



***Alma Mater Studiorum Università di Bologna
Antonio V. Gaddi***

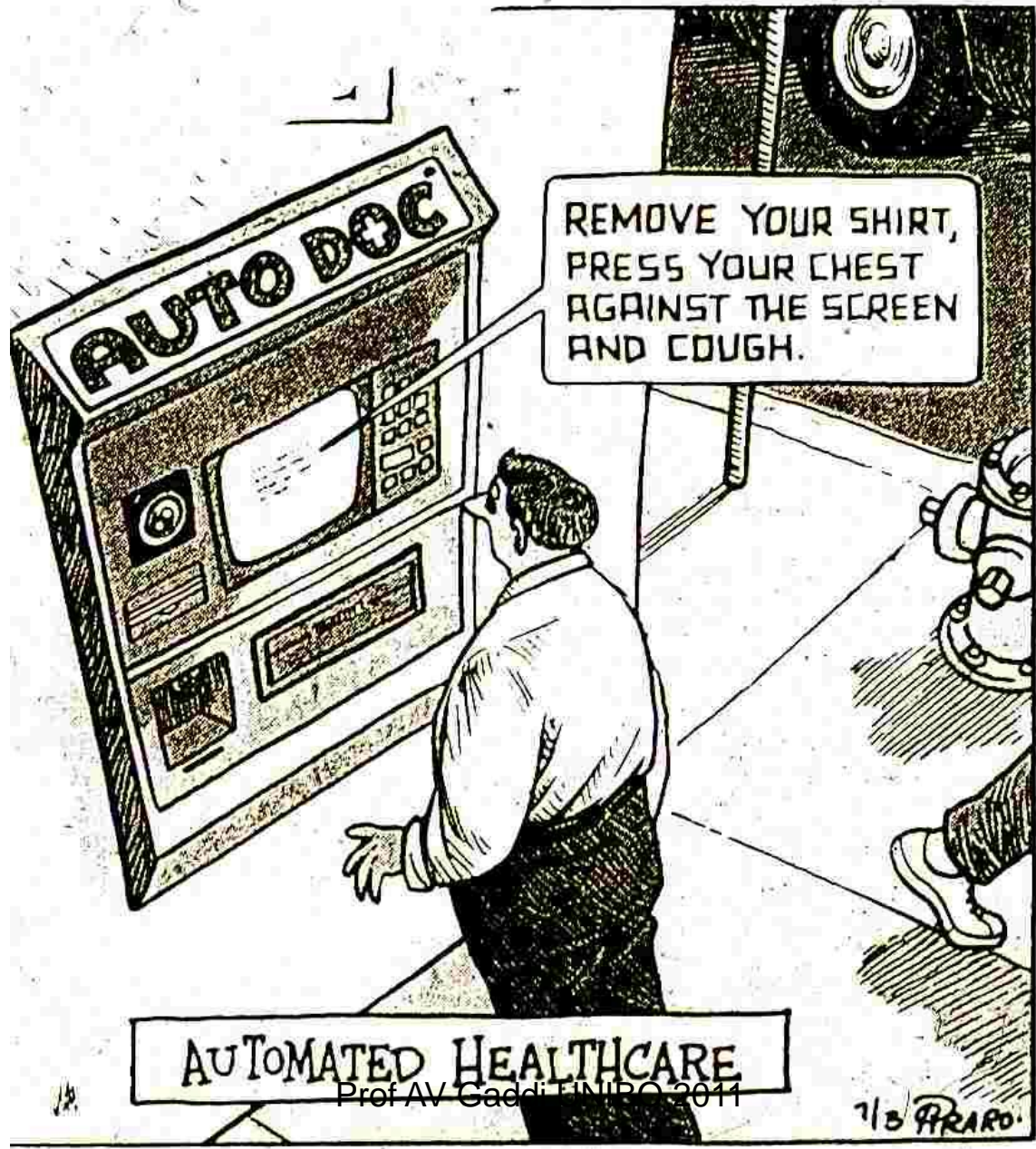
***Aspetti generali della telegestione in
cardiologia***

Torino, Ottobre 2011

Prof AV Gaddi UNIBO 2011

Ringraziamo il Prof Sergio Bertolucci –
Direttore Generale Ricerca del CERN, il
Prof Giorgio Noera, Presidente della
HRS srl, il Dott Giovanni Rinaldi,
Fisico, esperto in eH, il Dott. Gabriele
Cipriani, Resp. Corte dei Conti
Europea, e altri colleghi per i
suggerimenti e per la creazione di
alcune diapositive

"Telemedicine System of the Future"



