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Smart Health & Future Internet

Vision of the Service Industry

Josema Cavanillas – R&D&I Director

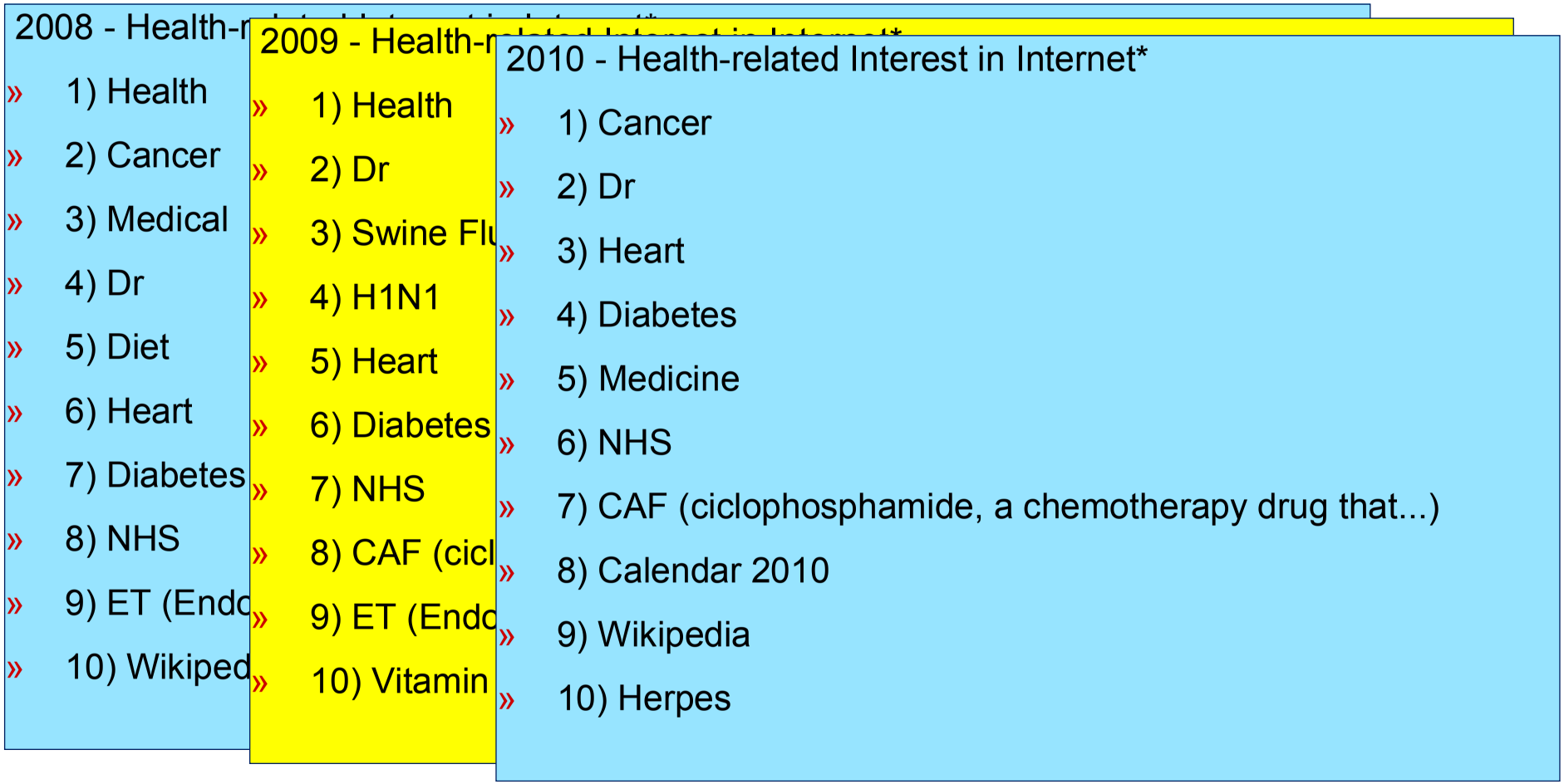
Brussels, June 22nd 2010

Agenda

- Health & Internet Today
- Future Internet & Health
- The near future
- The mid-term future
- The long-term future
- The Future Internet Approach

