



U.S. Department of Veterans Affairs
Veterans Health Administration
Office of Informatics and Analytics



The Self-Certification Initiative: A Briefing

What is it and how does it impact you?

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Presentation to Connected Care and Development Teams
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Today's Agenda

- Background
- What is the Compliance Process?
 - How does a Self-Certification fit in?
- The Logistics & the Process
 - Why Use Personas?
 - User Interface (UI) Evaluation
 - Heuristic Evaluation
 - Rankings of the findings
 - Peer Review
- Additional Resources
- Questions and Discussion

Background

- We all want to build great health IT products for Veterans, family caregivers and clinicians.
- Initiative goals:
 - Build a process to support ongoing self-certification for VHA mobile apps.
 - Produce training materials so that project teams can check their own apps for user interface and heuristic* issues.
- Why?
 - To save time in the Compliance process for project teams.
 - To help project teams understand and use some of the same materials employed by Human Factors professionals.
 - To bring ‘usability thinking’ earlier into the app development process.
 - To free up HFE resources to engage earlier with project teams in the mobile app lifecycle.

What is the Compliance Process?

- First, the Validation and Verification (V & V) process occurs as a developer is finishing an app and wants to ensure that basic requirements have been met.
- After the V & V process is completed, the app is sent for Section 508, Informatics Patient Safety and HFE reviews, among others.
 - HFE has been doing both Heuristic and UI Mobile Evaluations (aka HE and UI).
- This Self-Certification process replaces the HFE reviews by training the app teams to perform the evaluations.

The High-Level Process

1. Review UI criteria and answer questions
 - Personas, Rankings, Screenshots included
2. Review heuristics and look for violations
 - Personas, Rankings, Screenshots included
3. Pass off for peer review and agree on findings

Mobile User Interface Design Certification for App

Category	ID	Criteria	Findings	Comments (UIE)
Consistency	C.1.1	Does the application use standardized icons that conform to iOS branding and conventions for native or browser-based apps?	Criteria Met	
Device Orientation	D.1.1	Does the application provide a user experience consistent with the referenced iOS device or OS guidelines for regular multiple screen orientations (portrait and/or landscape)?	Criteria Met	
Errors	E.1.1	Are application messages (e.g. error, warning, informational, alert) written simply and clearly?	Not Evaluated	
Errors	E.1.2	Do error messages clearly and promptly describe the problem and how to recover?	Criteria Not Met (Minor Finding)	Error message not reviewed; see Heuristic Evaluation Local file
Frequent Interactions	F.1.1	Does every screen have a clear path to the next step in the activity or, when appropriate, access to other relevant activities?	Criteria Met	
Frequent Interactions	F.1.2	If the app opens in "landscape" (2x) or "full screen" (landscape mode) then placed on home screen, does it allow user to perform all of the app's functions?	Not Applicable	
Modal Tasks	M.1.1	When a user task presents a modal screen, is the user given the choice to complete the task or abandon the task (no change in affected)?	Criteria Not Met (Minor Finding)	No options to abandon task.

UI Evaluation Questions

Heuristic Evaluation(s) for App

Heuristic	Severity	Findings	Comments	Original Recommendation
1. Consistency	Moderate	The breadcrumbs navigation for this app does not work properly. It appears as if all items are still saved in the queue (possibly in the device's cached memory) not being a part of the navigation.	1	D, F
2. Visibility of System Status	Minor	It would be useful to have a "Cancel" button on an interactive page, as a way to assist those who may not be so tech-savvy, like Dan.	2	E, G
3. Error Prevention	Minor	In the "Home Safety" or "Managing Pump" screen, the referenced link at the bottom cannot be activated by the system. The same situation was found on other screens, such as "Managing the Ventilation" and "Managing Support Line".	3	B, C, D
4. Recognition of Errors	Minor	In the "Home Safety" or "Make the Home Safe" screen, a slide show (carousel) is provided, which Meghan can manually tap on the left or right arrows around the graphic to advance to the next picture and next set of text. However, this slideshow does not have the ability to loop back to the first screen. Typically, once you reach the end of a slideshow like this the next screen can be	4	A, B, C, D