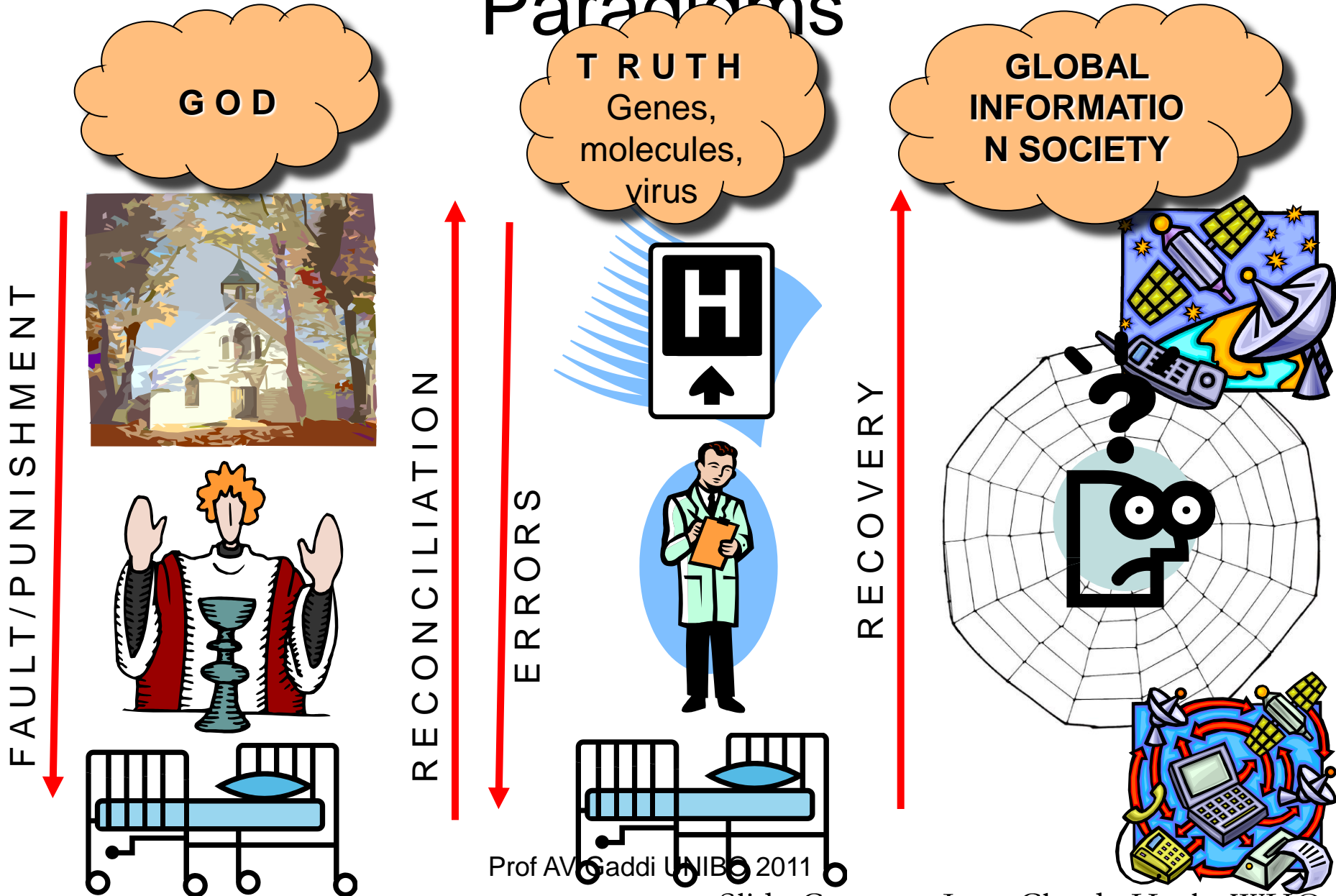
AUTOMATED HEALTHCARE

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7/3 PRARO

Eschatological Approach of Health

Paradigms



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Slide Courtesy Jean-Claude Healy, WHO

e-Health

Il termine e-Health si riferisce all'utilizzo delle moderne tecnologie di informazione e di comunicazione al fine di incontrare le necessità dei pazienti, del personale sanitario, dei cittadini e del governo.