Health in Internet

Interests of users worldwide



*: Source: Google Insights for Search: http://www.google.com/insights/search/?hl=en-US#cat=45&date=1%2F2009%2012m&cmpt=date

FI & Health

Future Internet and e-Health

Process	Prevention	Acute care / Treatment intramural / extramural	Rehabilitation
Partner	▪ Citizen ▪ Payer ▪ Regulator	▪ Patient ▪ Payer ▪ Regulator ▪ Provider	
Challange	Citizen prevention portal ▪ Aims at the preventive aspect of health trough self-empowerment of citizen and the promotion of healthy behavior	Unified Biomedical Data System prototype ▪	Machine to Machine (M2M) communications ▪
Scope	▪ Provides secure end-to-end identification and connectivity to store personal wellness and health related data ▪ Creates personalized recommendations based on consumer-grade sensor elevated at home data	▪ Facilitates the retrieval and integration of information from several sources ▪ Based on a semantic mediation process and cloud-computing to integrate heterogeneous data (e.g. EHR, imaging, omics data, personal wellness and social information)	▪ Combination of new generation sensors including contactless and nano-scale devices with the Internet of the Things based on wireless communications among these devices

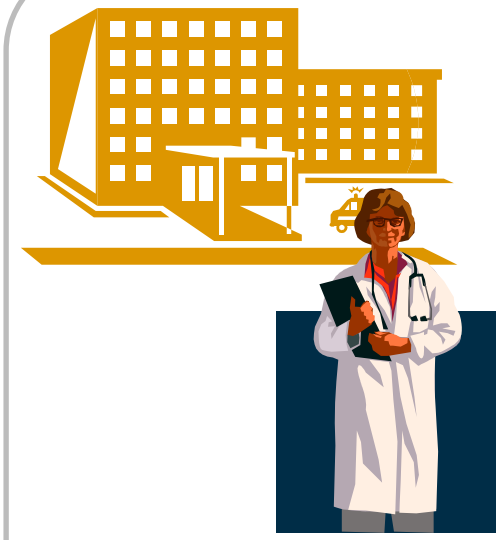
SmartHealth: Research & Innovation Targets

Segmentation per timeframe

- Short-term – Personal Health Systems
- Mid-term – Medical Infostructure
- Long-term – Virtual Physiological Human