Heuristic Evaluation

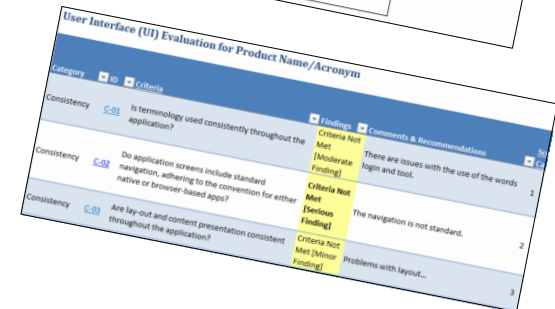
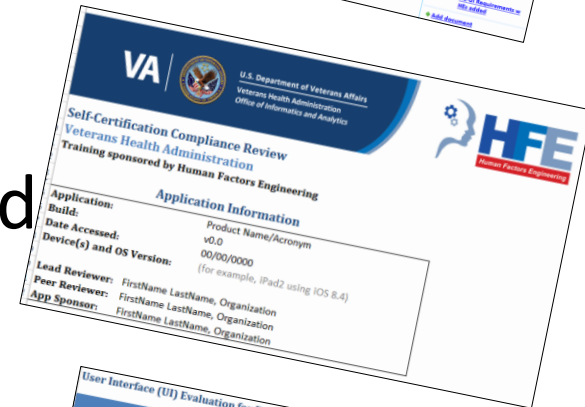
Issue Rankings:
Minor
Moderate
Serious

