

MILESTONE 4

Bright Solutions

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Demographics

There were 10 participants who helped evaluate our prototype - five participants who did retrospective testing interviews and five participants who did think-aloud interviews. The participants of the retrospective testing interview were between the ages of 19 and 20 and all were University of Georgia students. All five of the participants were white with 2 participants being male and 3 female.

The participants of the think-aloud interviews were between the ages of 17 and 50. None were University of Georgia students. Two identified as Non-binary, two identified as female, and one identified as male. Of the five, one had used a similar system to manage accommodations for a disability or other condition. All five were white.

Due to the ongoing covid-19 pandemic, we were only to conduct our research and evaluations using a convenience sample, rather than the preferred method of random sampling.

Evaluation Methods

Tasks for Evaluation

To evaluate our prototype, we chose 2 tasks that users of the system are most likely to complete. These tasks are kept consistent throughout our various testing & evaluation methods. The tasks are as follows.

Task 1: Add the testing accommodations “Time and a Half” and “Reduced Distraction Environment” to your CSCI 1301 class.

This task is one that users are likely to complete once per semester for each class that they are registered for. While this may not seem like a common task at first, considering that some users may be enrolled in 4-7 classes each semester, and with most undergraduate students having 8 semesters, the number of times students do this task could reach as high as 56 times or more over the course of their time at school using this portal. Compared to Task 2, this is our second most common task, and is actually required to be completed at the beginning of the semester before users are allowed to complete Task 2.

Task 2: Schedule an exam in your CSCI 1301 class of type “Exam” for April 17th at 8:00AM.

This task is the most commonly completed task in our system. After users are registered for classes each semester, and they have set their accommodations for each class, they are allowed to schedule exams through this portal that let them make use of their special DRC accommodations. If we assume that a student has 4-7 classes in a semester, and

2-5 exams in each class, this task may be completed by the student anywhere from 8 to 35 times in one semester. If we consider again that undergraduate students typically take 8 semesters to graduate, the number of times students do this task could reach as high as 280 or more over the course of their time at school using this portal. Therefore, we felt as though it was quite important to evaluate this particular task.

Task 3: Turn on “High Contrast Mode” and “Large Text Mode” in your profile accessibility settings.

This task is not used nearly as frequently as the other two, but is just as important, especially for visually impaired users. Completing these tasks allows the user to transform the look of the DRC Testing Portal into High Contrast Mode (pure black-and-white for increased readability of text & icons), and Large Text Mode (which increases text size across the site). These two accessibility settings greatly increase the usability of our prototype for visually impaired & disabled users.

Methods & Techniques

Heuristic Evaluation:

A heuristic evaluation is performed to review a system design or prototype for any usability issues. Evaluators are guided by a set of heuristics or usability principles to determine whether user-interface elements conform to those principles. The design heuristics utilized consist of:

- Showing system status
- Using familiar metaphors & language
- Having control & freedom
- Consistency of system
- Error prevention
- Recognition over recall while using system
- Flexibility & efficiency of use
- Aesthetic & minimalist design
- Recognition, diagnosis, & recovery from errors
- Helpful information/documentation

These usability principles will help guide the heuristic evaluation we conduct for our prototype.

Cognitive Walkthrough:

When conducting a cognitive walkthrough of a design or prototype, the evaluator goes through the prototype and works through a series of tasks from the perspective of a user, answering a set of questions along the way. In our cognitive walkthrough, we will break

down each of the two main tasks into subtasks that the evaluator will complete, and answer these questions from the perspective of a user:

- Will the user understand how to start the task?
- Will the user notice that the controls/actions are available?
- Will the user associate the correct action with the effect the user is trying to achieve?
- Will the user see that progress is being made toward the solution of the task?

Predictive Evaluation:

When conducting a predictive evaluation, we use an established and peer-reviewed predictive model. This enables us to evaluate our prototype and designs without directly involving users. For our predictive evaluation, we will be using the Keystroke Level Model (KSLM), developed by Card, Moran, and Newell in 1983. This will allow us to identify on a keystroke-by-keystroke basis what the user does within our prototype, and calculate a predictive time for each task.

