Use of clinical simulation for assessment in EHR-procurement; design of method

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Clinical simulation

• Clinical simulation: clinicians using it-systems in realistic environments

• Clinical simulation may be used for various purposes and in all stages of the lifecycle of clinical information systems
IT Experimentarium (ITX)

- 20+ clinical simulation during 6 years

- Clinical simulation is used for
  - analyzing and assessing existing & future work practice
  - analyzing and assessing user requirements and usability
  - user involvement
  - design and evaluation of clinical information systems
  - identification of potential issues in new technology

- Mandatory before implementation of clinical IT-systems
Background

• Procurement of new EHR-platform 2012 – 2013
• 2 Danish regions
• 14 hospitals covering half the Danish population
• Approx 40,000 healthcare professionals
• Broad functionality to support clinical and administrative core processes

• Strategic demand of simulation assessment:
  • shall cover usability & human factor issues
  • must cover demands from various different end-users, specialties and cultures
  • shall meet transparency demands of procurement in a public tender according to EU rules
Purpose of new EHR-platform

Main topic is increased effectiveness in quality of care
1. continuity of care and patient safety
2. streamlining of clinical processes and workflow
3. patient and employee satisfaction

Furthermore
- Support cross-functional work processes
- Support hand-over of responsibility
Procurement plan

- **Preliminary procurement**: August 2012
  - Reduce from 8 to 5 vendors

- **Dialogue phase**: May 2013
  - Reduce from 5 to 3 vendors
  - Final requirement specification

- **Assessment of 3 offers**: 21/6 2013
  - ITX assessment

- **Signing of purchase agreement**: Ultimo Dec. 2013
Assessment: full scale clinical simulation

Part of the assessment: clinical simulation

Part of user involvement
Challenges

• Conditions for procurement
• Vendors
• Qualitative data must be made quantitative
• Time schedule
• Resources
• Organization
  • Perspectives of various stakeholders such as risk managers, quality managers and clinical manager must be taken into account
• New method had to be developed
Elements and relations in assessment
Scenarios - work practice

- First visit in outpatient clinic
- Dispensation and administration of drugs
- Assignment to hospital (physician and nurse)
- Ward round
- Patient care and nursing treatment
- Hand over
- Consult
- Interruption and shift between different patients
- Discharge of patient (physician, nurse)
- Children’s outpatient clinic
Patient cases

Patient cases:

• Hip fracture
• COPD
• Appendicitis
• Depression
• Breast cancer
• Child with failure to thrive
Clinicians - future users

• 9 physicians
  • Surgery (3)
  • Internal medicine (3)
  • Psychiatry (2)
  • Pediatrics (1)

• 7 nurses
  • Surgery (3)
  • Internal medicine (3)
  • Psychiatry (1)

• 2 medical secretaries

• Divided into 3 teams (red, blue, green)
Metrics of assessment

Overall metrics for assessment
1. ability to support key areas of clinical work practice
2. clinicians experience of the use of the systems
3. patient safety

Data collection
• Observations
• Questionnaires
  • Paper version after each scenario to support memory
  • Electronic versions after each vendor
Detailed plan

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<thead>
<tr>
<th>Day 1</th>
<th>Morning</th>
<th>Afternoon</th>
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<tbody>
<tr>
<td></td>
<td>Training</td>
<td>Hands-on</td>
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<td>Evaluation</td>
<td>Questionnaires</td>
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## Overall plan of assessment

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<tr>
<th>Vendor</th>
<th>26 August</th>
<th>27 August</th>
<th>28 August</th>
<th>29 August</th>
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<tbody>
<tr>
<td>Vendor A</td>
<td>Red team</td>
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<td>Blue team</td>
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<tr>
<td>Vendor B</td>
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<td>Green team</td>
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<td>Red team</td>
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<tr>
<td>Vendor C</td>
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<td></td>
<td>Blue team</td>
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<td>Green team</td>
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<tr>
<th>Vendor</th>
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<th>3 September</th>
<th>4 September</th>
<th>5 September</th>
<th>6 September</th>
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<tbody>
<tr>
<td>Vendor A</td>
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<td>Green team</td>
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<td>Overall assessment of the 3 solutions</td>
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<tr>
<td>Vendor B</td>
<td>Red team</td>
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<td>Blue team</td>
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<tr>
<td>Vendor C</td>
<td>Green team</td>
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<td>Red team</td>
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Conclusion

- Thoroughness in scenarios
- Simulations must be performed uniform
- Metrics of assessments must be very specific
- Context sensitive patient safety issues