INFORMATION SYSTEMS IN HEALTH CARE

Michel Kana, Ph.D.

Lesson 2 – Winter Term 2014

Schedule

1. **Syllabus of lectures and tutorials**
2. **Pre-test**
3. **Medical Informatics and IS definition**
4. **OpenEMR**
5. **Conclusion**

Syllabus of lectures and tutorials

Syllabus of lectures and tutorials

		Lectures (45 min)	Tutorials (45 min)
Lesson 1	Sep 23	Class introduction	
Lesson 2	Sep 30	Medical Informatics and IS definition	OpenEMR
Lesson 3	Oct 7	HW infrastructure of IS	OpenEMR
Lesson 4	Oct 14	Operation systems and databases of IS	GaiaEHR electronic health records
Lesson 5	Oct 21	Clinical oriented IS	GaiaEHR electronic health records
Lesson 6	Oct 28	Decision support systems	OpenMRS
Lesson 7	Nov 4	Medical data coding	OpenMRS
Lesson 8	Nov 11	Data and communication standards	Analysis and design with UML
Lesson 9	Nov 18	Heterogeneous and regional IS integration	Databases in MySQL
Lesson 10	Nov 25	Phase and IS development principles	Databases in MySQL
Lesson 11	Dec 2	Standard implementation methodology	Programing in PHP
Lesson 12	Dec 9	Health care IS management and support	Programing in PHP
Lesson 13	Dec 16	Presentation of practical projects and final exam	

Requirements for grade

- Attendance to ALL lessons
  - In case of non-attendance, provide a valid reason
- 30 points from homework
  - 1 homework per week
  - 3 points per homework
  - The homework is an essay about the topics covered in the lecture
- 20 points from practical projects
  - 5 points for analyzing your own information system
  - 10 points for implementing your own information system
  - 5 points for presenting your own information system
  - Guidelines will be given in lesson 8
- 50 points from final exam
  - 30 points about the lectures
  - 20 points about the tutorials

