Functional Spec – SciGuides Lab Manual Reader

Overview

"Abject Terror" is the terms that many lab scientists have used to describe operating high-priced lab equipment after only casual training. SciGuides will enable scientists to easily and confidently follow procedures from equipment manuals.

Although lab equipment is often both expensive and delicate, many labs don't give sufficient training to incoming students. Equipment manuals are frequently lost or not thoroughly read. Their trial-and-error learning frequently results in wasted reagents and broken equipment. This web application offers a better way for them to find and follow procedures from the lab manuals.

User Scenario*

Grace the Grad Student's training on the mass spectrometer had consisted largely of being walked through another Pete the Post-Doc's home-brewed procedure. She'd technically been the one pressing the buttons, but Pete's explanations for each step were as short as his patience for questions, so she resolved to spend some time reading the user manual. Later, she learned that the lab's version had been lost, but that there was a 200-page PDF on the shared drive that she could read. Fortunately, the lab had also just bought a subscription to SciGuides, and she decided to be one of the first to try it.

She logs into the website with her username and password, and her eyes are drawn to the list of machines. She double-clicks 'Mass Spectrometer (Model X24)' and it expands to show a list of procedures associated with the device. She double-clicks the relevant procedure and sees a list of steps appear in the center pane. The first step is highlighted in blue, and it expands like an accordion to show 3 simple sub-steps. The right pane has an image of the machine, with numbered arrows (one for each substep) pointing to the part of the machine that the step references.

She takes her laptop over to the machine and sets it down on a nearby desk. After finishing the first three steps, she taps the right arrow key. A lightbox gently reminds her to use the spacebar or down arrow to advance to the next step, and she waits 2 seconds until it fades. She is then able to refocus on the equipment, reaching across the machine to tap the space bar every few minutes to advance to the next step. She settles into the routine, and by the time she reaches the last step, she has complete confidence in the validity of her results.

*Best read with the wireframe for reference

Users

- New Grad Students and undergrad researchers
  - The users can be expected to know vocabulary, but not specific pieces of equipment or protocols
- Lab Managers
  - Because they understand the frequency and cost of equipment failures, and also have purchasing power, they are the target customers.

Design Goals

For the equipment operator, it must be **less distracting to use than a printed instruction manual.**

Success Metric

- Users prefer this system to a printed page with equivalent information

What's Not Being Optimized For

- Content creation
  - Guides will be created in a different interface
- Large Databases
  - Loading a set of steps will be a fairly infrequent occurrence. However, movement between steps must be near instantaneous.
- Bandwidth Conservation
  - Though some labs have WiFi issues, it can generally be assumed that the users have connections of above 6 Mbps

Account Access

Each user will be registered under a lab, which is the paying entity. Those users can log in as frequently as they like and consume as many procedures as they like. They will only have access to procedures that were purchased by their lab.

Accounts and payment will use standard best practices, including:

- Password Reset
  - Do not store password in plaintext
- Administrative privileges by lab account
- Session timeouts
  - 30 minutes
- HTTPS-only access to all logged-in content

User Flow
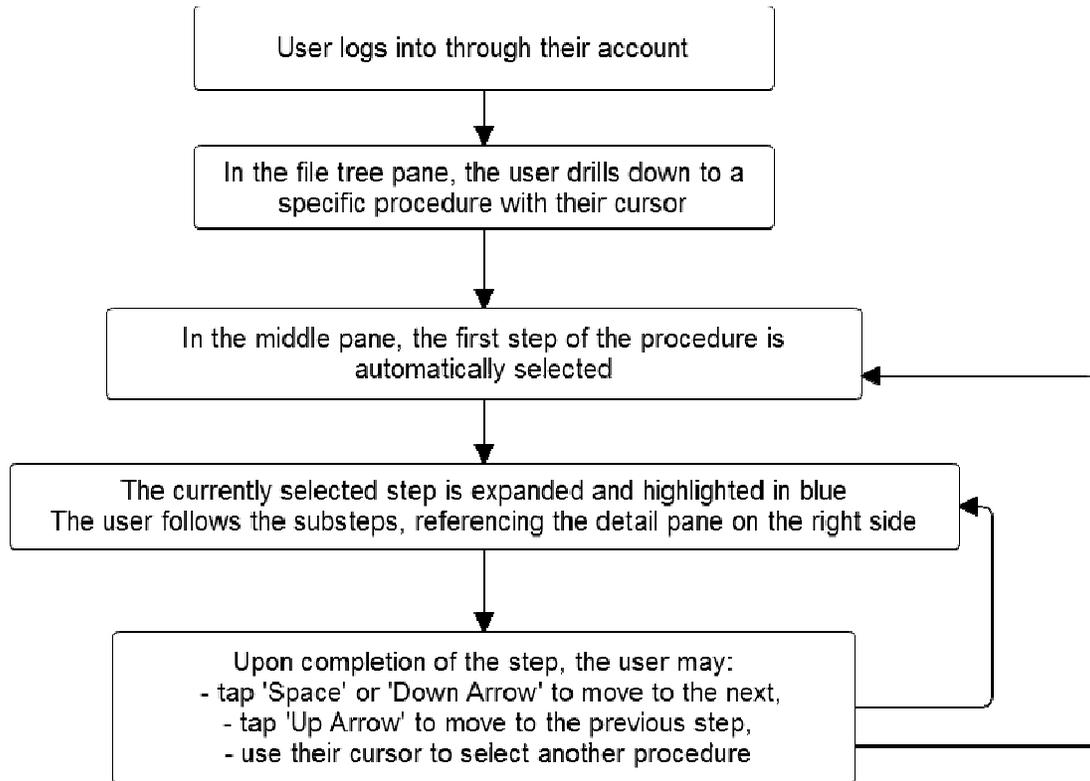
Edge Cases

- **User is at the first or last step**: Attempting to select the previous or next step moves the selected step side-to-side briefly
- **User logs out in a separate window**: They will be able to continue navigating through the current procedure, but the app will close the session once they try to access a new procedure.
- **The number of steps is too large to fit in the middle pane**: It's expected that this will be rare. If it happens, a scroll bar will appear on the right hand side of the middle pane, and it will dynamically scroll to keep the selected step on top (hiding the steps before it, unless scrolled with the cursor).
- **No procedure is yet selected**: The center and right panes are blank, drawing the user's eyes to the left pane, where they can select a procedure
- **The user taps the wrong key**: The system fades a lightbox into the center of the screen, reminding them of the correct keys

Future Considerations

- Allow user to flag steps as confusing or broken
- Integrate troubleshooting
- Support for offline use (with HTML5)
- Support for touchscreens/mobile
- Printing of guides as PDF