: The international courses brought to teaching and training a total of 35 professors coming from European, African and Ibero-American countries (Italy, Greece, France, Germany, USA, Spain, Uganda, United Kingdom, Belgium, Argentina, Venezuela, Cuba)

2. Material resources

1. For the administrative work: Computers fax machines, xerocopy machines, printer, and storage systems.
2. For the teaching/training/research activities: Videoconference, workstations, ultrasounds, video-edition, projector, Book edition, CD-edition, Proceedings editions, e-learning, Digital Fingerprint control systems.
3. For the information and documentation activities: Web site, Posters, brochures, Proceedings, Book editions, CD-edition
4. For other activities *(Please specify):* Videoconferencing, 3D-virtual reality, Distant control,

III. Activities

Please, provide information on items 1 to 7 for each activity, when available, and specify:

- *Target groups, in accordance with Annex 1*
- *Geographical coverage, in accordance with Annex 2*
- *Funding sources, in accordance with Annex 3.*

1. Education/Training/Research

- Title and expected results for each course, workshop,…

See joined memorandum and programs of the Winter Course of the CATAI

- Duration: 2weeks.
- Target groups: doctors, nurses, health-care providers, NGOs
- Partnership *(please specify the name of the Institution, city, country): Universities Regensburg, Trier, Bremen, Humboldt Univ. Berlin, Magdeburg, Innsbruck, Makerere, Entre-Rios, La Habana-Cuba, Zulia, Thessaloniki, Athens Univ. of Economics and Business, Aristoteles University Tesaloniki, Rochester-USA, La Laguna, Kazakhstan.*
- Geographical coverage for partners and participants: Europe-Africa-South & North America.
- Funding sources: CATAI founding. Telefónica SL. Agency of cooperation in Iberoamerica.
- Outputs: Please specify number of doctoral students: 150-200 students per year . For the publications, complete form of Annex 4, and Annex 5 for the multimedia material.

2. Conferences/Congresses/Meetings

- *Title and expected results for each conference, meeting…:*
  Always in Telemedicine. Expected increase of knowledge and training of how to handle medicine at distance for people and areas underserved or with health care constrains availability.
- Dates and place: Casablanca (8-12 Oct. '03), Madrid (6-9 Nov.'03), Madrid (11-13 Feb.'04), Tenerife (15-28 March 04).
- Partnership *(please specify: Name of the Institution, City, Country): see joined programs plus Mulago Hospital-Uganda; Roche Research Center, Univ.* Kazakhstan
- Participants *(number*): *100 up to 1000 depending of the type of meeting*
- Geographical coverage for participants and partners: Europe-Africa-South America-Asia
- Funding sources: CATAI fundings. Telefonica SL.
- Outputs: Please complete Annex 1 for the publications and Annex 2 for the multimedia material.
- Preparing ***"Learning" video conferencing sessions*** between Mulago and us, once a month inside the Telemedicine Project Makerere Medical School

3.Missions / Travels abroad

Destination: University La Laguna-UNESCO Chair Telemedicine.
From : Entre Rios-Argentina, Cuba, México, Uganda and Venezuela
Purpose: Students training in telemedicine
Duration: from 1 to 2 month
Funding source: University of La Laguna/Telefónica SL / Catai fundings/ Agency of cooperation in Iberoamerica.
Outputs: training of students to provide telemedicine in underserved areas.

4. Visiting professors / Fellowships

Number: (10)
Duration: 1-2 month

University of origin: U. Zulia-Venezuela (2), U. Entre-Ríos (5), U. Makerere (1), University of La Habana-Cuba (1), U. México (1).
Funding sources: University of La Laguna, CATAI fundings, Telefonica SL, PCI-Agency of cooperation in Iberoamerica.

5. Information and documentation activities

1. CATAI 2004, Editor: Prof.Dr.O.Ferrer-Roca. CATAI editions. Tenerife. ISBN 84-6070493-8
2. European Telemedicine Glossary, 5th Edition Editor: Luciano Beolchi: Information Society Directorate-General – Directorate B, Unit B1 – Applications Relating to Health; European Commission, 2003

6. Others

Written agreements with Universities

6.1 Written agreement with the Development Department of Roche USA-Barcelona for the implementation of the wireless SMS Diabetes and Coagulation results reports. Signed on the 10th February 2003 by the President of Roche Spain Mr. A.Ferrer.
6.2 Written agreement with the University of Kazakh-Kazakhstan for high technology advice and cooperation in the field of Telemedicine. Signed on 18th February 2004 with the President of the Kazakh National Medical University.

Training Books donations

6.3 Donations of the English version of the Handbook of Telemedicine to the University of Mexico (1).
6.4 Donation 300 European Telemedicine Glossary 5th Edition to the attendants of the XII Winter Course of the CATAI. Tenerife. Spain.

