Workshop on semantic interoperability prerequisites for efficient e-health systems.

How to support convergence of ontology, standards in health informatics for clinical terminologies, classifications, coding systems and e health records.

A strategy for a top down approach

Brussels 14-15/02/05

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WHY A TOP DOWN APPROACH

1 BETWEEN 2 OPPOSITE POSSIBLE ERRORS
11 IDEAL SOLUTIONS
No chances before we are all dead
12 PRAGMATIC RESIGNATION
So difficult let us go our old traditional way (ex procedures coding systems)

2 DIVERGENT BOTTOM UP INITIATIVES
See before

3 SEMANTIC INTEROPERABILITY PERCEIVED AS A RISING PRIORITY BUT
31 No clear understanding by decision makers
32 Underestimation of the complexity of the whole and of some parts
33 Mixing not optimal between industry and academic

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WHERE WE ARE

The different aspects of interoperability (Electronic Health Records, messages, security, terminology and languages, data types, information models, architectures, archetypes, standards, etc.) are addressed by divergent initiatives aiming at exchanging not only data or information, but also at transferring meaning: in healthcare, such a practice is related to risk.

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Advanced technologies in computer and other disciplines, such as artificial intelligence, allow for much more complex problems solving in routine: this is possible through the use of such tools as ontologies and formal representations, hidden within the computer for terminology, or personal microprocessor cards for security.

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Bridges/roles in semantic interoperability

ARCHITECTURE AND ARCHETYPES STANDARDS

ONTOLGY

TERMINIOLOGY STANDARDS

Natural language

Clinical Terminologies

Coding & Classifications

Decision support

Claims casemix

Continuity of care

Patient information
1 Information Model (RIM HL7)
2 Architecture:
   prEN 13606 EHRcom,CDA
3 Archetypes:
   prEN 13606 EHRcom,Templates HL7

set of minimal ontology and context structure constraints

4 Terminology standards
   EN1828 Categorial structure for surgical procedures
   EN ISO 18104 Integration of a reference terminology model for nursing
   prEN12264 Categorial structure :reference terminology model
   prEN medical devices, clinical laboratory, medicinal products, ClaML14463

X prEN medical devices, clinical laboratory, medicinal products, ClaML14463

5 Ontology Formal knowledge representation with editing, reasoning and nlp software tools as OPEN SOURCE to share acquisition, validation, use between countries, centres and languages

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## Relations ontology: nlp Classifications

**craniotomy, cranial incision, incision of the skull**

**Set of sensible statements**

(cl\_Incising, rel\_actsSpecificallyOn, cl\_HollowBodyStructure).

**And annotations**

(22.1, cl\_GeneralisedProcess, rel\_actsOn, cl\_BodyStructure,
[en([adj,cpl,nprem]), fr([adj,cpl]), it([adj,cpl])],
[en([adj,partPerf(affected,by)]),…] )

FOR COMPUTERS AND NOT FOR HUMANS

NOT EASILY PERFECT AND EXHAUSTIVE

<table>
<thead>
<tr>
<th>1st Generation</th>
<th>2nd Generation</th>
<th>3rd Generation</th>
</tr>
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<tbody>
<tr>
<td>ICD 10</td>
<td>ICF</td>
<td>GALEN</td>
</tr>
<tr>
<td>ICD 9 CM</td>
<td>CCAM</td>
<td>SNOMED RT</td>
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<tr>
<td>CPT 4</td>
<td>SNOMED intern.</td>
<td>FMA</td>
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</tbody>
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CONFUSING FACTORS
Consensus process between professionals
Inter rater reliability
Assessing quality of the whole process?

A new identifier
End users

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Macro view
Road map for decision makers
- understanding complexity and issues
- implementation platforms
at different levels
(EU, nation, region, organisation)
- coordination (member states, EU, SO, Who, industry, academia)
- action plan
METHODOLOGY

To identify the needs of target beneficiaries,
To keep in mind the context (levels of development, cultural and linguistic sensitivities),
To assess impact (benefits) over time and to prioritise,
To identify missing links (R&D) in qualitative terms
To assess implications in quantitative terms (planning and resource).

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Micro approaches: targeted topics
Disease
Anatomy
Procedures
Medicinal products
to what extent existing applications and tools can be improved and at what cost to come useful for specific purposes.

OR

to what extent ideal solutions can be operationalized and at what cost to be practically implemented to be useful for specific purposes.

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END