



The Health Informatics Process

Foundational Curricula:

Cluster 4: Informatics

Module 7: The Informatics Process and Principles of Health Informatics

Unit 3: The Health Informatics Process

FC-C4M7U3

Curriculum Developers: Angelique Blake, Rachelle Blake, Pauliina Hulkkonen, Sonja Huotari, Milla Jauhiainen, Johanna Tolonen, and Alpo Värri

22/60



Unit Objectives



- Describe how technology, process and people intersect in the discipline of informatics in health information/eHealth
- Convey the importance of informatics in the design, development, implementation, training, testing, support and optimization of health IT/eHealth



The Health Informatics Process



- Health informatics professionals use their knowledge of patient care combined with their understanding of informatics concepts, methods, and health informatics tools to:
 - assess information and knowledge needs of health care professionals, patients and their families
 - characterize, evaluate, and refine clinical processes
 - develop, implement, and optimize clinical decision support systems, and
 - lead or participate in the procurement, customization, development, implementation, management, evaluation, and continuous improvement of clinical information systems





The Health Informatics Process (cont'd)



- Clinicians collaborate with other health care and information technology professionals to develop health informatics tools which promote patient care that is safe, efficient, effective, timely, patient-centered, and equitable
- The people involved in health informatics are the eHealth workforce and patients
- **eHealth Workforce Development** is a holistic approach to capacity building of the **eHealth workforce**, the digitally-skilled new and incumbent body of workers who are fit for practice in the interprofessional healthcare field



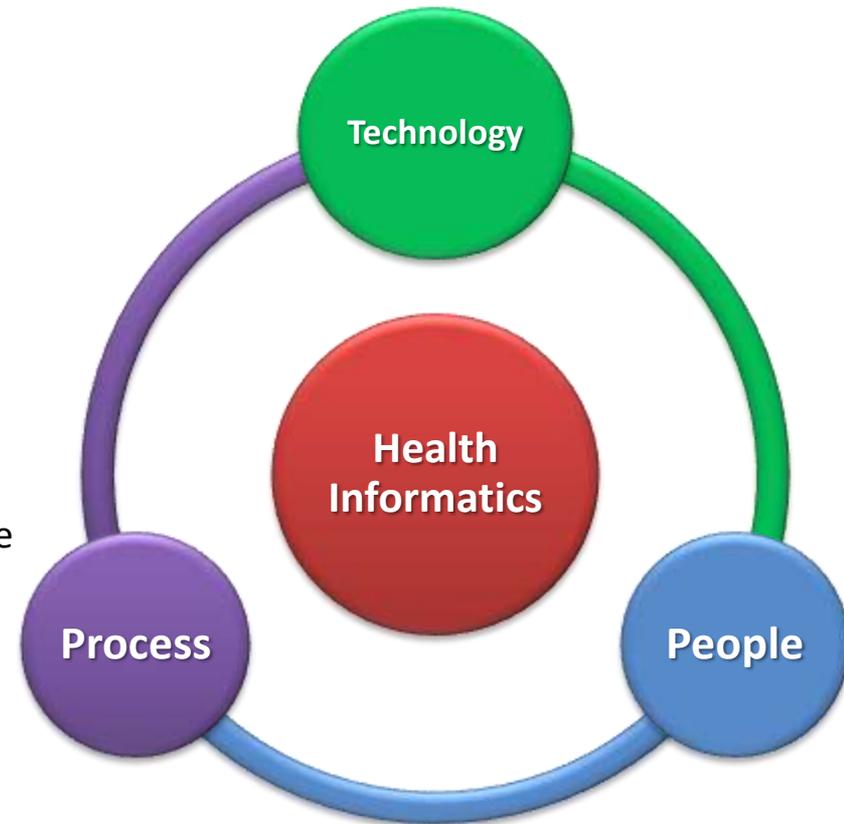


The Health Informatics Discipline



Health informatics is the intersection of people, process and technology

- **People**
 - Patients as well as eHealth workers are affected by processes and technology
 - Usability and satisfaction are major factors in all areas of process and technology
 - Process and technology can be affected by individual skills and personality
 - Basic education provides the knowledge, but interests and specialization affect the skills
- **Process**
 - The processes used need to fit into the healthcare setting
 - Education needs to be provided and other guidance need to be available
 - Safety – security – privacy of the patient and data
- **Technology**
 - Technology enables sufficient use of informatics in patient care and management
 - Complex technology requires more from the information systems and management

