

**Region
Hovedstaden**

REGION

Simulation of IT-systems in the ITX laboratory, Region H

E-sundhedsobservatoriet October 2009



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The 21st of October 2009

Agenda

- The IT Experimentarium
 - Objectives
 - Method used
- Results
 - What have we done so far?
 - What is our experience?
- Discussion
 - How can simulation be used in developing health it?
 - How can simulation be used for assessing usability in health it?
 - How can simulation be used for assessing implementation aspect such as need for instruction and information?
- Conclusions

The IT Experimentarium (ITX)

Background

- Many it-systems implemented in the Danish hospitals
- Lack of sufficient ability to support and cooperate with clinical work processes
- Use of it-systems are different than expected
- New unintended accidents and adverse events

Need of a another way of assessing the usability and effectiveness of clinical it-systems

Objectives

1. More focus at interaction between humans, organisation and technology
2. More focus on the human limitation in use of technology
3. Comprehension of risk for new adverse events by use of simulation of work practice in realistic clinical environment

The overall objective is to improve the quality of the clinical it-systems before implementation at the hospitals

IT Experimentarium

Established in 2007 by Cooperate IT

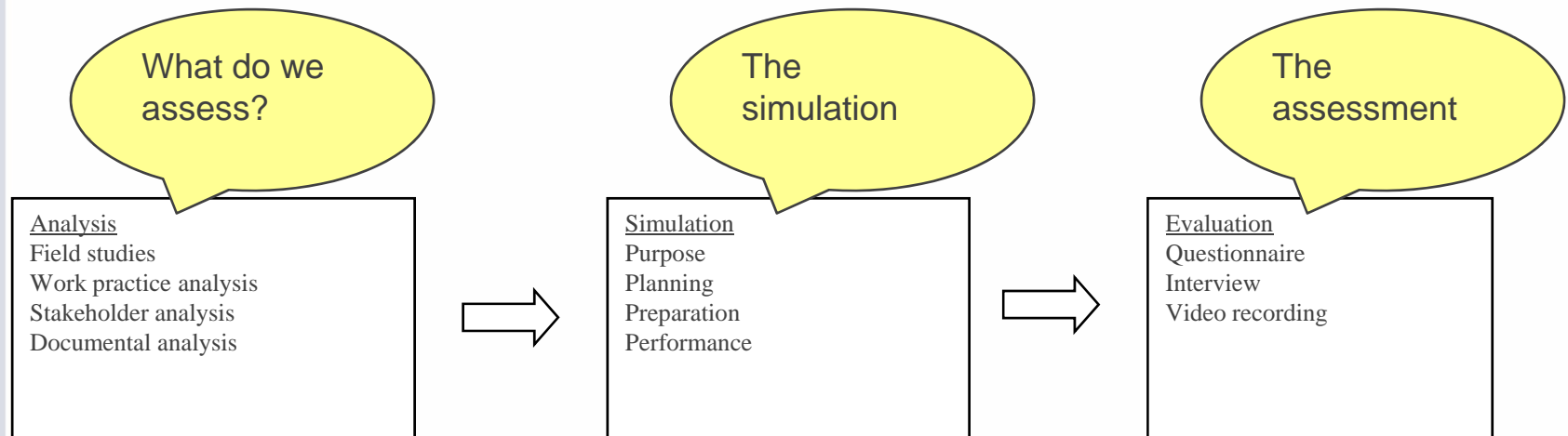
- In cooperation with
 - The Danish Institute for Medical Simulation
 - Patient safety unit

13 simulation rooms, Herlev Hospital, Copenhagen

- Ordinary ward rooms, intensive care, operating room
- Medication room
- Video camera, loud speakers, microphones
- Observation rooms
- Computer controlled dolls used for simulation



Assessing health-it by use of simulation



Analysis

- Field studies
- Work practice analysis
- Stakeholder analysis
- Documental analysis



Simulation

• Purpose

- Analyse, identify, create mutual understanding.....
- Has to be very specific and clear
- Provide the basis for the simulation



• Planning

- Scenarios
- Number of tests
- Participants
- Clinical set up
- Technical set up
- Test data

Kenny Test Dahl 230649-7835
Patient data og koreplan

Patient data:
 Navn: Kenny Test Dahl Alder: 58 år.
 Vægt: 108 kg Højde: 182 cm.

Introduktion:
 Kenny er 182 cm høj, vejer 108 kg. Han er 58 år gammel. Kenny er kortfattet og dement efter et liv med højt alkoholforbrug. Har ikke været me get for af sengen. Føler sig besværet af sin vægt. Har ikke drukket tilfredsstillende i de sidste dage, og skal derfor have rekræske.

