

# Evaluation - CS 352 Group 4

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**ABSTRACT -- This paper discusses the evaluation of our 2D planning website. We will be using our evaluation plan to gather information for our prototype, and record the results of the analysis. We, as a group, will then include our own insight on how to improve the prototype based on our analysis and interview results.**

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## I. INTRODUCTION AND SUMMARY

This paper presents the results and insights of the evaluation we planned and completed this week. Last week we formulated an evaluation plan that consisted of two parts: an analytical analysis based on heuristic principles and an empirical evaluation completed with a potential user. The analytical analysis was completed by our team members, providing insight into how our prototype could be improved based on known usability principles. In our original plan this part was to be completed before the empirical evaluation. However, due to timing constraints it was completed in conjunction with the user evaluation of the prototype. The empirical evaluation was completed by one of our team members with a potential user of our 2D website. We had them complete a relevant task and recorded their responses to our prototype on a prepared handout. The information from both the analytical and empirical analyses has given us areas of improvement for our prototype which we will implement in the next iteration.

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## II. ANALYTICAL RESEARCH

### *Goals:*

Before our prototype can be evaluated by potential users, we must set standards that can be evaluated on a professional level. This includes functionality, consistency, recovery, and learnability of our interface. Users can provide some of the most important critiques with regards to usability (after all, they will be the ones using it!), however the prototype must follow some standards to be comprehensible for someone outside of the developmental scope. This is what makes analytical research so important before continuing on to user testing.

### *Outline:*

Three group members conducted analytical evaluations. Keeping the aforementioned goals in mind, it was determined that each evaluation shall be completed with reference to Nielsen's ten heuristic principles for good interface design. Our team did this using prepared sets of questions and tasks to be analyzed.

### *Nielsen's Ten Heuristic Principles:*

1. Visibility of system status
2. Match between system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design

9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

#### *Analytical Questions:*

The following questions were developed for prototype analysis and discussion. They encompass the ten principles listed above and make an effort to develop each concept with regards to our prototype.

1. Does our system provide feedback to the user so they know what is happening? How so?
2. Does our system use terms and concepts that are common to the real-world? Are we avoiding jargon and system-oriented terms?
3. Is our system easy to navigate?
4. Is our design consistent?
5. Does our system avoid user error when possible? Do we provide enough clear information to the user so they can understand and resolve the issue?
6. Are the icons we use intuitive? Are tasks and icons clearly labeled?
7. Is our site intuitive to use? How long does it take for the user to perform a basic task (i.e. create a layout)?
8. Did we design the website with only the necessary items displayed? Did we avoid the use of irrelevant information?
9. If an error occurs do we provide a solution? Is the solution easy to follow and understand?
10. Can the user find help when they need it? Is the help section concise and complete?

As each team member completed the chosen tasks, we returned to these questions and noted any issues or concerns. The tasks that we focused on included: profile creation, layout creation, furniture creation, furniture placement on the layout, learning using the help

documentation, and printing or saving the layout. We chose these tasks because they are essential to the use of our website, and these tasks will be common to most users.

We then collected the responses and compared responses to pinpoint obvious issues or common concerns. We then used this information to improve our prototype's user interface so that it conforms to Nielsen's heuristic principles. Initially, we had planned to complete the analytical evaluation before our empirical research, however, due to time constraints with our members we were unable to achieve this. Nonetheless, both the analytical and empirical evaluations provided valuable insight. And in the end, the changes that we came up with from analytical evaluation were fairly minor, so it did not affect the empirical evaluation to a great degree.

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### **III. EMPIRICAL RESEARCH**

#### *Goals:*

This form of research is important in gathering more specific critique from users. As developers/designers, we are, to a degree, biased. Often, those who will want to use the tool are a great source of feedback since they can discuss what works and what doesn't while keeping in mind their own desire for certain functions, styles, or layouts. They don't necessarily have any preconceived inclination for these features like a developer might, meaning they may or may not like a function, but it is based purely on how they view the tool, rather than work or effort that went behind making the prototype.

In this way, critique from users may be more abrasive, but necessary to properly understand what will be well received in a final production.