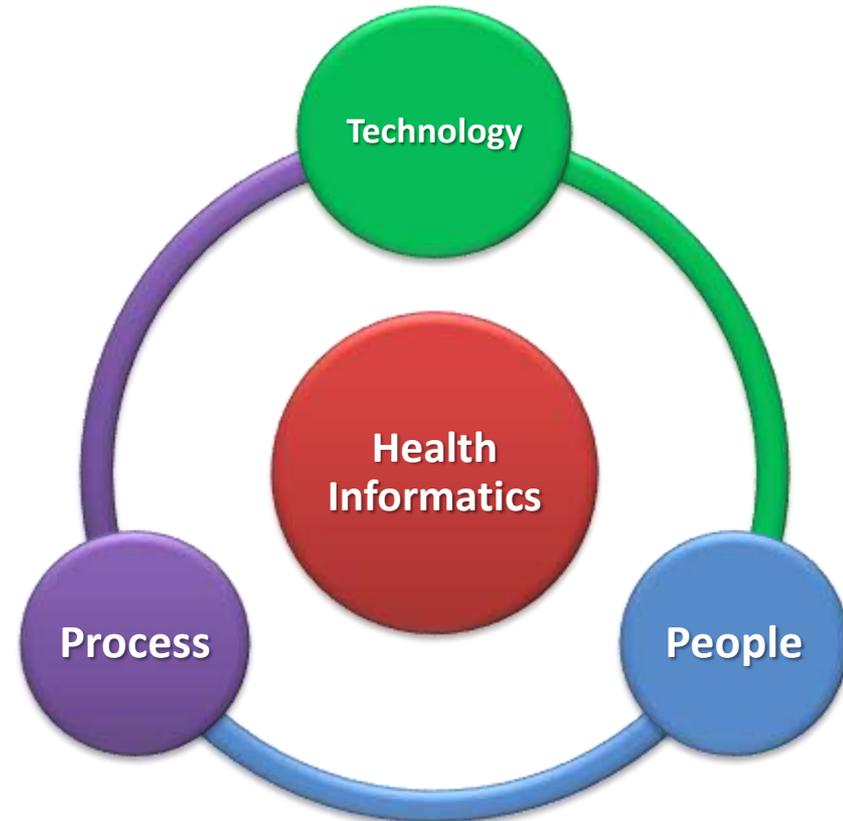




The Health Informatics Discipline (cont'd)



- Technology
 - does not substitute for workforce and best practices in processes
- Processes
 - must be improved/optimized before applying new technologies
 - Use of technology requires efficient processes
- People
 - are the end users and the focus of the processes and technology
- Educated people + modern technology + efficient processes = good health informatics





The Impact of Health Informatics

- Health informatics has an impact on many levels of health IT, including:
 - Design and development
 - Implementation
 - Training and testing
 - Support and optimization