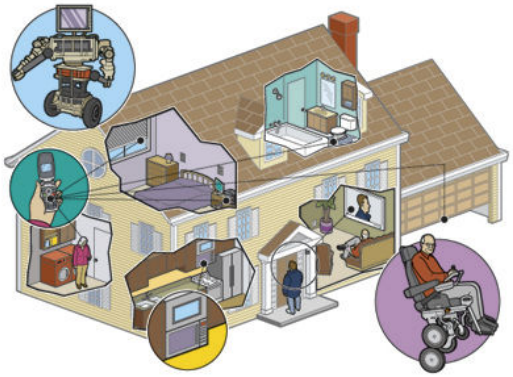
Personal Health Systems: Challenges

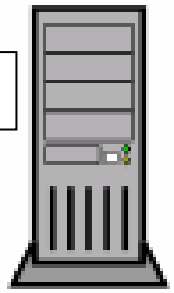
Future Internet



Medical actors

Citizen





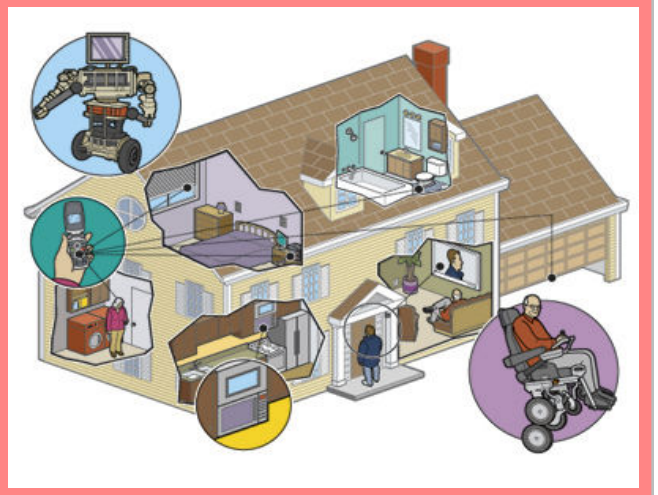
Smart Houses in Healthcare

Other actors

Healthcare solutions based on FI: main challenges

Hospital/Health centres and pharmacies: interoperability, information management, and M2M communications

Citizens: wearable and mobile devices to continuous monitoring and communication



Smart Houses: M2M communication, non-invasive monitoring, telecare

Future Internet will allow to connect all potential actors/places related to healthcare.

Other services: emergency services, public transport...

SmartHealth: information - issues and enablers

Why VPH? Why long term?

Virtual Physiological Human

The key to a new healthcare service

- Evidence-based medicine & Personalized Medicine -> Comparative Effectiveness
- Comparative Effectiveness requires combining medicine knowledge & experience and induction/deduction of human body knowledge
- VPH is the implementation of EC modelling and simulation approaches
- Requires huge research work on information, models, coordination of systems and subsystems…
- When operational, a leapfrog in healthcare

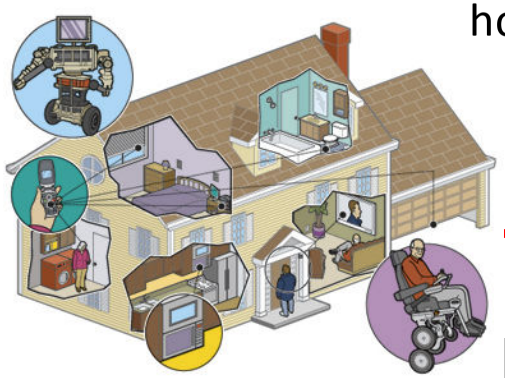
SmartHealth – connection among all enablers

