

D!BS

Library Room Reservation (Mobile Version)

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Introduction

For our final project, we've chosen to critique and redesign the UCSD library room reservation mobile website, D!BS.

Link: <https://ucsd.evanced.info/dibs/>

Many students choose to study at Geisel and to meet with fellow classmates or club members in these study rooms because of the convenient library locations and privacy; however, they may face obstacles when trying to reserve these rooms. With the mass amount of users who often use this website to book rooms, we strive to redesign the website to better accommodate these users with more intuitive interface and a better understanding of their priorities.

The current mobile website fails to acknowledge that students prioritize what time each room is available and if the room can accommodate the capacity of their group. We were left frustrated and confused when we were expected to keep logging into our account in order to book the room we needed. Our group proceeded to interview users who often use the website and some who have never used DIBS in order to see how we can improve the website in our redesign.

We found the need to redesign this service because as students, we found value in the service that D!BS provides. Especially right now, during finals week, when Geisel is really crowded, it's very hard to find available space to meet for study groups or group projects. However, due to the tedious process that students have to go through in order to book rooms, they often don't take advantage of this resource.

Current Design

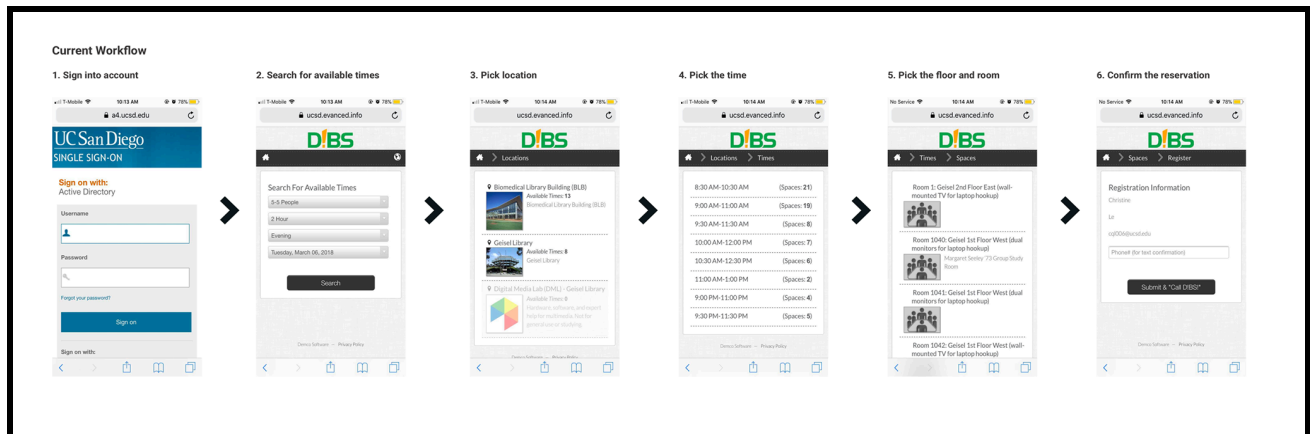


Figure 1: As seen in this series of pictures, booking one single room in a UCSD library can be confusing and tedious. There are certain language that can make the process confusing for users and the interface, in general, doesn't prioritize the needs of users.

DATA COLLECTION

Interview Methodology

For our interviews, we wanted to give our users a standardized task to test what difficulties they may face and how we can fix these problems to make our users more satisfied with the website. Each user was given the task to: reserve a room on the 5th floor in Geisel in the evening for 5 people. We wanted to approach our interviews with the **Master-Apprentice Model**, requesting each user to think aloud their thoughts and teach us how to use the website to reserve rooms. Our focus was to have our users show us their interaction with the website and what priorities they have when going through the process.

Some users are board members for organizations and prioritize the capacity of the room. Some users are members in group projects and prioritize the time available in order to accommodate to their members' schedules. Although they may have different priorities, they are all executing the same task - reserving a room. Therefore, a **universal task** is

needed in order to truly demonstrate the recurring problems in the interface in order for our group to observe how we can solve them.

With this universal task, we found many slips and mistakes with both experienced users and newcomers to the website. We wanted to understand how users navigate with the website, from the beginning of their Google Search to the end of the process with cancelling their reservation. We also did not help our users during our interview when they faced difficulties in the system, so we can clearly see where our users get frustrated and how to combat these problems.

