From strategies to services
– eHealth as the enabler for cross-border healthcare
• Healthcare a strict national prerogative
• Previously only limited co-operation on a general policy level
• Substantial variations between national healthcare systems, but also similar challenges are faced and....
• …substantial similarities in political ambitions to reform healthcare as well as in the challenges to reach these goals
• The work started in 2003-2006 at the Ministerial Conferences
• In 2004 the eHealth Action Plan was adopted and the I2010 was created
• In 2007 in Berlin the eHealth Initiative was created....
a new era in legal and policy framework for EU Cooperation on eHealth

- Proposal for a European Directive on patients’ rights in cross-border healthcare
- Commission Recommendation on cross-border interoperability of electronic health record systems
- Communication on telemedicine for the benefit of patients, healthcare systems and society
- eHealth Standardisation Mandate 403
- 2009, the European eHealth Governance Initiative through a Joint Action Initiative was launched
Austria
Czech Republic
Denmark
France
Germany
Greece
Italy – Lombardy
The Netherlands
Slovakia
Spain
Spain – Andalusia
Spain – Castilla la Mancha
Spain – Catalonia
Sweden
United Kingdom – England
United Kingdom – Scotland
The Project Team consists of 27 beneficiaries from 12 member states: AT, CZ, DE, DK, EL, ES, FR, IT, NL, SK, SE and the UK

- ATNA, ANDA, CATA, CLM, CNRS, DENA, DKNA, ELGA, EMPIRICA, ESNA, FRAUNHOFER, FRNA, GEMATIK, GIPDMP, IHE, IZIP, LOMBARDY MEDCOM, NHS, NHIC, NICTIZ, NLNA, PHARMAXIS, SALAR, SENA, THESS, ZI

- Competence Centers Including/working with local organizations with thousands of Contributors

- IHE-Europe representing ICT industry team
The epSOS Industry Team

• Accenture
• Engineering Ingegneria Informatica S.p.A
• Oracle
• Agfa Healthcare
• ETIAM
• Posam
• Apollo
• GE Healthcare
• RISE
• BT
• Gemalto

• Sineura S.p.A
• Carecom
• Gnomon
• Steria Mummert Consulting AG
• Cisco
• ICW
• Tiani-Spirit
• CMP Medica
• Indra
• TrebleM
• CompuGROUP
• Mawell

• Insiel
• T-Systems
• dbMotion
• Intel Corporation S.A.
• X-tention
• Dedalus
• Microsoft
• 3M
• Electronic Record Company
• Netsmart
Goals & Challenges

• Goal for the epSOS eHealth Project:
  – “to develop a practical eHealth framework and ICT infrastructure that will enable secure access to patient health information, particularly with respect to a basic patient summary and ePrescription, between European healthcare systems”

• Challenges to get there:
  – Legal Interoperability
  – Organisational Interoperability
  – Semantic Interoperability
  – Technical Interoperability
From Strategies to Services

Provide **concrete cross border services** that ensure safe, secure and efficient medical treatment for citizens when travelling across Europe

- **Focus on services close to the patient:**
  - **Patient Summary for EU Citizens**
    - Occasional Visit
    - Regular Visit
  - **ePrescribing for EU Citizens**
    - Medication ePrescription
    - Medication eDispensation

- **Build on existing National eHealth Projects** and use experiences and knowledge from all Member States
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Leader</th>
<th>Start</th>
<th>End</th>
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<td>Analysis and comparison of NLNA</td>
<td>M1</td>
<td>M6</td>
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<td>Overall evaluation of the pro FRNA</td>
<td>M1</td>
<td>M6</td>
<td>M1</td>
<td>M44</td>
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<td>ATNA</td>
<td>M1</td>
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<td>M6</td>
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<td>M7</td>
<td>M12</td>
<td>M7</td>
<td>M15</td>
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<td>M12</td>
<td>M7</td>
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<td>Common Components Spec FHGISST</td>
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<td>M18</td>
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<td>M17</td>
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<td>FRNA</td>
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<td>M18</td>
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<td>M15</td>
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<td>Security Services</td>
<td>LOMBARDY</td>
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<td>M10</td>
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<tr>
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<td>Integration and customisation</td>
<td>MEDICOM</td>
<td>M13</td>
<td>M18</td>
<td>M13</td>
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<td>Development of proof of cor</td>
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<td>M24</td>
<td>M13</td>
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<td>M30</td>
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<td>M12</td>
<td>M6</td>
<td>M16</td>
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<td>Preconditions and EU level p</td>
<td>GEMA</td>
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<td>M15</td>
<td>M19</td>
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<td>WP4.2B</td>
<td>Preconditions and site level</td>
<td>ZlP</td>
<td>M13</td>
<td>M21</td>
<td>M19</td>
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<td>Pilot implementation (EU, nat)</td>
<td>ZlP</td>
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<td>M27</td>
<td>M25</td>
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<td>Operation I</td>
<td>ZlP</td>
<td>M25</td>
<td>M27</td>
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<td>Operation II</td>
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<td>M34</td>
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<td>WP5.1</td>
<td>Coordination</td>
<td>SENA</td>
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<td>M6</td>
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<td>WP5.2</td>
<td>Technical management</td>
<td>GEMA</td>
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<td>M6</td>
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<td>WP5.3</td>
<td>Administrative management</td>
<td>EMPIRICA</td>
<td>M1</td>
<td>M6</td>
<td>M1</td>
<td></td>
</tr>
</tbody>
</table>
Availability of Patient Identifier 2010