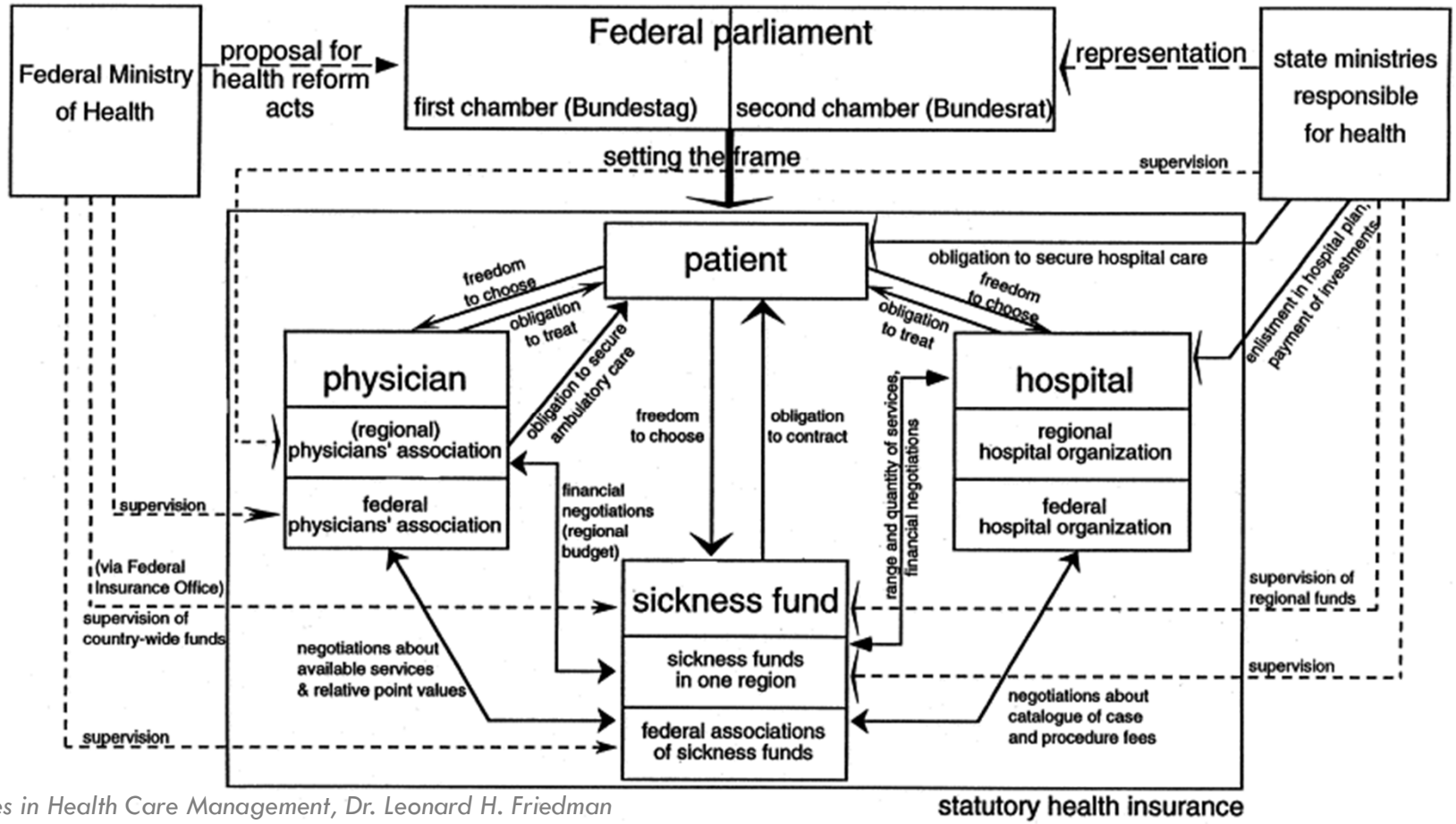
Pre-test

Medical Informatics and IS definition

The Framework of Information Systems in Healthcare

- Health informatics is an interdisciplinary field covered by the international classification standard ICS 35.240.80
  - Health care: prevention, diagnosis and treatment of diseases
  - Information science: storage and retrieval information
  - Computer science: automatic computation of information
- Health informatics deals