(Fonte: dichiarazione ministeriale Brussels 22 Maggio 2003)

COMMISSION OF THE EUROPEAN COMMUNITIES



Brussels, 30.4.2004
COM (2004) 356 final

**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE
EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

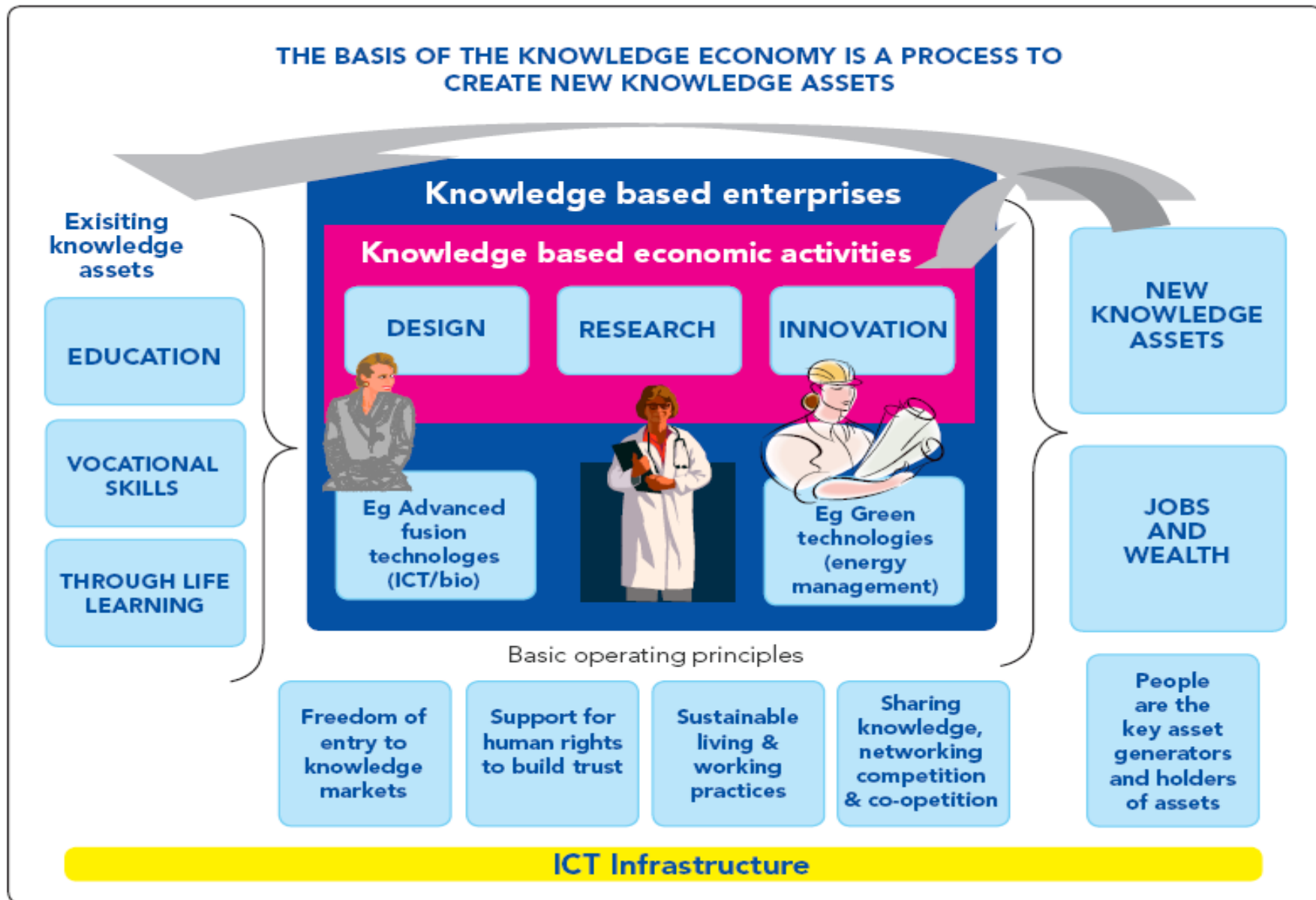
**e-Health - making healthcare better for European citizens: An action plan for a
European e-Health Area**



A Green Knowledge Society

An ICT policy agenda to
2015 for Europe's future
knowledge society

Figure 3. Key elements of the knowledge economy and its value creation process



CONTRIBUTO COMUNITARIO TOTALE (IMPEGNI IN MILIONI DI EURO ESPRESI IN PERCENTUALE DELL'INTERO BILANCIO PER IL PROGRAMMA) E NUMERO DI PROGETTI PER CIASCUN CAPITOLO