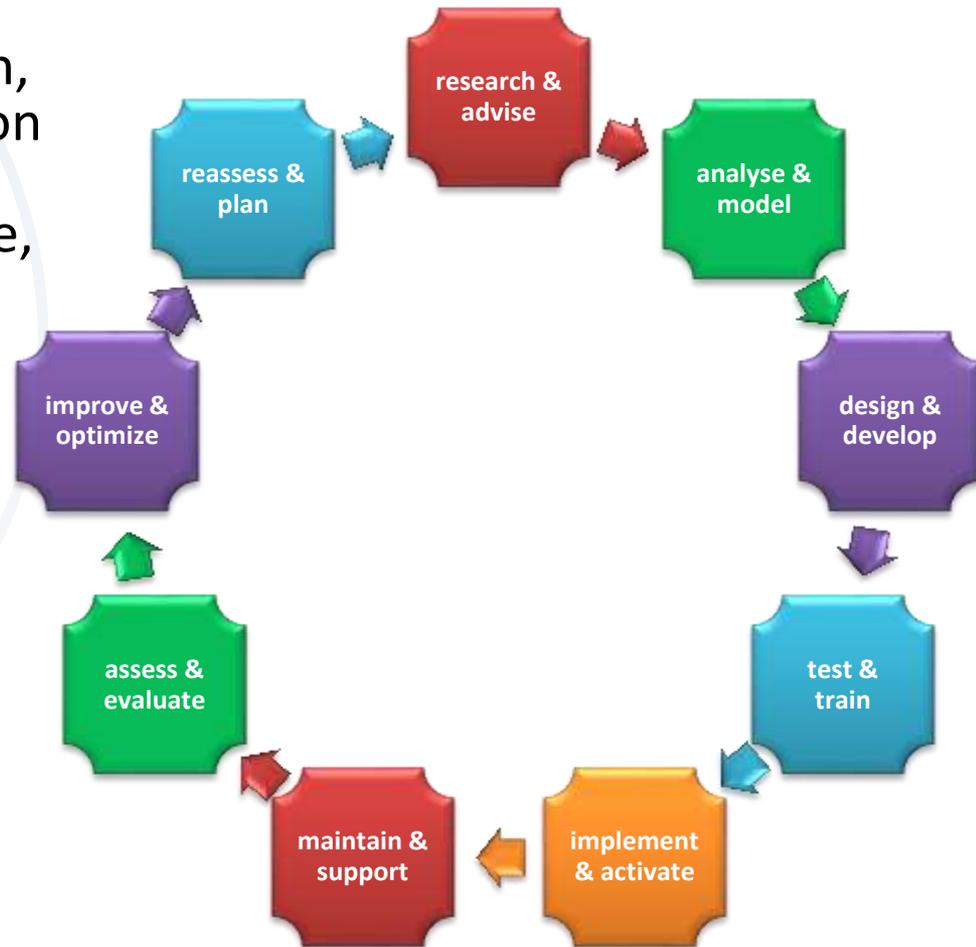




The Health Informatics Life Cycle



- The health informatics life cycle integrates several key steps involved in the implementation, use and adoption of information and technology in healthcare. These processes involve people, processes and technology. Following these steps, an informaticist will:
 - research & advise
 - analyse & model
 - design & develop
 - test & train
 - implement & activate
 - maintain & support
 - assess & evaluate
 - improve & optimize
 - reassess & plan





The Health Informatics Life Cycle: Research and Advisement



- Health informatics is an important part of health IT research and advisement on best practices
- Research in health informatics focuses on developing and using health information technology to transform health care delivery
- Research also provides evidence that helps inform policies and procedures, and guides innovation and design of health care technologies
- Research provides the basis for providing advisement to healthcare organizations and leadership regarding vendor selection, staff engagement, training and other features of implementations



research &
advise



The Health Informatics Life Cycle: Analysis and Modelling

- Health informatics contributes greatly to the analysis and modelling of health information systems and technology
- Informaticists take stored data (clinical, statistical and other data) and analyse it so they can learn from it, fold that knowledge back into the EHRs and other information systems and health technology tools, and improve patient care

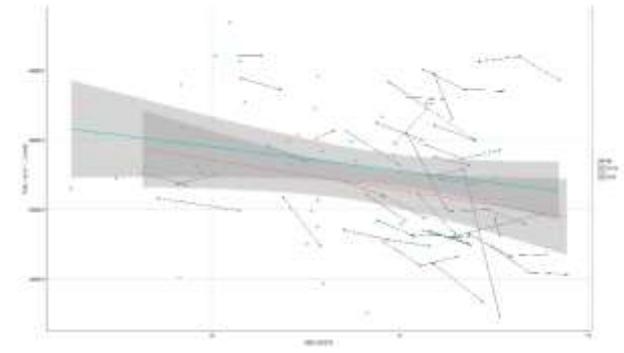




The Health Informatics Life Cycle: Analysis and Modelling (cont'd)