Computer donations

Studying the strategy for the second delivery of 8-12 computers working properly, Pentium III with Windows 98 to the Dean of the Faculty of Medicine of the University of Makerere- Uganda. Costs will be assumed by the CATAI.

IV. Impact

Please describe shortly (one page maximum) the impact of the mentioned activities on the human, social, economical and cultural development at national, regional or international level.

The relevance of the telemedicine in areas underserved or to people with limited access to health care do not require further comments.
One of the principle obstacles in the wide use of Telemedicine is the lack of specific training and qualifications in the health care environment (doctors, nurses, paramedics, managers, NGOs) as well as related areas from which they require support (computer science, telecommunications)
The Unesco chair of Telemedicine has become during the previous years of activity an International reference in the aspects of quality training in Telemedicine particularly to developing countries, giving furthermore support to implement local solutions or health care at distance whenever needed.
Furthermore their location in an archipelago territory, which is the bridge between Europe-America and Africa, also facilitate his tasks.

V. Forthcoming activities

1. XII SUMMER COURSE OF THE CATAI – September 2004 – Kos Island - Greece
2. XIII WINTER COURSE OF THE CATAI - March 2005 – Tenerife - Spain

3. GREEK EDITION OF THE MANUAL OF TELEMEDICINE
4. ITALIAN EDITION OF THE MANUAL OF TELEMEDICINE
5. FRENCH EDITION OF THE MANUAL OF TELEMEDICINE
6. GERMAN EDITION OF THE MANUAL OF TELEMEDICINE
7. STUDENTS EXCHANGE TO TENERIFE
8. STUDENTS TRAINING IN TENERIFE
9. UGANDA DOCTORS TRAINING IN EUROPE
10. SCHOLARSHIPS FOR IBEROAMERICAN BIOENGENEERS
11. KAZAKHSTAN INTERCHANGE
12. TELEMEDICINE MASTER FOR DEVELOPING COUNTRIES (ERASMUS MUNDUS)

VI. Development prospects

The activities of the Chair started on 1999 has expanded during the period 2003-2004 to:

1. - Mediterranean Countries, particularly in the North of Africa (Argelia).
2. - Expansion in other Ibero-American countries, particularly to Cuba and Mexico.
3. - Expanded to India, Kazakhstan, Russia, Bulgaria and Rumania.
4. - Approach with the WHO (World health organization) to help the NGOs with Telemedicine devices, is still pending. Nevertheless there is an initiative to introduce Telemedicine in the disaster area international norms.

Annex 1

Target groups

Undergraduate students	YES
Graduate students	YES
Postgraduate students	YES
Academics	YES
Public administrators	YES
Employees from industry, or other private organizations *(please, specify)*	YES: NGO's
Teachers from primary education	NO
Teachers from secondary education	NO
Teachers from technical and vocational education	YES
Teachers from adult education	YES
Others groups *(Please specify)*	YES: VOLUNTIERS

Annex 2

Geographical Coverage

- **National**

Spain: Canary Islands (7 Islands)

- **Regional**

Please specify countries and regions

  - Africa: Nairobi-Kenya, Makere-Uganda,
  - Arab States: Israel
  - Asia/ Pacific: Kazakhstan, Tel-Aviv-Israel, New Delhi-India
  - Eastern and Central Europe: Sofia-Bulgaria, Rumania
  - Western Europe and North America: Germany-Regensburg, Italy-Udine, Greece-Athens and Aegean islands, Austria-Tyrol, France-Strasbourg, Lachen-Switzerland.
  - Latin-America: Argentina-Entre_Rios, Venezuela-Maracaibo, Panamá, Cuba-La Habana, México.

- **Interregional**

Please specify regions

Annex 3

Funding sources

Funding source	Type of Organization / Institution	Period	Amount US$
UNESCO Contribution		2003/04	0
Other contributions: *Please specify, for each contribution:* *Institution, City, Country*	Host Institution	2003/04	10000
	Partner university/ institution	2003/04	15000
	Governmental body		
	Other public institution *Please specify*		
	UN Agencies		
	IGOs		
	NGOs: CATAI	2003/04	20000
	Industry		
	Other private sources *Telefónica SL -Spain*	2003/04	60000
TOTAL		2003/04	105000

Annex 4

Outputs

Form 1: Publication

Title of activity: CATAI 2004-

Title: CATAI-2004, ISBN 84-6070493-8
Publisher(s): CATAI- Tenerife-Spain
Year: 2004
Number of pages: 168

Type of document/material:

- Book
- Periodical
- Others *(specify, please)* X Proceedings XII Winter Course CATAI.

