

Developing a Framework for Assessing an EHR's Usability



Michael E. Wiklund
General Manager – Human Factors Engineering
UL–Wiklund (formerly Wiklund Research & Design)

Research Project

- NIST retained Wiklund R&D (now part of UL) to develop guidelines for EHR usability and to develop a framework for EHR usability assessment.
- Project funded by the American Recovery and Reinvestment Act of 2009.
- NIST staff: Svetlana Lowry and Sharon Laskowski.
- Performance period: Spring 2011 to Spring 2014.



Team



[National Institute of Standards and Technology](#), Information Access Division, a group that has sponsored extensive EHR research.



[Wiklund Research & Design](#), a consulting firm specializing in medical technology user interface design and usability testing.

DESIGN
SCIENCE

[Design Science](#), a consulting firm specializing in ethnographic research in the medical domain.

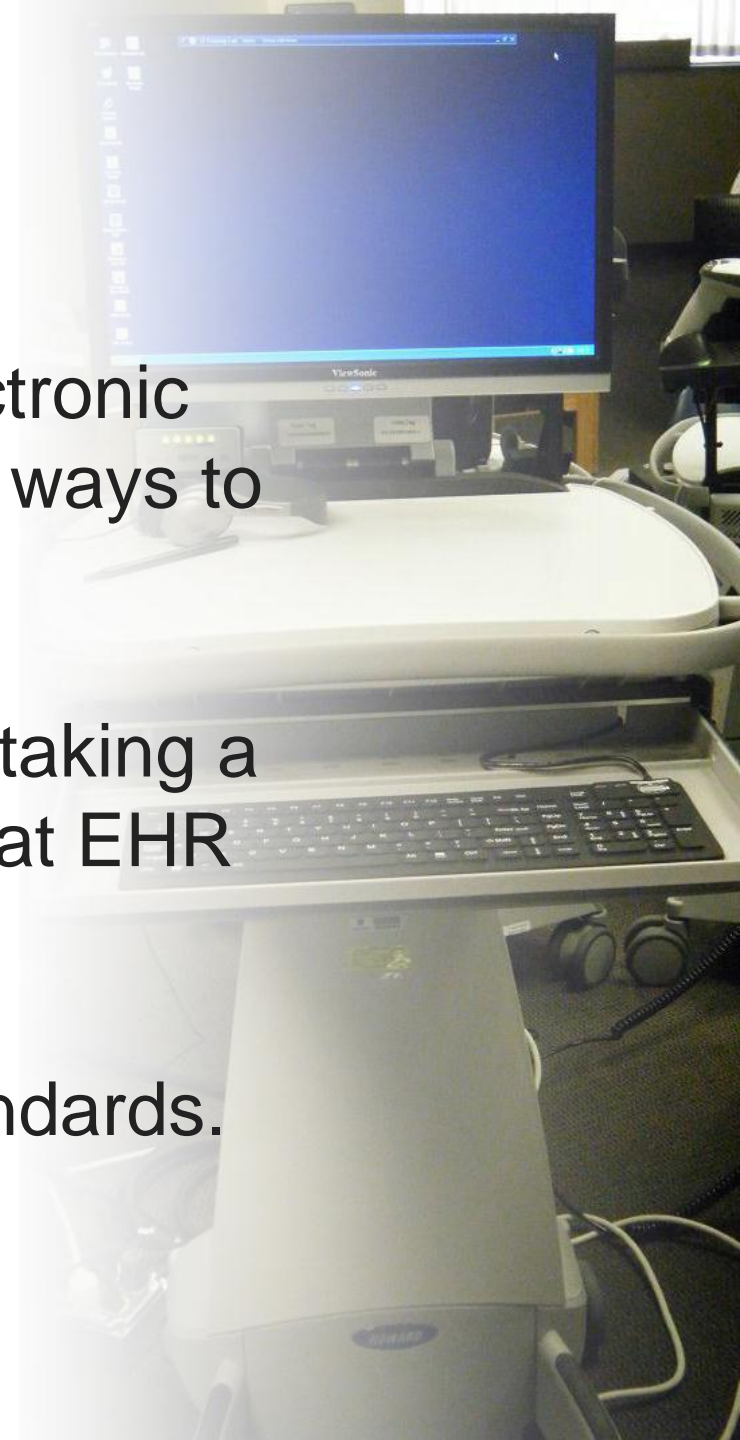


[Vanderbilt University](#), Center for Research and Innovation in Systems Safety – a group that conducts human factors research on patient safety-related topics and has deep EHR use and development expertise.



