Developing a Usability Ranking System for Findings in Health Information Technology Products

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Abstract

Resources for addressing usability issues identified by practitioners are often limited and teams look to usability professionals for help in prioritizing the issues. Health Information Technology (HIT) products face an additional level of complexity due to the intertwined relationship between usability issues and potential patient safety issues. Human Factors Engineering (HFE) team within the Office of Informatics and Analytics of the Veterans Health Administration (VHA OIA) developed a usability ranking system, sensitive to the specific challenges of HIT products, to help teams prioritize resolution of usability findings. The system considers factors concerned with the findings themselves, including user experience impact, organizational impact, and frequency of the problem. Constructed with "checklist style" definitions for each level, the system helps practitioners more consistently select the appropriate initial ranking.

How the System Was Developed

In the creation of this ranking system, VHA HFE drew upon published material and explored the unique challenges in applying severity scales to HIT products within the VA health system. We discussed the following topics in the adoption of our system:
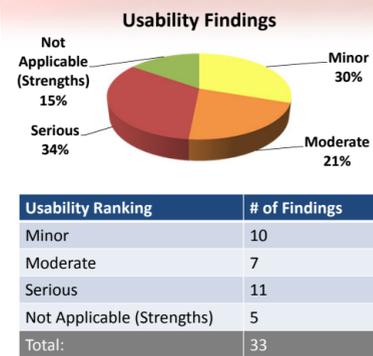
- User experience impact of the problem
- Organizational impact of the problem
- Market impact of the problem
- Persistence of the problem
- Frequency with which the problem occurs
- Consistency of the ranking system with other VA certifying bodies (such as OIA Informatics Patient Safety) and VA developer ranking systems
- Conflict in terminology within medical context (e.g., "critical")
- Use of the ranking system with quantitative usability metrics
- Academic validity of the system[1]

The Ranking System

VHA HFE evaluates HIT products' strengths and weaknesses to assist development teams with improving their usability. We call these strengths and weaknesses *findings*. HFE has developed a ranking system to help business owners prioritize resolution of the findings:

Ranking	Definition	Recommended Priority
Minor	One of more of the following: ☐ Causes user hesitation, confusion, or slight irritation. ☐ Impedes task completion or decreases efficiency but does not cause task failure. ☐ Presents small likelihood that the credibility of the VA HIT product will be diminished.	Consider resolving this issue.
Moderate	One or more of the following: ☐ Causes occasional task failure after which recovery is possible. ☐ Causes user delays and/or moderate dissatisfaction, but some users are able to recover in order to complete the task. ☐ Expected to negatively impact use, possibly leading to dissatisfaction at a level that users might opt to discontinue use. ☐ May diminish the credibility and/or reputation of the VA product.	Give high priority to resolving this issue.
Serious	All of the following: ☐ Causes frequent task failure or occasional task failure from which recovery is not possible. ☐ Causes extreme user irritation and/or task abandonment. ☐ Likely to diminish the credibility or reputation of the VA product. Or: ☐ Causes system/sub-system failure (i.e., produces system error or "crash")	Give highest priority to resolving this issue prior to further product testing or release. **HFE recommends resolution or mitigation for serious usability issues before deploying products.**
Not Applicable	Strengths or Unsolicited Suggestions Any findings related to strengths in the system (or unsolicited suggestions for improvement, which are not related to a usability weakness).	Optional.

Employing the System

To maintain consistency in communicating usability issues within VHA, regardless of the usability evaluation method employed, HFE categorizes all findings using the ranking system. The system relies on observed user behavior and frequency. This pose some challenges when applying to methods other than usability testing.

### Applying to Heuristic Inspections

When applying the system to this type of method, the practitioner employs his/her judgment in estimating the potential for task failure and the frequency with which the issues may occur.

Consistency in Ranking

It is not uncommon for practitioners to find different weaknesses and/or disagree on the ranking of weaknesses that they collectively identify. The system is designed to aid consensus by providing a standardized "checklist style" set of definitions by which findings are ranked. In addition, VHA HFE employs a series of examples gathered from previous evaluations to guide ranking decisions.

Usability Findings

Pie chart: Minor 30%, Moderate 21%, Serious 34%, Not Applicable (Strengths) 15%

Usability Ranking	# of Findings
Minor	10
Moderate	7
Serious	11
Not Applicable (Strengths)	5
Total:	33

Example of Findings Breakdown

With each usability evaluation report, VHA HFE provides program offices and development teams with a breakdown of the ranking of the usability issues identified. This serves a dual purpose of communicating the general usability of the current build as well as providing a basis for comparison as usability issues are addressed and/or resolved.

Example of a Minor Finding

(from Heuristic Evaluation of VA's CPT Coach, a Cognitive Processing Therapy Mobile App for PTSD)
The loading splash screen does not fit the tablet device.
Recommendation(s): Apply proper size scaling to the splash screen to enable all sizes of device to view a correctly sized screen.
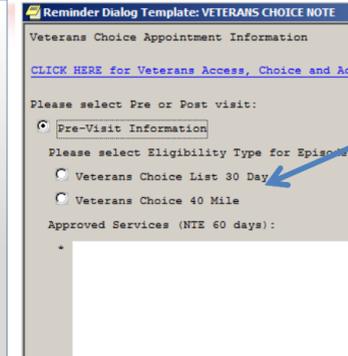
Example of a Moderate Finding

(from Heuristic Evaluation of Veteran's Choice Dialog from VA's Computerized Patient Records System (CPRS))
Two eligibility types may not be mutually exclusive. If a Veteran qualifies for both, the provider may not know which to select.
Recommendation(s): If Veterans can be both types, consider making the selections checkboxes, or writing short guidance on which one to choose if one takes precedence.

Example of a Serious Finding

(from Baseline Usability Testing of VA's My HealtheVet Web Portal)
Participants believed "Learn More" link would lead to appointments function. This issue was rated "Serious" due to the frequency in which it caused errors. In addition, this issue directly impacted three (3) of the other six (6) Serious issues. The "Learn More" section contains information regarding common areas of MyHealtheVet; three of the four selections are Appointments, Rx Refills, and Secure Messaging. Inclusion of these features in the "Learn More" section is counterintuitive, as it leads to false navigation and frequent frustration.

Recommendation(s): The "Learn More" section should be removed from the homepage. While it's important to have the resources available to the user to inform them of the function of these areas, the current placement results in frequent navigation failure. HFE also recommends that each "Learn More" widget have a link to the specified area of interest so that the user can complete their desired action.

Conclusions

Ranking the severity of usability issues is not a new concept. Usability practitioners have likely been providing severity ratings to development teams as long as they have been providing feedback on product usability. Severity feedback is often used to prioritize resources to fix the most serious problems and to roughly estimate the need for future usability study. VHA HFE incorporates changes to this system by addressing practitioner challenges and soliciting feedback from VHA program offices and development teams (such as via the After Action Review process).

References
1 "You say "disaster", I say "no problem": Unusable Problem Rating Scales" from the CHI '13 Extended Abstracts on Human Factors in Computing Systems (http://dl.acm.org/citation.cfm?doid=2468356.2468410)
2 See Jeff Sauro, "Report Usability Issues In A User By Problem Matrix," http://www.measuringusability.com/blog/problem-matrix.php (June 6, 2012)
3 See http://www.plainlanguage.gov/ for more information on Plain Language.

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