Teaching/learning material X

Language(s): English, Spanish

Main keywords (4 or 5): Telemedicine, Information Society, Health Care

SHORT ABSTRACT

(Brief description of the content in English, French or Spanish)

The proceedings of the XII Winter Course of the CATAI bring new technological aspects to distant delivery of Health Care with Quality and Security. Particular interest had been the wireless technology in distant medical support and the use of multimedia messages in a wireless environment including the SMIL format.
Covered new technologies are smart houses, wearable computers including the smart bandages capable to diagnosed infections and treat them, or MEMs (Micro-electromechanical devices) some of those even developed in developing countries.
Furthermore in all applications starting with the electronic clinical record the standards on architecture and implementation in the field of distant health care as well as professional card implementation and digital signature for quality health and certificate recognition are essential.
Best practice in Canary Islands as well as over the world and the rest of the 13 chapters of the Body of Knowledge finish the book.

Title of activity:__WEB-WAP Diabetes control_____

Title: " Web-Wap Diabetes Control in Canary Islands."
Publisher(s): Sent to Journal of Telemedicine and Telecare on September 2003
Year: 2004
Number of pages: 13

Type of document/material:

- Book
- Periodical X
- Others *(specify, please)*

Teaching/learning material

Language(s): English

Main keywords (4 or 5): Diabetes. SMS. Messaging. Management. Telemedicine. Standards.

SHORT ABSTRACT

(Brief description of the content in English, French or Spanish)

Summary:

The paper analyses the acceptance of a Web-WAP-based diabetes control service in the Canary Islands covering 5/1000 people fulfilling the trial criteria. The web site allows the patient to post biological measurements, as for example blood glucose, diastolic and systolic pressure, temperature, pulse, weight, etc. An individual management plan selected by doctors is build for each patient and later doctors or patients can review the data through the web. The site has an automatic answering system based on value ranges and goals defined by the doctor for each patient. The interface has an interactive message window that allows the doctors to send advice to patients. Patients have the option to self-manage their diabetes, reviewing measurements in a table/graph identical to the doctor's interface.

User analysis was carried out with personal and on-line questionnaires. The trial had recruitment difficulties; the main reason was the limited patient Internet access.

Patients had the feeling that they were not closely controlled because doctors did not use messaging facilities to communicate with the patients, indicating that patient self-management culture with software programs has to be integrated with doctors' distance management.

Users were satisfied with continuity and self-efficacy of care, but lack of time was a drawback for the 38% and 75% expressed their preferences to send their data in a more comfortable way using Short Message Services (SMS).

The initial Canary Islands Web-based diabetes management was extended to allow the patients to send their glucose or other measurements using their mobile phones by SMS. This was done building an SMS-server based on a GSM modem with a SIM card and a simple Visual Basic application that interacted with the database of the initial Web-based diabetes management program..

The data received from the patient by SMS could be blood glucose, blood pressure, weight and temperature. Automatic answers were sent upon reception according to individual patient ranges/goals. Furthermore, a server program monthly-calculated the glycosylated Haemoglobin value, sending a SMS message to the patient.

After five months of implementation, the Tenerife diabetes trial expanded from 6,02 per1000 inhabitants able to fulfil the trial criteria to 9,41/1000. Patients entering the SMS trial were of two age groups; one was significantly younger than web-wap users and the second included old patients whose data had to be introduced by their relatives.

Overall user satisfaction was good (64,88%).The majority preferred to manage diabetes by themselves (76%) and considered that messages received from the doctors were irrelevant (38%).

The paper showed its simple design and low cost infrastructure/maintenance. Running costs for the diabetes manager was 5 € per patient/month. Using Premium SMS Short numbers, the costs can be transformed into benefits, gaining 7 € per patient/month .

Title of activity:__SMS for Diabetes Control_____

Title: Health Care SMS messaging. Diabetes management application

Publisher(s): Sent to Journal of Telemedicine and Telecare January 2004

Year: 2004

Number of pages: 11

Type of document/material:

- Book
- Periodical X
- Others *(specify, please)*

Teaching/learning material

Language(s): English

Main keywords (4 or 5): Diabetes. SMS. Messaging. Management. Telemedicine. Standards.

SHORT ABSTRACT

(Brief description of the content in English, French or Spanish)

Objectives: The present paper describes the use and potential value of mobile phone Short Message Services (SMS) for distance diabetes management that has not been previously published in scientific journals. It outlines a eight month experimental trial that complemented an existing Web-based management system.

Design: The trial was based on an SMS-server using GSM modem with a SIM card by means of a Visual Basic application. Patient data (blood glucose, blood pressure, weight and temperature) were received via SMS. The server automatically answers via SMS with pre-recorded messages depending on individual ranges/goals established by the doctor and with a monthly-calculated glycosylated Haemoglobin. Doctors send individual advice messages via Web interface or SMS. Patients and doctors were able to control parameter evolution through web interface.

Measurements: Differences between SMS versus Web users were studied together with user satisfaction. Activity of the SMS-server was analysed through the log files. User concerns were collected at periodic meetings with user associations.