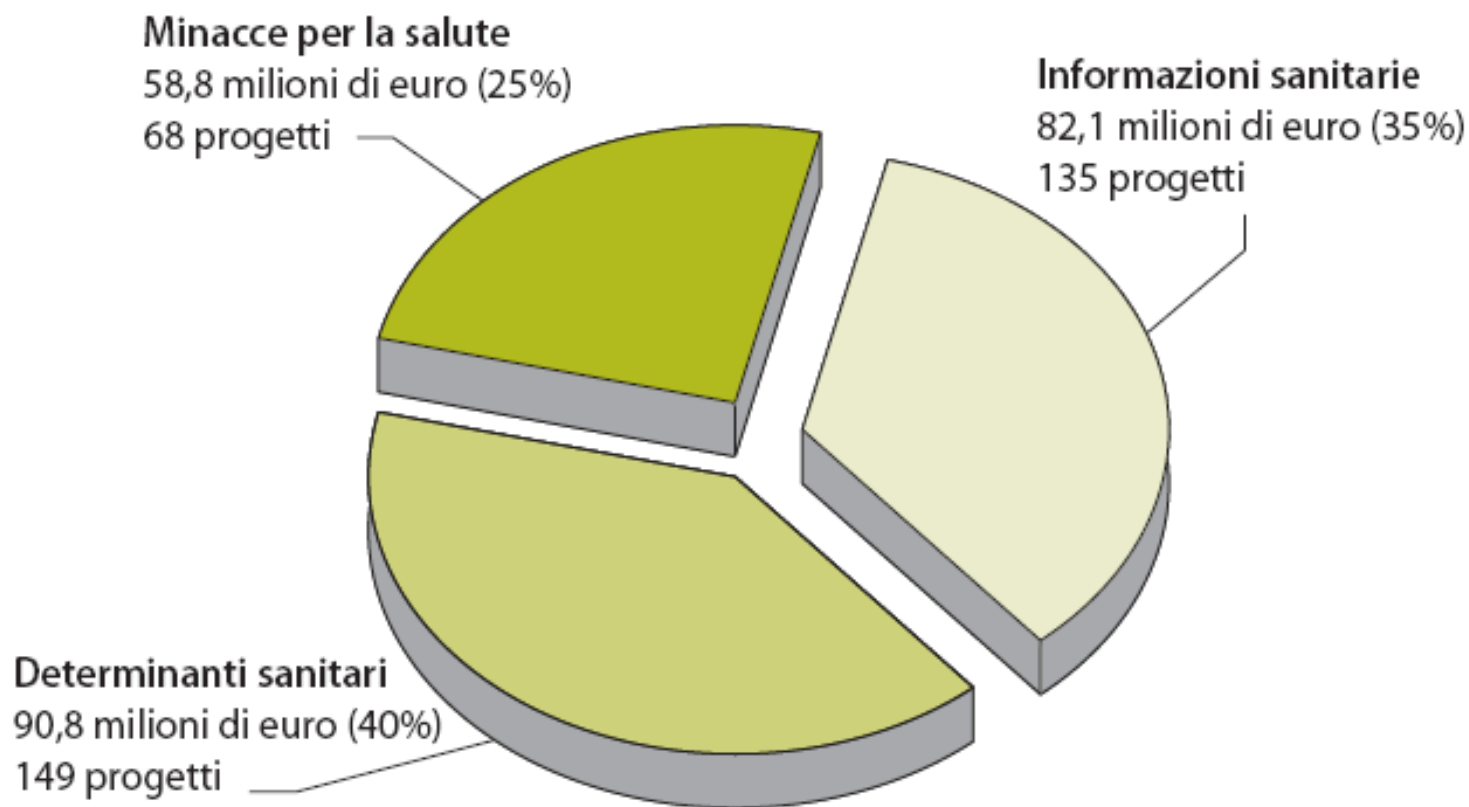
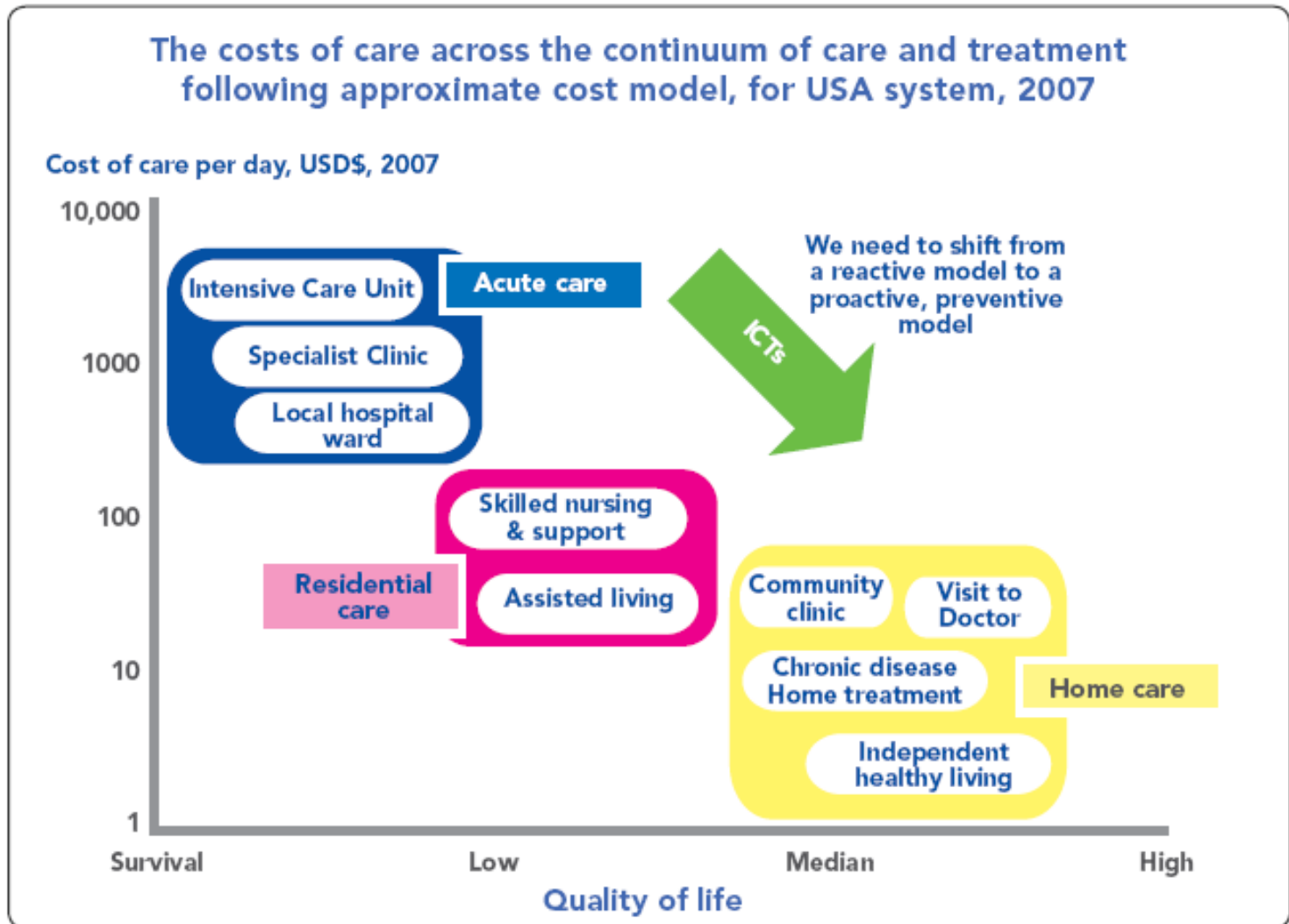