The goal of our interviews was to discover how people book rooms and what are their priorities when going through the reservation process. We wanted to take into account if they were a **frequent user of DIBS** or **if they rarely used the website**, therefore, we asked how frequently they have used the mobile website during the quarter and compare it to how easily they navigate the website. There also seems to be a different layout for the desktop and mobile version, which results in inconsistency and confusion for the users.

We received **critique in studio** about our interview process and how to further implement the **Master-Apprentice model** and better highlight the **mental model** of the user. The users may each have a priority in mind, therefore, a different mental model when booking their rooms on DIBS. We agreed to have one standardized test that everyone completes and a suggestion to have another task that aligns with the user's needs. To increase the website's interaction with the user, we not only asked people how to use the website, but we told them we want to redesign the way people book rooms in Geisel, and we cared about how often they book rooms and for what purpose were they booking the rooms.

Interview Task

Find DIBS website on their phones through searching on browser (e.g. Geisel study rooms), sign in with the correct system, reserve a room for 5 people on the 5th floor of Geisel in the evening, successfully confirm reservation, and cancel the reservation.

Link to a screen recording of our task:

<https://www.youtube.com/watch?v=gH8-O-1Xy3g&feature=youtu.be>

Interview Questions

Interview Sheet

Note: Have them think aloud during the interview

1. Have you used DIBS before?
 - a. If yes: Continue with the rest of the interview
 - b. If no: Ask why
2. How many times have you used DIBS this quarter?
3. Do you usually use desktop or mobile?
4. How has your experience been with DIBs?
5. **Simulation**: Can you reserve a room on the 5th floor of Geisel for 5 people during the evening? And then cancel it?
6. Why would you want to reserve a room?
 - a. What's most important to you when reserving a room?
7. How was your overall experience?

Note: As you can see, there are few questions that are not open-ended - specifically questions 1, 2, and 3. We mentioned earlier that we utilized these questions in order to get a better understanding of the demographics of our interviewees. This allowed us to

effectively diversify our interviewees: first time users vs frequent users. Furthermore, these questions were an outline of our interview. Lastly, throughout all the interviews we conducted, we would usually ask follow up questions such as “what’s important to you when reserving a room?”

Problems & Trends

With our initial experiences with the website, it wasn’t difficult to recognize many design flaws and complications within the mobile site, such as technical errors and visibility issues. Through our interviews, we encountered more problems than we initially thought. 56% of users had trouble *finding the correct website*, due to the lack of keywords to find it on Google or any browser. Users would search different phrases, such as “UCSD library rooms” or “UCSD Library” and end up on the Library homepage instead of the correct website to reserve study rooms.

Current Default for Students

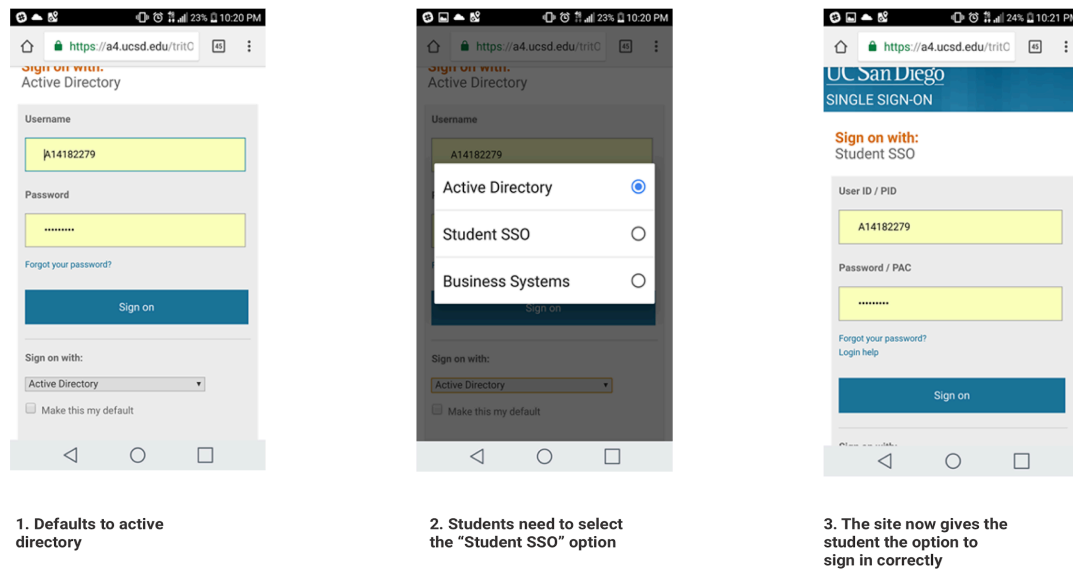


Figure 1.5: The current process for students when they need to sign into D!Bs.