Results: The distant diabetes management trial reached 1.6% patients who fulfilled trial criteria, and 52 % were SMS users. The SMS system had special success in teenagers and elderly patients whose data were introduced by younger relatives.

Overall user satisfaction was good (65%) without differences between SMS and Web users. Although 80% of patients manage diabetes by themselves, they value receiving automatic or doctors messages (70%) that keep extreme-aged patients on track.

The willingness-to-pay analysis demonstrates the SMS barriers for teenagers using pre-paid cards and cost concerns among older user groups.

Title of activity:__Digital Signature_____

Title: Applied Health Care Security Standards. PMI and PKI for e-prescriptions.

Publisher(s): Sent to International Journal Medical Informatics. April 2004.

Year: 2004

Number of pages:

Type of document/material:

- Book
- Periodical X
- Others *(specify, please)*

Teaching/learning material

Language(s): English

Main keywords (4 or 5): Telemedicine, e-health, PMI, PKI, Digital signature, Digital Certificates, TTP, Security and USB-token.

SHORT ABSTRACT

(Brief description of the content in English, French or Spanish)

Objectives-.This article outlines a demonstrator model of electronic health care infrastructure and access management for *e*-prescription. The model fulfills international health-care standards and national laws of security and privacy, and attempts to respect strict, global EU norms and flexible, sectored USA laws.

Design-. A professional ID-card was built into the highly secure single-chip USB token (ISTEC E4 High; EAL-5) incorporating a hardware hash accelerator for digital signature. Data security management drew on commercially available solutions necessary to authenticate and authorize data access and to sign, using PKI and PMI for legal and liability purposes.

Measurements-. Degree of legal compliance of existing solutions to ensure secure access by authorized health workers was evaluated.

Results-. PKI/PMI proved unable to handle health care attributes in *ad hoc* certificate extensions and no templates to build role-rule privileges based on trust certificates could be obtained from legally established Certification Authorities. The single-chip USB token has proved highly efficient for multiple computer

interactions and electronic signature, only being constrained by the USB-1.1 interface speed (12Mbits/sec.). Chip initialization using a banking-type mask limited the space required for the health-care channel of trust.
Discussion-. Law-compliant security and international health care standards could not be fully deployed due to lack of commercial solutions. Existing solutions and quality labels are discussed.

Title of activity:__Digital Signature_____

Title: Health Care Security Standards versus immediate solutions.
Publisher(s): CATAI 2004. . ISBN 84-6070493-8. Prof.Dr.O.Ferrer-Roca Ed. Tenerife. Canary Islands.
Year: 2004
Number of pages: 100-107 (8)

Type of document/material:

- Book
- Periodical X
- Others *(specify, please)*

Teaching/learning material

Language(s): English

Main keywords (4 or 5): Telemedicine, e-health, PMI, PKI, Digital signature, Digital Certificates, TTP, Security and USB-token.

SHORT ABSTRACT
(Brief description of the content in English, French or Spanish)

The paper deploys an electronic health care infrastructure and access management for *e*-prescription, fulfilling security and privacy international health-care standards and country laws. It tries to cope global/strict EU norms with sectored/flexible USA laws.

A professional ID-card was built in the most secure single chip USB token (ISTEC E4 High; EAL-5) that provide a hardware hash accelerator for digital signature. The security management takes available solutions to authenticate, to authorize data access and to sign using PKI/PMI for legal and liability purposes.

Degree of legal compliance of existing solutions to authenticate health workers allowing secure access was evaluated.

The PKI/PMI was not able to handle health care attributes in the *ad hoc* certificate extensions and no templates to built role-rule based privileges based on trusted certificates could be obtained from legally established Certification Authorities. The single-chip USB token had been highly efficient for multiple computer interactions and to electronically sign, being only constrained by the USB-1.1 interface speed (12Mbits/sec.). Chip initialization using a banking-type mask limited the space required for the health-care channel of trust.
Law compliant security and international health care standards could not be fully deployed due to lack of commercial solutions. Existing solutions and quality labels are discussed.

Title of activity:__Diabetes control_____

Title: Health Care SMS applications. Diabetes management.
Publisher(s): CATAI 2004. . ISBN 84-6070493-8. Prof.Dr.O.Ferrer-Roca Ed. Tenerife. Canary Islands.
Year: 2004
Number of pages: 14-18 (5)

Type of document/material:

- Book
- Periodical X
- Others *(specify, please)*

Teaching/learning material

Language(s): English

Main keywords (4 or 5): Telemedicine, e-health, Diabetes.SMS.

