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HUS

User Experience Monitoring in Electronic Health Record Systems

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Invaluable Insight

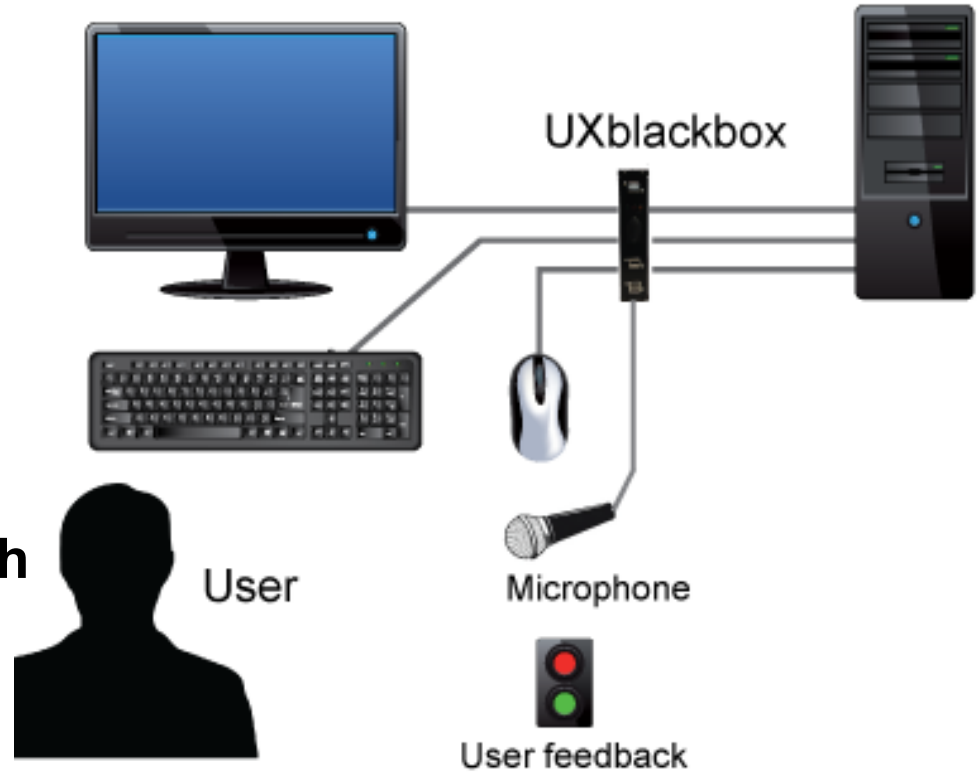
Motivation of the Study

- **Electronic Health Record (EHR) systems always have defects and deficiencies that hinder productivity.**
 - not caught in testing
 - present themselves in production
 - cause a loss in working time
 - decreased staff morale
 - compromised safety
- **Previous survey study found that physicians are highly critical of the healthcare information systems and they would be willing but not able to participate health IT development [1]**

[1] S. Martikainen, J. Viitanen, M. Korpela, and T. Lääveri, "Physicians experiences of participation in healthcare IT development in Finland: Willing but not able," *Int. J. Med. Inf.*, pp. 98–113, 2012.

Monitoring Method

- **Captures everything**
 - shown on screen
 - mouse clicks
 - keystrokes
- **Comment via either speech or writing**
- **Feedback console for tagging any good or bad user experiences**



Objectives

- **Acquiring more knowledge on the impact of the method**
- **How healthcare professionals feel upon using it?**
- **Usability of existing systems?**

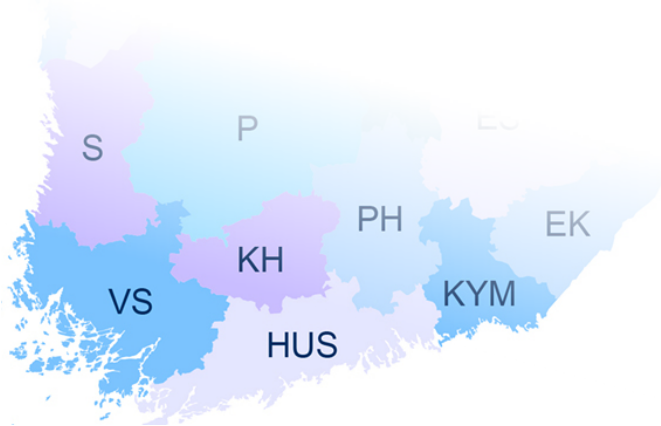
- **Looking for understanding on**
 - how easy the tool and the method are for users
 - evaluation of prospective benefits of the method
 - user willingness to participate in user experience monitoring