Single (national) patient identifier
Multiple (regional) patient identifiers
EU memberstate (not participating)
Non EU country
Availability of Opt-out Consent 2010

16.04.2010

Nationally-led
- Fully available
- Partly available

Regionally-led
- Fully available
- Partly available
- Not available / unknown
- Opt-out likely to be implemented
- EU memberstate (not participating)
- Non EU country
Availability of Patient Summary 2010

- Nationally available & operational
  - >25%
  - <25%
- Regionally available & operational
  - >25%
  - <25%
- Not available / unknown
- EU memberstate (not participating)
- Non EU country
Availability of ePrescription 2010

- Nationally available & operational
- Regionally available & operational
- Not available / unknown
- EU memberstate (not participating)
- Non EU country
Availability of Dispensation info 2010

- Nationally available & operational
  - > 25%
  - < 25%
- Regionally available & operational
  - > 25%
  - < 25%
- Not available / unknown
- EU memberstate (not participating)
- Non EU country
<table>
<thead>
<tr>
<th>Main Issues</th>
<th>Legal Certainty</th>
<th>Legal Certainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Protection and Confidentiality</td>
<td>sufficient</td>
<td>Pilot and beyond</td>
</tr>
<tr>
<td>Health Systems</td>
<td>sufficient</td>
<td>pilot</td>
</tr>
<tr>
<td>Professional aspects and social context</td>
<td>sufficient</td>
<td>pilot</td>
</tr>
<tr>
<td>Liability</td>
<td>sufficient</td>
<td>pilot</td>
</tr>
<tr>
<td>Access to standards-IPR issues</td>
<td>sufficient</td>
<td>Pilot and beyond</td>
</tr>
</tbody>
</table>
A country becomes a member of the epSOS trusted domain.....

If a health care provider organisation (HCPO) demonstrates conformance to epSOS requirements then it may offer the epSOS services

The HCPO is accountable to the NCP

The NCP is accountable to the epSOS community
<table>
<thead>
<tr>
<th>Information/dataset</th>
<th>Contains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Identification</td>
<td>Unique identification for the patient in that country.</td>
</tr>
<tr>
<td>Patient Personal information</td>
<td>Full name.</td>
</tr>
<tr>
<td></td>
<td>Date of birth</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
</tr>
<tr>
<td>Allergies</td>
<td>Allergy description and agent</td>
</tr>
<tr>
<td>Medical Alerts</td>
<td>Other alerts not included in allergies</td>
</tr>
<tr>
<td>List of current problems</td>
<td>Problems/diagnosis that need treatment and/or follow up by a HCP</td>
</tr>
<tr>
<td>Medication Summary</td>
<td>Current medications</td>
</tr>
<tr>
<td>Country</td>
<td>Name of Country A</td>
</tr>
<tr>
<td>Date of creation of PS</td>
<td>Data on which PS was generated</td>
</tr>
<tr>
<td>Date of last updated</td>
<td>Data on which PS was updated</td>
</tr>
<tr>
<td>Author organization</td>
<td>At least an author organization (HCPO) shall be listed. In case there is not HCPO identified at least a HCP shall be listed.</td>
</tr>
</tbody>
</table>
• Three different blocks in each dataset
  – Patient Identification
  – HCP identification
  – Medicine: prescription and dispensed medicine data

<table>
<thead>
<tr>
<th>Prescription Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original or copy of the prescription in Country A</td>
</tr>
<tr>
<td>Country B Single concept</td>
</tr>
<tr>
<td>—Active ingredient (Country B)</td>
</tr>
<tr>
<td>—Strength of the medicinal product (Country B)</td>
</tr>
<tr>
<td>—Medicinal product package (in Country A)</td>
</tr>
<tr>
<td>—Pharmaceutical dose form (in Country B)</td>
</tr>
<tr>
<td>Brand name of the medicinal product prescribed in Country A</td>
</tr>
<tr>
<td>Number of packages</td>
</tr>
<tr>
<td>Posology</td>
</tr>
<tr>
<td>Date of issue of the prescription</td>
</tr>
</tbody>
</table>
Progress of the Architecture