SHORT ABSTRACT
(Brief description of the content in English, French or Spanish)

The present paper describes the use and potential value of mobile phone Short Message Services (SMS) for distance diabetes management that has not been previously published in scientific journals. It outlines a eight month experimental trial that complemented an existing Web-based management system.
The trial was based on an SMS-server using GSM modem with a SIM card by means of a Visual Basic application. Patient data (blood glucose, blood pressure, weight and temperature) were received via SMS. The server automatically answers via SMS with pre-recorded messages depending on individual ranges/goals established by the doctor and with a monthly-calculated glycosylated Haemoglobin. Doctors send individual advice messages via Web interface or SMS. Patients and doctors were able to control parameter evolution through web interface.
Differences between SMS versus Web users were studied together with user satisfaction. Activity of the SMS-server was analysed through the log files. User concerns were collected at periodic meetings with user associations.
The distant diabetes management trial reached 1.6% patients who fulfilled trial criteria, and 52 % were SMS users. The SMS system had special success in teenagers and elderly patients whose data were introduced by younger relatives.
Overall user satisfaction was good (65%) without differences between SMS and Web users. Although 80% of patients manage diabetes by themselves, they value receiving automatic or doctors messages (70%) that keep extreme-aged patients on track.
The willingness-to-pay analysis demonstrates the SMS barriers for teenagers using pre-paid cards and cost concerns among older user groups.

Title of activity:__Quality of services_____

Title: Calidad de Servicios. ISO 9001-2000
Publisher(s): CATAI 2004. ISBN 84-6070493-8. Prof.Dr.O.Ferrer-Roca Ed. Tenerife. Canary Islands.
Year: 2004
Number of pages: 140-142 (3)

Type of document/material:

- Book
- Periodical X
- Others *(specify, please)*

Teaching/learning material

Language(s): English

Main keywords (4 or 5): Telemedicine, e-health, Diabetes.SMS.

SHORT ABSTRACT
(Brief description of the content in English, French or Spanish)

La calidad de servicios es fundamental para la practica de la telemedicina ya que es el requisito indispensable para garantizar la seguridad y eficacia de las intervenciones destinadas a prevenir, diagnosticar, curar o controlar las enfermedades.. La calidad de servicios en la practica de la telemedicina debe extenderse a la totalidad de la cadena de los servicios tele-medicos, desde el punto en que se recoge la información hasta que concluye la intervención medica. El modelo propuesto en la norma ISO 9001 en su versión del año 2000, es sin lugar a dudas, una evolución natural de las demandas de las organizaciones

públicas y privadas para contar con herramientas de gestión más sólidas y efectivas para hacerse al incierto mar de la globalización y capitalizar sus esfuerzos.

La Global Harmonization Task Force SG3 suministra estos comentarios y sugerencias a ISO TC 176 e ISO TC210 WG1 para consideración. Tal y como se describe en el Memorando de Entendimiento entre GHTF e ISO TC 210, los miembros de SG3 buscan trabajar de cerca con WG1 para desarrollar un juego revisado de normas que cumplan las necesidades de la comunidad de dispositivos médicos regulados.

Estas recomendaciones se plasman en las normas ISO 13485:2000 y ISO 13488: 2000 que establece los requisitos para un sistema de gestion de calidad aplicables a los productos sanitarios y servicios relacionados

ISO 9000 presenta una base fundamental de sistema para gerencia aplicada al sector de servicios médicos. Es la forma más efectiva de atender las necesidades de pacientes y seguridad concurrente con un esquema de mejora. Además, aplicando principios y métodos ISO Kaizen-Blitz el sector médico se beneficia tanto como organización como a sus clientes (pacientes). El enfoque es uno de procesos al igual que los hospitales y centros médicos operan.

El sector de servicio puede administrar de forma efectiva y eficiente sus procesos en la responsabilidad de cuidados a pacientes con enfoque en mejoras.

Title of activity:__e-learning_____

Title: Adaptive Personalized Telemedicine Data Handling.
Publisher(s): Sent to the Journal IEEE T. INT TECH in BIOMEDICINE. November 2003.
Year: 2004
Number of pages:

Type of document/material:

- Book
- Periodical X
- Others *(specify, please)*

Teaching/learning material

Language(s): English

Main keywords (4 or 5): e-learning. Semantic Web. Telemedicine.

SHORT ABSTRACT

(Brief description of the content in English, French or Spanish)

Introduction. - Telemedicine (TM) is a multidisciplinary speciality on permanent renewal according to new trends and innovations in information technology. Professionals with different backgrounds make use of this new science whose knowledge is acquired through a continuous training rather than as part of their curriculum. In this context, it has become a challenge to create an intelligent tool that not only delivers personalized training but also utilizes up to date sources such as those found in Internet.

Objectives. - The purpose of the present paper is to describe a list of innovations in relation to medical metadata packaging and rule building capable of achieving an adaptive retrieval that takes into account all available resources including those from the Internet.

