Cross-frontier Information Provision in the ALIAS European Project

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Context: the ALIAS project

- Alpine Space programme
  www.alpine-space.eu
- 8 hospitals
- 6 countries, 4 languages
  - Austria, France, Germany, Italy, Slovenia, Switzerland
- August 2009 - 2012
- Pilot phase October 2011
- Production August 2012
Objectives of ALIAS

• Foster the exchange of medical knowledge in the Alpine area
  – Know-how exchange between healthcare professionals
  – Medical care of mobile patients

• Based on existing infrastructures
  – Hospital and regional EHR platforms

• ALIAS proposes the interconnection of existing infrastructures
  – ALIAS is an exchange platform

• Key features
  – Security of exchanges, strong medical professionals’ identification, patient consent
Services in the ALIAS platform

• Patient record service
  – Tools to search and consult patients medical records in the partnering information systems

• Medical advice service
  – Allows a healthcare professional ask for advice on a difficult case to another medical professional in the partnering

• Translation service
  – Translation of exchanged documents for both services
Scenario (using ALIAS)

• Ana, a Milano (Italy) citizen goes on holidays to Grenoble (France)
  – She gets a heart attack and is taken in charge in Izola hospital

• The slovenian doctor connects to Izola EHR information system and gets access to the ALIAS platform
  – The doctor enters Ana’s identification information
  – The doctor gets Ana’s consent and she fills in the corresponding form

• The doctor gets access to Ana’s medical record stored in the Milanese platform
  – Documents are written in Italian, the translation service provides help
Agenda

• Context and translation needs: the ALIAS project

• The translation service
  – Approach followed
  – Translation process
  – Tools used

• Conclusion
Translation approach

• Constraints
  – Translation at runtime
  – Exact even if incomplete
    • full-text translation not adequate
  – Short delays for pilot phase launching

• Conclusions
  – Partial translation limited to a controlled vocabulary
  – Translation = Annotation of the original document
Vocabularies selection

• Translated information and needs
  – Diseases one controlled list per language
  – Drugs one controlled list per country

• Interoperability of vocabularies
  – ICD: International Classification of Diseases
  – ATC: Anatomical Therapeutic Chemical classification

• ATC is used as a pivot between the national drugs databanks
Translation process

1. Receive and open the document

2. Identify terms

3. Translate terms

4. Enrich the document
1. Open the document

- Manage only text content
- Most documents are PDF
- Rtf and txt also
- Apache Tika parser to manage different formats
2. Identification of terms

• Using the GATE framework
  – A global architecture for the processing of text documents
  – Provides a large set of natural language processing tools
  – Large vocabularies are manageable using the « Large KB Gazetteer»
  – Vocabularies must be provided in the OWL format
3. Translation

- **Diseases:** direct translation

  | R04  | Epistaxis |
  | R05  | Toux      |
  | ...  | ...       |

- **Drugs:** search for equivalent drugs in the country

  - Kardégic (ATC: B01AC06) -> B01AC06
  - Acido acetilsalicilico
  - Acebutolol (ATC: C07AB04)
  - Cardirene (ATC: B01AC06)
  - Ascriptin (ATC: B01AC06)
  - Cardioaspirin (ATC: B01AC06)
4. Showing the augmented document

**Diagnosi:**
Blocco atro-ventricolare 2 gradi Mobitz 2; impianto di PM-DDDR.
Angina da sforzo in portare di plurime angioplastiche con stent.
Arteriopatia arti inferiori stabile.

**Anamnesi/ Motivo del Ricovero:**
Dislipemia.
Cardiopatia ischemica nota:
2001: PTCA-bare stent su CD e CX
2002: re-PTCA e stend su CD e CX
2002: nuova PTCA-stent sulla CX, con EF conservata. N/A ndp.
Successivamente asintomatica per angor.
Concomitante arteriopatia arteria inferiore sinistro, in trattamento medico con claudicatio stabile da anni (visita angiologo).

**APP:**
Da qualche settimana ripresa di angina stabile da sforzo.
In terapia con ramipril 10, ASA 100, minitrans 10, simvastatina.
Un recente controllo cardiologico mostra ECG: BAV 2° grado, stimolazione definitiva e inizio terapia BB.

**Decorso della Degenza:**
Paziente asintomatica e in buon compenso clinico.
Non angor.
Esami:
ECG-Holter: conferma BAV 2 grado sia Mobitz 1 che Mobitz 2.
Ecocardiogramma: normale funzione sistolica con EF 56%.

**Terapia e Prestazioni Eseguite:**
Beta-bloccante, antiaecedente, aceinhibitore, simvastatina.

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**simvastatina**

- Classe ATC: C10AA01
- Classe chimica: Simvastatina
- Classe terapeutica: Inibitori di l'hmgl-coa reductase

**Prodotti equivalenti:**
- LODALES
- SIMVASTATINE
- ZOCOR
Tools used

• For the service development
  protégé

• During the service use

1. Receive and open the document

2. Identify terms
  Tika

3. Translate
  GATE

4. Enrich the document
  jena

0. Host the service
  AXIS2
Conclusion

Translation of terms in documents
• At the moment of document opening
• For different formats
• Precise translation
  – Limited to a controlled vocabulary
• Under the form of annotations on the original document
Perspectives

• Towards more semantics
  – Using the context
    • Detect negations
    • Use the logical structure of the document?
  – Use other vocabularies
    • SNOMED?
    • Posology and dosage using ATC-DDD

• Next month, run the pilot phase and get first users feedback!
Thanks for your attention

Questions