Goals

- Increase knowledge about electronic health record (EHR) users and ways to enhance EHR usability.
- Build on prior work in the field, taking a fresh and comprehensive look at EHR usability.
- Lay foundation for national standards.

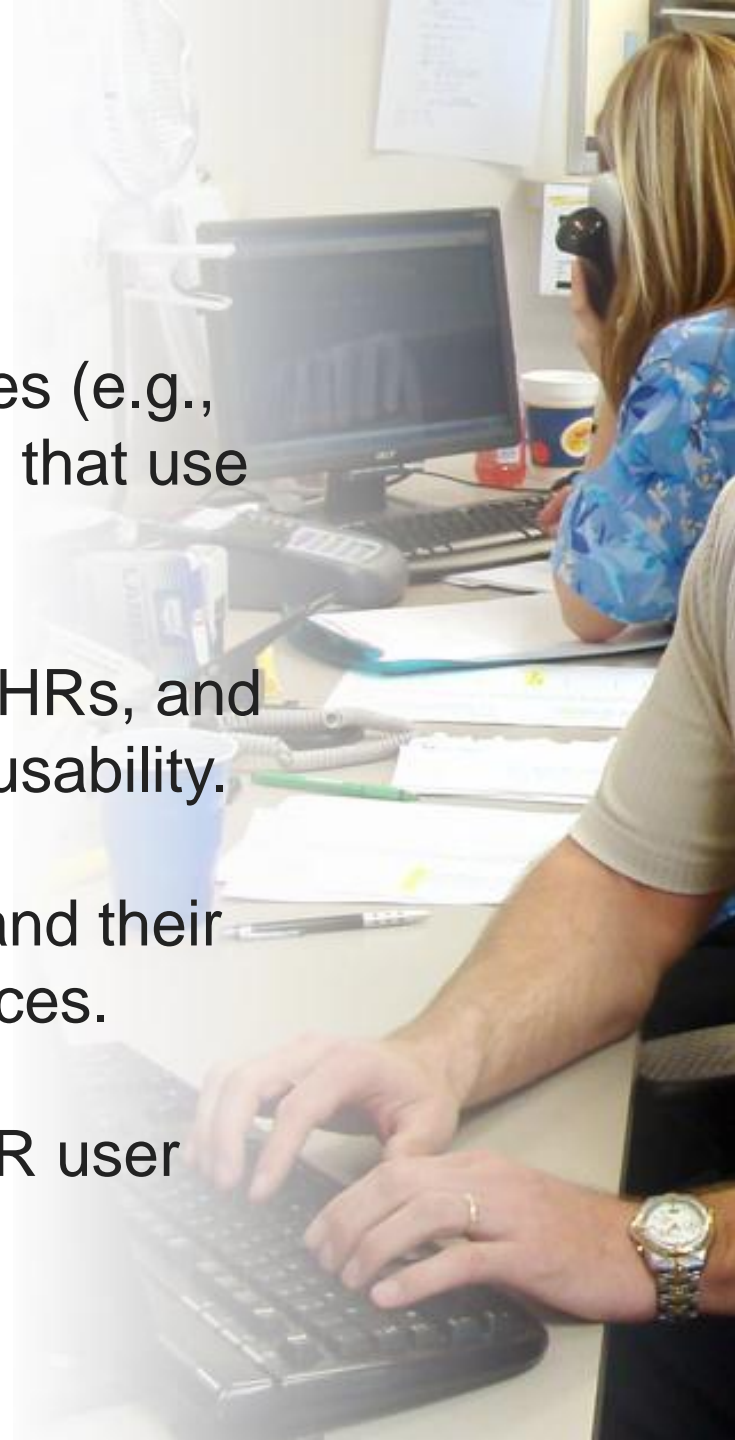


Activities

- Survey, observe, and interview EHR users
- Conduct HFE inspection of sample EHRs
- Conduct usability test of sample EHRs
- Develop EHR user interface design guidelines
- Develop recommended process for EHR usability assessment
- Document results in a report

Identify EHR users

- Identify an appropriate sample of sites (e.g., physician's offices, clinics, hospitals) that use various types of EHRs.
- Observe clinicians interacting with EHRs, and then interview them regarding EHR usability.
- Define specific types of EHR users and their usability-related needs and preferences.
- Define general characteristics of EHR user interfaces that influence usability.