Design.- The packaging tool create a *modified* XML-manifest that contains a Navigable Knowledge map and a separated rule-extension executed during the process of navigation by means of agent technology. Agents systems also handle personalization, selecting knowledge packages according to metadata tags. Vocabulary and ontologies use in the process are based on the telemedicine body of knowledge (TM-Bok) and MeSH (Medical Sub-headings).

Conclusion.- The *modified* XML-Manifest opened to the Internet and to agent technology interpretation is ideal for telemedicine, multidisciplinary, personalized e-learning. Distant intelligent medical data management and retrieval innovations demand health care agent development teams as well as the introduction of the TM-BoK in medical ontologies.

Annex 5

Outputs

Form 2: Multimedia material

Title of activity:_____TELEMEDICINE-CD___

Title: CATAI Telemedicine-CD. ISBN 84-923357-2-6

Producer and/or distributor *(with address)*: CATAI
Year: 1999-2004
Teaching/learning material X

Type of material:

- Video
- CD ROM X with videos
- Visioconference:
- Other type of material

*(Please specify):*_____

Duration: 643 MB
Format: Word, Html, */ppt, /mpeg*
Language(s): English- Italian-Spanish
Main keywords (4 or 5): Telemedicine

SHORT ABSTRACT

(Brief description of the content in English, French or Spanish)

According to one of the numerous definitions of Telemedicine "providing medicine at a distance", any doctor being trained in the use of some telematic devices could effort that practice. The reality is far from this because to assure a safe practice, people have to learn and bear a minimum understanding of a wide range of topics: from economics to telecommunications and from medicine to legal aspects. Technology learning is not limited to technology itself but linked to its social practical consequences in all their aspects. To guarantee that none of the aspects related with Telemedicine are missed, this minimum knowledge has to be fixed, organised and in some way standardized. The main purpose of this book is to structure the basic knowledge linked to teaching to provide or to practise telemedicine, as well as an overview of the technology developments linked to this new discipline. As expressed in the title (Handbook of Telemedicine), the book is precisely structured as a "handbook" whose main value is the joint opinion of all the participating authors of what are the learning requirements for anyone that would like to practice Telemedicine. It is not a full treatise nor a complete collection of all telemedicine applications or telemedicine basics. It was built with the aim of creating awareness to the academic aspects (technology development, telecommunications approach, law and regulations, medical practice) as well as to the minimum knowledge requirements to guarantee safe and appropiate medical practice. Nowadays this fact is enhanced by the evidence that welfare expenses cannot be endlessly increased, whilst an efficient health provision system in the context of the information society, will mark a new trend to configure health care practice in the next century. If training and teaching schemes are to cope with the demands of society it seems obvious that those carers and professions should consider structured and sufficient training in Telemedicine.

AIMS OF THE MULTIMEDIA CD-ROM

The present CD-ROM contains the Handbook of Telemedicine as a whole, internally structured in 12 Chapters and 13 Annexes (file *HANDBOOK.DOC*). Some of them are complemented with diverse multimedia material for training and teaching purposes. The handbook is presented in Word and Html formats (directory */html*), while the multimedia material is located in the directories */ppt* and */mpeg*. The former are PowerPoint 97 presentations and the latter are video-clips on Mpeg format.

Title of activity:_____DISTANT TELEMEDICINE TRAINING-CD___

Title: Telemedicine training CD. ISBN demanded when finished.
Producer and/or distributor *(with address)*: CATAI
Year: 2004
Teaching/learning material X

Type of material:

- Video X
- CD ROM X with videos
- Visioconference:
- Other type of material Videostreaming
  *(Please specify):*_____

Duration: 2 GB
Format: RM (real media)
Language(s): English-Spanish
Main keywords (4 or 5): Telemedicine

SHORT ABSTRACT

(Brief description of the content in English, French or Spanish)

The capability to get trained by the best experts in Telemedicine is now not only limited to the Summer and Winter Courses of the CATAI. The editions of the CDs with the Real Media video containing the power point presentations together with the personal training by the world experts, assure that this high quality training is available either on video or on paper for developing countries.

Title of activity :_____Web and On Line distant training_____

Title: www.teide.net/catai

Producer and/or distributor *(with address)*: CATAI

Year: 1997-2004

Teaching/learning material X
Type of material:

- Video
- CD ROM
- Visioconference:
- Other type of material X
  *(Please specify):*_____ Web page; Videostreaming training

Duration: 60 hours.
Format: Html; RM (real media)
Language(s): English- Spanish
Main keywords (4 or 5): Telemedicine

SHORT ABSTRACT

(Brief description of the content in English, French or Spanish)

The CATAI web has as main objective the spread of the Telemedicine in Spain and in developing countries. The non-for profit association fo the CATAI (Center of Advanced Technology in Image Analysis) support Telemedicine activities and studies in the field of:

Image Analysis at distance
Data transmission
Videoconsultation and videoconferences
On Line training
Distant telequantitation.