Issue Rankings

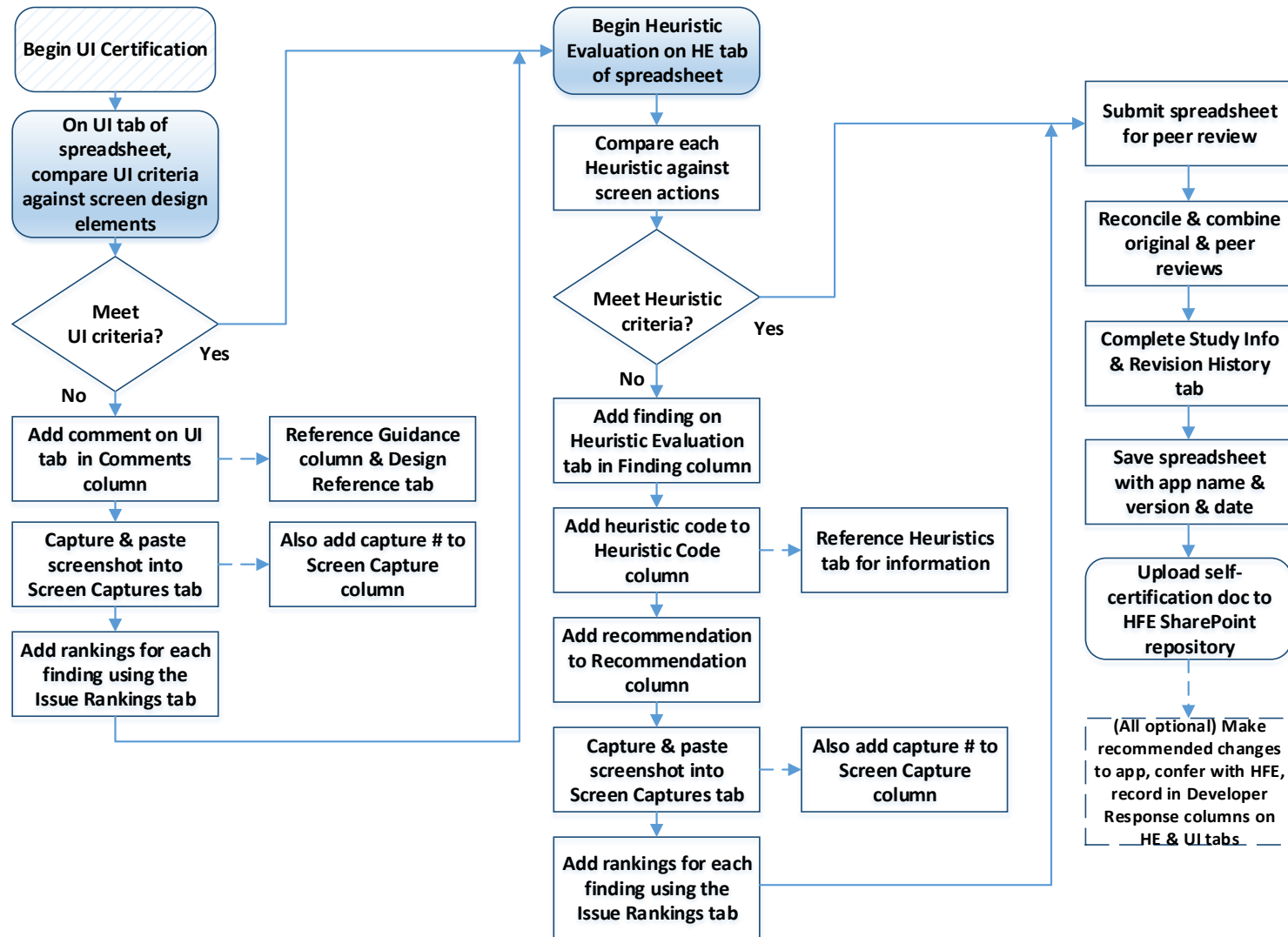


High-Level Logistics

1. Download the Excel workbook template from the Self-Certification Reviews page on VA Pulse.
2. Save a copy with the app name.
3. Go to the UI tab, answer the questions and add screen shots and rankings.
4. Go to the HE tab and add findings, screen shots and rankings.
5. After peer review, save the doc and upload to the HFE SharePoint Repository.

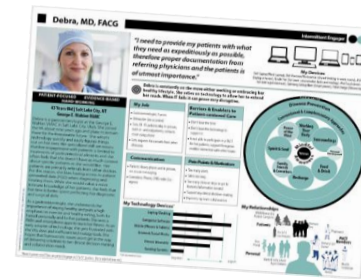


A Detailed Process Flow



Why Use Personas for UIs and HEs?

- Personas are specific individuals who represent the needs and expectations of a larger group.
- The HFE personas have been rigorously researched and can stand in as the app's user representatives.
- Doing an evaluation using a persona's perspective produces a user experience close to how actual end users would perceive the app.
- The HFE personas are on tabs in the workbook.



User Interface (UI) Evaluation Criteria

1. **Consistency** – Terminology, standard navigation, lay-out, content presentation, load times, gestures, VA branding, icons:
 - For example, *Is terminology used consistently throughout the application?*
2. **Device Orientation** – portrait vs. landscape choices:
 - *Does the application provide a user experience consistent with the referenced device or OS guidelines for single or multiple screen orientations (portrait and/or landscape)?*
3. **Errors** – Issues described, issue recovery:
 - *Do error messages plainly and precisely describe the problem and how to recover?*
4. **Frequent Interactions** – Clear navigation, all functionality available:
 - *Does every screen have a clear path to the next step in the activity or, when appropriate, access to other relevant activities?*
5. **Modal Tasks** – Task abandonment, button displays, tasks identified:
 - *When a user task presents a modal screen, is the user given the choice to complete the task or abandon the task (no changes are effected)?*
6. **Readability** – External links properly denoted, truncation avoided, text size, scrolling, space “used” by controls:
 - *Do links correctly indicate the destination sites to which they navigate?*
7. **Sound** – Volume adjustment:
 - *When sound is inherent to application functioning (e.g. video or audio clip), can the user adjust volume levels based on their preference?*
8. **User Input** – Proper size on tappable elements, active entry field indicators, menu design:
 - *Are all tappable elements 44 x 44 points or larger (either 44 points horizontally and/or 44 points vertically)?*

UI Evaluation Examples

An example of a User Interface (UI) cert:

User Interface (UI) Evaluation for Product Name/Acronym

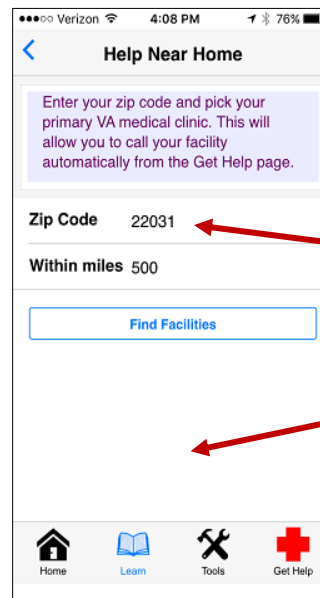
Category	ID	Criteria	Findings	Comments & Recommendations	Screen Capture(s)	Guidance
Consistency	C-01	Is terminology used consistently throughout the application?	Criteria Not Met [Moderate Finding]	There are issues with the use of the words login and tool.	1	
Consistency	C-02	Do application screens include standard navigation, adhering to the convention for either native or browser-based apps?	Criteria Not Met [Serious Finding]	The navigation is not standard.	2	HTML 5: back button included within app that goes up one level in architecture, not back one step. (Browser based apps will also be able to go back one page in browser) iOS and Android handle this very differently.
Consistency	C-03	Are lay-out and content presentation consistent throughout the application?	Criteria Not Met [Minor Finding]	Problems with layout...	3	
Consistency	C-04	Do all methods of scrolling and screen movement look and behave consistently throughout the application?	Criteria Met			
Consistency	C-05	Does the application provide immediate (.25) response (visual, audio, haptic feedback) indicating user input?	Criteria Met			
Consistency	C-06	Does the application provide a processing indicator (e.g. a twirling wheel) when tasks take between 1-10 seconds?				If 1-10s load times are not encountered, then the criteria could be scored "not evaluated". If waiting on app for something like loading text (when user would not expect long load time), use this criteria even if load time exceeds 10 seconds.