Share of a common view of the Architecture
Impact on timing for WP3.x

Building Blocks Identification
Frontiers & Responsibilities within WP3.x

Consolidation (business, IS, technology)

Inputs & Best Practices from participants

Deliverables

Consolidated View

D3.3.1 & D3.4.1
January 2010

D3.3.2/3 & D3.4.2
February 2010

Transactions & Fluxes
Standards & Profiles

Regular Syncro.

Building Block Specs.
Example of a WP (3.5 - Semantic services)

Deliverables

- “The Semantic Service Definitions” document, with:
  - Appendix A - Glossary
  - Appendix B - Data Elements Correspondence
  - Appendix C - Implementation Specifications
  - Appendix D - Master Value Sets Catalogue Content (MVC)
  - Appendix E - Ontology Specifications
  - Appendix F - Terminology Access Services
  - Appendix G - EN13606 Implementation
1. **International standard**
2. **In Use**
3. **Existence of transcoding systems / services**
4. **Cost of licences, of implementation and maintenance**
5. **Implementable**
6. **Relevancy to scope documents**
7. **Information sufficient for clinical decision**
8. **Information systems behind**
9. **Frequency of use**
10. **Severity**
11. **Content evaluation and acceptance**
12. **Syntactical and orthographical rules of each language have to be held.**
13. **Reconcilability**
14. **Unambiguity**
15. **Clinical acceptability**
16. **Consistency and systematic order**
Content

Total amount of concepts: 9126 (ATC 6088, other 3038)

• 25- valuesets:
  A. LOINC (2), Id doc & section, Blood pressure, pregnancy information
  B. HL7 (3), technical & IHE specific,
  C. SNOMED CT (13), Adverse Event Type (drug, food, substance), Allergies (Allergen), Blood group, Vaccination, Medical devices, Procedures, Social history
  D. ICD-10 (1), Diagnosis, Illnesses, Problems (Allergy symptoms)
  E. UCUM (1), Units
  F. EDQM (3), routes, dosage forms, container
  G. ISO (1), language
  H. ATC (1), Drugs, Active ingredient

Temporary OID’s on all value sets
Development strategy

- In creating the reference terminology existing standards have to be taken into account.
- The format of reference terminology must be in parallel with the ongoing Semantic Web efforts. We propose Web Ontology Language (OWL2 DL) as format.
- The initial epSOS Ontology should be small and simple in order to be effective. This basis will be evolved.
- The paradigms of best practice in ontology development must be taken into account.
General Flow of Information

1. Document sending

2. Retrieving epSOS pivot document

3. Semantic services: Data transformation into the epSOS pivot document according to the established syntax and terminology

4. Query for Document

5. Run-Time Components fulfilling the access and management of the terminology

6. Document retrieving and displaying in national language 8 with coding system B

7. Semantic services: Data transformation into the local format and official language

8. Query for Document

9. Run-Time Components fulfilling the access and management of the terminology

10. Document Consumer (HCP Ø)
epSOS Pilot Sites: Patient Summary

- **Scenario 1**: acting as Country B (receiver of patient information)
- **Scenario 2**: acting as Country A (sender of patient information)
Scenario 3: acting as Country A (sender of prescription information)

Scenario 4: acting as Country B (receiver of prescription information)
Scenarios:

- **Scenario 5**: acting as Country B (sender of dispensed medicine information)
- **Scenario 6**: acting as Country A (receiver of dispensed medicine information)
### Total numbers

<table>
<thead>
<tr>
<th>INFRASTRUCTURES INVOLVED</th>
<th>PS/eP</th>
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<td>HCPO</td>
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<tr>
<td>• Hospitals</td>
<td>183</td>
</tr>
<tr>
<td>• Farmacies</td>
<td>2.149</td>
</tr>
<tr>
<td>• PoC</td>
<td>1.113</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>HUMAN RESOURCES INVOLVED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HCP</td>
<td>30.157</td>
</tr>
</tbody>
</table>
Pilot Site Candidates: Austria

- **Involved regions**: five cities - Innsbruck, Grieskirchen, St. Pölten, Vienna and Wels

- **Coverage**: Patient Summary (acting as Country A & B) in Innsbruck, St. Pölten and Vienna. eDispensation (acting as Country A) in Grieskirchen and Wels