Retrospective Testing Interview:

Retrospective testing interviews provide evaluators feedback from users after they have performed tasks they have been assigned to do while using the prototype. This gives designers an idea of what the users perspective is as well as any issues they had in performing the tasks given. We will conduct retrospective testing interviews with 5 individuals and ask that they perform these tasks:

- Add testing accommodations: select the class CSCI 1301 and choose both the time and a half and reduced distraction environment as exam accommodations
- Schedule a test: select the class CSCI 1301, select request type as Exam, select the date as April 17, 2020, and select the time of 8:00 AM
- Set accessibility settings: select both the High Contrast and Large Text check boxes

Think Aloud Evaluation:

Think-Aloud evaluations are used to help designers test their prototypes by recording, observing, and receiving feedback from users. Users are provided with certain tasks to conduct while going through the prototype and are asked by a researcher what they are thinking while they perform each task. This is known as “thinking aloud,” and this feedback helps the researchers better understand a user’s thought process as well as pinpoint any difficulties a user may encounter while using the prototype. We will ask 5 people to help us conduct a think aloud evaluation in order to test our prototype. Users will be asked to perform these tasks:

- Add testing accommodations: select the class CSCI 1301 and choose both the time and a half and reduced distraction environment as exam accommodations

- Schedule a test: select the class CSCI 1301, select request type as Exam, select the date as April 17, 2020, and select the time of 8:00 AM
- Set accessibility settings: select both the High Contrast and Large Text check boxes

Questionnaire:

Generally, researchers and evaluators use questionnaires to help them get an idea of a participant’s point of view before and after asking an individual to test their prototype. This gives researchers insightful feedback as to whether there is any room for improvement for their prototype and can pinpoint any common issues or confusions individuals face while using the prototype. We will ask our 10 participants (5 from the think aloud evaluation and 5 from the retrospective testing interview) to take the questionnaire we give them to help us better understand any issues within our prototype we may not have noticed and how to improve the prototype.

Heuristic Evaluation

Scenario:

A user who is new to the system wants to schedule an exam for their 1301 class. They want to set their accommodation preferences and, this being their first time on the system, want to ensure their profile information is correct.

Severity Rating - on a scale from 1 to 5, 1 being least severe and 5 being extremely severe

1) Visibility of System			
#	Issue	How Issue Violates Heuristic	Severity Rating
N/A	N/A	N/A	N/A
2) Familiar Metaphors and Language			
#	Issue	How Issue Violates Heuristic	Severity Rating
N/A	N/A	N/A	N/A
3) User Control and Freedom			
#	Issue	How Issue Violates Heuristic	Severity Rating
3.1	No back or cancel button	User cannot navigate back or cancel the current action. No button like that exists. Users can only navigate home.	3

3.2	No direct way of handling scheduling mistake	If a scheduling error occurs, it is not clear how to remedy that issue.	5
4) Consistency and Standards			
<i>#</i>	<i>Issue</i>	<i>How Issue Violates Heuristic</i>	<i>Severity Rating</i>
4.1	Success message format is inconsistent	Successful accommodation alert and successful scheduling alert appear differently. The accommodation alert occurs on the same page at the very bottom whereas the scheduling success alert takes the user to an entirely new page.	2
5) Error Prevention			
<i>#</i>	<i>Issue</i>	<i>How Issue Violates Heuristic</i>	<i>Severity Rating</i>
5.1	No current way to prevent errors when scheduling test dates and times	The user is not alerted if a selected test time conflicts with another class time.	3
6) Recognition Rather Than Recall			
<i>#</i>	<i>Issue</i>	<i>How Issue Violates Heuristic</i>	<i>Severity Rating</i>
N/A	N/A	N/A	N/A
7) Flexibility and Efficiency of Use			
<i>#</i>	<i>Issue</i>	<i>How Issue Violates Heuristic</i>	<i>Severity Rating</i>
N/A	N/A	N/A	N/A
8) Aesthetic and Minimalist Design			
<i>#</i>	<i>Issue</i>	<i>How Issue Violates Heuristic</i>	<i>Severity Rating</i>
N/A	N/A	N/A	N/A
9) Help Users Recognize, Diagnose, and Recover from Errors			
<i>#</i>	<i>Issue</i>	<i>How Issue Violates Heuristic</i>	<i>Severity Rating</i>

N/A	N/A	N/A	N/A
10) Help and Documentation			
#	Issue	How Issue Violates Heuristic	Severity Rating
10.1	No first time walkthrough	Users who are new to the website have to work through the different functionalities of the site with no direction to find what they need.	1

Note: In terms of the Heuristic Evaluation, there were not any issues found associated with Visibility of System, Familiar Metaphors and Language, Recognition Rather Than Recall, Flexibility and Efficiency of Use, Aesthetic and Minimalist Design, Help Users Recognize, Diagnose, or Recover from Errors that were directly associated with website functionalities.