Figure 10. Comparing the costs of acute, residential and home care



Source: adapted from Intel, 2007

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Uno dei tanti esempi di possibile utilizzo corretta della telemedicina

Eur J Cardiovasc Prev Rehabil. 2009 16(3):281-9. **Telehealth interventions for the secondary prevention of coronary heart disease: a systematic review.** [Neubeck L](#), [Redfern J](#), [Fernandez R](#), [Briffa T](#), [Bauman A](#), [Freedman SB](#). Faculty of Medicine, University of Sydney, Sydney, New South Wales, Australia. ineubeck@med.usyd.edu.au

In total, 11 trials were identified (3145 patients). In conclusion, telehealth interventions provide effective risk factor reduction and secondary prevention. Provision of telehealth models could help increase uptake of a formal secondary prevention by those who do not access cardiac rehabilitation and narrow the current evidence-practice gap.

Euro Consumer Heart Index 2008

	Subdiscipline score	16	13	8	10	13	14	11	15	16	14	13	14	16	8	12
Outcomes	AMI 30-day case fatality	⦿	⦿	⦿	⦿	⦿	⦿	⦿	⦿	●	⦿	⦿	○	⦿	⦿	○
	Ischaemic stroke 30-day case fatality	●	⦿	○	⦿	⦿	●	○	●	⦿	⦿	⦿	○	⦿	●	○
	Death rates from CHD (SDR / 100 000)	⦿	⦿	○	●	○	⦿	○	⦿	●	⦿	●	○	⦿	●	○
	Death rates from stroke (SDR / 100 000)	●	⦿	○	⦿	⦿	⦿	○	⦿	●	●	⦿	○	●	●	○
	Rehabilitation/post-event programme	⦿	⦿	○	○	⦿	⦿	●	⦿	⦿	●	○	⦿	⦿	⦿	○
	Subdiscipline score	12	10	6	10	9	11	8	11	13	12	10	6	11	13	5
TOTAL SCORE		769	691	468	638	605	711	619	718	834	693	576	553	652	715	47
RANK		5	14	28	18	21	12	19	10	2	13	23	24	16	11	21

- = Good
- ⦿ = Intermediary
- = Poor
- n.a = Data not available

Criteri di appropriatezza clinica,
tecnologica e strutturale nell'assistenza alle malattie
del sistema cardiovascolare



Criteri di appropriatezza clinica, tecnologica e strutturale nell'assistenza alle malattie del sistema cardiovascolare

