Preksha Kashyap
kashyapp, 998198524

MIE 1401: Prototype Proposal

Project Objective

This project aims to conduct a human factors assessment on scanning related tasks with the Lexmark Prospect SE pro208 printer. This portion of the project will suggest prototype mock-ups that address the issues outlined in the previous project overview submission.

Figure 1: Lexmark Prospect SE pro208, fom the Lexmark website
https://media.lexmark.com/www/asset/30/6388/+image_standard.png

Issues Using the Printer

Through observing users trying to scan documents with the printer (when creating the hierarchical task analysis) and through post-observation interviews, a list of usability issues was created. The issues that were collected are listed below. Not all user issues will be fixed with the prototype suggestions, but they will aim to resolve the bolded issues.

- **Users were not sure whether to initiate scan from computer or from printer (confusing language – they thought the same thing would happen regardless of starting at the printer or the computer)**
    - Pressing scan on the printer didn't work, so had to scan from computer anyway
- **Wasn't sure whether to scan as photo or PDF**
- **Users were too intimidated to use the advanced scan settings or ignored it/didn't notice it**
    - However, cannot scan via automatic document feeder through normal settings
    - Therefore users only scanned via the scanning bed
    - Missed out on other options like adjusting colour settings or resolution
- Users were too intimidated to scan to USB and then transfer to computer/didn't realise it was an option
- Since printer was already set up with WiFi connection, users were not interested in trying to connect via a wired connection and scan that way
- Users found the physical interface of the printer not that friendly
    - Too crowded
    - Screen too small
    - Not clear which button to be pressed (important buttons/areas not highlighted that well)
- **Users not impressed with software UI – didn't find the options descriptive**
    - E.g. Issue with scanning another page: When scanning to PDF, a prompt would appear asking whether the user wanted to scan another page. If the user hit "Yes",

the scan would begin immediately without warning them that they needed to replace the page in the flatbed before hitting the “Yes” button.

Prototype Design

In the previous project report, it was noted that some functionality could not be tested because it simply did not work, which remains the case. These firmware issues cannot be addressed. However, from the list of outlined issues the main takeaway is that there seems to be uncertainty with using the device amongst users. From being uncertain about advanced scanning (“is this something I need to use?”) to not understanding how to initiate the scan, to being confused by the language provided by the software.

Addressing Issue 1: Determining whether to initiate scan from printer or computer

To provide context for the redesign, some figures have been included. Figure 2 shows the overall interaction panel on the printer. It is through this that users can select to scan to their computer or a memory device from the printer. Figure 3 shows a close up of the printer’s screen when the scan setting is engaged – as mentioned, it shows the devices one can scan to. Figure 4 is a screenshot of the printer companion software on the user’s computer. One can initiate a scan from the computer through the companion software.

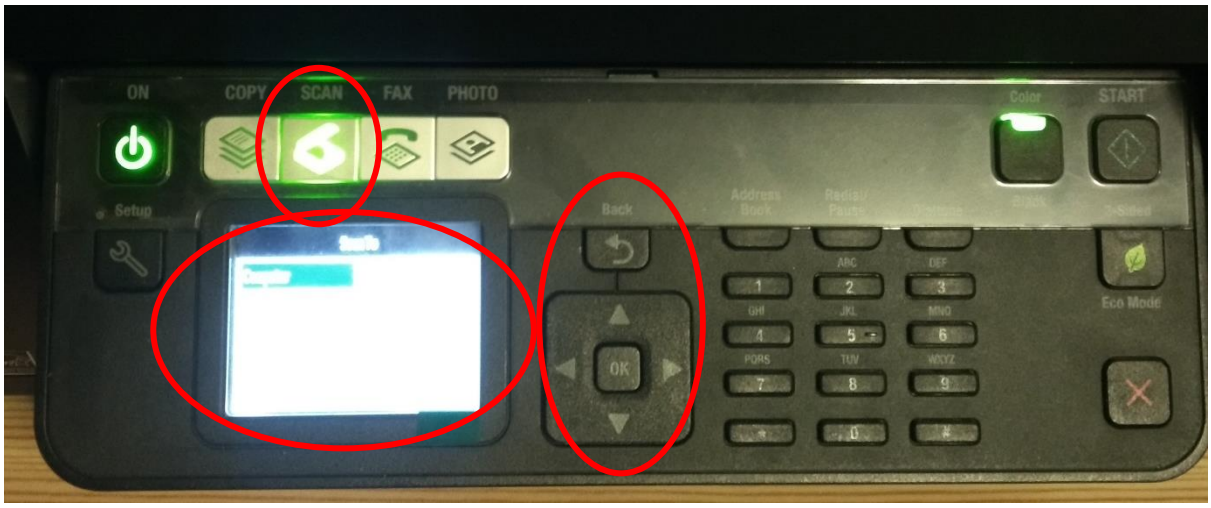

Figure 2: The control panel on the printer. The red circles highlight important control buttons.