Synopsis:

Upon working more closely with the new DRC website interface, I was only able to find a few things that made the experience less than optimal. Accommodations and Schedule a Test pages alert users when tasks are successfully completed. Buttons change color based on whether enough information has been provided before it can be selected. Symbology is easy to interpret and it can be easily deduced what they stand for (i.e. home button is a house). Users have options to adjust accessibility and ease their user experience (i.e. high contrast mode, large text). The same type of font, symbols, and color scheme are persistent throughout all pages. All pages of the same type also follow the same layout of buttons and information. These minor touches really enhance the user experience. Information regarding current class schedules and profile information is pulled from university information and is accurate. In the case that there is an error, a message displays telling the user how to get the information corrected. Classes available for the user to schedule an exam for are displayed in the drop down which prevents the user from having to remember class number or class name to select it. All information a user would need can be selected from a drop down rather than being typed in freely which prevents user typing input errors. Users can immediately select to schedule a test from the home menu which speeds up the process tremendously. Test accommodations can be specified and immediately applied to scheduling requests for specific classes thereby creating a streamlined experience for the user. The minimalist design choice with straightforward language and symbology does not include irrelevant pictures/information. A small variety of colors are utilized in the design preventing an excessively distracting interface. Although blue is a main color choice, the design ensures accessibility by supporting a high contrast mode within the accessibility settings

section. Throughout the entire experience, no fatal errors were shown! Overall, the experience with this platform was incredibly positive.

Cognitive Walkthrough

Most people who use UGA’s disability resource center’s (DRC) AIM portal are students who need to schedule an exam they are not able to take in their class due to their disability. Since the DRC provides accommodations for students, students can schedule to take a test at the DRC instead. This is the main goal of many students and one our prototype focuses on. In order to schedule a test for a class, students must set their preferred testing accommodations that the DRC provides while they take their exam and then schedule a test. Our prototype also offers users accessibility settings to further enhance and assist their experience using the interface to help accommodate for any visual disabilities or impairments.

Scenario:

A user wants to schedule an exam for their 1301 class on April 17 at 8:00 AM. They want to set their testing accommodation preferences for this class to include an extra amount of time by a time and a half as well as a reduced distraction environment. The user also wants to enable the system’s accessibility settings to include both high contrast and large text.

Set Accessibility Settings Tasks:

- 1) Click the Profile button
- 2) Click the High Contrast check box
- 3) Click the Large Text check box
- 4) Click the home icon

Tasks	Will the user understand how to start the task?	Will the user notice that the controls/actions are available?	Will the user associate the correct action with the effect the user is trying to achieve?	Will the user see that progress is being made toward the solution of the task?
Click the Profile Button	If the user is trying to find a settings button, they may be confused as it	There is no apparent settings button, but the Profile button is one of	The user can assume that the Profile button will have not only	Yes. After clicking the Profile button, the user will be directed to the

	is not readily apparent. But, they can safely assume that clicking the Profile button may get them there.	three main buttons on the home screen that the user has access to that they may assume may get them there.	their personal information but also any extra settings options.	Profile page which indicates progress as the user is no longer on the same page as before.
Click the High Contrast check box	The user will see a section of the page titled "Accessibility Settings." Underneath this is the option for high contrast which the user seeks and is easily noticeable being at the top of the page.	The high contrast setting is displayed as a check box which appears as an easy selection.	Yes. If the user wants the interface to have high contrast, then all they would have to do is select the check box for it.	Yes. After selecting the checkbox, the user will see the high contrast effects on the page immediately.
Click the Large Text check box	The user will see a section of the page titled "Accessibility Settings." Underneath this is the option for large text which the user seeks and is easily noticeable being at the top of the page.	The large text setting is displayed as a check box which appears as an easy selection.	Yes. If the user wants the interface's text to be larger, then all they would have to do is select the check box for it.	Yes. After selecting the checkbox, the user will see that the text on the page has increased in size immediately.
Click the home icon	There does not appear to be a	The home icon may be a bit	Since the icon looks like a	After clicking the home icon,

	back button, but there is a home icon that the user can assume leads to the home screen.	difficult to find if a user reads from left to right and would not expect the icon to be in the top right corner.	house, the user can assume that clicking it will lead them back to the home screen.	the user is directed back to the home screen, but it does not look like the accessibility settings selected got applied to the system.
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Set Testing Accommodations Tasks:

- 1) Click the Accommodations button
- 2) Click Select a Class drop down and choose CSCI 1301
- 3) Check the Time and a Half check box
- 4) Check the Reduced Distraction Environment check box
- 5) Click the Set button

Tasks	Will the user understand how to start the task?	Will the user notice that the controls/actions are available?	Will the user associate the correct action with the effect the user is trying to achieve?	Will the user see that progress is being made toward the solution of the task?
Click the Accommodations Button	Yes. The user understands that they need to click on the Accommodations button if they want to set testing accommodations.	The user found the button quickly as it was one of three main buttons on the home screen.	The user notices that one of the three main buttons on the home screen says "Accommodations." They click on this button with the assumption it will lead them to setting accommodation	Yes. After clicking the Accommodations button, the user is directed to the Accommodations form. This is a clear indication that they are making progress.