- Data can be stored, retrieved and analysed from previous years or care encounters for comparison
 - This is called **longitudinal data** – data observed or examined over a period of time
 - This captured data provides a longitudinal view of each patient over the entire course of his or her treatment
 - The data helps improve care because clinicians can see what is occurring in different care settings for patients, can review care and treatment plans, and can see how new diagnoses or medications affect future treatments and care, etc.
- Computer models are used in health informatics in conjunction with analysis to examine various topics such as how exercise affects obesity, smoking cessation, association of diagnoses with tests ordered, and other healthcare issues





The Health Informatics Life Cycle: Design and Development

- Health informatics is an also a vital component of health IT design and development
- When a new technology is needed, informatics helps demonstrate that the technology can/will improve the current workflow in the healthcare setting by:
 - conducting needs assessments
 - diagramming current workflows
 - collecting data and feedback from current processes, including manual systems, any software/hardware used, through end user interviews, focus groups, surveys, etc.
 - assessing and integrating into the design all aspects of technology, including device needs, system usage and **ergonomics** (an applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely — called also human engineering or human factors)
 - demonstrating **bottlenecks** or problem areas
 - suggesting process improvements for the design and development based on informatics





The Health Informatics Life Cycle: Design and Development (cont'd)



- Informatics can be used to create design and development processes that are measurable. Thus, comparisons can be made in more objective ways
- Integral to health informatics support is designing and developing technologies that are user-friendly and meet the needs of both patients and providers

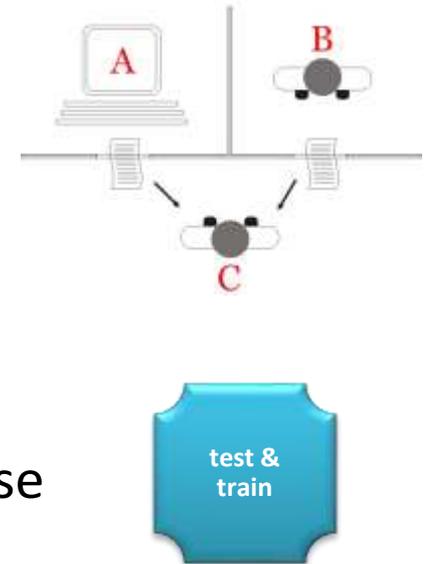




The Health Informatics Life Cycle:

Testing and Training

- Informatics is used during testing to ensure the system meets usability tests from the perspective of people, process and technology
 - This is especially important in usability, workflow and functional testing
 - Information and statistics can be collected during test phases and training. Feedback is then collected in electronic form for further use
- **Test scripts**, comprised of a set of instructions that will be performed on the system in a test environment to see if the system functions as expected, are created and carried out by informaticists, and form the foundation for training materials





The Health Informatics Life Cycle: Testing and Training (cont'd)



- **Clinical champions** receive special training in the new system and technology and can sometimes be **superusers**
- **Superusers** are the people who have the most expertise and training of the system. They then can pass on their expertise and knowledge to other users, in the **train-the-trainer model**
- Superusers then use informatics techniques to train their peers and colleagues to use the system during implementation
 - They also train other end-users to use the system/technology effectively in classrooms, during rounds, and in short, relevant, just-in-time one-on-one learning sessions (called **armchair training**)
- Datasets from use and training help to detect problems and situations where more training is required





The Health Informatics Life Cycle: Implementation and Activation



- **Implementations** of health information systems and EHRs involve the process of putting the system into effect; **activation** is “turning on” or execution of the system, also called going live, or “**go-live**”
- Health informatics contributes to implementations and activations of information technology in healthcare in three significant ways: technological, sociological and organizational
 - Technological:
 - Informatics helps prepare the system to be intuitively user friendly
 - It promotes correct processes, yet safeguards against making mistakes within the system
 - Informatics also enhances interoperability
 - It ensures the information system or technology supports regulatory, data privacy and security, and other reporting requirements



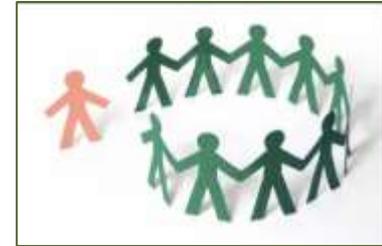


The Health Informatics Life Cycle: Implementation and Activation (cont'd)