Once users finally reach the actual D!BS site, Figure 1.5 shows the website automatically logs them into the “Active Directory” system instead of “Student SSO,” when ironically, it’s mainly students who use this website and reserve rooms. This login page is part of a UCSD system-wide interface, so our users would have familiarity or experience with this page beforehand and should have the knowledge to switch out of “Active Directory.” However, 11 out of 18 users skipped the step to change the system to “Student SSO”. This is classified as a **memory-lapse slip**, because our users had the correct mental model of logging in, but they forget to check whether it’s on “Active Directory” or “Student SSO.” The **gulf of evaluation** of signing-in is bridged by either positive or negative **feedback**. The user may receive the **positive feedback** of moving on to the next page, when they make the correct decision to change the system to “Student SSO.” When the user makes the error of not correctly changing the system, they receive **negative feedback** through red **signifiers** saying “incorrect username” or “incorrect password.” These **signifiers**, although pointing to the wrong error, help the user bridge the **gulf of evaluation** that they have made an **error** and forces them to start over and think of a new solution--changing the directory.

When proceeding in our task of reserving a study room, users had issues in selecting a room. There are no clear **signifiers** of which rooms are fully booked; the search results instead **constrain** the user's options by only showing them which rooms are available. If users clicked on an option and it didn't fit their needs, they had to keep going back and resetting their original search criteria. The navigation bar (Fig 3. shown below) on the site is meant to help facilitate going back between pages, by allowing people to click on "Times" or "Spaces" to go to that page. However, the bar itself was an easy to ignore **signifier**, since it was placed on the top of the page followed by a mass of information below it, and the "Times/Spaces" links did not **afford** clicking. People would instead go back through their phone's "back" button. This worked for some people, but for other people, depending on their phone, they would get an error message when going back.

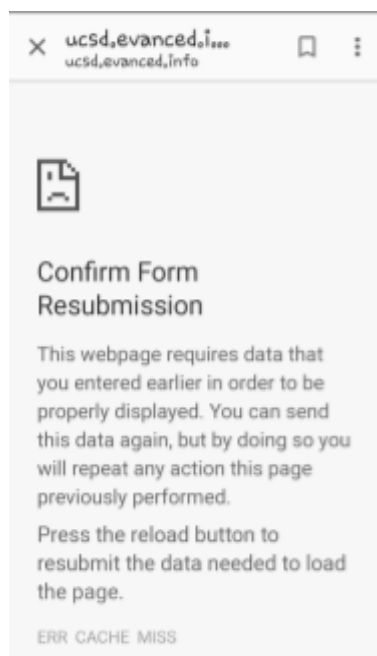


Fig 2. Error Message when going "back"

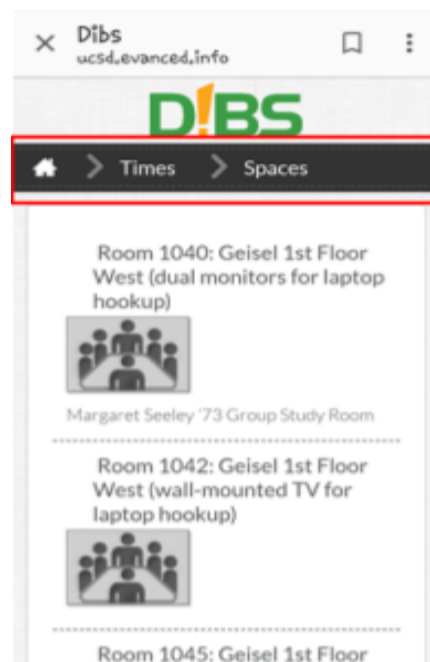
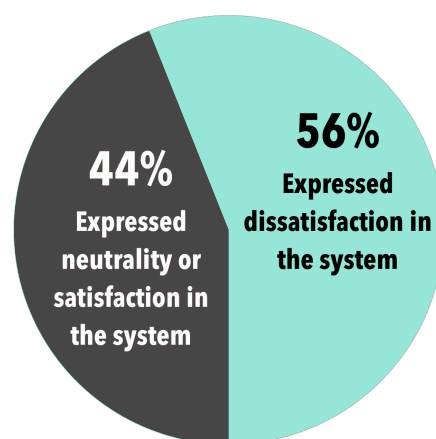


Fig 3. Navigation Bar Circled in Red

After confirming their room reservation, we asked users to cancel their reservation. 5 out of 18 users made the **knowledge-based mistake** of checking the website or their confirmation text message first for a cancellation link, when in fact, it is made available through their email confirmation.