The Summer and Winter Courses of the CATAI can also be followed on line during its production by means of the Helix Videoserver providing Real Media output that contain the Power Point presentation together with the video image of the speaker.

Title of activity:_____Distant teaching._____

Title: http://alexandros.ccslab.aueb.gr/~ctc

Producer and/or distributor *(with address)*: CATAI
Year: 2000-2004

Teaching/learning material X
Type of material:

- Video
- CD ROM
- Visioconference:
- Other type of material X
  *(Please specify):*_____ Web page

Duration:
Format: Html
Language(s): English-Spanish
Main keywords (4 or 5): Telemedicine distance training

SHORT ABSTRACT

(Brief description of the content in English, French or Spanish)

The present activity carries out the diffusion of the structured training skills in the field of TELEMEDICINE. It introduces an innovative professional training by assuming new Information Society skills not only in the Health Care provision but also in the teaching methodology. The co-operation inside of the present CTC consortium will provide and update the contents of those rapidly moving technologies, and will bring innovative approaches in the teaching done at distance with experience of the ODL of APOLLO project as well as the experience on surgical virtual reality simulators provided by the new partners. The training is directed towards trainers to update their knowledge and skills, it means health care professionals (including directors and responsible people) in the European Union. This requires the updating of the Information Society training applied to health care.

This activity is linked with the initiative of the UNESCO Chair of Telemedicine to apply the consortium experience towards the urgent demand of Telemedicine in developing countries to improve their limited health care system efficiency and accessibility. The International teaching activities are arranged in intensive Winter and Summer Courses particularly to update trainers knowledge and teaching material. This activity also takes into consideration the fact that a complete training is not possible in each individual country due to the irregular Health Care technology developments throughout the European Union

COURSE PROGRAMMS

XII Winter Course of the CATAI
XVII Image Analyses Course of the ULL

15-28th March 2004

QUALITY & SECURITY IN E-HEALTH

La Laguna. Tenerife. Islas Canarias. España

Curse recognized by the ESACP (European Society for Analytical Cellular Pathology) ISDQP (International Society of Diagnostic Quantitative Pathology) and ISCO (International Society of Cellular Oncology). http://www.qub.ac.uk/cm/pat/isdqp/ ; http://www.esacp.org/

160 Teaching hours

Monday 15th March 2004º

16-20h *Welcome to the course,* **Prof. Dr. J. A. Nuñez** Vice Chancellor of Industrial Development and Technological Innovation, Tenerife. **Prof. Dr. Á Gutiérrez and Prof. Dr. C. Évora** Rector and vice-rector of Research, University of La Laguna (ULL), Tenerife. *Experiences in the Canary Islands. Electronic clinical record and standards in the SCS (Canary Health Service)*, **Ing. J. C. Ossorio**, Dept. of Informatics SCS. *Tele-presence in Tele-psychiatry*, **Prof. Dr. C. De las Cuevas,** ULL, http://www.islands-project.etsit.upm.es. *Phone Medicine,* **Dr. O. Herreros**, University Hospital of Canary Islands (HUC), Tenerife. *Tele-ultrasounds*, **Prof. Dr. O. Ferrer-Roca**, ULL, http://www.teide.net/catai .*Tele-ophthalmology*, **Dr. J. Abreu** and **Dr. R. Abreu,** HUC**,** http://www.oftalnet.nu. *Diabetic Retinopathy*, **Dr. P. Abreu**, La Candelaria Hospital, Tenerife.

Tuesday 16th March 2004

16-20h *Other Telemedicine experiences: Tele-health aspects of Canary Islands- La Palma Digital project*, **Dr. J. de León,** General Direction of Information Technologies. *Web epidemiology,* **Dr. A. Hernández Borges**, Dept. of Pediatrics, HUC. *Telemedicina in the prisons*, **Dr. M. Pérez Vallina**, University Hospital Príncipe de Asturias, Madrid. *Electronic signature in the Canarian Government*, **Ing. M. G. Rodriguez,** General Direction of Telecommunication Technologies and Information Society, http://www.gobiernodecanarias.org/dgtsi.

Wednesday 17th March, 2004

16-20h *PKI and digital signature in medicine,* **Prof. Dr. Ch. Meinel,** Trier University, Franhofer Institute, Germany, http://www.telematik-institut.de. *Digital access management & Attribute Certificates (AC),* **Mrs. H. Rifa,** Safe-Layer, Barcelona, http://www.safelayer.com.

Thursday 18th March, 2004

16-20h *Wearable Computing and Mobile Applications in Health Care*, **Prof. Dr. I. Rügge**, Bremmen University, Germany. , http://www.wearlab.de/DOCS/mnahme/index_en.html *Biomedical aplications of microelectromechanica l(MEM) systems*, **Mr. F. Balducci,** University of Entre Rios, Bioengineering Faculty, Argentina, http://www.edumedica.com.ar .

