SHARE

A Roadmap for a European HealthGrid

A Roadmap for the Adoption of Grids in Epidemiology

Ignacio Blanquer
Vicente Hernández
Universidad Politécnica de Valencia - GRyCAP

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Framework

SHARE
A Roadmap for a European HealthGrid

- A Roadmap for the Adoption of HealthGrids is been developed in the Frame of the SHARE Project.
- SHARE stands for "Supporting and Structuring HealthGrid Activities and Research in Europe: Developing a Roadmap".
- SHARE Validates the Roadmap in two Application Domains (Innovative Medicine and Epidemiology).
- The Sources of Information have been Key Users, Relevant Projects, Round Tables and Workshops in Events.

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Epidemiology Use Case

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Epidemiology Use Case

SHARE
A Roadmap for a European HealthGrid

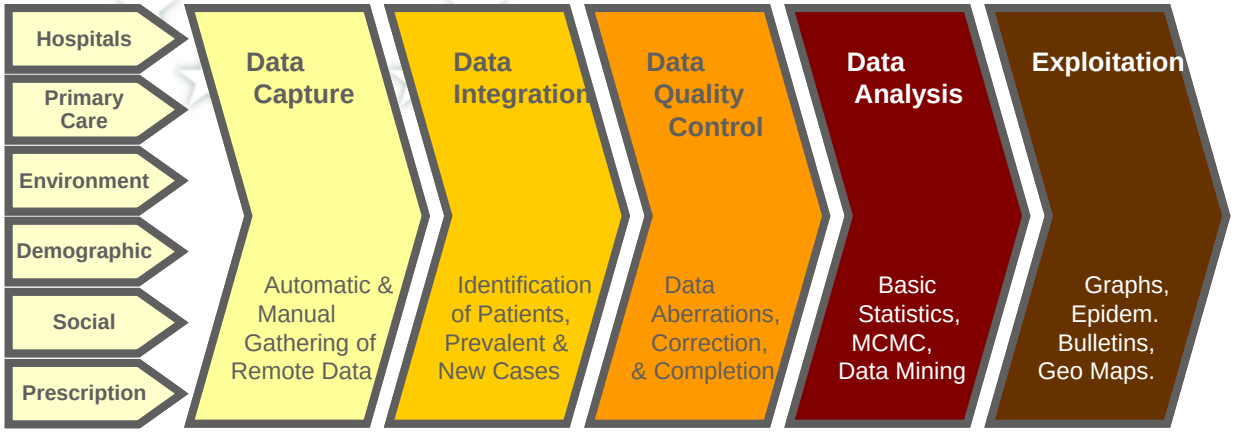
- Epidemiology: "The Scientific Study of Factors Affecting the Health and Illness of Populations, and Serves as the Foundation and Logic of Interventions Made in the Interest of Public Health and Preventive Medicine"
- Medical Problem
  - Data from Large Distributed Populations Analysed through Complex Simulation, Statistical Procedures or Knowledge Discovery Methods.
  - Objective: Assessment of the Real Effect of Treatments on Actual Population.

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Epidemiology Use Case

SHARE
A Roadmap for a European HealthGrid

- Data
  - Variety of Sources: Demographic, Primary Care, Prescription, HIS, ...).
  - Data is Large, Heterogeneous and of Low Quality (the Main Aim is Clinical Care, not Research).
- Current Procedure
  - Capture: Automatic & Manual Gathering of Remote Data.
  - Integration: Identification of Patients, Prevalent and New Cases.
  - Quality Control: Data Aberrations, Completion and Correction.
  - Analysis: Basic Statistics, Data Mining.
  - Exploitation: Aggregated Results, Graphs, Geographical Maps.



The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Where HealthGrids Provide Benefits

SHARE
A Roadmap for a European HealthGrid

- Data
  - Virtualising Distributed and Huge Data Storages.
  - Automatic Data Gathering and Preprocessing. Data Quality Enhancement.
  - Semantic Organisation of Complex but Resonably Structured Data.
- Processing
  - Data Mining and other Knowledge Discovery Processes on Real Databases Need Intensive Computing Resources.
  - Authorisation and Security Models of Grid Infrastructures Fit Better the Multi-Administrative Domains of Medical Environments.