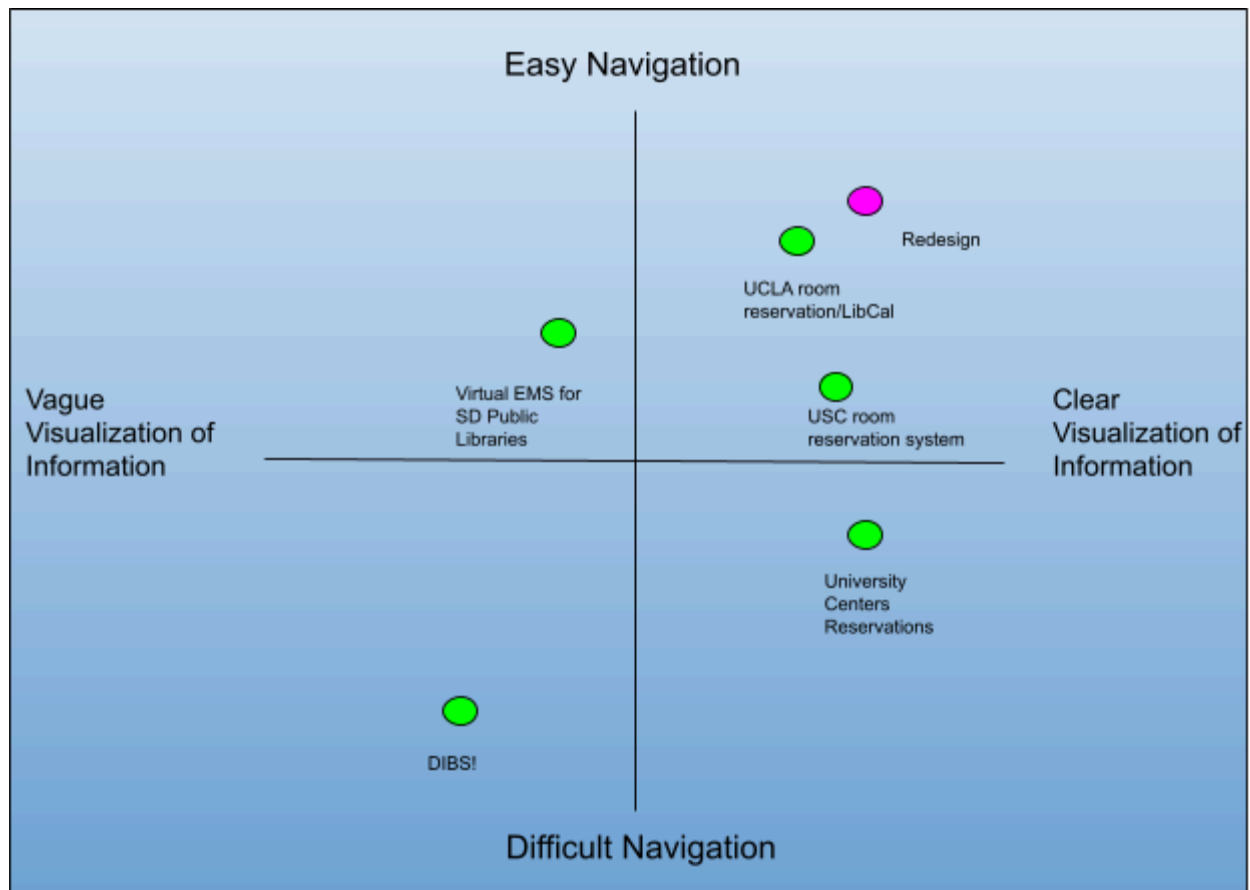
Other technical errors that we experienced with D!BS was that the website was down multiple times and didn't allow submitting reservations at one point. We found these problems significant because they hinder a lot of students from utilizing this resource. Overall, people were able to complete our interview task; however, as shown in the figure below, 56% of users expressed dissatisfaction with the system. Some things said by our users were that they were "annoyed" by the "small features" and that it was "confusing" because there were "too many steps." 7 out of the 12 experienced users said they preferred the D!Bs desktop interface more than the mobile version, because it allows them to see the scheduling of rooms better and the desktop site is "easier" than the mobile version. Ultimately, we see these discomforts as easy-fixes that we could make to improve the user's experience.