  - with methods, techniques, devices and resources
  - for the acquisition, storage, processing, retrieval and use
  - of information
  - to support decision and actions, and improves patient outcomes
- Synomyms of health informatics are
  - Health information systems, health care informatics, healthcare informatics, medical informatics, nursing informatics, clinical informatics, biomedical informatics

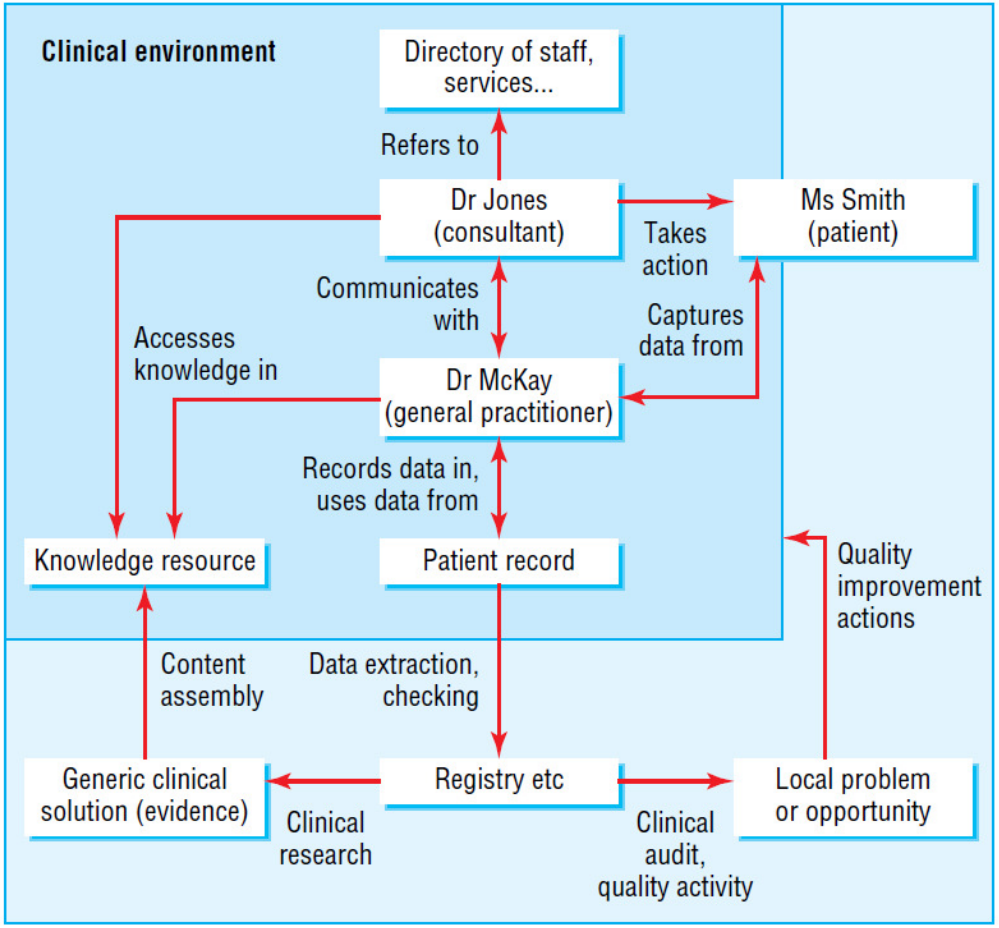
Roles and responsabilities in healthcare