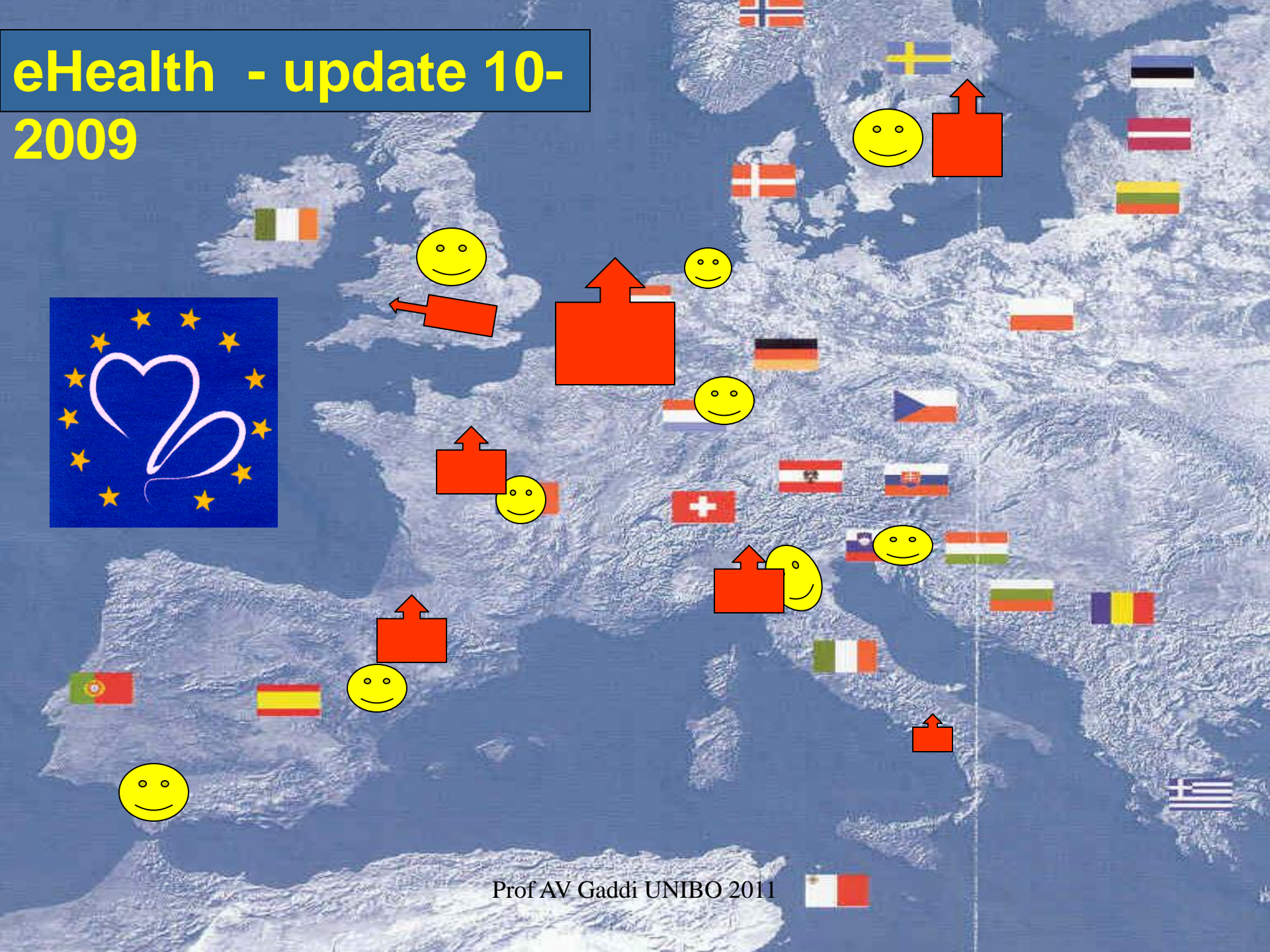
GRUPPO DI LAVORO

Alessandro Boccanelli, Pier Giorgio Cao, Luigi Chiariello,
Roberto Chiesa, Gian Paolo Cornalba, Antonio V. Gaddi, Giovanni Gandini,
Gian Luigi Lenzi, Valentino Martelli, Francesco Musumeci, Fabrizio Oleari,
Filippo Palumbo, Giovanni Simonetti, Alberto Zangrillo

Telecardiologia.....