HOW USERS FEEL ABOUT THEIR D!BS EXPERIENCE



DESIGN SPACES & REDESIGN

Design Space



In our design space, our two axes are “Navigation” and “Visualization of Information.” On the horizontal axis, the far-right end represents “Clear Visualization of Information” while the far-left represents “Vague Visualization of Information.” This axis represents how easily and quickly the user connects the information presented on the screen with a recognizable **mental model**. For example, our redesign offers the option of choosing the date for a study room through a clickable calendar. Much like how our main competitor, LibCal (UCLA’s room reservation site) does. This allows the user to instantly visualize the upcoming dates in relation to the current day and would fall closer to the right-end of the axis, toward “Clear Visualization of Information.” Meanwhile, the current DIBS! design asks users to

select a date through a scroll-down option, simply listing the days and date underneath each other in consecutive order. This option requires more reading and forces the user to take a moment longer to consider the date they want in relation to the day they are reserving it. This design falls closer to the left-end of the axis, towards “Vague Visualization of Information.”

On the vertical axis, the top represents “Easy Navigation” and the bottom represents “Difficult Navigation.” In our design space, “Navigation” refers to the user’s ability to go from one screen to another and be able to go back to change a response, like their preferred date or group size. UCLA/LibCal’s site has their calendar and room booking program all on the same page, eliminating the need to go through several pages, making it easy to navigate. However, since phones have small screens and the UCLA/LibCal site has a lot of information, the user has to scroll more than in other sites. This is a minor inconvenience, but still allows the UCLA/LibCal site to fall under “Easy Navigation.” The current DIBS! falls under “Difficult Navigation,” because there is usually an “ERROR” screen when a user goes back to a page and it requires to them to resubmit all their information all over again. Through our interviews, we also noticed that some users took more than five minutes just to reserve a room, this data confirms that the current design has difficult navigation. Lastly, the current DIBS! interface fails the three-click test that our redesign passes. The three-click test allows users to find any information about the service/app and complete their task with no more than three clicks.

DIFFERENT RESERVATION SYSTEMS					
CRITERIA (WEIGHT)	REDESIGN	CURRENT D!BS	UNIVERSITY CENTERS	UCLA RESERVATION	SD PUBLIC LIBRARIES
Aesthetic (4)	+	- -	+	+	-
Visual Aids (3)	++	-	+	+	-
Efficiency (5)	++	-	-	+	+
Usability (5)	++	-	-	+	+
NET VALUE	30	-21	-3	17	3

We used a design chart in order to create our design space. For our chart, we included four criterias there were highlighted during our interviews: aesthetic, visual aids, efficiency, and usability. Aesthetic and visual aids are graded in order to determine the placement of each system on the horizontal axis of the design space. We defined aesthetic through colors, neatness, and organization. On the other hand, we defined visual aids as different pictures, signs, and fonts that allow user to easily view the system. Efficiency and usability are pertaining to the vertical axis which is navigation. When using each system, we observed how long we were able to reserve a room. Lastly, we defined usability as having enough signifiers and feedbacks to navigate through the system easily. Some questions we kept in mind: Did the three-click rule apply? How was our overall experience?

Final Redesign

REDESIGN: <https://tinyurl.com/dibsredesign>

INTERACTIVE: <http://bit.ly/RedesignDibs>

For our final design, we wanted to keep three things in mind: three-click rule, colors and visual aids, and simplifying steps. After disseminating all our data gathered from interviews, we've observed three core problems: usability, visualization, and efficiency. Throughout our

sketching phase, we made sure that any features we add or changes we make, it will fix these three core problems.

To fix the **problem of usability**, we added several signifiers all throughout the design. One of the biggest features we added to fix the problem of usability is our navigational breadcrumbs. By adding this feature, users are able to keep track of their location within the application. We found this very convenient for users because they're able to navigate through different steps easily. For example, if the user is already choosing the specific room and time but they want to change the location, they can just click the home button on our breadcrumb and it will take the user directly back to the location page. By adding this feature, we're also implementing the three-click rule because users have clear signifiers to navigate through different levels of the application. Another problem a lot of users faced with the current design is the confirming and/or cancelling the reservation. Thus, for our final redesign, we added more signifiers on the confirmation page. On the confirmation page, we added options for user to either receive a text confirmation or an email confirmation. After submitting the reservation, we added another button that allows user to cancel their reservation. These two new features will lessen errors that we've observed. For example, if users pick email confirmation, they'll know to check their email; and vice-versa. Lastly, we added a feature that allows user to filter which floors they want to make it easier for them to choose rooms of their preference. In our interview, users had different purpose in reserving a room. For example, if users wants a room for a quiet study jam, they can easily filter the upper floors in Geisel where the noise level is down. On the other hand, if users want a room for project meeting, they'll probably want to reserve a room in the lower floors of Geisel and the filter feature will most likely make it easier for them to do so.