#### *Outline:*

First off, we want to understand who might represent our potential audience. Isolating some candidates to interview can provide us with useful feedback from people who may care more about this tool. We discussed the image of a user in Project 6 as , “users that have moved recently or often would be a particularly useful for our research, including but not limited to students living off-campus. The majority of these students move into new houses or apartments multiple times while living in Corvallis for school. These users would have experienced moving furniture into different rooms with varying dimensions and space. They would have the most use of our application both for overall helpfulness and usability.”

We will be collecting evaluation data as a user and interviewer walk through the prototype. During the interview(s) we will fill in the evaluation form based on observations, conversation, and user feedback. We will also keep track of completed tasks and how long they took, with or without assistance.

#### *Feedback to Note:*

1. Take notes when user look confused with the task.
2. Take notes when user ask for definition of words on the UI.
3. Take notes when user performs unintended actions.

#### *Tasks To Evaluate:*

1. Create a profile.
2. Create a new floor plan.
3. Create a new piece of furniture and place it.
4. Search for a piece of furniture and place it.
5. Share your floor plan with someone.
6. Save and export your floor plan.

#### *Follow Up Discussion Points:*

- Ask about the user’s opinion of the interface. This includes appearance, functionality, ease of access, and learnability.
- Ask about areas that seemed more frustrating. Why are some areas more confusing or difficult? What can be improved?
- Additional questions based on reactions noted above.

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## **IV. RESULTS AND INSIGHT**

Our analytical evaluation using Nielsen’s heuristics allowed us to scrutinize our current prototype for any issues with user interface. By reviewing the basic tasks and consulting our questions, we were able to consider using the prototype from a user’s perspective. Through this work, we were able to notice certain problems that could easily be addressed.

One issue that was noted in the prototype was the lack of a delete or undo button on the layout page. This would be an issue falling under the 9th heuristic principle, not providing a solution to errors. This would be an easy fix for the prototype and would greatly improve the user’s ability to fix their mistakes or adjust their designs. We may want multiple ways for a user to do this action. Deleting could be available as an ‘x’ or ‘trash can’ by each object in the ‘user objects’ window. It could also be available as a general delete icon on the editing frame where a user can drag and drop objects to be removed.

Another fix to the prototype would be to label our menu icon. Since it is small and not obvious in the corner of the screen it could be easy for an unfamiliar user to miss it or not know what it is for. By adding a simple label to the menu, we can make it clear what the purpose of that button is. This would fall under the 6th

heuristic principle, having icons that are clearly labeled. This would increase the menu's visibility which would then allow users to accomplish tasks such as sharing, exporting, or getting help.

Another possible addition to the prototype is a button or option to make the document strictly private, shared, or public. This would come before collaborators, so a document set to strictly private will no longer be accessible for collaborators. This follows the idea of having standards and would be one for security and privacy.

The empirical evaluation still shows that the UI requires further improvement. It might look decent for those who are more experienced with these online tools, but the basic concepts in the prototype still might not be obvious to some users. For example, the sharing setting resembles the invitation setting of Google Doc

and the contributor setting of GitHub. Some people might not be familiar with this design and fail to use ours.

Also, our prototype needs the model for creating furniture. This feature will be crucial for user's experience.

Apart from these issues, the tester can easily get his hands on the user interface since we made the prototype simplistic and straightforward. We should keep this principle as we improve our design in the future.

## V. PROTOTYPE

### Welcome Page



### Login Page

RoomSketch

Login

### Log in to RoomSketch!

Email

Password

[New to RoomSketch?](#) [Create a new Profile!](#)

Login

## Creating a profile

RoomSketch

Login

Welcome to RoomSketch!