- nel Piano Nazionale di Prevenzione Cardiovascolare
- nel Piano (Nazionale) Prevenzione Obesità e SM bambini (AUSPICIO)
- nei documenti per l'accREDITamento dei Dipartimenti Cardiovascolari
- nei documenti di UK SE NL E D ecc...
- nei MODELLI di riferimento di alcune Regioni.....

eHealth - update 10-2009





Telemedicine Interoperability Architecture: <http://telemedicine.sandia.gov>

The Role of Technology in Reducing Health Care Costs: <http://www.sandia.gov/CIS/6200/Telemedicine/>;
http://www.sandia.gov/CIS/6200/Telemedicine/index_tra.htm

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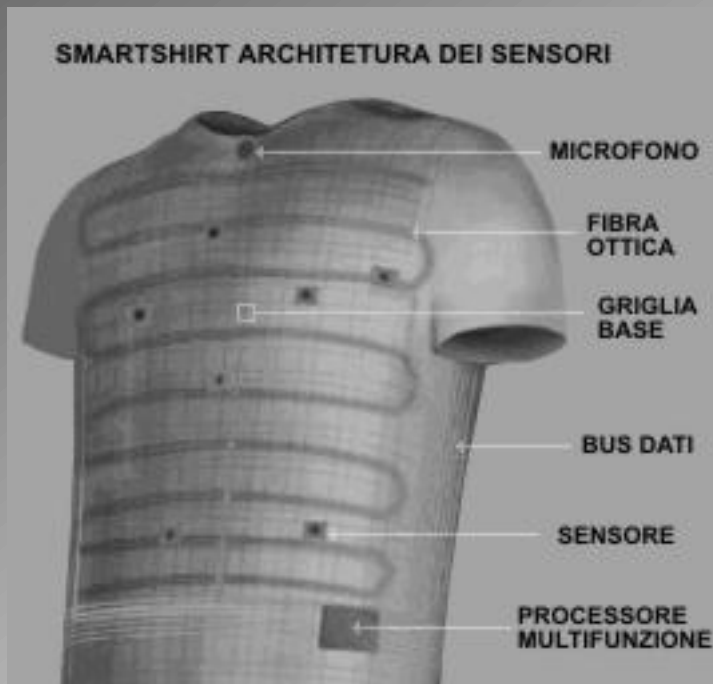
TELEMONITORAGGIO MEDICHECK



- Gateway per la registrazione di dati clinici: installato presso l'abitazione del pz, utilizza la normale linea telefonica , e serve per monitorare PA, freq, peso, glucosio, saturazione ossigeno ecc.
- (vedi pdf)

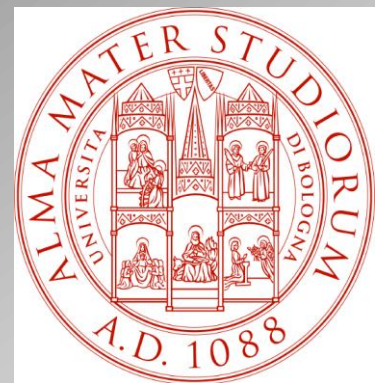
TELEMONITORAGGIO SMART SHIRT

- “ la t-shirt del futuro”
Utilizzata per monitorare le malattie del sonno, i pz diabetici (vedi doc word), in cardiologia



Spin Off Accademico di Massa Lombarda, sotto l'alto patrocinio del Presidente del Parlamento Europeo





**The health as
money for
the peace**



**Academic Spin Out - Health
Ricerca e Sviluppo**

**convergenza delle forze e allineamento dei
vettori**

questo e' un
esempio di ICT
correttamente
applicata,
**“telemedicina
clinica”**



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Fax +39 051238869
www.healthricercaesviluppo.it
e-mail : info@healthricercaesviluppo.it

E-Heart S.r.l.
Via Saragat 1, 44100 Ferrara, Italy
Codice Fiscale e p.IVA 01627800384

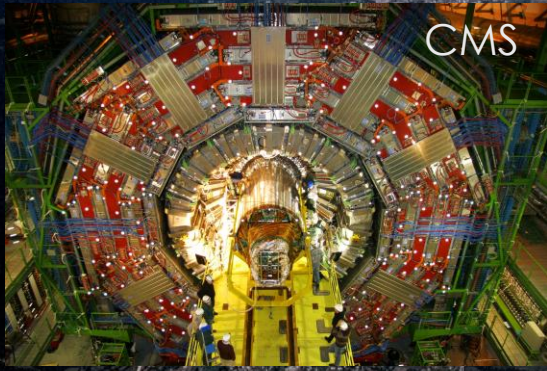
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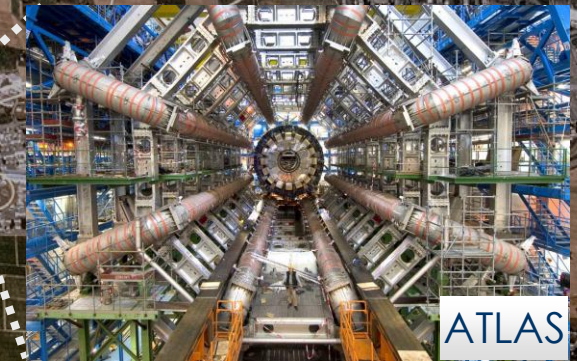
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Enter a New Era in Fundamental Science

Start-up of the Large Hadron Collider (LHC), one of the largest and truly global scientific projects ever, is the most exciting turning point in particle physics.