– Sociological:

- Informatics helps to ensure that go-live planning incorporates topics such as **change management** (the management of change and development within a healthcare organization), **user engagement** (the state of dedication/commitment of users to the activity) and **organizational readiness** (organizational members' shared resolve to implement a change and shared belief in their collective capability to do so) into the critical pathways
- Informaticists partner with implementers to bring the right combination of technical and healthcare skills to install the system
- Informaticists often engage **clinical champions** (doctors, nurses, or other health professionals who have sufficient informatics training and education to lead the introduction of the EHR into practice) to help spearhead the implementation

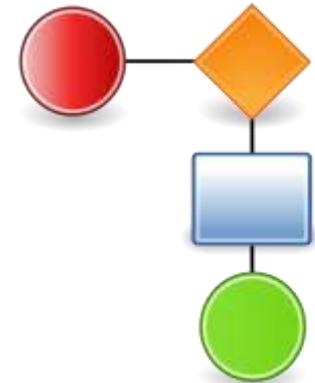




The Health Informatics Life Cycle: Implementation and Activation (cont'd)

– Organizational:

- Informatics departments ensure the people in the organization know the processes that are needed for the technology
- They ensure skills and competencies are reflected in job descriptions, training, and proficiency examinations given before system use
- They document the current and future workflows within the organization
- Informaticists help guide the organization's selection of information systems
- They integrate any new system(s) with existing systems and databases
- Informaticists identify real and potential system limitations, optimize current systems and technology, and help design next generation systems





The Health Informatics Life Cycle: Implementation and Activation (cont'd)

- Informaticists are very important to first use of the implemented technology or system, as well as immediately after activation
- Informatics play an important role in performing:
 - **Command centre operation:** helping new users with questions, workflows, tickets, training issues and more
 - **Go live support**
 - **Backfill staffing:** filling vacated permanent positions previously held by incumbent workers (clinicians in training, especially nurse informaticists)
 - **Arm-chair training**
 - and other help and assistance immediately after go-lives





The Health Informatics Life Cycle: Maintenance and Support



- Maintenance of the system begins immediately after activation, and informatics play a large role in this process
- Informatics plays a large role in:
 - Production support
 - Issue documenting and resolution
 - Modifications to the system or technology
 - Help desk liaising

support

maintain &
support



The Health Informatics Life Cycle: Assessment and Evaluation

- Health informatics plays a large role in assessment and evaluation of new and existing health information systems and technologies
- Informatics contribute to:
 - Developing system, training and testing evaluations and surveys
 - Composing and executing usability, satisfaction, device, needs and readiness assessments
 - Performing gap analyses on evaluations, assessments and surveys





The Health Informatics Life Cycle: Assessment and Evaluation (cont'd)

- Informaticists transform health care by assessing and evaluating information and communication systems and technology that enhance individual and population health outcomes, improve patient care, and strengthen the clinician-patient relationship
- Upgrades and updates to the systems or technology can be planned according to earlier feedback





The Health Informatics Life Cycle: Improvement and Optimization



- Health informatics is very important to the improvement of processes before, during and after application of health information systems and technologies
 - Process improvement in informatics involves:
 - Diagramming and improving clinical workflows and care systems
 - Using systems to identify and manage patient populations
 - Integrating clinical decision support systems into clinical practice
 - Utilizing data obtained from systems to support quality improvement initiatives

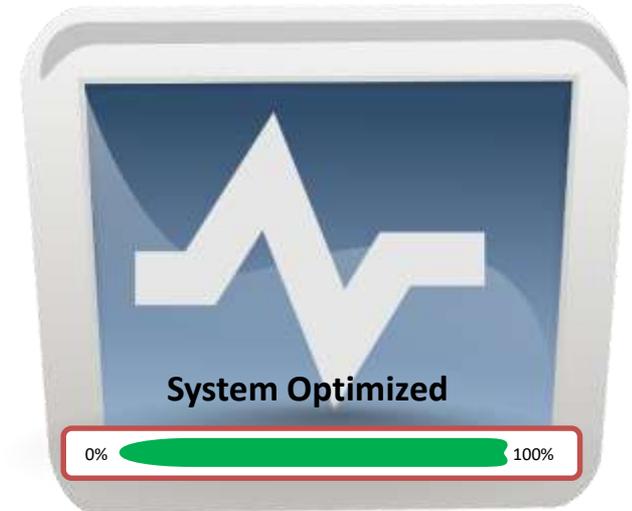




The Health Informatics Life Cycle: Improvement and Optimization (cont'd)