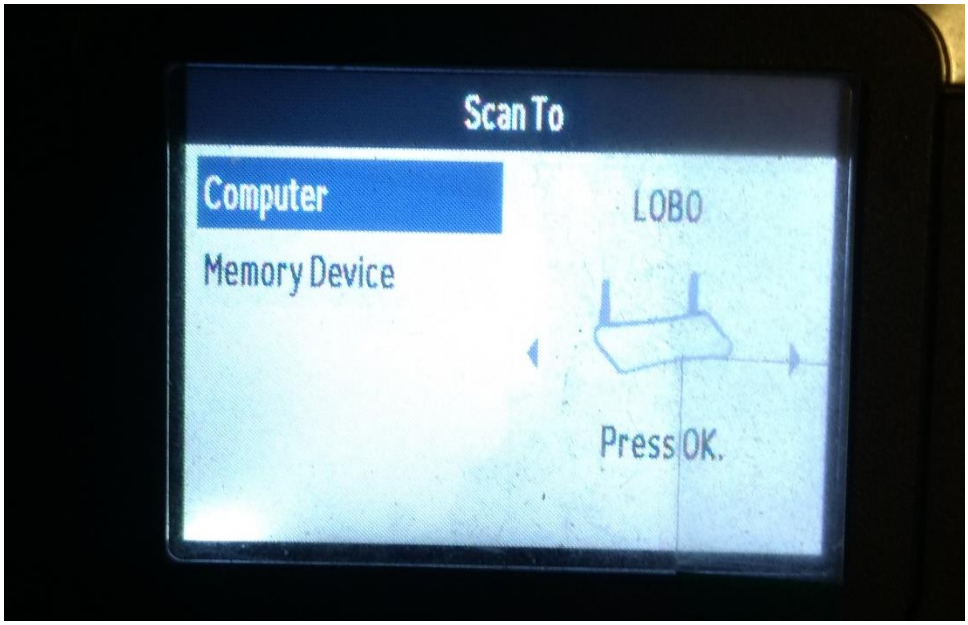

Figure 3: What the default “Scanning” screen on the printer looks like.