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Technological and Deployment Milestones to be Addressed in Short Term

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Milestones

- MR1. Need for successful pilots on Epidemiology.
  - Pilots are Needed in all IT Marketing Strategy to Convince Early Adopters.
  - Pilot Users will Act as Prescriptors.
- MR2. Need for real fault-tolerant scheduling systems and pervasive services
  - Current Reliability of Grid Infrastructures is Low.
  - Fault Tolerance is Implemented at the Application Level.

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Milestones

- MR3. Lightweight, Compact and Health-Networks-Compatible Grid Middleware
  - Grid Middlewares are Difficult to Maintain and Administer.
  - They are Incompatible with Private Network and Firewall Architectures of Health Networks.
- MR4. Secure Data Models Compliant to the Regulations
  - PKI is Insufficient if Non-Health Networks are Involved.
  - Security Must be Compliant to the Ethical Requirements.

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Milestones

- MR5. Epidemiology Data related Connectors (HL7, DICOM, ENV13606, etc.)
  - Grid Data Repositories Must be Compatible to Medical Standards.
  - Health Data Exchange Protocols are Becoming Universally Accepted.
- MR6. Infrastructures Able to Provide Quality of Service
  - Although not as Critical as in Healthcare, Production Usage will Require to Accomplish Quality of Service.
  - Priorities and Resource Reservation are Needed.
- MD1. Health Infrastructures and Exploitation Service Agreements
  - Usage Policies and SLAs of Current Infrastructures are not Clear.

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Technological and Deployment Milestones to be Addressed in Long Term

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Technology Milestones

SHARE
A Roadmap for a European HealthGrid

- MR7. Epidemiology Applications Adapted to Grid Models
  - Current Procedures Must be Not Drastically Modified.
  - Well-known Tools Must be Compatible with Grids.
- MR8. Scalability of Resources
  - Migration to Grids is a Long-Term Investment.
  - Epidemiology Systems are Kept on the Long Term, so Pervasiveness of the Services in the Long-term are Needed.
- MR9. Semantic Data Integration. Knowledge-driven Catalogues and Integration Based on the Metadata
  - Epidemiology Data is Huge.
  - Semantic Integration of Multiple Sources of Data and Processes is Necessary to Discover and Raise Knowledge.
  - SOKU view: Service Oriented Knowledge Utilities

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Roadmap / Deployment Actions