UI Evaluation Examples

An example of another UI issue:

Question: Do error messages plainly and precisely describe the problem and how to recover?

Category	ID	Criteria	Finding	Comments [HFE]	Screen Capture(s)	Guidance
Errors	E-02	Do error messages plainly and precisely describe the problem and how to recover?	Criteria Not Met [Minor Finding]	Error message not received on the "Help Near Home" screen, the reviewer put in a zip code for northern Virginia and 200 (and later 500) miles, yet no facilities were found, although no error or other message was displayed. The DC VA facility is about 30 miles away.	5	No error message = not evaluated- always APPLICABLE, we just might not see it



Zip code entered

No error message or feedback displayed

Heuristic Evaluation Criteria*

Heuristic Code	Heuristic(s)
A	Visibility of system status
B	Match between system and the real world
C	User control and freedom
D	Consistency and standards
E	Error prevention
F	Recognition rather than recall
G	Flexibility and efficiency of use
H	Aesthetic and minimalist design
I	Help users recognize, diagnose, and recover from errors
J	Help and documentation

Heuristic Evaluation Examples

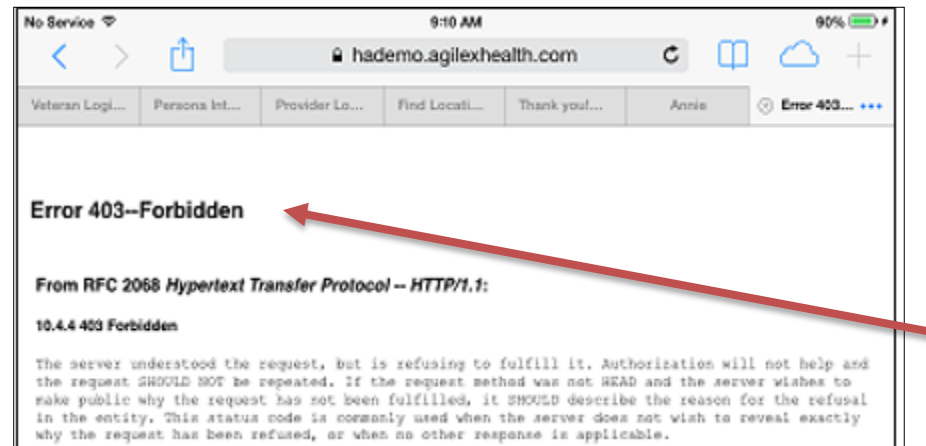
An example of a heuristic violation spotted by HFE:

Heuristic I: Help users recognize, diagnose, and recover from errors

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

Example Finding: The reviewer received a 403 error message when logging in to the app. Receiving such a message may cause Dan or Joyce to give up and never access the app in the future. The message does not tell the user how to recover from the error condition. **Moderate Ranking (may be Serious in some contexts)**

Example Recommendation: Discover the reason for the error and tell the user how to fix it.



