Workshop on designing clinical IT-systems – prerequisites and challenges

Clinical information systems and infrastructure, database systems and data networks

Agenda

- Introduction to a clinical case
- Introduction of two design exercises
  - Two groups do exercise 1, and two groups do exercises 2. Designs should be presented here at 15.00
- Presentation and feedback on designs

Goals

- To experience and understand in depth some of the basic challenges of designing clinical IT-systems
- To argument scientifically for a health IT-system design
Clinical case

- **Designing a system for nutrition screening**

- **Main points**
  - Screening is performed whenever a patient is admitted to a hospital
  - The primary screening measures basic nutrition/metabolism related values (4 questions)
  - The secondary screening measures nutritional risk from 0-3(4), estimated from a combination of nutritional status, severity of disease and age.
  - From this a treatment can be prescribed, but in this exercise the secondary screening is as far as we go

**Problem 1**

- **Characteristic 1: the complexity of clinical knowledge**
  - [Garde and Knaup, 2006]
  - What does it mean?

- **What does it mean when designing IT systems?**
  - Hard coding whenever new requirements occur is expensive
  - Flexibility becomes crucial
Exercise 1

- Design a nutrition screening system, where you take into account the complexity of clinical knowledge

- If there is time left, consider Characteristic 4 regarding relevance and Characteristic 6 regarding the complexity of stakeholders [Garde, 2006]

- Help: The Julius system has a basic idea for a solution [Chen, 2007]
**Problem 2**

- **Characteristic 5: patient-centric health information** [Garde and Knaup, 2006]
  - Information should follow the patient across institutional boundaries. Challenging in most countries because health care features a very heterogeneous systems landscape.
  - Does it make sense for nutrition screening? Does it make sense for all patient related information?

- **What does it mean when designing IT-systems?**
  - Revolutionary approach or evolutionary?
  - Revolution: We all commence to the same standards or use the same system. Difficult to achieved i.e. [European Commision, 2009]
  - Evolutionary: The need for information sharing should be balanced with the difficulty of ensuring this in a heterogeneous systems landscape. Message-based interoperability (ex. Medcom) or central storage of selected information (ex. Fælles medicinkort)

---

**Diagram:**

- **Data entry at admission**
- **Use of accumulated patient information. Do we remember to perform it? What is the nutritional status of patients? How well does nutrition treatment work?**
- **Use of patient information, when the patient is discharged i.e. to nursing home**
- **Use of patient information, when the patient is moved to more or less specialised hospital**
- **Use of patient information in the same contact**
- **Requirements**
Exercise 2

- Design a nutrition screening system (or consider it a network), where you take into account that information should be patient-centric.

- If there is time left consider the possible value of accumulated data for quality assurance or research.


Solution requirements

- Design a database-structure illustrated as an entity-relationship diagram.
- Design one or more user-interfaces as paper mock-ups. Data entry interfaces and/or output interfaces.
- (Exercise 2 illustrate the distribution in simple drawings)
- Note that argumentation is more important than beautiful design.

- Prepare a 8 min presentation to be held at 15.00.
- Here we discuss the argumentation of each design and look at alternatives.
References

Sundhedsstyrelsen, 2008:  

Garde and Knaup, 2006: Requirements engineering in health care: the example of chemotherapy planning in paediatric oncology

Rector, 1999: Clinical Terminology: Why Is it so Hard?

Chen et al, 2007: Julius – a template based supplementary electronic health record system

MedCom, 2009: MedCom 15 years - Status report, MedCom 6