Idligere:
 Hjerteselek.

Medicin:

| | |
|---------------------------------|---|
| Inhalation Ventoline 1 pust x 4 | <i>Ong. for testleder:</i> Dispenseret |
| Inhalation Bricanyl 2 pust p.n. | Dispenseret |
| tbl. Diclon 50 mg x 2 | Dispenseret, skal Dispenseres igen |
| tbl. Magnesia 1 g x 2 | Dispenseret |
| tbl. Fenofenol 50 mg p.n. | Dispenseret for 1 time siden, skal Dispenseres igen |
| mf. Sacol 0,9 % x 21 døg. | skal genDispenseres |
| inj. Eptapstan 10 mg iv p.n. | Dispenseret |

Allergier:
 Ingen kendte.

Socialt:
 Er gift, har ingen børn, har egen tømervirksomhed.
 Røger ca. 10-15 cigaretter dagligt.
 Drikker ca. 21 glas om ugen.

Kliniske tegn ved simulations start:
 Intet usædvanlig, men trækker vejret besværet, og er antydningvis småtemulerende.

Patienten:
 Hovedsædet er besværet 20 minutter.

Simulation - preparation

- Clinical and technical set up
 - Role definition
 - Instructor
 - Test coordinator
 - Technician
 - Observers
 - Patients or simulation dull
 - Introduction
 - Simulation & it-system
- ### Evaluation
- Questionnaires & Interview guide
- ### Dry run



Simulation - performing

- Introduction
 - Simulation & it-system
- Setting the scene
- Simulation
- Communication between simulation room and observation room



Evaluation

- Debriefing
- Questionnaire
- Interview
- Video recording

Test report



What have we done so far?

During the last 2 years – 8 assessments

- CPOE (EPM)
 - Assessment of new functionality and work practise
 - Assessment of need for introduction and training
- Templates for input of clinical data (SFI skemaer)
 - Development
 - Assessment of functionality before implementation
- Patient safety system used during surgery (CAPSIS)
 - Assessment of functionality
- Telemedicine for patients with COPD (BERTA)
 - Assessment of usability
- Medication between primary and secondary care (FMK)
 - Assessment of functionality and work practise
- Decision support for medication (PSIP)
 - development