			s for tests they wish to schedule.	
Click the Select a Class drop down and choose CSCI 1301	The user understands that the drop down needs to be selected to pick a class as the label above it states select a class.	The user will easily find the drop down and see the class options after clicking it. The drop down provides a list of classes that includes CSCI 1301.	Yes. The user will be able to select the drop down and choose a class(CSCI 1301) they want to add testing accommodations to.	After choosing a class from the drop down, that class is placed in the input box letting the user know that their choice has been noted by the system and displayed as the class testing accommodations are to be set and provided for.
Select the Time and a Half check box	The user will see that there are two check box options available indicating what accommodations the DRC provides. They can also see that they can check the time and a half check box.	The user will easily find the check box options as they are on the same page as the Select a Class drop down.	Yes. If a user would like to have an extra hour and a half of time when taking their test at the DRC, they can assume that by clicking this check box they will receive that accommodation.	After selecting this check box, users will see that the check box will be filled in with a check mark and that the Set button will be highlighted blue. This will show that their selection has been processed.
Select the Reduced Distraction Environment	The user will see that there are two check box options	The user will easily find the check box options as they	Yes. If a user would like to have a reduced distraction	After selecting this check box, users will see that the

check box	available indicating what accommodations the DRC provides. They can also see that they can check the reduced distraction environment check box.	are on the same page as the Select a Class drop down.	environment when taking their test at the DRC, they can assume that by clicking this check box they will receive that accommodation .	check box will be filled in with a check mark and that the Set button will be highlighted blue. This will show that their selection has been processed.
Click the Set Button	The user understands that this button needs to be selected in order to set their testing accommodations for their class as the button says "Set."	This button can be selected only after filling out the accommodations form completely. Users will see that they can choose to select one or both accommodations. Then only will this button be available to be clicked as it will be highlighted a blue color. Users will see this transformation easily and understand when the button may be clicked.	Yes. The button says "Set" which indicates to the user that after clicking the button, their testing accommodations for their class will be set up.	After clicking the Set button, users will be notified through a message that they have successfully set accommodations and will receive email notification. This indicates to the user that they have completed their goal.

Schedule a Test Tasks:

- 1) Click the Schedule button
- 2) Click the Select a Class drop down and choose CSCI 1301
- 3) Click the Request Type drop down and choose the Exam option
- 4) Click the Date drop down and choose April 17 on the calendar
- 5) Click the Time drop down and choose 8:00 AM
- 6) Click the Add Exam Request button

Tasks	Will the user understand how to start the task?	Will the user notice that the controls/actions are available?	Will the user associate the correct action with the effect the user is trying to achieve?	Will the user see that progress is being made toward the solution of the task?
Click the Schedule Button	Yes. The user understands that they need to click on the Schedule button if they want to schedule a test.	The user found the button quickly as it was one of three main buttons on the home screen.	The user notices that one of the three main buttons on the home screen says "Schedule." They click on this button with the assumption it will lead them to a test scheduling form.	Yes. After clicking the Schedule button, the user is directed to the Schedule a Test form. This is a clear indication that they are making progress.
Click the Select a Class drop down and choose CSCI 1301	The user understands that the drop down needs to be selected to pick a class since there is a label above it that states to select a class.	The user will easily find the drop down and see the class options after clicking it. CSCI 1301 should be chosen as it is the only option that is highlighted a	Yes. The user will be able to select the drop down and choose a class, CSCI 1301, they want to schedule a class for.	After choosing a class (CSCI 1301) from the drop down, that class is placed in the input box letting the user know that their choice has been noted by

		blue color and is one of the class options listed.		the system and displayed as the class a test is to be scheduled for.
Click the Request Type drop down and choose Exam	The user understands that the drop down needs to be selected to pick what type of exam they intend to take as the label above it states that the drop down is for requesting the type of exam. Although, it may be confusing to select this drop down before the date drop down since the date drop down is to the right of the select a class drop down.	The user will easily find the drop down and see the type of test options after clicking it. The regular Exam option should be chosen as it is the only option that is highlighted a blue color, and it is one of the exam types listed.	Yes. The user will be able to select the drop down and choose the type of test they want to take.	After choosing a test type from the drop down, that exam option is placed in the input box letting the user know that their choice has been noted by the system and displayed as the type of test to be scheduled to be taken.
Click the Date drop down and choose April 17 on the calendar	The user understands that the drop down needs to be selected to pick a date as the label above it states that the drop down is for picking dates to take the test.	The user will easily find the drop down and see a calendar with dates to pick from after clicking the drop down. April 17 should be chosen as it is the only option that is	Yes. The user will be able to select the drop down and choose which date on the calendar presented they would like to take their exam on.	After choosing when they want to take their test from the drop down, that date is placed in the input box letting the user know that their choice has been noted by