Heuristic Evaluation Examples

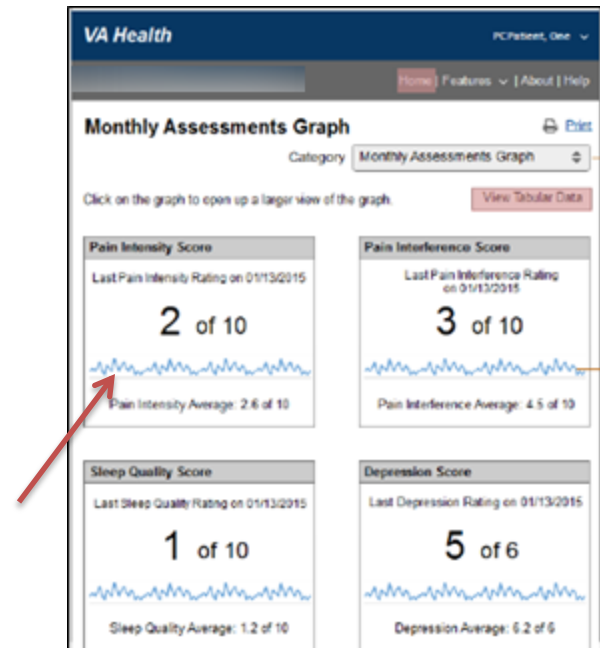
Another example of a heuristic violation:

Heuristic F: Recognition rather than recall

Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

Example Finding: The lack of labels on the many different graph axes could prevent the user from accurately interpreting the data. All of the personas who might use the app may have trouble remembering and interpreting the values and date ranges conveyed in the graphs, an otherwise powerful method of demonstrating trends. **Moderate**

Example Recommendation: Add x and y axis labels to provide exact context for the highs and lows and date range.



The Rankings

Clearly, not all issues are equal in severity or impact. HFE has developed a way to rank findings according to specific criteria.

Ranking	Definition	Recommended Priority for Resolution	Examples
Minor	<p>One of more of the following:</p> <ul style="list-style-type: none"> □ 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.	Use of “Click here for more” to take user to an external link.
Moderate	<p>One or more of the following:</p> <ul style="list-style-type: none"> □ 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.	Inconsistent access to app navigation (e.g., menu button alternates between the right and left side, depending on page).
Serious	<p>All of the following:</p> <ul style="list-style-type: none"> □ 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. <p>Or:</p> <ul style="list-style-type: none"> □ Causes system/sub-system failure (i.e., produces system error or “crash”) 	<p>Give highest priority to resolving this issue prior to further product testing or release.</p> <p>HFE recommends resolution or mitigation for serious usability issues before deploying products.</p>	Blank pages of importance in an app. Broken web links that are required for primary function (e.g., link has changed). Frequent app crashes with no explanation.

The Rankings, cont.

Not Applicable and Not Evaluated findings can also be marked. In fact, strengths of the app can be noted using those rankings.

Not Applicable	<p>Strengths or Unsolicited Suggestions</p> <p>Any findings related to strengths in the system (or unsolicited suggestions for improvement, which are not related to a usability weakness).</p> <p>In UI Cert: Criteria not applied</p>	Optional.	<p>UI Cert:</p> <p>If app does not have sound features, criteria S-01 is not applicable</p> <p>-(When sound is inherent to application functioning)</p> <p>If app does not support processing tasks, criteria C-07 is not applicable</p> <p>- (Does the application provide an indication of remaining processing time for tasks expected to take 10 seconds or longer)</p>
Not Evaluated	<p>In UI Cert: Reviewer did not come across (observe) criteria, so cannot say if criteria is met or not. This can be because function is not working or reviewer could not create the circumstances to support evaluation.</p>		<p>UI Cert:</p> <p>If reviewer does not come across error messages, criteria E-02 is not evaluated (because a different set of key presses or network speed might allow for it to be evaluated at another time)</p> <p>If reviewer does not come across pages that take 1-10 seconds to load, criteria C-06 is not evaluated (because a different set of device + network speed might allow for it to be evaluated at another time)</p>

Why is a Peer Review Vital?

A Human Factors Engineering best practice is to have two peers perform all reviews, in order to gain multiple perspectives and utilize a diversity of expertise.

1. A peer can be another person on the project team who did not develop the app, such as a project manager, business sponsor or scrum master.
2. The peer should use either a different device or a different OS than the initial reviewer, to get a better idea of what a diverse user base will experience.
3. The peer reviews the first evaluator's findings to see if they get the same results, then looks for additional findings and adds them.
4. The two reviewers agree on findings and rankings, and post the compiled report onto the SharePoint site.



Additional Resources

- Self-Certification SharePoint site
 - All training materials will be posted on VA Pulse.
 - The Template and a Job Aid are also posted.
 - Upload completed evaluations to the HFE SharePoint site.
- Support is available via HFE's email address: Vha10p2hfg@va.gov.
 - Bill and Jane will be the initial support.



Questions and Discussion?



Thank you!

What future topics would you like to discuss?

Let us know by providing feedback at the link below:

<https://www.surveymonkey.com/r/GN9FHB2>