Another problem that one of our interviewee expressed was that the “**interface isn't really clean and polished.**” Thus, we want to fix the aesthetic of the application while keeping it

clean and minimalist. A prominent feature we added is the new grid to choose pick and rooms. In this grid, users are able to see the date, time, and rooms all in one page. It's very clear and concise. We also added two distinct colors all throughout the application -- green and red. Visually, green would mean yes and red would mean no. Similarly on our redesign, we utilize green for availability and confirming your reservation while red signifies unavailability and cancellation. In selecting the date, we added a calendar to improve users visualization. This allows user to envision the time and date better -- rather than just giving a long list of dates (in reference to the current design).

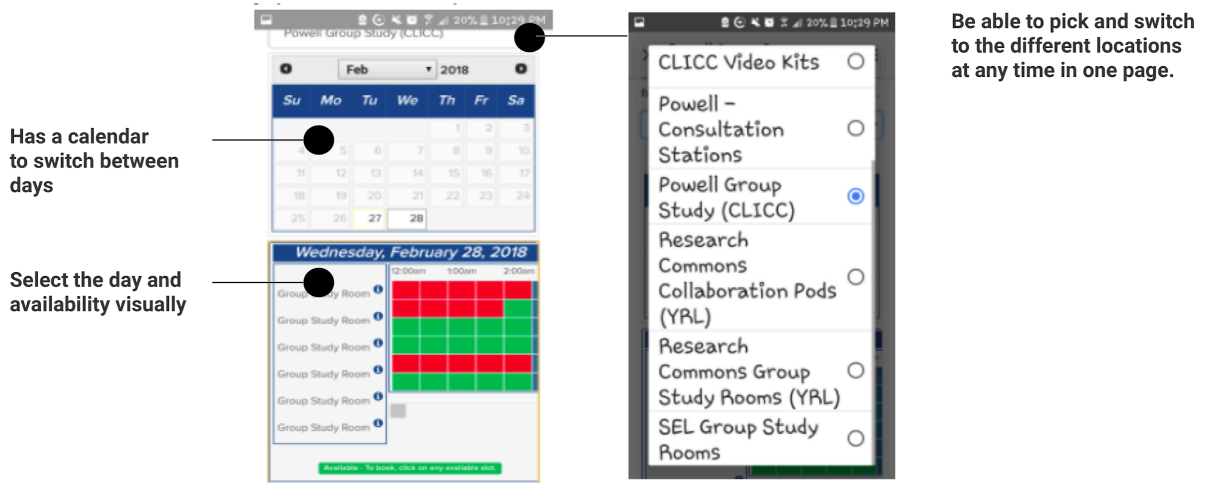
The last problem we want to tackle is the **inefficiency of booking rooms**. Another user mentioned how he probably wouldn't use this app because it was too tedious. One of our goals was to minimize the steps by optimizing every page. This can be viewed in the "picking time and room" page. In this page, users will be able to change dates rather than going back to the previous page. Furthermore, to immediately cancel reservation, users don't have to look for their confirmation email since we added a cancellation page at the last page. If people don't want to filter the size of the room, the navigation breadcrumb will allow them to jump straight to picking time and room.

Trade Offs

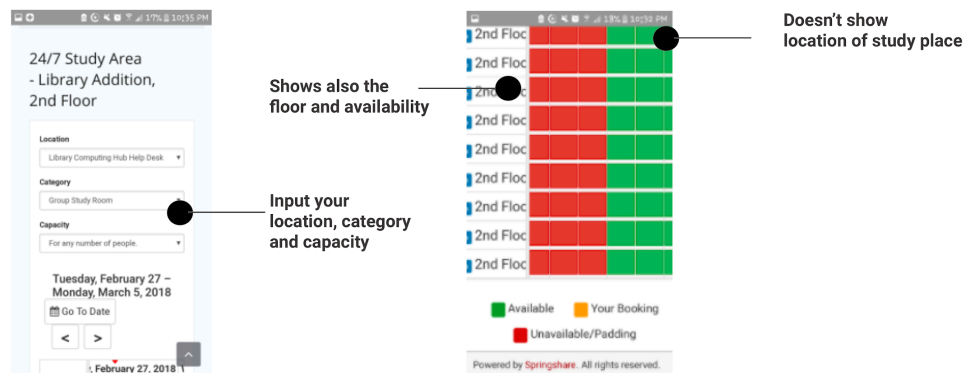
In the current D!Bs website, it asks users to constrict their options by first selecting a time frame (morning/afternoon/evening) and their period of reservation (0.5-3 hours) along with their preferred date and room capacity. However, this **constrains** the different time options that users may want to explore and forces them to start their search all over to see different time and period options. Our redesign **trades off** narrowing down user choices in order to have a greater visualization of their options and to prevent the need to constantly navigate between the reservation page and the home page to reserve their room. Another feature we wanted to implement was the ability to navigate between Geisel and Biomedical Library when making a reservation by having them present as a tab, however, we **traded**