		highlighted a blue color, and one of the date options on the calendar.		the system and displayed as the day they wish to schedule and take an exam.
Choose the Time drop down and choose 8:00 AM	The user understands that the drop down needs to be selected to pick a time as the label above states that the drop down is for picking times to take the test.	The user will easily find the drop down and see different times available for them to take their test. The time 8:00 AM should be chosen as it is the only option that is highlighted a blue color, and it is one of the times listed.	Yes. The user will be able to select the drop down and choose what time they would like to take their exam at.	After choosing what time they want to take their test from the drop down, that time is placed in the input box letting the user know that their choice has been noted by the system and displayed as the time they wish to schedule and take an exam.
Click the Add Exam Request button	The user understands that this button needs to be selected in order to submit their request to schedule an exam as the button says "Add Exam Request."	This button can be selected only after filling out the scheduling test form completely. Then only will this button be available to be clicked as it will be highlighted a blue color. Users will see this transformation easily and understand when the	Yes. The button says "Add Exam Request" which indicates to the user that after clicking the button, their test can be scheduled.	After clicking the Add Exam Request button, users will be directed to another page notifying them that they have scheduled an exam successfully and will receive email notification. This indicates to the user that they have completed

		button may be clicked.		their goal.
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Synopsis:

After going through our prototype, I found that the process of setting accommodations and scheduling a test were pretty smooth in terms of completing those tasks. There was a slight confusion when scheduling a test, especially for those who are accustomed to reading left to right, since it seemed that the next thing to do after selecting a class was to select a date. This was due to the placement of the drop downs, but selecting the request or test type came first after selecting a class which might be a bit confusing. The biggest issue stemmed from trying to apply accessibility settings as they did not appear to work. There was no save button that added clarification to the user that the settings selected would be applied to the interface, and after getting back to the home screen, the interface looked exactly the same as before. The home icon was not as easily detectable, specifically for those accustomed to reading from left to right, since it was not expected to be found in the top right corner of the screen. Setting testing accommodations and scheduling a test seemed straightforward as did applying accessibility settings except the system did not actually save those settings which would appear offsetting to a user.

Predictive Evaluation

Assumptions About User:

- Average typist (40 wpm) (0.28 sec / keystroke)
- Drawing a line using a mouse: 0.5 sec for movement across 25% of the screen
- User is somewhat familiar with the interface

Keystroke Level Model (KSLM) Evaluation

Choice of Technique

We chose to conduct a KSLM Evaluation on our system primarily due to the fact that our system is intended for use on desktop systems. If we had chosen a mobile-first design for our prototype, we would have likely considered a different technique. However, since our prototype is desktop-first instead, we decided to use the tried-and-true method of evaluating it with KSLM.

How Evaluations Were Conducted

Evaluations of each task using KSLM made a few assumptions to keep each evaluation consistent. The first is assumptions about the user, listed under the section “Assumptions about User” above, including their typing and cursor speed. The second assumption we made is that the user will always start each task from the Home screen, since a successful completion of another task always leads the user back to the Home screen afterwards. The table of KSLM operators and times is as follows:

Operator name	Description	Time (sec)
K	Pressing a single key or button	0.35 (average)
	Skilled typist (35 wpm)	0.22
	Average typist (40 wpm)	0.28
	User unfamiliar with the keyboard	1.20
	Pressing shift or control key	0.68
P	Pointing with a mouse or other device to a target on a display	1.10
P ₁	Clicking the mouse or similar device	0.20
H	Hoisting hands on the keyboard or other device	0.40
D	Draw a line using a mouse	Variable depending on the length of line
M	Mentally prepare to do something, e.g. make a decision	1.35
R _(t)	System response time—counted only if it causes the user to wait when carrying out their task	t

Task 1: Add the testing accommodations “Time and a Half” and “Reduced Distraction Environment” to your CSCI 1301 class.

