

Heuristic Evaluation

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Team 2: Blu Team

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Description of Undergraduate Design

Team 2: Blu Team will be designing, developing, and testing a water monitoring app produced for the Oklahoma Blue Thumb. Currently Blue Thumb relies on a large volunteer base's efforts to test local creeks and streams for the physical environment conditions and water samples. At the volunteer's discretion, recording monitored data can range from paper, Adobe Forms, to other methods and can be submitted from fax, email or even traditional mail. Water samples can also be submitted to be chemically tested. The app developed by Blu Team will be used to unify the means of monitoring and recording data to a form that can easily submit data to Blue Thumb.

Identification of UI Domain

The application developed will be a simplified web form that should be viewable on a range of devices hence it falls under the Web User Interface (UI) Domain. The application allows for users to create new logs, or to view old logs that have yet to be submitted. If the user starts a new log, they will be presented with a sequence of pages that allow logging of the conditions of the environment, including weather, time, date and more. These logs can be saved and come back at a later time to complete. This is especially useful when completing chemical tests, which generally occur much later at a different scene than the recorded environment. The information recorded by the users will go through some basic sanitization to prevent erroneous data submissions.

Heuristic Usability Principles for Design's UI Domain

This evaluation references Jakob Nielsen's Usability Principles found here:

<https://www.nngroup.com/articles/ten-usability-heuristics/>

Visibility of System Status

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

Match Between System and Real World

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

User Control and Freedom

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

Consistency and Standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

Error Prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

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.

Flexibility and Efficiency of Use

Accelerators, unseen by the novice user, may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

Aesthetic and Minimalist Design

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

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.

Help and Documentation

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

Usability Problems Generated from Heuristic Evaluation

Lack of Vertical Scroll Bar

Not applicable to every form in the application, some are exceedingly long and have the potential to not fit on a screen's device vertically. In this scenario a vertical scroll bar is required to clearly communicate there is more information not being displayed. This is in contradiction to the visibility of system status principle.

Unvalidated Input

While it was noted that input validation was a design goal, it was also stated the exact input validation parameters are not yet known. At this time, this is a clear contradiction to error prevention principle.

Unclear Features - Compass and Autofill

These design features would greatly enhance the flexibility and ease of use of the application, without a proper known implementation plan it's unclear how these features will be added. If these features aren't implemented correctly yet remain in the application, it could be conflicting with the aesthetic and minimalist design if objects appear broken.

Lack of Help Menu

While the users are trained by the Blu Team, there still are times where a user may forget need help navigating, explaining, or using the application. There is no help menu in this event, this is in contradiction of the help and documentation principle.

Lack of Back Navigation

While filling logging data, there is a next button which proceeds to the following form in the sequence. However there is an absence of a back button which proceeds to the preceding form in the sequence. Some devices using the app have a hardware back button, however this should not be relied on as not all devices have such utility. This is in contradiction of the user control and freedom, and flexibility and ease of use principles.

Identification of Critical Usability Concerns

After reviewing the usability problems and their descriptions above, compiled below is a list of what would be the critical and lesser critical usability concerns. These were ordered based on potential severity.

Critical Usability Concerns

Unvalidated Input

Lack of Back Navigation

Lack of Help Menu

Lesser Critical Usability Concerns

Lack of Vertical Scroll Bar

Unclear Features - Compass and Autofill

Illustration of Critical Usability Concerns

Scenario Short Story

This scenario is fictional, and is created to showcase a real possible example that could occur due to the critical usability errors.

Robert Smith, 45, is a retired air force veteran and has become a new volunteer to Blu Thumb. Has an older model iPhone with low screen resolution. He has no issue opening the application, and clicking a new log. However he is immediately faced with a broken compass applet since it's not supported on his model phone, he wants to know why it's broken but there's no help menu so he continues onto the next page. He incorrectly enters a time in a field that requests a date but continues since he wasn't prompted an error message. When he gets to the next page he remembers he made a mistake but there's no way for him to go back and change it at the time. The next page contains a very large vertical form, and he after filling out the data he doesn't see the next button on his screen, so he assumes he's finished and closes the app without saving the log.

Here we see Mr. Smith struggle to use the application correctly. An unsupported feature causing confusion with no help menu to refer to. Inputting time into a date field due to lack of input validation. Unable to go back and fix his mistake. Unable to complete the form being unable to tell the next button is off screen. Hopefully this fictional, but plausible, scenario highlights the critical concerns.