- With optimization, informaticists work to improve adoption and best practice use of information systems by clinicians and other health care professionals
- This involves making optimal use of existing and new information systems and technology, while collecting utilizing metrics and analytics to validate progress and consider future possibilities
- Informaticists bring great value to the improvement and optimization phases of the clinical systems and technology integration process





The Health Informatics Life Cycle: Reassessment and Planning

- Informaticists are key to reassessment of existing systems and technologies and planning of new ones
- In reassessment, informatics play an important role in performing:
 - Workflow assessment and modifications
 - Training updates
 - System updates, upgrades and patch applications
 - Change management communications, including downtime communications, preparation and assistance
- Informatics is collaborative to the following activities:
 - Health information system project planning
 - New technology planning
 - Planning of new staff needs due to new systems and/or technology
 - Planning of new workflows required because of new systems and/or technologies





Unit Review Checklist

- Described how technology, process and people intersect in the discipline of informatics in health information/eHealth (FFL02)
- Conveyed the importance of informatics in the design, development, implementation, training, testing, support and optimization of health IT/eHealth (FFL01)



Unit 22 Review Exercise/Activity



Match the life cycle process an informaticist follows on the left with its correct feature on the right

- | | |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Research & Advise | a. composing and executing usability, satisfaction, device, needs and readiness assessments |
| 2. Analyse & Model | b. planning of new staff needs and workflows due to system and/or technology implementations |
| 3. Design & Develop | c. creating and carrying out a set of instructions to be performed on the system in a test environment, forming the foundation for training materials |
| 4. Test & Train | d. taking longitudinal data, learning from it, and folding that knowledge back into the EHRs and other information systems technology tools |
| 5. Implement & Activate | e. providing arm-chair training, back-fill staffing for clinicians in training, and other help and assistance immediately after go-lives |
| 6. Maintain & Support | f. utilizing data obtained from systems to support quality improvement initiatives |
| 7. Assess & Evaluate | g. providing evidence that helps inform policies and procedures, and guides innovation and design of health care technologies |
| 8. Improve & Optimize | h. helping ensure go-live planning incorporates topics such as change management, user engagement and organizational readiness |
| 9. Reassess & Plan | i. assessing and integrating into the design all aspects of technology, including device needs, system usage and ergonomics |



Unit Exam



1. Health informatics is the intersection of:
 - a. people, places and technology
 - b. people, process and technology
 - c. places, process and technology
 - d. people, process and places
2. Which of the following is a true statement about the health informatics discipline?
 - a. Great technology can substitute for workforce and best practices in processes
 - b. New technologies should be applied before improving processes when necessary
 - c. People are the focus of the processes and technology
 - d. Skills and education of people have little effect on process and technology



Unit Exam (cont'd)



3. The health informatics life cycle includes which of the following steps:
 - a. teach & train
 - b. test & aggregate
 - c. program & stabilize
 - d. maintain & support

4. “Engaging clinical champions to lead the process of putting the system into effect” describes which step in the health informatics life cycle?
 - a. implementation & activation
 - b. maintenance & support
 - c. assessment & evaluation
 - d. reassessment & planning



Unit Exam (cont'd)



5. “Enhancing individual and population health outcomes, improving patient care, and strengthening the clinician-patient relationship” describes which step in the health informatics life cycle?
 - a. implementation & activation
 - b. maintenance & support
 - c. assessment & evaluation
 - d. reassessment & planning

6. “Issue documenting and resolution, and modifications to the system or technology” are all part of which step in the health informatics life cycle?
 - a. implementation & activation
 - b. maintenance & support
 - c. assessment & evaluation
 - d. reassessment & planning