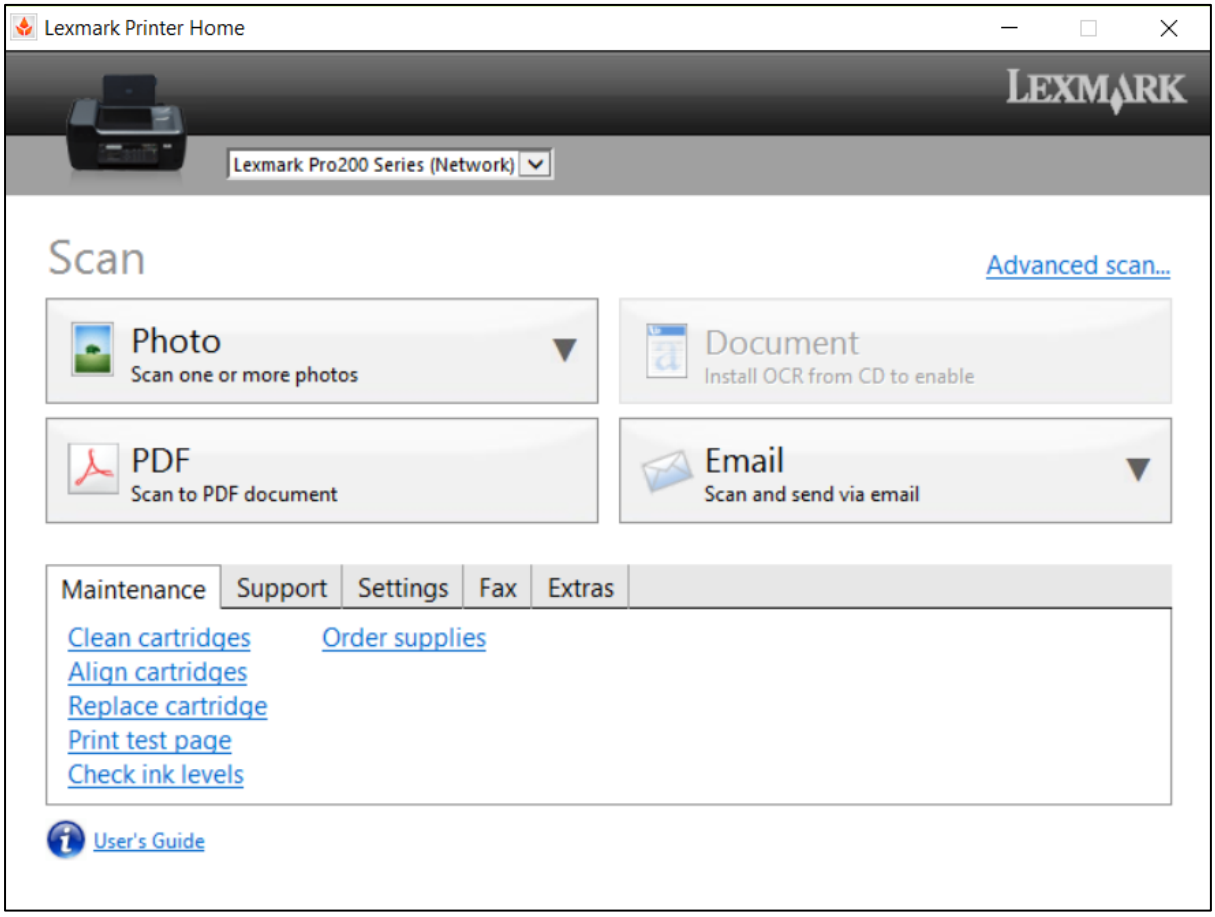

Figure 4: A screenshot of the Lexmark Printer Home software installed on the user’s computer

For this issue, the best redesign would be to fix the language on the printer’s screen. This is because if the user chooses to open the companion software first, they already see their scan options right away and can simply engage with them. However, when the observed users were trying to scan they first approached the printer device itself and were confused by the screen they saw. Only after

searching for help did they choose open the companion software and then proceed to scan as they found that to be an easier process. Figures 5 through 7 exhibit the simple change in language that can be used to inform users how to approach the task of scanning. As per usual interaction with the printer, users will use the arrow keys, back button and "OK" button on the printer panel (shown in Figure 2) to navigate between their choices.

①

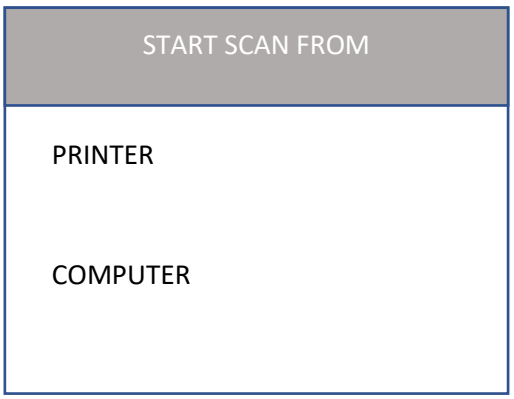

Figure 5: This proposed scanning screen informs the user that they can start the scan from either the printer or from their computer. The screen title has also been changed to be more descriptive.

②'

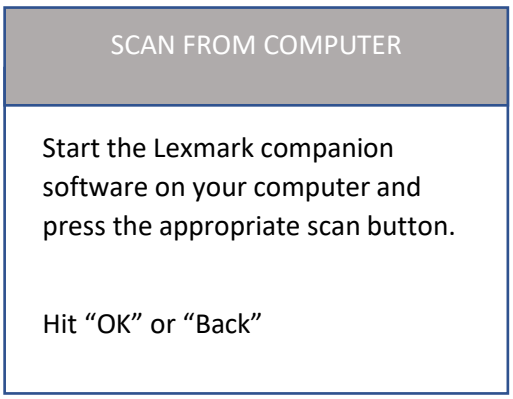

Figure 6: Selecting to start the scan from the computer leads to an explanation of how to do so. The screen title reminds the user what option they are pursuing.