Participating Organizations and Users

- **Two major hospital districts**

- HUS
- VSSHP



- **Healthcare professionals**

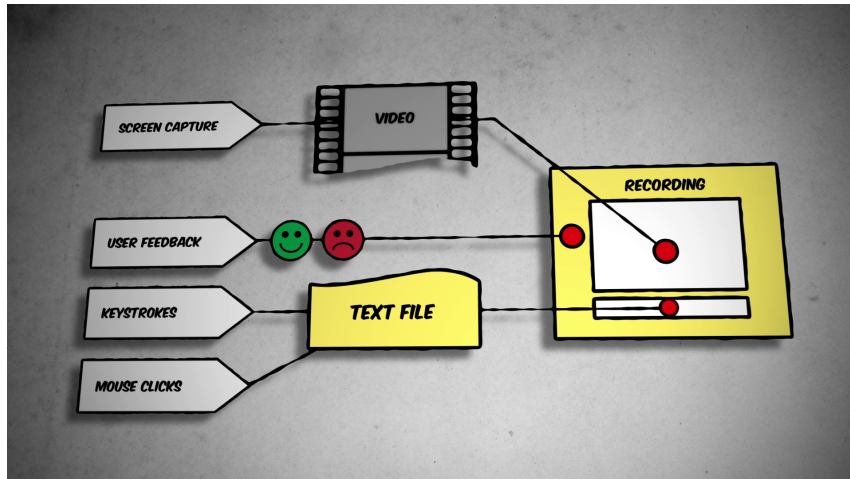
- nurses
- physicians
- administrative persons

- **Monitoring period**

- one week per user
- up to 20 users per hospital district
- survey afterwards

Research Methods & Data Collection

Observation:



Survey:

9. Käyttäisin mieluummin tietokoneohjelmaa fyysisen laitteen ja palautemoduulin sijaan.

10. Uskon, että tällä tavalla keräämiä havaintojen sisältö voisi olla ratkaisevassa asemassa järjestelmien käytettävyyden parantamiseksi.

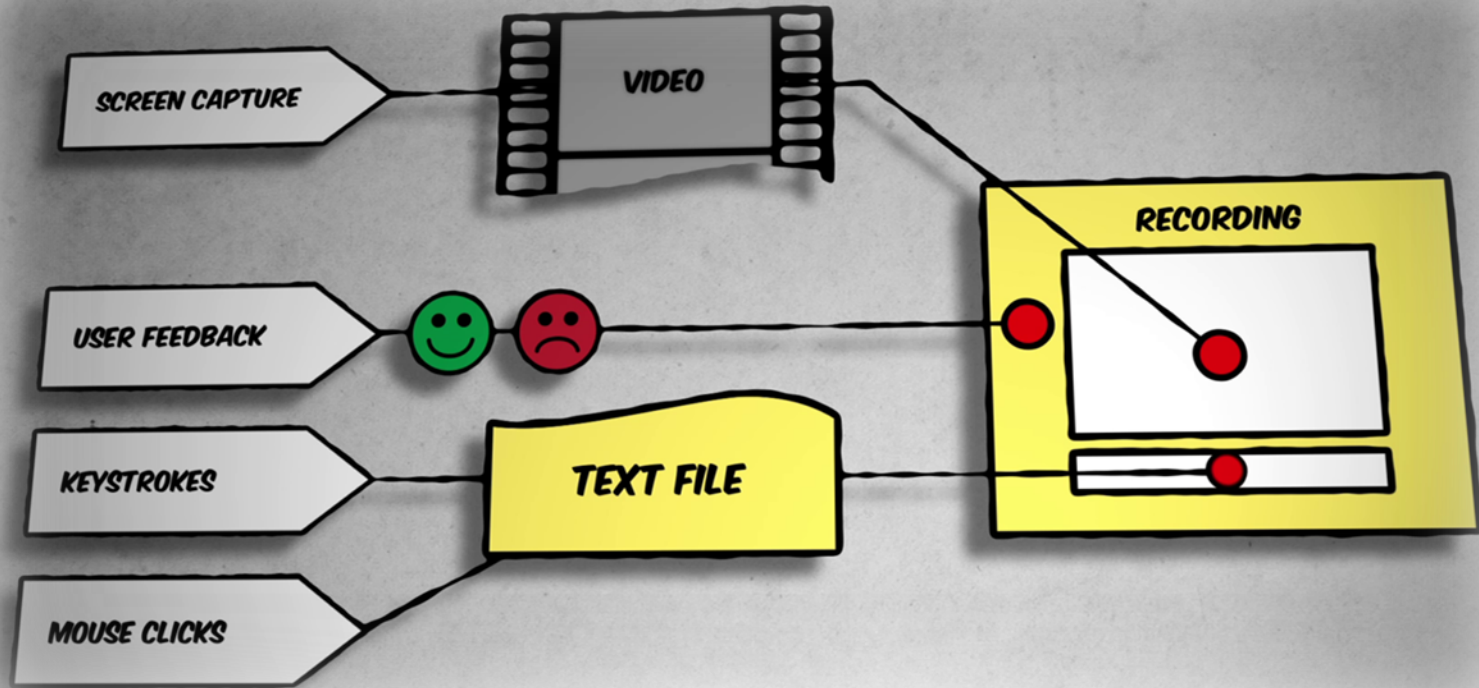
Jäikö mieleenne erityisesti jokin tilanne, josta haluaisitte itse kertoa lisää tai saada lisää tietoa järjestelmien kehittäjiltä?

Olisitteko halukas osallistumaan tulevaisuudessa tällaiseen käyttökokemusten seurantaan, jos tuloksia käytetään järjestelmien kehittämiseen?