Actions:

- **H** (home on mouse)
- **P** (point to *Accommodations*)
- **P₁** (click on *Accommodations*)
- **P** (point to *Select a Class* dropdown)
- **P₁** (click on *Select a Class* dropdown)
- **M** (decide which class to set accommodations for - assume CSCI 1301)
- **P** (point to *CSCI 1301* class option)
- **P₁** (click on *CSCI 1301* class option)
- **M** (review what accommodation options are available)
- **M** (decide if *Time and a Half* is desired for this class - assuming yes)
- **M** (decide if *Reduced Distraction Environment* is desired for this class - assuming yes)
- **P** (point to checkbox beside *Time and a Half* option)
- **P₁** (click checkbox beside *Time and a Half* option)
- **P** (point to checkbox beside *Reduced Distraction Environment* option)
- **P₁** (click checkbox beside *Reduced Distraction Environment* option)
- **P** (point to *SET* button)

- P_1 (click *SET* button)
- P (point to *Home* button)
- P_1 (click *Home* button)

Time:

$$\begin{aligned}
 \text{Predictive Time for Task 1} &= H + 7P + 7P_1 + 4M \\
 &= 0.4 + 7(1.10) + 7(0.20) + 4(1.35) \\
 &= \mathbf{14.9 \text{ seconds}}
 \end{aligned}$$

Task 2: Schedule an exam in your CSCI 1301 class of type "Exam" for April 17th at 8:00AM.

Actions:

- H (home on mouse)
- P (point to *Schedule*)
- P_1 (click on *Schedule*)
- P (point to *Select a Class* dropdown)
- P_1 (click on *Select a Class* dropdown)
- M (decide which class to schedule an exam for - assume CSCI 1301)
- P (point to *CSCI 1301* option)
- P_1 (select *CSCI 1301* option)
- P (point to *Request Type* dropdown)
- P_1 (click on *Request Type* dropdown)
- M (decide which type of exam to schedule - assume Exam)
- P (point to *Exam* option)
- P_1 (click on *Exam* option)
- P (point to *Date* dropdown)
- P_1 (click on *Date* dropdown menu)
- M (decide what day to schedule the exam for - assume April 17th, 2020)
- P (point to *April 17th* on the calendar presented)
- P_1 (click on *April 17th* on the calendar presented)
- P (point to *Time* dropdown)
- P_1 (click on *Time* dropdown)
- M (decide what time of day to take the exam - assume 8:00AM)
- P (point to *8:00AM* option)
- P_1 (click on *8:00AM* option)
- P (point to *ADD EXAM REQUEST* button)
- P_1 (click *ADD EXAM REQUEST* button)
- P (point to *Home* button)
- P_1 (click *Home* button)

Time:

$$\begin{aligned}\text{Predictive Time for Task 2} &= H + 11P + 11P_1 + 4M \\ &= 0.4 + 11(1.10) + 11(0.20) + 4(1.35) \\ &= \mathbf{20.1 \text{ seconds}}\end{aligned}$$

Task 3: Turn on “High Contrast Mode” and “Large Text Mode” in your profile accessibility settings.

Actions:

- **H** (home on mouse)
- **P** (point to *Profile*)
- **P₁** (click on *Profile*)
- **M** (decide which accessibility settings to activate - assume High Contrast and Large Text)
- **P** (point to checkbox of *High Contrast*)
- **P₁** (click on checkbox of *High Contrast*)
- **P** (point to checkbox of *Large Text*)
- **P₁** (click on checkbox of *Large Text*)
- **P** (point to *Home* button)
- **P₁** (click *Home* button)

Time:

$$\begin{aligned}\text{Predictive Time for Task 3} &= H + 4P + 4P_1 + 1M \\ &= 0.4 + 4(1.10) + 4(0.20) + 1(1.35) \\ &= \mathbf{6.95 \text{ seconds}}\end{aligned}$$

Analysis of Results

The results of this Keystroke Level Model Predictive Evaluation were in line with what we were expecting from our system. Task 2 took approximately 5 seconds longer than Task 1, which was expected due to its increased complexity with more options to consider for each dropdown menu. Task 3 on the other hand took only 6.95 seconds to complete, since it has significantly less complexity than the two previous tasks. Through this analysis, we can also see that a design that involves less dropdown menus and instead replaces them with radio buttons, sliders, or check boxes may cut down the time required for both tasks, since the time required to expand each dropdown menu starts to add up, especially on Task 2 where there are 4 dropdown menus to consider. In the future, a different type of predictive evaluation may be appropriate, considering a weakness of the KSLM is tasks involving conditionals.

Retrospective Testing Interview

Task 1: Setting accommodations for a CSCI 1301, then returning to the home screen

Actions	Feedback
Clicking on accommodations	Was not a problem, intuitive
Selecting 'CSCI 1301' under class dropdown	No feedback, straightforward
Selecting "Time and a Half" and "Reduced Distraction Environment" under accommodations	Also no feedback, straightforward
Pressing "Set"	It was intuitive to press set, but most participants thought the indication on the bottom of the screen that says they have succeeded in requesting the new accommodations could be more clear.
Selecting Home button	The users struggled slightly in finding the home button. They suggested they may have found it quicker if the home icon was larger and located on the left, as opposed to the right side of the screen.

