# Supplemental Testimony:
# Developing a Road Map for Addressing the Behavioral Aspects of HIT "Meaningful Use"

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## Poor Usability Has a Severe Impact on Adoption and Effectiveness of HIT Systems

Poor usability is one of the key barriers to adoption of HIT systems and a principal reason for rejection once these systems are installed. There is substantial anecdotal evidence and a growing list of peer-reviewed published research that shows poor usability is a key barrier to the adoption of HIT systems. Systems that are perceived as overly time-consuming or difficult to use also have a negative impact on the quality of healthcare data entered by healthcare providers.

The current criteria for a 'certified HIT system' are necessary but not sufficient to ensure user adoption. Current certification is based on functionality, privacy, and security criteria but lack real-world understanding on how these systems are actually used. User performance criteria for HIT system performance can be measured and performance outcomes should be tracked and reported. These data must be used to improve the learnability and long-term usability of HIT systems.

## Potential Road Map for Addressing Behavior Aspects of HIT "Meaningful Use"

We are proposing a standards-based framework for measuring and collecting user performance data and improving the usability of HIT systems...

| | Proposed Framework | Sample Activities |
|---|---|---|
| 1 | Leverage established tools and methods for measuring human performance on software systems | • Define core task-based scenarios for clinical HIT use |
| 2 | Apply these methods to augment and extend existing certification processes for HIT systems | • Identify human performance HIT metrics that track across the continuum of patient care |
| 3 | Measure key pain points of installed HIT systems in clinical settings to drive the improvement of usability and adoption of HIT systems | • Conduct performance research with HIT users in clinical care settings<br>• Independent analysis of HIT system impact on clinician efficiency and quality of healthcare data |
| 4 | Develop consistent interface conventions to minimize learning across applications | • Develop consistent icons and common visual vocabulatory for HIT applications<br>• Best practices for clinician-centered design processes |
| 5 | Create standards-based framework for tracking and comparing human performance data on HIT systems | • Assess human performance during extended periods of HIT use:<br>  • Initial adoption<br>  • Conversion<br>  • Learning curve |

**Using Human Factors Methods to Identify and Eliminate HIT Usability Problems**

For decades, industries such as aviation, nuclear power, and communications have employed human factors methodologies to improve human performance with systems. The goal of human factors research - and user-centered design - is to understand what users do, why they do it, how they do it, and then provide recommendations for the improvement of technology and systems to support end-user needs and goals.

This level of user research in HIT is not typically seen, but is sorely needed. With research methods already on hand, HIT system usability can be measured, tracked, and improved **today**. The human factors community can take active steps to mitigate many of the risks associated with sub-optimal user interface design and support stakeholders as they take steps to achieve meaningful use.

Through targeted human factors research, we can help health care stakeholders determine:

- High-volume, efficient workflow that should be supported by HIT systems
- Major and minor usability issues faced by clinical team members during patient care activities
- Real-world impact of HIT systems on clinical resources and quality of healthcare data
- Identity of trouble spots on HIT workflow and major interface issues

Using proven user research methods from the behavioral sciences such as…

- Workflow analysis and end-user interviews
- Time and motion performance analysis
- Eye-tracking (which helps assess users' decision-making)
- Context-driven interface evaluations and cognitive walkthroughs
- Surveys of end-user satisfaction and confidence

… we and others in the human factors community advocate an organized effort to understand the needs of the major HIT end users. Different stakeholders will define 'meaningful use' by what is meaningful to them as part of their specific clinical workflows, needs for quality reporting, decision support, and interoperability with other HIT systems. There is an urgent need for research activities in these areas, which we would be pleased to support.

**Recommendations for Action:**

**HIT adoption will substantially increase as a result of integrating user performance criteria within the certification process.**

From other industries and prior experience we have valuable insights that can be used to dramatically improve the usability of systems. **The added focus on improving usability will drive innovation and ultimately deliver the value promised by investing in HIT**. Therefore we recommend the following actions:

- **Near-term:** Action-oriented workshop to define scenarios and metrics on human performance on applications with HCPs, quality / standards groups, human factors experts, and HIT solution providers
- **Short-term:** Immediate attention to establishing:
  - Clinician-centered, human performance criteria for HIT solution providers
  - Standard user testing protocols
  - Minimum system standards for supporting user activities and learnability and long-term use
- **Longer-term:**
  - Development of common user-interface standards and guidelines (e.g. visual vocabulary)
  - User research to improve the experience of introducing technology into the clinical environment