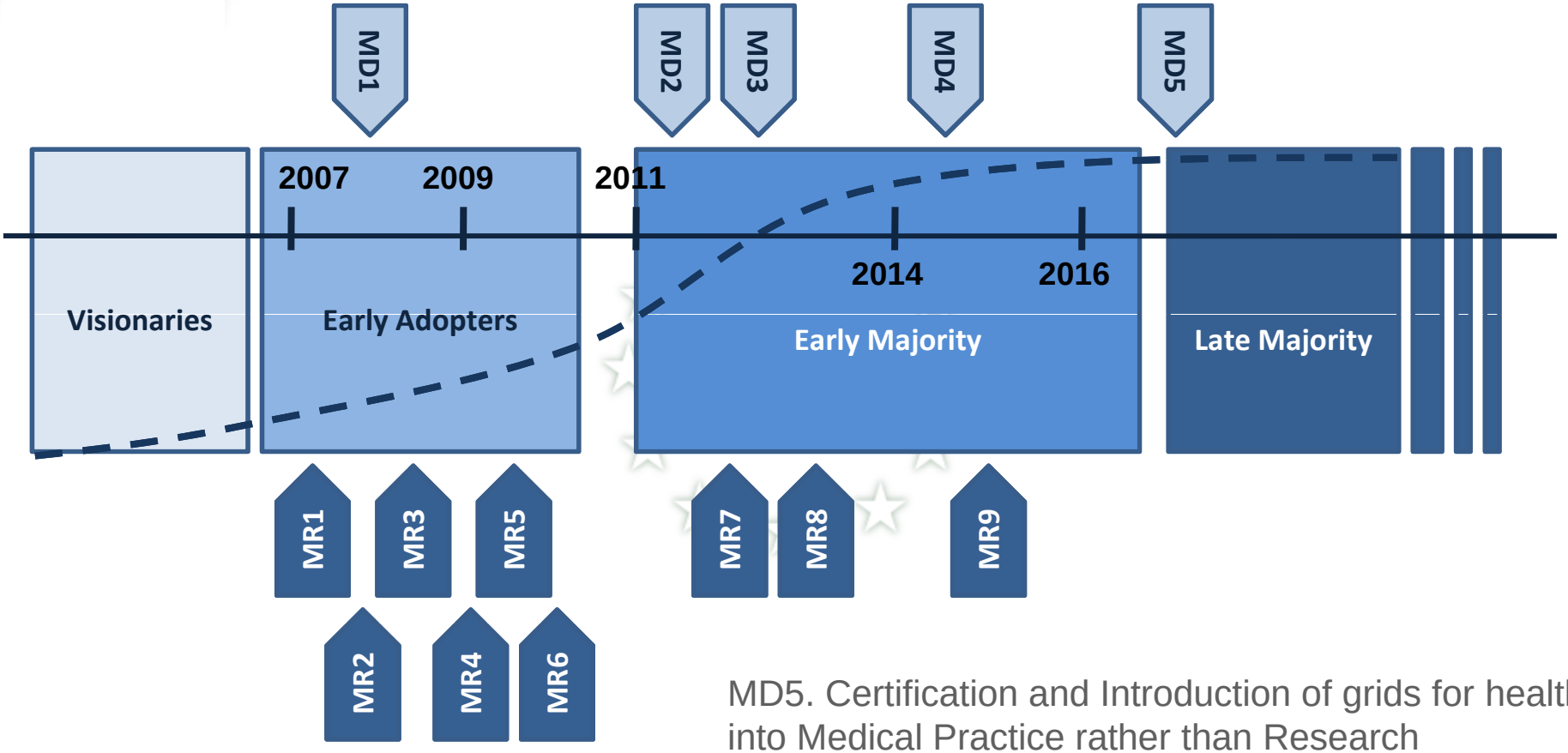
SHARE
A Roadmap for a European HealthGrid

- MD2. Development of Patient Consent Management Valid Across the Boundaries of Countries and for Long Living Processing.
- MD3. Support for the Integration of Health Protocols.
- MD4. Accepted Jurisprudence on the Legal Issues of Health Grids to Create Trust
  - Current Regulations on International Repositories is on the Boundaries of the Law.
- MD5. Certification and Introduction of grids for health into Medical Practice rather than Research
  - Health Services Need to be Certificated Before Used in Clinical Practice.

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Timeline

SHARE
A Roadmap for a European HealthGrid



MD5. Certification and Introduction of grids for health into Medical Practice rather than Research

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Conclusions 1/2

SHARE
A Roadmap for a European HealthGrid

- Epidemiology is a Representative Case Study, Involving Large Data Management and Integration, and Intensive Computing.
- First Step is to Target Small But Significant Communities.
  - To Foster the Development of Exploitation and Quality of Service Models.
  - To Standardise and Deploy the Already Effective Security and Privacy Guard Technologies.
- Pilots and Early Deployments are Needed to Leverage Awareness.

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Conclusions 2/2

- Long Term Research Should Take Into Account the Problems of Larger Communities
  - Scalability, Integration of Data and Widely Used Tools at a Large Scale.
  - Jurisprudence that Could Give the Stability in the Ethical and Legal Framework.
- ELSE Issues Concerning the Management of Responsibility, the Impact of Legislation and the Reimbursement Through Service Business Models.
- Grids for Health Need Coordination with other Medical Informatics Developments.
- New Health Challenges in the Study of Treatments, the Quick Reaction Against Epidemic Bursts, or the Long-term Surveillance of the Population's Health Could be Managed.

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.

Contact

Ignacio Blanquer
Vicente Hernández
Universidad Politécnica de Valencia
Camino de Vera s/n
46022 Valencia, Spain
Tel: +34-963879743
Fax. +34-963877274
E-mail: iblanque@dsic.upv.es
vhernand@dsic.upv.es

The Share project (FP6-2005-IST-027694) is funded by the European Commission Information Society and Media DG under the 6th Framework Programme.