Task 2: Scheduling a test with accommodations for CSCI 1301, then returning to the homescreen.

Actions	Feedback
Clicking on schedule	Was not a problem, intuitive
Selecting 'CSCI 1301' under class dropdown	No feedback, straightforward
Selecting Request Type	Users thought that they should select date next (if one was reading left-to-right), but the user is unable to select date before request type, which many participants said

	was confusing.
Selecting Date	Was not a problem, but in this prototype there was only one date available to be selected which oversimplifies the process.
Selecting Time	No feedback, straightforward
Pressing “Add Exam Request”	Participants had no problems with this, and actually preferred the full screen notification after this task to the smaller notification for task 1. Also, users said all of these success notifications should be consistent across the web application.
Selecting Home Screen	Like the previous task, the users struggled slightly in finding the home button. They suggested they may have found it quicker if the home icon was larger and located on the left, as opposed to the right side of the screen.

Think Aloud Evaluation

Researcher Script

Is it ok with you if I record this session?

[If yes, start recording]

Today you are helping us test a new prototype of a design for the Disability Resource Center’s testing accommodations portal. The goal of this design is to be as accessible and clear as possible. In order to test that, I will be asking you to complete a few tasks in the system, and think aloud as you do. Participation is completely voluntary, and you may stop at any time. Please remember that these activities are meant to test our design, not to test you.

In these activities our main goal is to learn about our users’ thought process when trying to complete a task. In order to do this, I will ask you to speak out loud the entire time you are completing the tasks. I do not want you to plan what you will say or try to explain to me what you mean. You should act as if I am not here, and you are simply speaking to yourself. If you are silent for a long period of time, I will ask you to continue speaking, but I cannot answer any questions once you start the task. That should not discourage

you from asking them though, as learning what kinds of information users are missing is helpful to our analysis. I can answer any questions after the session.

I will now demonstrate a think-aloud exercise to solve a simple problem: “How many rooms does my mother’s house have?”

[Demonstrate]

While I solved this problem in my head, the actual tasks will be on a computer. You will be looking for and noticing things on the screen, so I encourage you to vocalize those thoughts as well. Also, since this is a prototype, some of the options shown in dropdown menus will not be clickable, though there should be a visual indicator for which options are. Do you have any questions about the think-aloud exercise?

[Answer any questions]

[If you are conducting the test remotely]

I will now send you the link to the interface.

[Send]

<https://xd.adobe.com/view/85d770f3-c137-469d-476f-ab85eee49092-f3e6/screen/2b38d0b2-a215-4f24-ab9a-37c7e3638496/Home/?fullscreen>. Give them a moment to connect.]

I will now ask you to turn on screen sharing so that I can see your interactions with the interface.

[Confirm that screen share is working]

[If you are conducting the test in person, turn the screen towards the subject]

Here is your first task. Please read it aloud to get used to speaking out loud.

[Let them read it aloud]

Do you have any questions about the task?

[Answer any questions]

You may begin.

[Let them complete first task]

Good. Here is your second task, please read it aloud.

[Let them read it aloud]

Do you have any questions about the task?

[Answer any questions]

You may begin.

[repeat this part for the third task as well]

Thank you. Do you have any other questions?

[Answer any questions]

Alright, that's all for now. I will send you a questionnaire to fill out as well. It just asks a few questions about your experience with the design, and it should only take a few minutes.

[Send

https://docs.google.com/forms/d/e/1FAIpQLSeNFeVfisdGB7fs1cwal0Lm66Zssjn4u1E4TlaUMW8dAoYRvw/viewform?usp=sf_link]

Results

Task 1: Please request all possible accommodations for the class CSCI 1301, then return to the home screen.

Most subjects had no issue with this task, though one at first went to “Schedule” instead of “Accommodations.” This may have been due to the wording of the task. One subject was confused by the fact that the system was already logged in, but this would not be an issue in a fully developed system.

Task 2: Please schedule an exam for the class CSCI 1301 on April 17th, 2020 at 8:00 AM.

While no subjects had any issue completing this task, a few wanted to complete the form in a different order than we had set up (going left to right first instead of top to bottom). Supposedly in a fully developed system this would not be an issue, but it is something to keep in mind.

Task 3: Please set your accessibility settings to high contrast and large text.

This task caused the most trouble. Most of the subjects were confused by the lack of a “submit” or “save” button. One mentioned that their first instinct was to go to “Accommodations” instead of “Profile” while others mentioned that they were looking for a “Settings” button.