②"

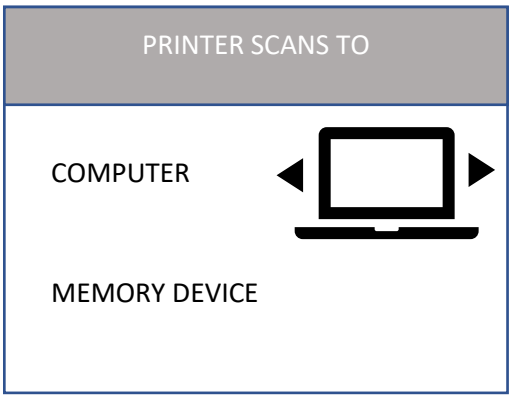

Figure 7: Selecting to start the scan from the printer leads to the usual screen and process that is displayed in Figure 3. However, this updated screen title reminds the user that scanning option they are pursuing.

This change in design is driven by the human computer attention principle of anticipating the user's needs. Since the current implementation leaves the user unsure and reaching out for assistance, the proposed design aims to mitigate that by providing the user with complete instructions. The hope is that this change will help prevent users from needing to search for more information to complete the task.

Addressing Issue 2: Determining whether to scan as a photo or PDF

A significant contributor to the difficulty users faced when using the Lexmark printer was their lack of knowledge about the product. This is something that improves with time, and also exposure to useful information about the product. The formal user manual is quite lengthy and not always quick to get a hold of. As such users may be tempted to click the "Support" tab displayed in the software companion with the hopes of quickly accessing the answers they need. However, most of the resources listed under support ("Learn more about your printer", "Lexmark service center", "Online

support") are geared towards the product line and general information, and do not support the user with information critical to their tasks. Additionally, all of the resources in the support tab are online resources which means that they will not be accessible to a user lacking internet. Taking these into consideration, the incorporation of an extra F.A.Q. tab at the bottom of the software companion would be an easily implementable solution. It would contain simple tidbits that users who are not tech-savvy would be able to understand and would be available for offline use so the users always have access to them. See Figure 8 for a mock up of what the screen might look like.

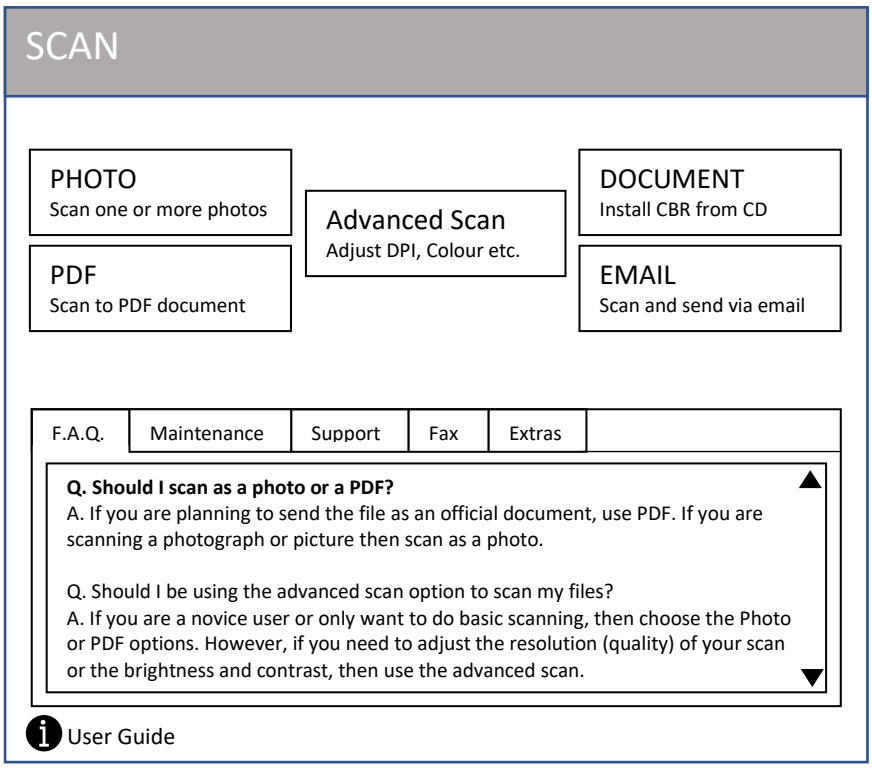

Figure 8: A redesigned UI for Lexmark's software companion, incorporating an easily accessible F.A.Q. tab to help novice or less tech-savvy users.