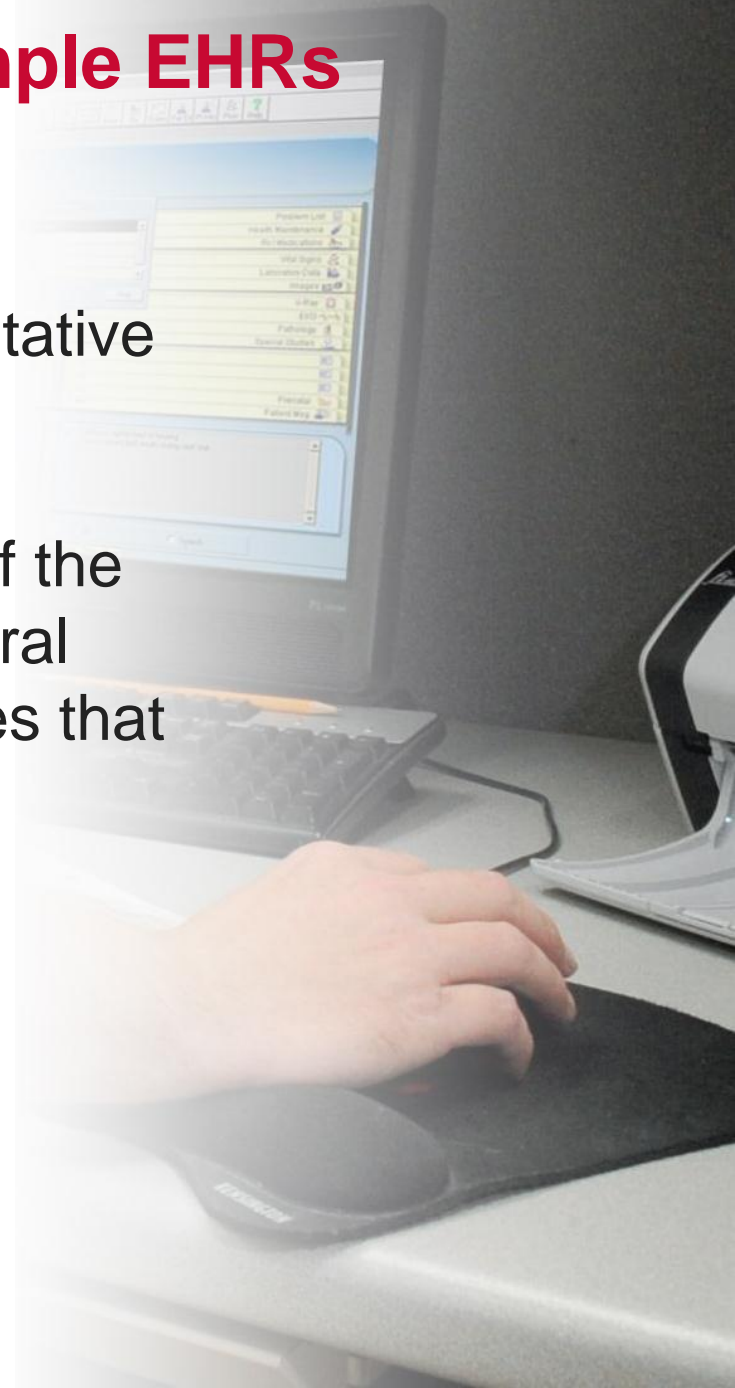
Survey

- Surveyed 559 people (including physicians, nurses, and administrators) who use Vanderbilt University's StarPanel and other off-the-shelf EHRs.
- 3 month process, 18% response rate.
- Generated new insights on multiple topics including:
 - Information density
 - Usefulness and hazards of default values
 - Information update frequency
 - Information integration



Conduct usability tests of sample EHRs

- Identify an appropriate and representative sample of EHRs.
- Conduct benchmark usability tests of the selected EHRs, also to identify general characteristics of EHR user interfaces that increase versus decrease usability.