Kyllä En En osaa sanoa

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Computer usage in real context-of-use

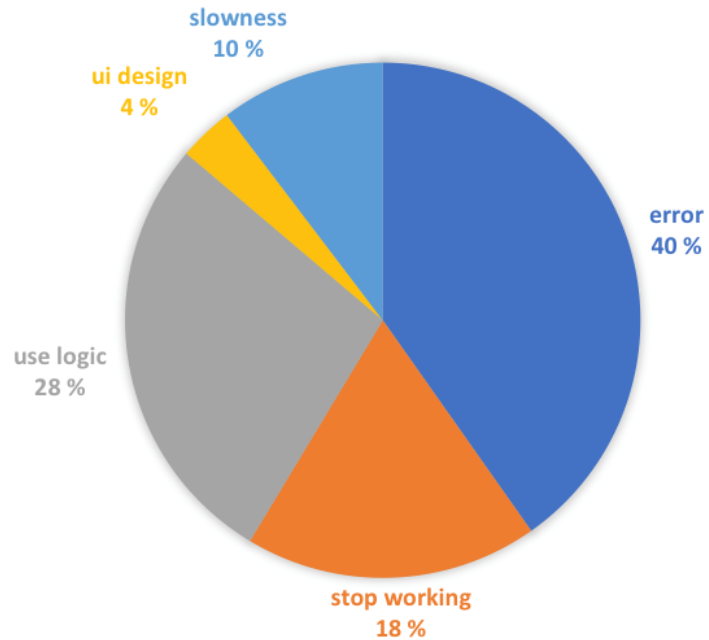


Ethical Considerations

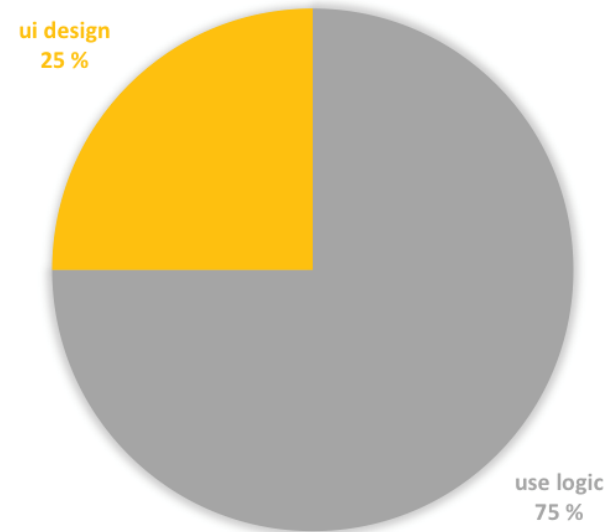
- **highly sensitive patient information involved**
- **Information security with the device**
- **who can access the actual recordings**
 - research permit and further work on practicalities
- **users:**
 - letter of consent
 - registry of the participants
- **opportunity vs. risk on affecting health of patients**

Example of the results

NEGATIVE FINDINGS PER CATEGORY N=87



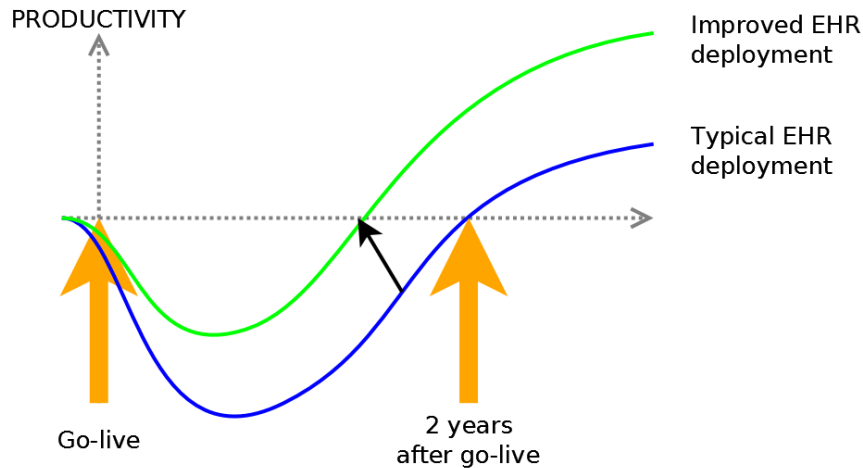
POSITIVE FINDINGS PER CATECORY N=12



Conclusions

- **”It doesn’t reveal only the usability problems – the findings are just any practical issues where the system could do better.” - User experience researcher at an EHR vendor**
- **Users feel their voice is heard better for improvements**
- **Setting up the black box device requires an on-site visit**
 - part of the captured data was lost due to misconfiguration
 - replacing the hardware with software for wider use
- **End-user organizations learned to prioritize user complaints**

Future work: Minimizing the post-deployment productivity loss



- **Hypothesis: productivity loss is caused by mismatch between working practices and system workflows**
- Need for adjusting the system to support the practices
- Need for training the users to accommodate to the new practices
- **Is it possible to ease this bottleneck by feeding development and training with insights on actual user experiences (UX)?**

Thank you!



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