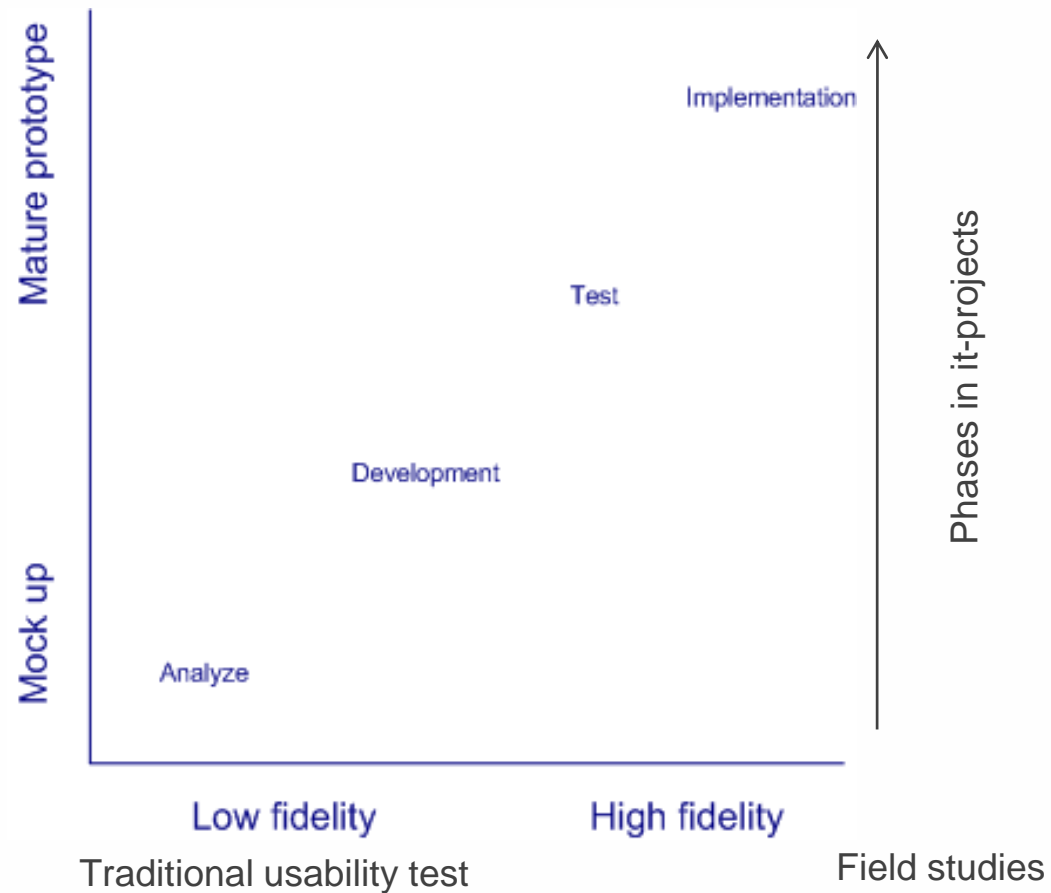
3 more assessments are planned

What is our experience so far?

- The method is useable
 - Profitable evaluation from clinicians and experts
 - Input for development
 - Knowledge concerning
 - work practice & organizational issues
 - Implementation aspects such as training and introduction
- Simulation is very time consuming
 - Test resources are a challenge
 - Test need to be planned from the start
 - Planning and preparation takes a lot of time

Adjustments depending on the circumstances and purpose for the assessment

Use of simulation in different context



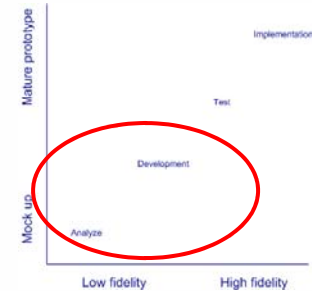
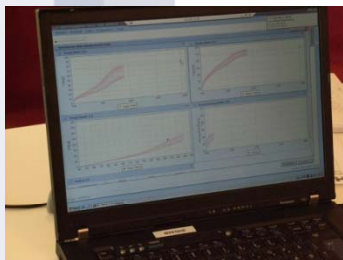
How can simulation be used in developing health it?

PSIP project

- Mock up build by a spread sheet
- Limited functionality
- Clinical environments not complete realistic
- Many input for further development
- Scenarios can be a challenge

SFI

- The scenarios not completely included in the test
- Use of partly mature prototype
- No integration
- Many input for further development



Analyze of functionality and user interface
Input for specification and creation of new ideas

How can simulation be used for assessing usability in health-it?

Telemedicine for patients with COPD

- Input concerning organizational topics
- Assessment of usability
- Participation of patients is feasible
- Input for further development
- Structural test



Capsis

- Surrounding work flow to be taken into account
- Support of work flow – new functionality
- Assessment of usability and effectiveness
- Realistic simulation
- Knowledge of work practice is crucial



Assessment of usability and effectiveness

Input for specification and support of work practice

How can simulation be used for assessing implementation aspect?

CPOE (EPM1) – new functionality for PDA

- Support of work flow
- Introduction to EPM
- Interruptions
- Communication with patient
- Handling of PDA



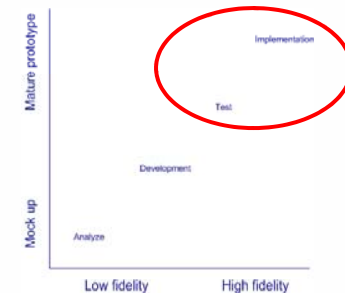
• CPOE (EPM3) – consolidation of CPOE

- Assessment of different versions
- Need of introduction and training
- Assessment of usability
- Need of information

Assessment of support of work practice

Knowledge of need for introduction and information

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Use of simulation

| Analysis | Specification | Development | Organisation Implement. | Production | Simulation of work practice and use of it in clinical environment |
|----------|---------------|-------------|-------------------------|------------|---|
| x | x | x | x | x | Test of usability of health it; software and hardware |
| | | | x | x | Assessment of materials for education and introduction |
| | | | x | x | Assessment of need for information and introduction |
| x | x | X | x | x | Optimizing of existing work practice |
| x | x | X | x | x | Identification of need for new work practis |
| | | | x | x | Visualization of potential or existing adverse events |
| | | | x | x | Test of plans for back up |

Conclusions

By assessing it-systems in simulated clinical surroundings we are able to

- Gain knowledge of the impact at work practice
- Visualize and optimize new workflows
- Qualify IT training of and information to clinicians
- Create a mutual understanding between it-developers, healthcare informatics and end user
- Analyse and assess health-it in controlled environments
- Create environments very similar to reality

Test usability, effectiveness and usefulness



The IT Experimentarium

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