First Name

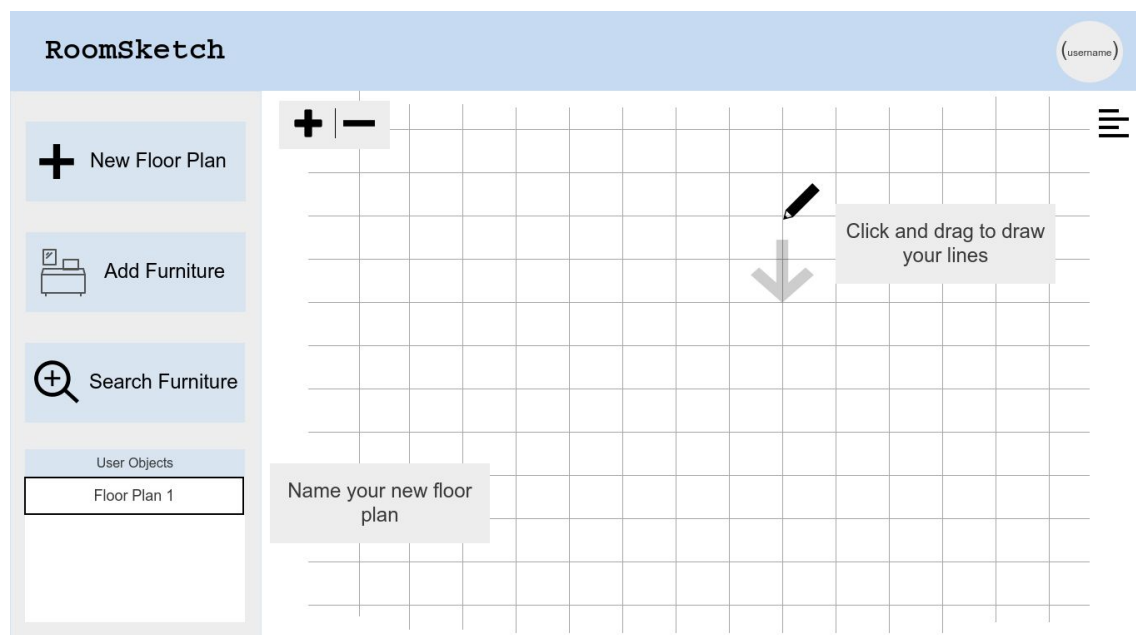
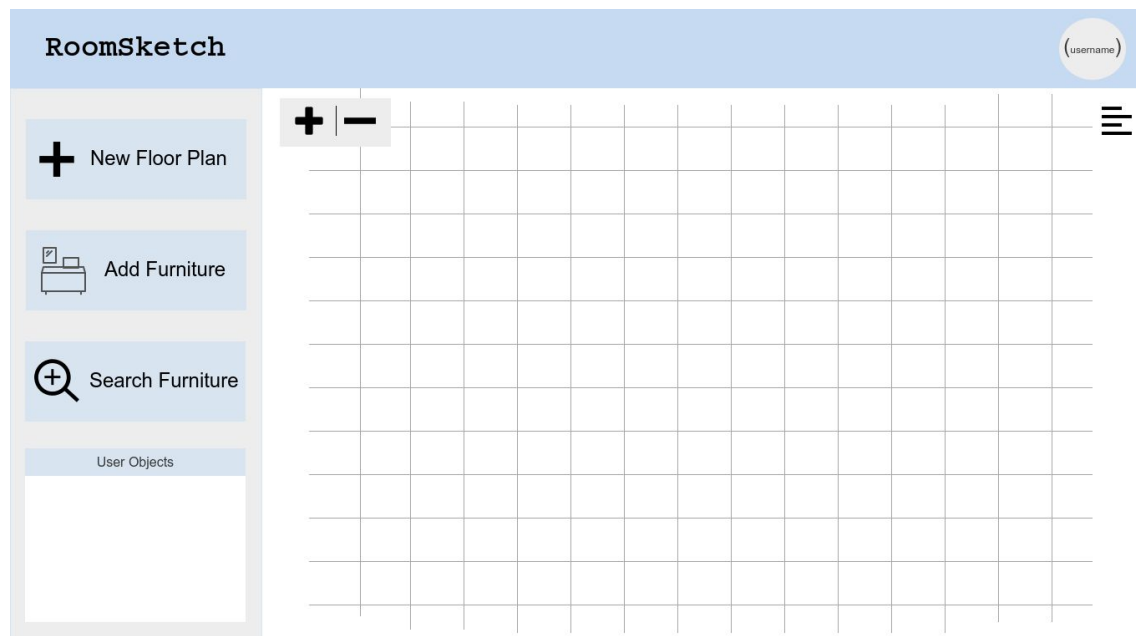
Last Name