Semantic Interoperability and standards to transmit information

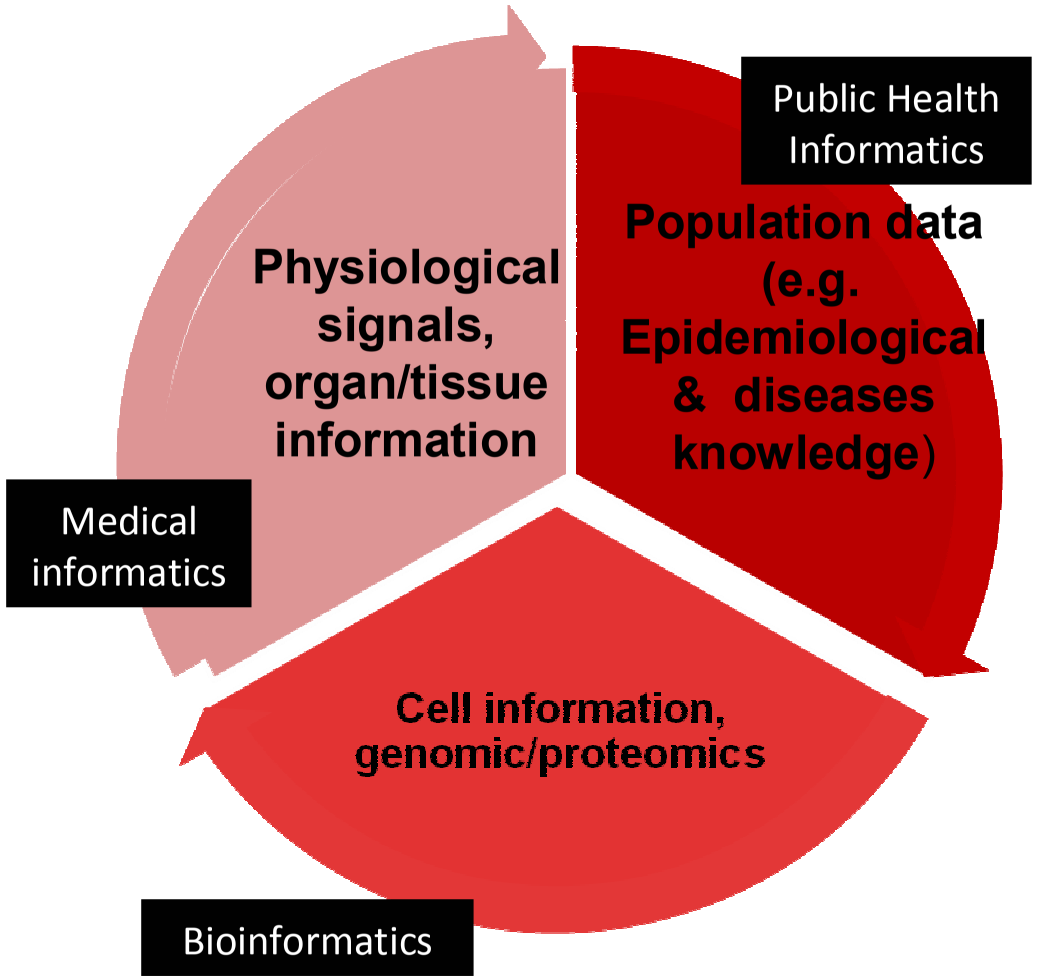
High Capacity & Trustworthy Networks

Cloud & Grid Computing to develop the VPH and Decision Support Systems

IoT: Devices and M2M communications in houses and hospitals



Tasks previous to the trials – bridging all technologies



Solving Medical Information exchange making use of semantics & standards. Integration of heterogeneous biomedical data in order to provide personalized treatment and lay the foundations of VPH

M2M Communications: Implementing sensors networks to provide homecare and ubiquitous healthcare

Future Internet – Focus points

- Provision of requirements to Core Platform
- Focus on Management of chronic disease
  - 86% of deaths
  - 77% of disease budget in the WHO Region
  - User-oriented services
  - Smart Environments
- Focus on prevention
  - Wearable devices, M2M, mHealth
  - Medical record
- Allow a large scale demonstration
  - Possibilities for hospitals – city health services
  - Boost SME industrial tissue based on services

Future Internet on Health – Targets

- **Scalability testing**:
  - many millions of citizens
  - Thousands of hospitals and medical centres
  - Thousands of sources of medical knowledge (universities, international fora, companies,…)
  - It is not a communication problem, it deals with information processing, understanding, endorsement and real-time ubiquitous reactions (decision & acting) to specific situations.
- **Inter-EU interworking** for:
  - Knowledge gathering, endorsement, annotation and federation.
  - Connection of healthcare infrastructures and civil infrastructures.
  - Encompassing ongoing activities on the fields at a European scale (DG INFSO, DG HEALTH,…) and member states, as well as ETPs.

Future Internet on Health – Ambitions

» Ambition 1:

Setup a pan-European knowledge space based on semantic technologies involving a large number of participants (knowledge sources and) from different countries. Interoperability of ontologies across the internet and advanced services developed on top of that are crucial for the deployment of the info space. This will allow field for growth of thousands of hi-tech SMEs around the environment.

» Ambition 2:

Develop a large scale infrastructure to provide Collaborative tools for hospitals, as well as to enhance homecare. Services based on mHealth to connect the whole set of involved actors in the healthcare provision constellation.

» Ambition 3:

Enabling the beginning and interoperability of the initial VPH services, duly connected to the info space and accessible by the mHealth infrastructure.

Thank you

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Josema Cavanillas
ph : +34 – 91 214 86 09
jose-maria.cavanillas@atosorigin.com

ARI – Atos Research & Innovation
www.atosorigin.es / www.atosresearch.eu