An F.A.Q. section minimizes information access cost through displaying relevant information in the same screen rather than having to open the user guide or search online. Novice users will probably need to refer to some of this information repeatedly until they have scanned enough to have it be ingrained in their memory. Support agents and customer feedback information will be able to provide details regarding which questions are considered worthy of being added to the F.A.Q.

Addressing Issue 3: Not engaging with the advanced scan setting

The solution for this issue is also addressed by the software companion redesign seen in Figure 8. Instead of having a miniscule link in the top-right hand corner for advanced scanning (as is the current design shown in Figure 4), we apply the discrete control rule of consistency. That is, a similar action should be shown in a similar way. Instead of a link "Advanced Scan" is transformed into a button placed alongside the other scanning buttons. Additionally, it is subtitled with a description of what one can expect to use it for, just like how other buttons are captioned with a description. This way users can easily determine if they would like to use it.

The discrete control design principle of proximity compatibility is also applied here. Although the actions are not sequential and do not necessarily rely on each other, all options need to be seen and

considered so that the user can make the best choice. By incorporating the advanced scan button with descriptor into the area with all the other scan buttons, it becomes a part of the scan menu that the user can interact with. Likewise, the accessibility of advanced scanning has been improved since the control is now no longer in a corner but in the central area of the software window. This is further improved by taking advantage of Fitts' Law by increasing the surface area allocated to the function so that it is also more easily clicked. Having the advanced scan button be designed the same way as the other buttons will improve the time it takes for users who are seeking it out to reach it. This is all due to the combination of increased width of the button, larger text size, and its central placement.

Although the addition of an extra button will probably increase user's reaction time to pick an action, the addition of an F.A.Q. and choice of words "Advanced Scan" will likely dissuade users who do not need to use the function from dwelling on it too much.

Addressing Issue 4: Scanning another page to the PDF

Currently, when a user scans pages to a PDF document through the flatbed scanner, they need to scan one page at a time. After scanning one page, the software companion presents the prompt shown in Figure 9 to ask whether or not they would like to scan another page. In this scenario, all observed users hit "Yes" without expecting that the scanner would immediately start scanning. This then lead to the same page being scanned again since the users did not have an opportunity to remove the page in the flatbed and replace it with their desired page. As a result, they had to scrap their scan and start again since the software does not have an option to edit pages scanned to a PDF (that functionality would be present in PDF editing software). A quick fix for this would be to augment the prompt so that it provides a warning to the users that they should replace the paper in the flatbed before hitting "Yes". Figure 10 is an example of what this prompt might look like.