off this idea in order to allow our selection screen to be bigger and more spacious without multiple tabs. Another **tradeoff** is that our redesigned room selection process requires users to hold and scroll to highlight the room they want. This may cause some **action-based slips** from accidentally pressing the wrong time slot, however, it requires fewer clicks and allows for clearer navigation as opposed to checking off each individual time and having to go back and forth between screens.

UCLA



USC

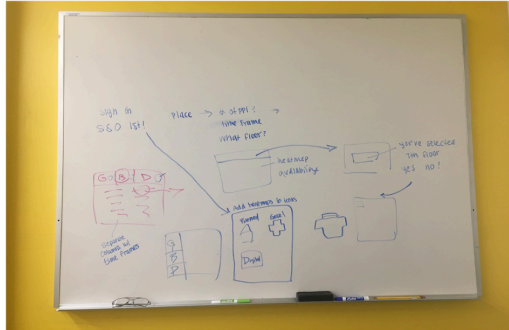


Other room reservation systems, such as UCLA and USC, allow a clear visualization for the user to see which days and which locations are available through the use of a calendar and a color-coded feature that signifies when each room is available. With the color-coded monthly calendar view, users can easily navigate between different days to fit their priorities, but a **tradeoff** they will encounter are many **action-based slips**, which may occur when the user may perform an action that was not their original intention. In this situation, examples of these **action-based slips** are: if the user clicks on the wrong

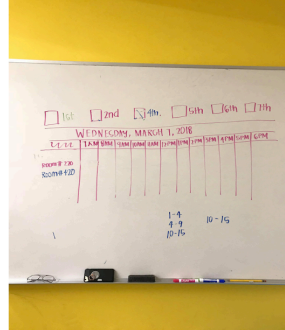
time-slot, clicks on a room they did not intend to reserve, or have trouble scrolling through different times and accidentally select time-slots. A feature that we also observed on other schools' websites is a "*Back*" and "*Next*" option for each page. This offers the users the option to correct or modify a response they may have previously inputted into the system, although the **tradeoff** is the addition of more steps, therefore making the room reservation process longer, more time-consuming, and less efficient.

PROTOTYPE

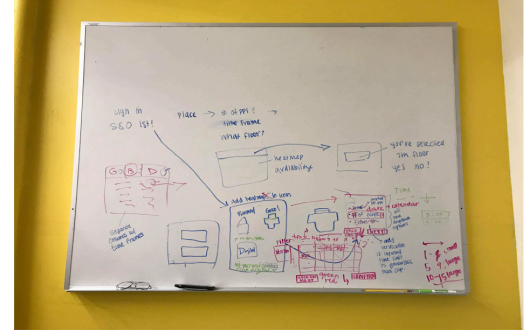
Sketches



Trying to figure out the order of each page



**Rough sketch of “pick
time & room”**



What features should we add? Take off?