Friday 19 th March, 2004

16-20h. *Public Key and Privilege Management Infrastructures. Attribute certificates and role/rule management*. **Prof. Dr. Ch. Giorgiadis,** Aristotle University, Tesaloniki**.** http://infolab.gen.auth.gr/georgiadis/index.html **.** *Open sources in e-learning,* **Prof. Dr. A. Kastania,** Dept. Informatics, University of Economics & Business , Athens, http://www.aueb.gr/users/kastania/reserachank.htm

Saturday 20 th March, 2004

16-20h *Spanish laws for protection of personal sensitive data. Implications regarding Electronic Clinical Record*, **Lcdo. Emilio Aced,** Adjunct Director of the Data Protection Agency, Madrid, https://www.agenciaprotecciondatos.org/datmen.htm . *Smart bandages. Sensors applied to telemedicine,* **Prof.Dr. F. Fauchet**, Rochester, USA, http://www.futurehealth.rochester.edu/research/pathogen.html .

Sunday 21st March 2004

16-20h. *Remote control of electron microscopy*, **Prof. Dr. O. Ferrer-Roca** and **Prof. Dr. G. Graschew**, Humboldt University, Berlin, http://www.rrk-berlin.de/op2000 . *MedSky-OpenSky applications of EUTELSAT*, **Prof. Dr. Y. Matsakis**, Telemedicine Technologies, Boulogne, France, http://www.tentelemed.com *Medical Assistance Platforms,* **Ing. M. Poveda,** Dept. Computer Science, University of Cyprus, http://www.cs.ucy.ac.cy/ .

Monday 22nd March 2004

16-20h. *Interactive Telemedical networks via Satellite: WinVicos, WoTeSa, Deltass (Disaster Emergency Logistic Telemedicine Advanced Satellites System), MedaShip (Medical Assistance for Ships) and Emispher (Euromediterranean Internet-Satellite Platform for Health) Project,* **Ing. G. Graschew,** University Clinic Charite, Humboldt University, Berlin, http://www.rrk-berlin.de/op2000. ESA-European Space Agency, ESTEC- European Space & Research Technology Center, Noordwijk, Netherlands, http://www.esa.int/ . *Telemedicine Glossary. Importance of the Grid cooperation for Telemedicine,* **Prof. Dr. L. Beolchi**, General Direction of Information Society, IST International Cooperation, European Commission, http://www.cordis.lu/ist/ka1/health/publications/glossary.htm.

Tuesday 23rd March, 2004

16-20h *Telemedicine Body of Knowledge*, **Prof. Dr. O. Ferrer Roca**, ULL. *Electronic Prescription and digital signature,* **Prof. Dr. O. Ferrer-Roca,** ULL, http://www.teide.net/catai . *Electronic Prescription Project of the General Assembly of the Pharmaceutics (PISTA Project),* **Lcdo. E. B. Hernández-Reboso**, President of the Pharmaceutics Official College of Tenerife, http://www.setsi.mcyt.es/sat/pista/sanidad/SAN_II_C.html .

Wednesday 24TH March, 2004

16-20h *An Interactive TV based system facilitating lifestyle changes and health services provision at home: The PANACEIA-ITV paradigm***, Prof. Dr. N. Maglaveras**, Tesaloniki University, Greece. *WIFI in Internet. Isolated telemedicine solutions ADSL modem-router.* **Mr. F. Cubero**, Telefonica SA, http://www.telefonicaonline.com.

Thursday 25TH March, 2004

16-20h *Unified patient card and health professional cards*, **Prof. Dr. Blobel,** University Magdeburg, Task force leader, http://www.centc251.org. *Applications at the HUC of the digital clinical history, radiology and laboratory analysis integration*, **Eng.JC Acosta.** HUC. Tenerife. Canary Islands.

Friday 26TH March 2004

16-20h. *Risk factor Analysis*, **Mr. F. Lopez Crespo,** Telematic Department of Public Administration, http://www.map.es/csi/. *Quality Services. ISO-9001:2000 in Telemedicine processes*, **Eng. A. Diaz Cardama,** CATAI, http://www.teide.net/catai .*Ethics in Teledismorphology*, **Dr. R. Cedeño,** Faculty of Medicine, University of Zulia, Venezuela.

Saturday 27TH March, 2004

16-20h. *Spanish law and Telemedicine,* **Prof. Dr. E. Sola**, Faculty of Laws, ULL. *New goals on Telemedicine legislation,* **Mr. B. Stanberry**, Institute of Telemedicine Laws, England, http://www.avienda.co.uk/.

Sunday 28TH March, 2004

16-20h *Internet and Info-ethics*, **Mrs. P. Wilson,** Health Care Informatics of the European Commission, Brussels, Belgium.