Preksha Kashyap
kashyapp, 998198524

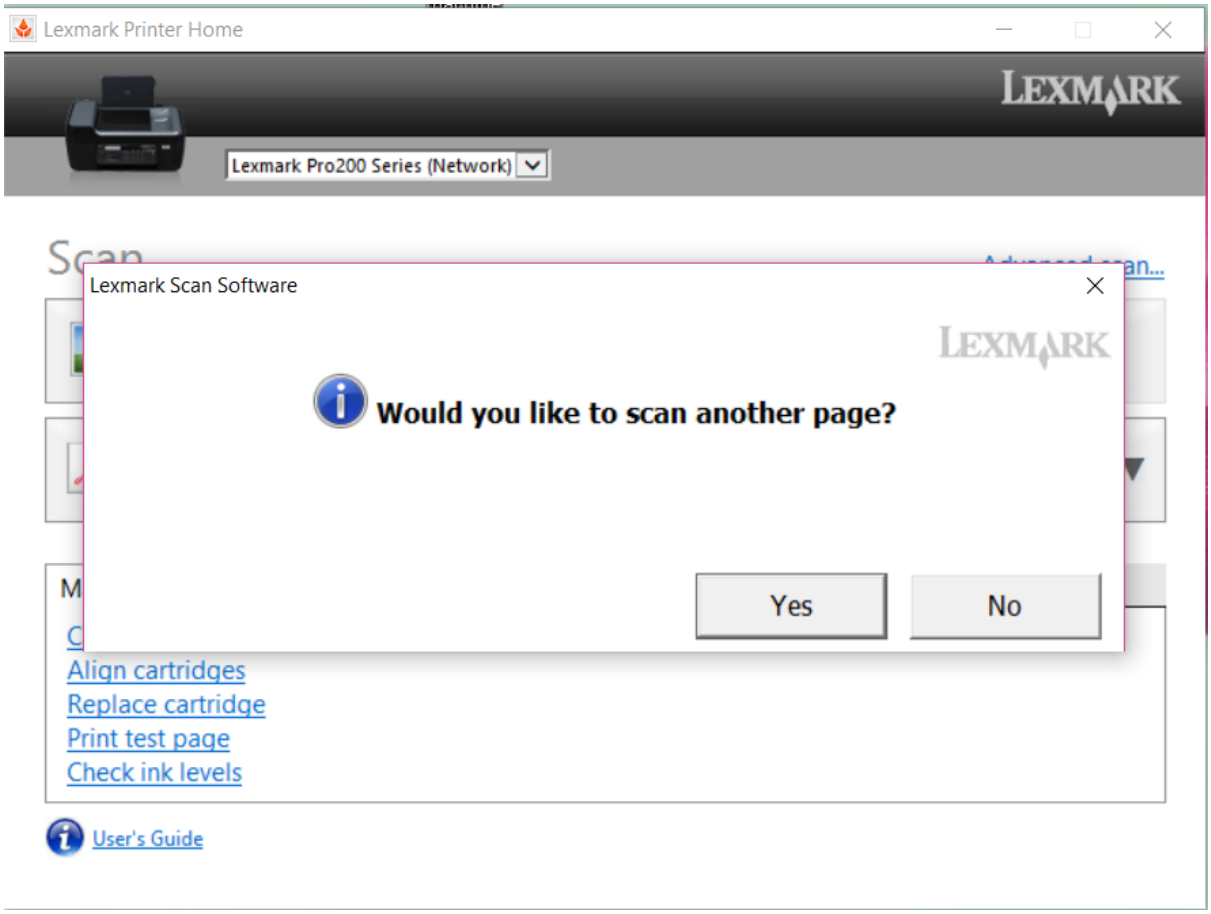

Figure 9: Prompt that appears when asking user if they'd like to scan another page to add to their PDF document.

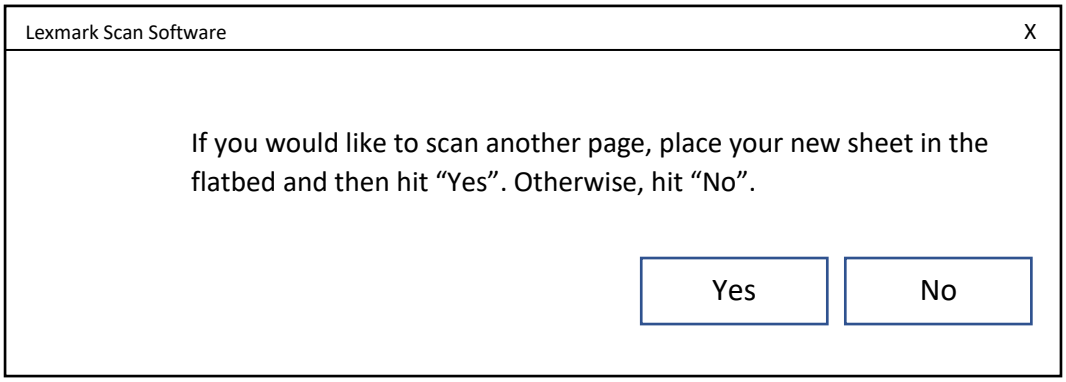

Figure 10: Redesigned prompt that explains to the user the process to scan another page to the PDF.

While technically the software could be developed to edit PDF files to remove unwanted pages, the amount of cost and technical complexity to do so might be too expensive. A simple change in language can help the user avoid accidental activation by guiding them to follow expected behaviour and costs very little to implement.

Preksha Kashyap
kashyapp, 998198524

Conclusion

While the solutions that have been put forth have been created with relevant design principles in mind to facilitate a smoother experience for the end user, there is no guarantee that will be the case. The users who participated in the task analysis and gave their feedback will be shown the proposed alternatives and interviewed on their thoughts about the redesigns. The aim of these secondary tests and interviews will be to gauge if the users feel that the redesigns would improve the scanning process from what it currently is.