Ref.: Advances in Health Care Management, Dr. Leonard H. Friedman

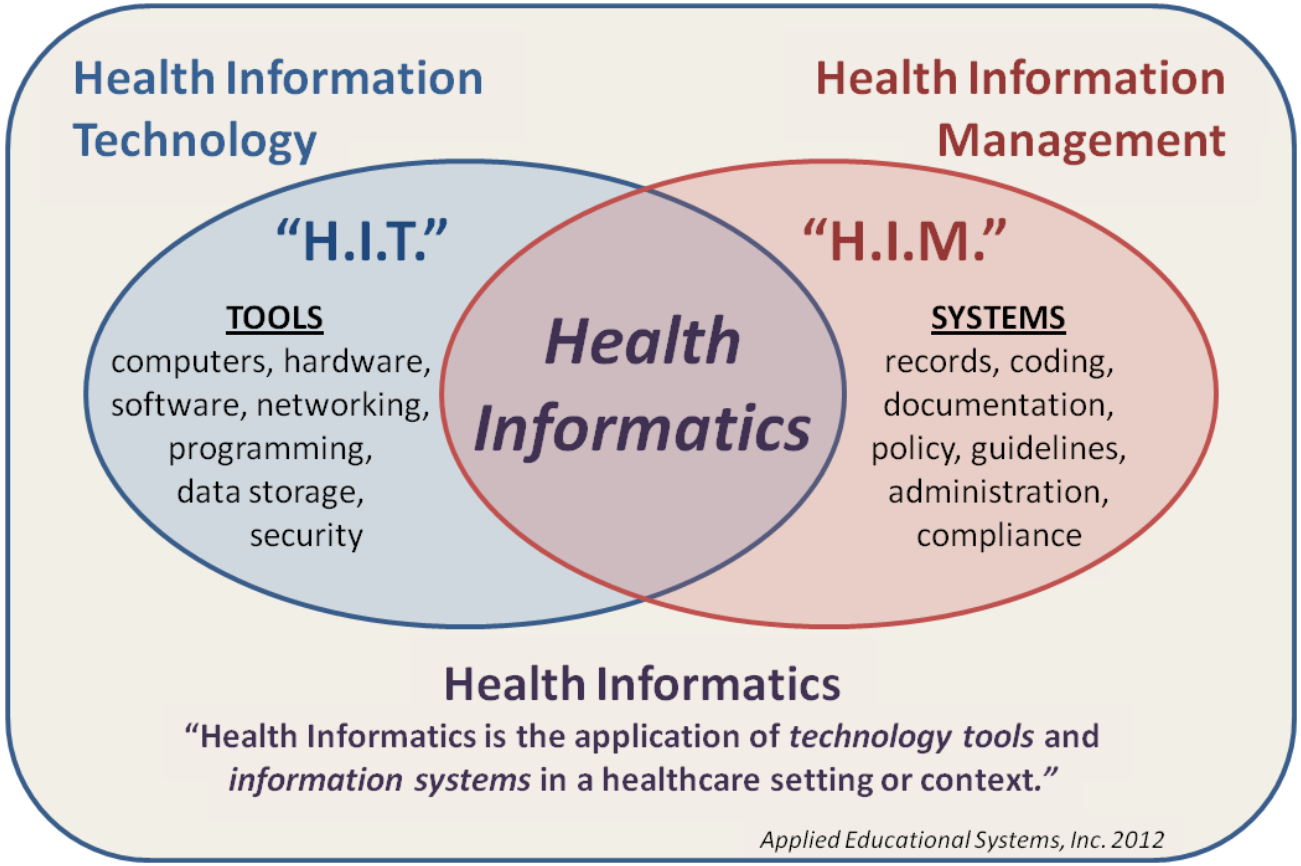
Information in health care

- Patient data
- Medical knowledge
- Directory information

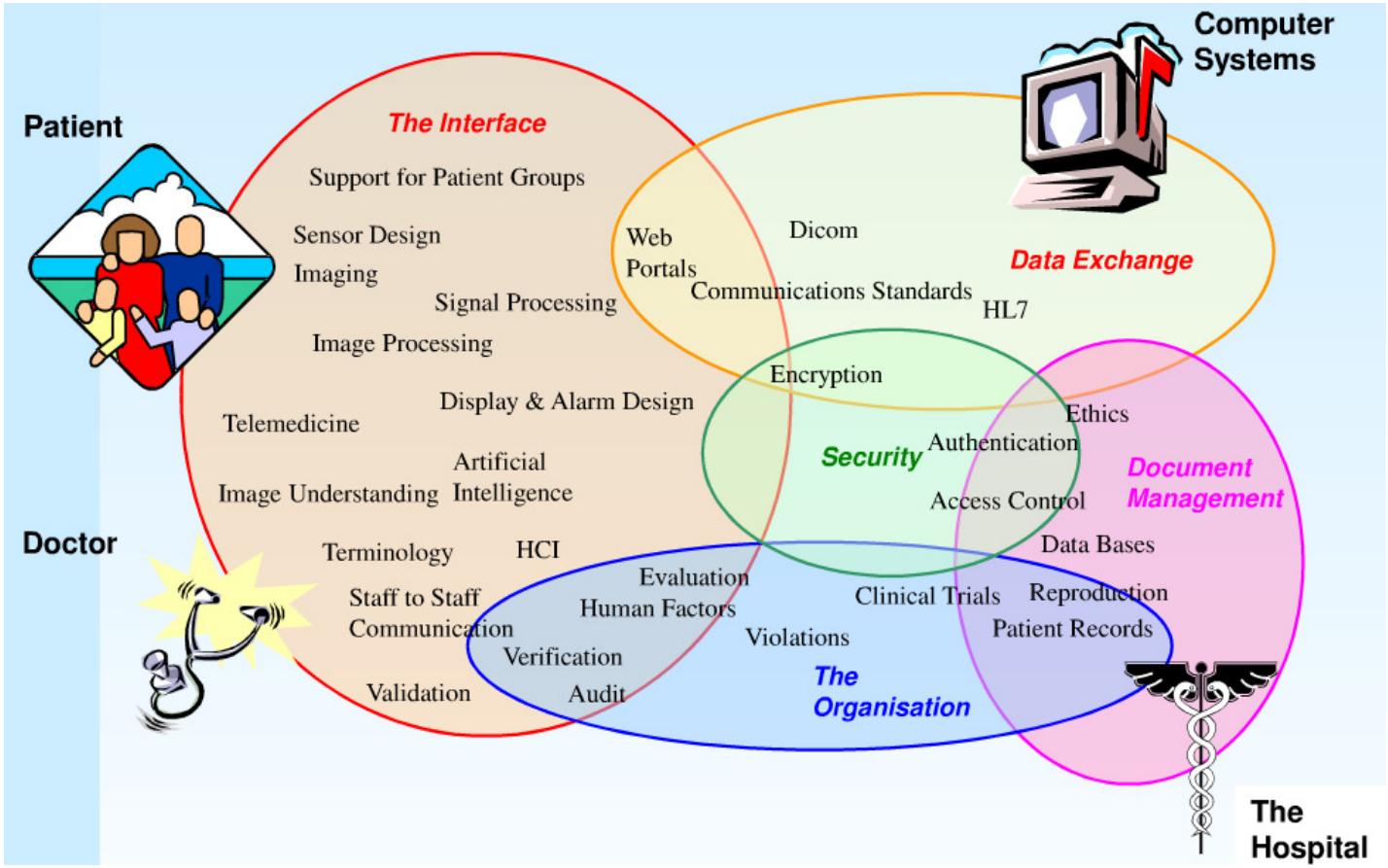


Ref.: ABC of Health Informatics, University of Dundee

Information systems in health care

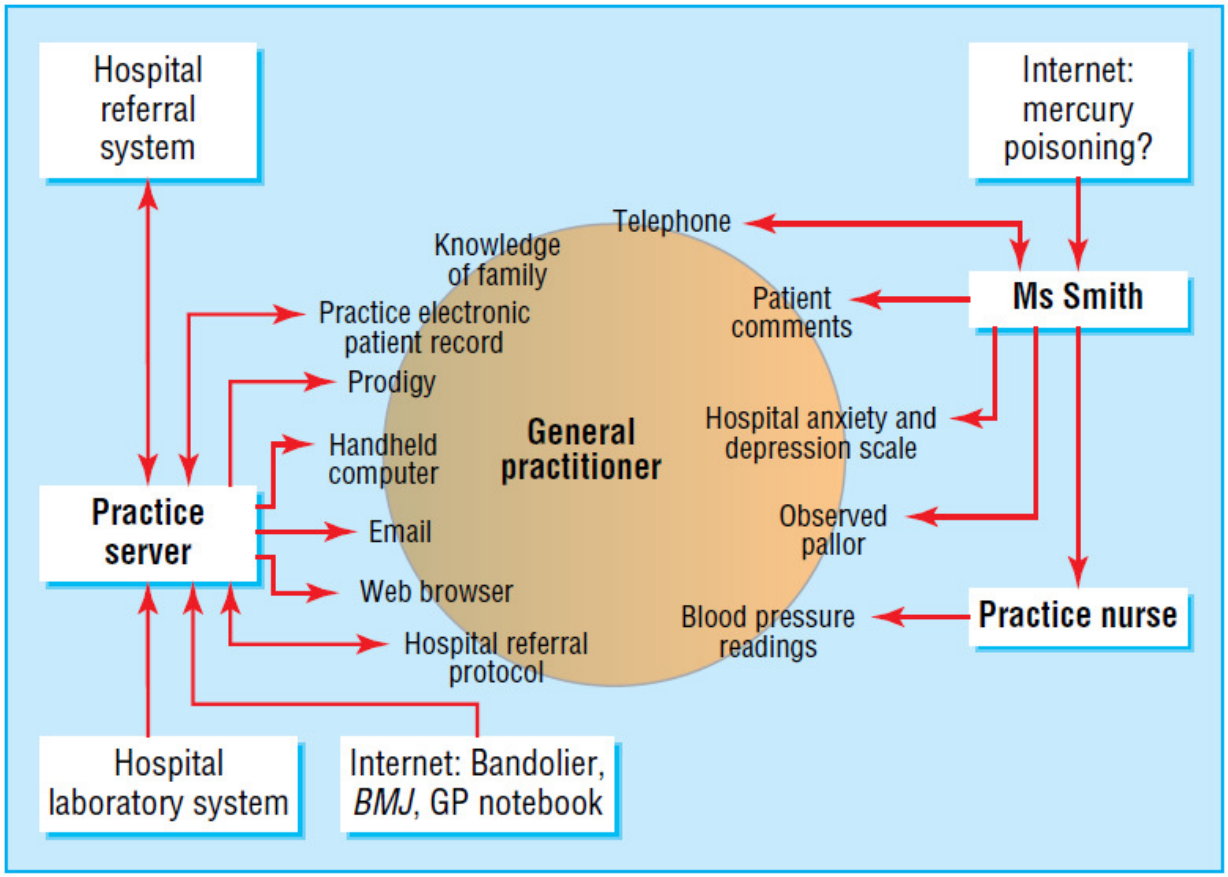


Information systems in health care



Ref.: The University of Manchester, Imaging science and biomedical engineering

Information systems in health care



Ref.: ABC of Health Informatics, University of Dundee

Types of information systems in health care

- **Electronic health record (EHR)** is the systematic collection, processing and sharing of health information in electronic form.
- **Medical practice management software (PMS)** is a set of tools for helping health provider in their day-to-day operations in a medical practice.
- **Computerized provider order entry (CPOE)** in an ordering and fulfillment system for medical practitioner instructions for the treatment of patients.
- **Clinical decision support system (CDSS)** is a real-time tool for diagnostic and treatment recommendations. CDSS may be used as part of CPOE and EHR.