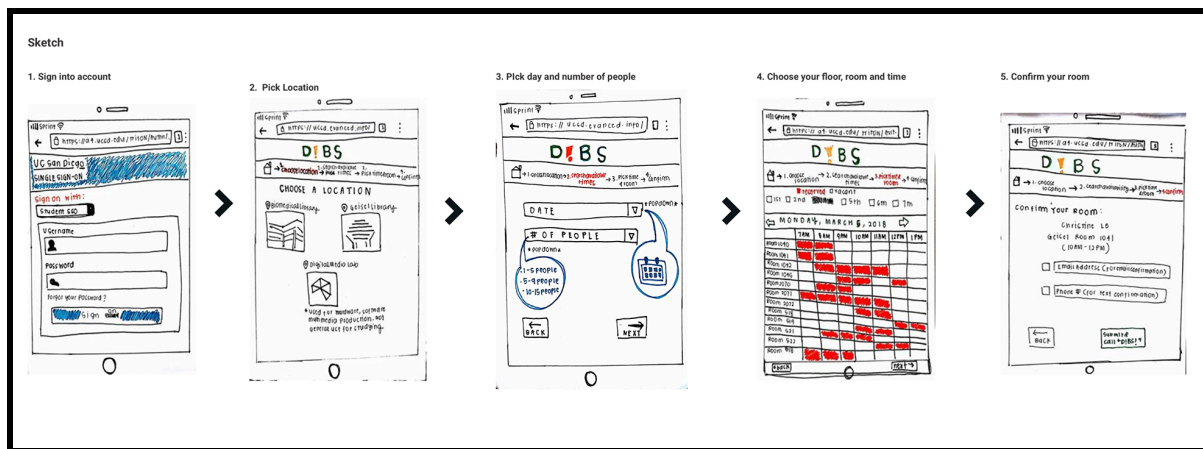
We began our redesign process by sketching different ways we can redesign the application. This really helped us brainstorm all the features that we add into our redesign and it gave us room for error since we used a whiteboard. In the first picture, we were trying to figure out the order of each page. As you've seen in the current design of D!BS, the order of each page isn't very conducive. Users have to pick a time before picking the room and/or floor. For our redesign, we wanted to prioritize the order of the page because we wanted to make sure users are able to navigate through different preferences easily.

In the second picture, you can see the rough sketch of “pick time & room” page. In this sketch, we’ve already figured out that we wanted users to **visualize** the important factors in reserving a room: availability, floor, date, and time. In one page, we’re able to condensed all these important factors and we managed doing so with such minimalist aesthetic since users did mention that the current design wasn’t “polished.”

In the third picture, we were trying to figure out which **features** to add. In specific, we wanted to add a heatmap for each location. This will help users visualize how impacted each floor is for every location. However, after discussing as a group, we figured that this would be more useful for an application looking for a general study spot, not a study room.

Another feature that we thought of was having a location tab for each page. Through this, users are able to navigate through different locations in every page. However, we thought this would be too distracting for users and it wouldn't really solve any of the core problems we've discussed. Instead, we added the navigation breadcrumbs so users can still navigate between different locations easily.

Initial Prototype



As you can see through our initial paper prototype, we've already included a lot of features that will be implemented into our final redesign. While doing the paper prototype, we've constantly made changes that we found would make our final redesign more effective. First, in the pick and time page, it's not very polished -- for instance, the filter feature wasn't clear. When we first conducted the paper prototype, we also didn't have the date on this page. We added it very last minute. In our paper prototype, there's no confirmation page that shows your confirmation and most importantly, the cancellation button. This was only added after we thoroughly discussed the paper prototype and figured the importance of that page. Also there are minimal improvements we made from paper prototype to actual redesign. First, for navigational breadcrumbs, we took off the numbers because it was making the feature too crowded. Also, we saw that the pick location page had too much negative space. For aesthetic purposes, we restructure our pictures to better fit the page.

During our **prototype** stage, we explored different **alternative designs**. Mostly, the order of each page; considering which preferences would be most important for users. However, based on our interviews, though some people really puts importance on time, our data still showed a spectrum of preference. Thus, we figured that the navigational breadcrumb would fix the issue of reordering the pages. Also, other features we wanted to implement were also discussed and discarded during the sketching part.

CONCLUSION

For most of this project, we focused on the first step of the **double-diamond process**, which is ***finding the right problem***. The problem we found through our interviews was that many users were not able to book rooms based on their priorities and the website limited their options. If we had more time and resources, we would move on towards the second half of the **double-diamond process** and test our redesign with a sample group. We would observe their interactions with our redesign and adjust our current redesign based on collected data. This would allow us to create more **iterations** of our redesign until we come up with a design that we feel best works for the UCSD student population. Our goal, if we were to continue reiterating this redesign, would be to design a function that gives users more options and to change the way people book rooms based on our repeated interview testings. This newer redesign would include things that we weren't able to add to our first redesign. For example, a "My Reservations" page that displays the user's reservations, so that they can cancel and check their reservations within the website and not be confused by different text and email messages. Also, if we had enough time and resources, we would team up with UCSD to fix the sign-on page. The sign-on page was the biggest issue we found; however, since the sign-on page is managed by UC San Diego, it was not something we could simply fix for D!BS, it would have to be something implemented systemwide to all UCSD websites. Finally, instead of just changing the mobile website view, we would make D!BS its own mobile app.