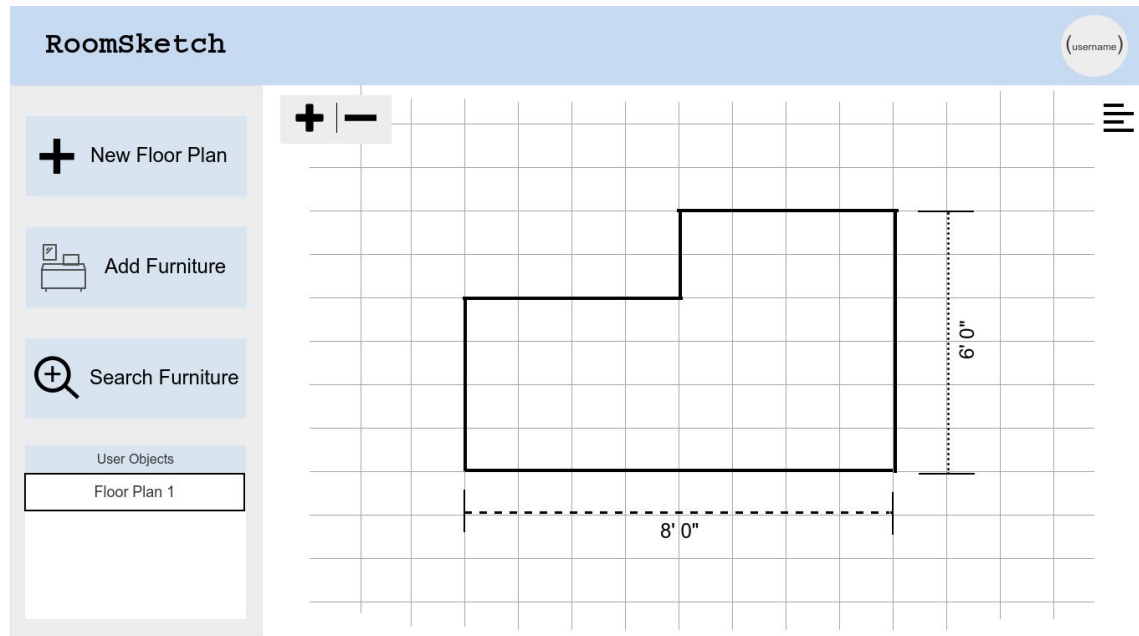
Email

Password

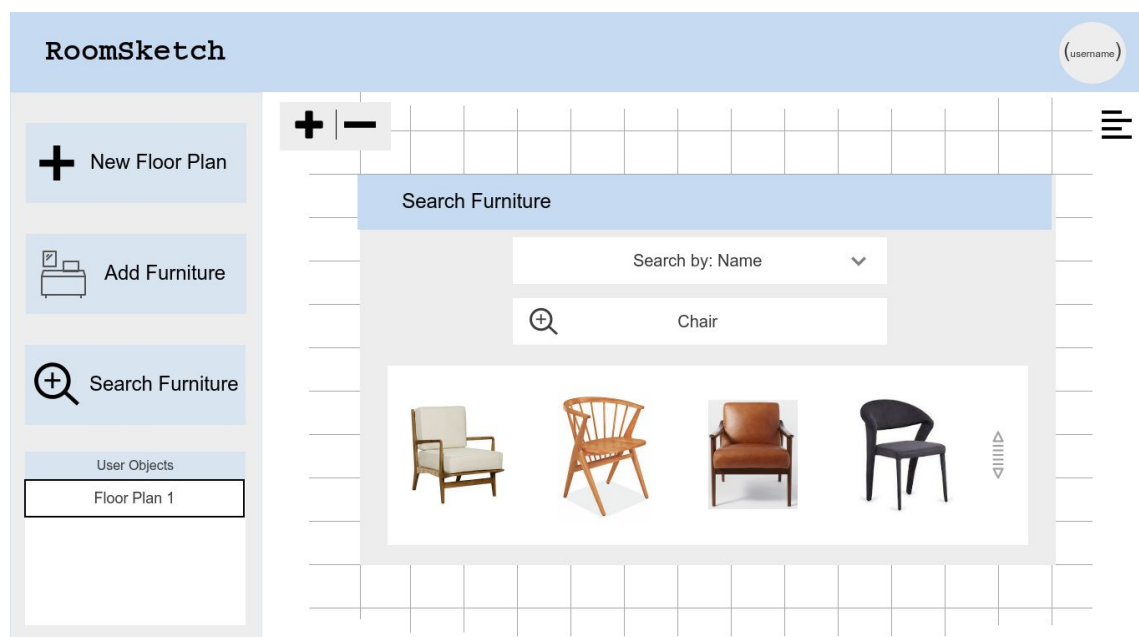
Join Now!