- **Picture archiving and communications system (PACS)** captures and integrates diagnostic and radiological images such as x-ray, MRI and CT.
- **Electronic materials management (EMM)** tracks and manages inventory of medical supplies, pharmaceuticals, and other materials.
- **Telemedicine software** provides communications and transmission of health information between patient and healthcare provider.

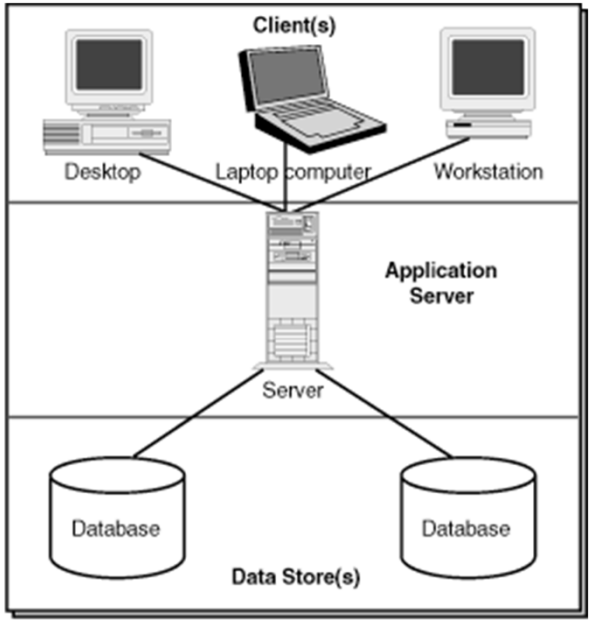
OpenEMR

What is OpenEMR?

- OpenEMR is an electronic health record (EHR) and medical practice management software.
- Features
  - Patient demographics
  - Patient scheduling
  - Patient portal
  - Electronic medical records
  - Prescriptions
  - Clinical decision support
  - Medical billing
  - Reports
  - Multilanguage support
  - Security
  - Free: Open Source under GNU General Public License

OpenEMR Architecture

- OpenEMR is a web-based 3-tier application
  - The client sends a request using a web browser
  - The web and application server receives a processes the request
  - The database server executes queries against a database



Our OpenEMR PlayGround

- http://demo.open-emr.org:2099/openemr
- Tutorial
  - Adding a patient
  - Using the calendar
    - Setting up a quaterly schedule
    - Making appointments
  - Opening a new encounter for first visit
    - Entering family history, brief description, alergies
    - Entering system checks, vitals
    - Adding a fee sheet
    - Making a prescription
  - Adding a medical issue (problem)
    - Associate medical issue and encounter
  - Adding Immunization

Our OpenEMR PlayGround

- http://demo.open-emr.org:2099/openemr
- Tutorial
  - Adding patient notes and sending messages
  - Creating a referral transaction
  - Using patient portal
    - Enabling access
    - Resetting password
    - Viewing reports

Homework

- Provide an organization chart of health care in your country
  - Graphical overview
  - Description of roles and responsabilities
  - Description of information flow between entities
- Describe a software development methodology of your choice
- Send your essay as editable document (e.g. MS Word format) by Oct 5

Plan for next week

- *HW infrastructure of IS*
- *OpenEMR: billing, reporting, clinical decision rules, Configuration.*