Exploration of a new energy frontier
Proton-proton collisions at $E_{CM} = 14 \text{ TeV}$

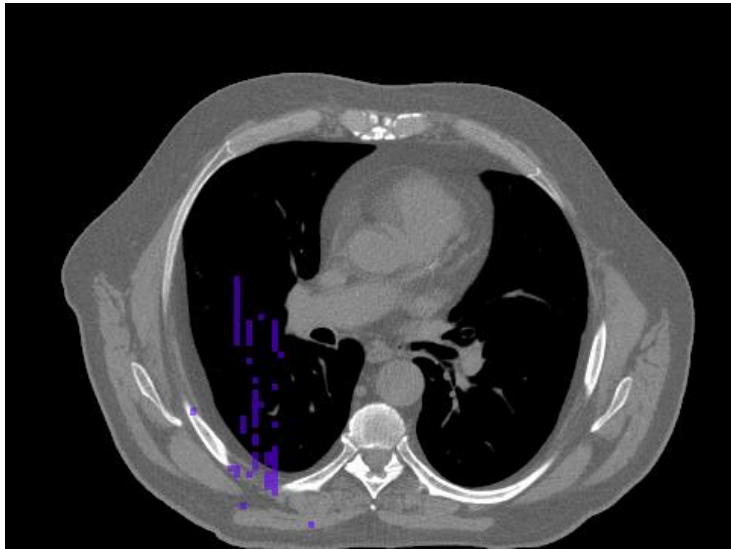


Astronomy & Astrophysics
Civil Protection
Computational Chemistry
Comp. Fluid Dynamics
Computer Science/Tools
Condensed Matter Physics
Earth Sciences
Finance
Fusion
High Energy Physics
Humanities
Life Sciences
Material Sciences
Social Sciences

~285 sites
48 countries
>140,000 CPU cores
>20 PetaBytes disk, >38PB tape
>13,000 users
>12 Million jobs/month
21:13:50 UTC

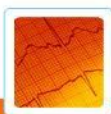


GridPP
UK Computing for Particle Physics



- **Cancer treatment by irradiation** of patient with beams of photons, protons or carbons
- CT image (482x360x141)
- 3D dose distribution, 700h CPU

- Offer an open platform to researchers for Monte Carlo simulations optimisation
- Offer a fast and reliable simulation tool for researchers in medical physics and medical imaging for treatment control
- Produce a reference dataset for non-conventional therapies (hadrontherapy).



Measurement of Pulmonary Trunk

Dynamic measurements of the Pulmonary Trunk

- Pulmonary trunk morphology classification based on the diameters measured at time 50% and 100% of the pulmonary trunk length

RV and LV Automatic Modelling

Automatic

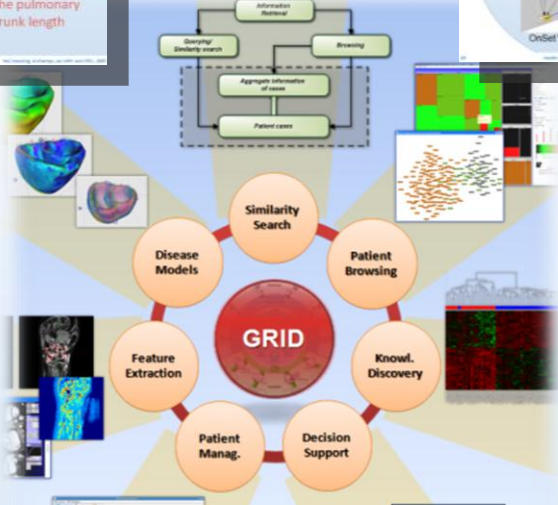
Similarity Search

Similarity Search

Temporal Modelling

- Each visit's internal dependencies are represented as edges between nodes of the same layer (intra slice topologies)
- Temporal dependencies between visits are represented as edges between nodes belonging to different layers (inter slice topologies)

Temporal Modelling



Visual Data Mining

Visual Data Mining

Surgery Planning

Virtual Volume Reduction Surgery

Personalised Simulation

Personalised Simulation: Results

Semantic Browsing

Semantic Browsing

PA - Cerebrum vs. Cerebellum

Genetics Profiling

Genetics Profiling

Example: treatment response

Treatment Response

Treatment Response

Biomechanical Model

Biomechanical Models
Tumor Growth Modelling

Temporal reasoning: Inferring outcome

Inferring Outcome

Inferring Outcome