Evaluate sample EHRs based on HFE principles

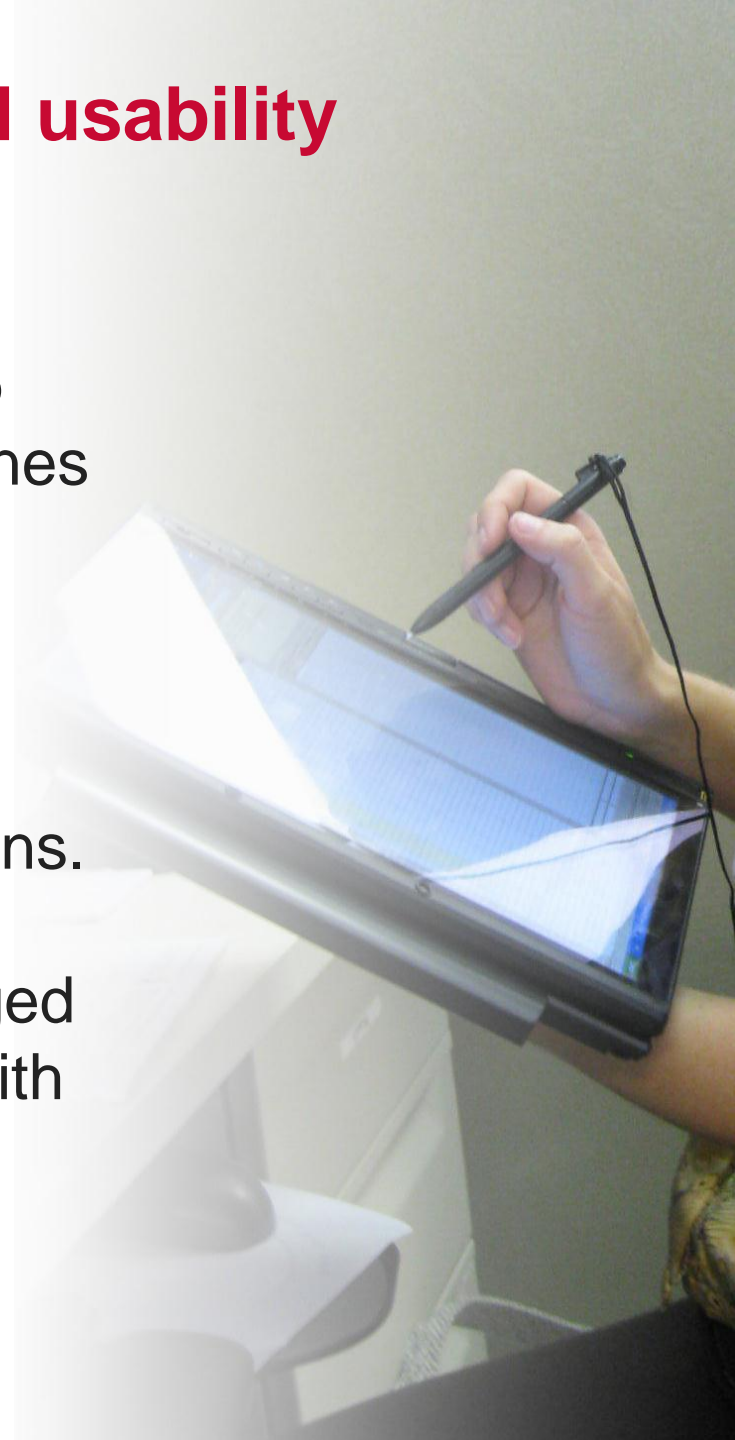
- Review existing user interface design guidance pertaining to EHRs.
- Expand the set of guidance based on field research and the team's HFE and UI design experience.
- Consolidate the user interface design guidance into a practical, EHR-specific set.
- Evaluate a selected set of EHRs based on the consolidated guidance.



Develop performance-oriented usability guidelines

Draw upon our earlier work to develop performance-oriented usability guidelines that may be used as a basis for developing national standards.

Importantly, the guidelines will not prescribe user interface design solutions. They will suggest user interface characteristics demonstrated and judged to enhance the quality of interaction with EHRs.



Report our results

Final project deliverable will be a report containing:

- Performance-oriented usability guidelines.
- Framework for EHR usability evaluation.