- **Acting as Country A**: Estimated annual outwards patient flow: approx. 7,200

- **Acting as Country B**: 4 hospitals, 136 GPs and specialists
Pilot Site Candidates: Czech Republic

- **Involved regions**: the whole country
- **Coverage**: Patient Summary, acting as Country A & B
- **Acting as Country A**: over one million patients with an electronic health record. Estimated annual outwards patient flow to epSOS countries: 7,300
- **Acting as Country B**: 10,000 HCPs within 6,000 HCOs, of which 50 are hospitals (see map), scattered all over the country
Pilot Site Candidates: Denmark

- **Involved regions**: the whole country, and in particular Copenhagen

- **Coverage**: Patient Summary (acting as Country A), ePrescription (acting as Country A & B) and eDispensation (acting as Country A & B)

- **Acting as Country A**: eP for the entire country. Estimated outwards patient flow: approx. 8,000

- **Acting as Country B**: 3,100 GPs and specialists, 60 hospitals, eDispensation at 2 pharmacies in Copenhagen
Pilot Site Candidates: France

- **Involved regions**: four cities - Dijon, Lille, Paris and Poitiers
- **Coverage**: Patient Summary (acting as Country A & B) for incoming and outgoing Erasmus students at the universities of Dijon, Lille, Poitiers and Paris-X.
- **Acting as Country A**: 600 French students from the 4 universities participated in the Erasmus programme 2006/07 (outgoing)
- **Acting as Country B**: the four universities received more than 400 incoming Erasmus students in 2006/07
Pilot Site Candidates: Germany

- **Involved regions:** Baden-Württemberg, Bavaria, Rhineland-Palatinate

- **Coverage:** Patient Summary, acting as Country A
Pilot Site Candidates: Greece

- **Involved regions**: two cities – Athens and Thessaloniki
- **Coverage**: Patient Summary and ePrescription/eDispensation, acting as Country B
- **Acting as Country B**: estimated HCOs/HCPs involved: 15 pharmacies, 2 hospitals, 20 HCPs. Total annual tourist flow (inwards): over 6 million visitors
Pilot Site Candidates: Italy

- **Involved regions:** Lombardy, in particular the provinces of Pavia and Brescia
- **Coverage:** Patient Summary (acting as Country A & B) and ePrescription/eDispensation (acting as Country A)
- **Acting as Country A:** Acting as sender of PS in the provinces of Pavia and Brescia. The whole region Lombardy acting as sender of eP information and receiver of dispensed medicine information
- **Acting as Country B:** Acting as receiver of PS in the Garda Lake area (Brescia)
Pilot Site Candidates: Slovakia

- **Involved regions:** Martin and Dolny Kubin

**Coverage:** Patient Summary and ePrescription/Dispensation, acting as Country A & B

**Acting as Country A:** PS and eP for 10,000 citizens

**Acting as Country B:** eP at 8 pharmacies in Martin and Dolny Kubin. PS at 2 hospitals and 15 outpatient care units
Pilot Site Candidates: Spain

- **Involved regions:** Andalusia, Balearic Islands, Castile - La Mancha, Catalonia, Valencia

- **Coverage:** Patient Summary and ePrescription/Dispensation, acting as Country A & B
  
  **Acting as Country A:** PS for the entire population of all five regions. eP for the entire population of all regions except CLM.

  **Acting as Country B:** PS and eP/eD in the whole regions of Valencia and the Balearic Islands, and in selected cities/provinces in Andalusia, Catalonia and CLM
Pilot Site Candidates: Sweden

- **Involved regions:** the whole country, and in particular Östergötland, Scania, Stockholm and Norrbotten

- **Coverage:** Patient Summary and ePrescription/Dispensation, acting as Country A & B

- **Acting as Country A:** eP for the entire country. Acting as sender of PS in Östergötland and Norrbotten

- **Acting as Country B:** acting as receiver of PS in Östergötland and Norrbotten. eP/eD at selected pharmacies in Stockholm, Scania and Norrbotten
• epSOS & CALLIOPE in CALLIOPE WG7
• Communication with a broader audience in both directions
• Infrastructure for dissemination activities
• Qualified feedback
• Input from Calliope's defined areas of work (Roadmap, EU-recommendations, Standards)

Welcome to CALLIOPE
A European Thematic Network for eHealth Interoperability

http://www.calliope-network.eu/
Have joined CALLIOPE WG 7

- Estonia
- Finland
- Iceland
- Slovenia
- Portugal
- Norway
- Switzerland
- Luxembourg
- Belgium
- Malta
Oh so you are also implementing eHealth?
Thank you for your attention!
Fredrik.linden@skl.se