Questionnaire

Questions	Reason for Question
What is your name (Optional)?	To see which respondents had answered already so that if any were missing I could ask them.
What is your age?	To find any significant difference between

	age groups.
What is your gender?	To find any significant difference between gender groups.
Do you currently, or have you in the past, use a system like this to manage accommodations for a disability or other condition? 1. Yes 2. No 3. I'm not sure	To find any significant difference between people who had or had not used a similar system before.
Are you, or have you been in the past, a student at the University of Georgia? 1. Yes 2. No 3. I'm not sure	Used in conjunction with the previous question to find if there was any possibility of overlap with people who had used the current DRC system.
Describe how the design aesthetic of the platform makes you feel	To discover any glaring issues in the aesthetic design of the system.
Rate how frustrated you felt completing task #1: [not at all frustrated] 1 2 3 4 5 [very frustrated]	To discover whether or not the test proctor's assessment of the subjects' emotional states was accurate.
Rate how frustrated you felt completing task #2: [not at all frustrated] 1 2 3 4 5 [very frustrated]	To discover whether or not the test proctor's assessment of the subjects' emotional states was accurate.
Rate how frustrated you felt completing task #3: [not at all frustrated] 1 2 3 4 5 [very frustrated]	To discover whether or not the test proctor's assessment of the subjects' emotional states was accurate.
Rank the following sections of the application from easiest to hardest in terms of use: 1. Profile 2. Accommodations 3. Scheduling	To discover whether or not there was one section that clearly needed more work than the others.
Which section do you think you would use the most often if you were to use this	To discover which section should be the primary focus going forward.

system? 1. Profile 2. Accommodations 3. Schedule	
Would you agree with the following statement: “This was one of the better web applications I have used in terms of ease and efficiency.” 1. Yes 2. No	To discover whether our design goals were met.

The form above is an example of the questionnaire we gave to the participants. We used this Google Form as the actual questionnaire, with the same questions as above, to be provided to the participants:

https://docs.google.com/forms/d/e/1FAIpQLSeNFeVfisdGB7fs1cwal0Lm66Zssjn4u1E4TlaUMW8dAoYRvw/viewform?usp=sf_link.

Questionnaire Results

Most respondents had a positive reaction to the design, though one said “If I had a disability I might feel like the design was “talking down” to me.” Only one respondent ranked Task 1 at a “2” for frustration, the rest ranked it as a “1”. All respondents ranked Task 2 as a “1” for frustration. Three respondents ranked Task 3 as a “2” in frustration, while two respondents ranked it as a “1”. Respondents generally found the “Accommodations” and “Schedule” sections easier to use than the “Profile” section, but the question was improperly designed (allowed multiple sections to be marked for each ranking) so the data is not formatted as we had anticipated. All respondents said that they would probably use the “Schedule” section the most, and that this was one of the better web applications they have used in terms of ease and efficiency.

Results and Analysis

Results

From the evaluations and studies, we have drawn the following conclusions:

- Many subjects expected the order they can select dropdown menus across the app to be more flexible. This is a symptom of the prototyping system we used, but can still give us some information about the way in which users will “read” our interface. Some subjects parsed the screen from top to bottom (though that may be a side effect of the wording of the task), but some parsed it from left to right. In

the final product, nothing should be done to force the users to fill out forms in a certain order.

- At times, subjects struggled to find the home button in the corner of the screen. Some possible solutions are moving the home button to the left side of the screen and making it larger.
- Many subjects were confused by the lack of a “submit” or “save” button on the Profile page when they changed their accessibility settings. We should add a confirmation button for any form on the site, for consistency.
- The location of the accessibility settings may be confusing to some at first, but only a small number of subjects has this problem. More testing would need to be done to determine whether this needs to be changed.
- A couple users noticed there was a difference in the way the success messages were presented after setting accommodations and scheduling a test. We will make sure these success notifications are consistent across the interface to avoid any confusion.

Roadmap to the Future

If we had another semester to continue this work, there are several improvements we would make to enhance the user experience. With our prototype, we only accommodated for a specific use case involving a certain class and time required to schedule a test. In the future, we would implement functionality to allow the user to select from a variety of classes, test dates, and test times. Another future improvement would be to have accessibility settings persist through the entire interface if selected. As of right now, the accessibility setting only shows on the Profile page. This really served as a testing point to see how that would integrate into the interface design rather than become a persistent option. With more time, we would be able to create interfaces that correspond with the options selected. Once these modifications are incorporated into our prototype, we would focus on finding a larger sample size to test our product. This would include more individuals who are familiar with using the current system to schedule tests with accommodations as well as new users who have no experience with the older system. Upon receiving their feedback, we would adjust our design and fine tune our interface to better meet their needs.