## Creating a new floor plan





## Search Furniture





Placing Furniture

RoomSketch

(username)

+ New Floor Plan

Add Furniture

Search Furniture

User Objects

Floor Plan 1

Chair 1

+ | -

Drag and drop onto your layout

8' 0"

6' 0"

Share your floor plan with someone/ Sharing Settings

RoomSketch

(username)

+ New Floor Plan

Add Furniture

Search Furniture

User Objects

Floor Plan 1

Chair 1

+ | -

8' 0"



6' 0"

Save

Export

Share

Help

 New Floor Plan Add Furniture Search Furniture

User Objects

Floor Plan 1



Chair 1



## Sharing Settings

## Add Collaborator

## Collaborators



Can Edit



Can Edit



Can View

Save

Export

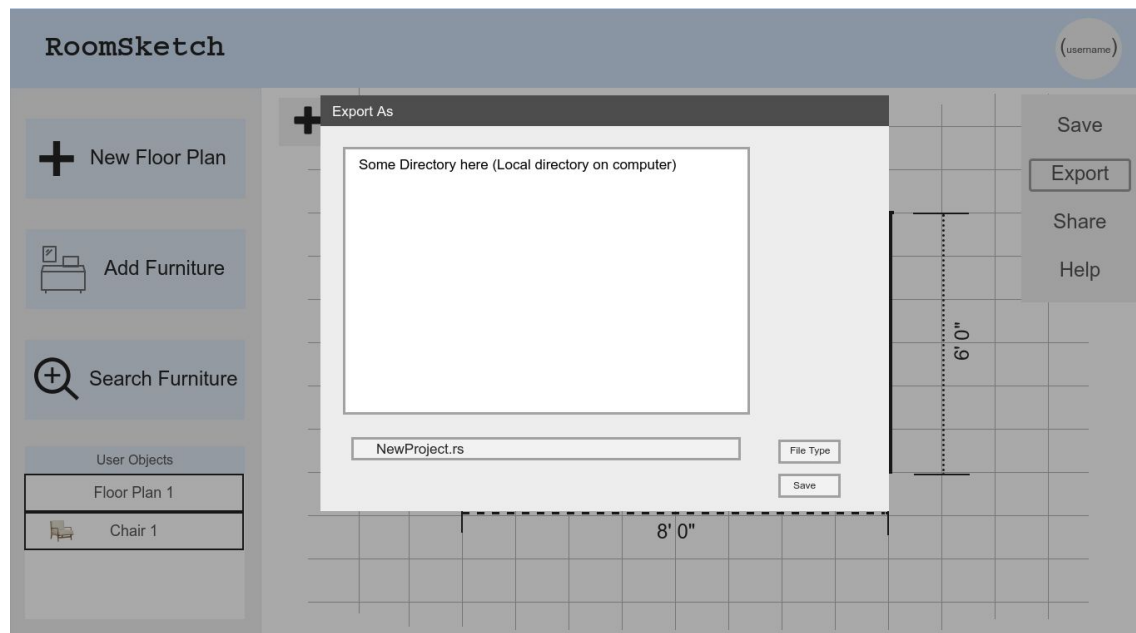
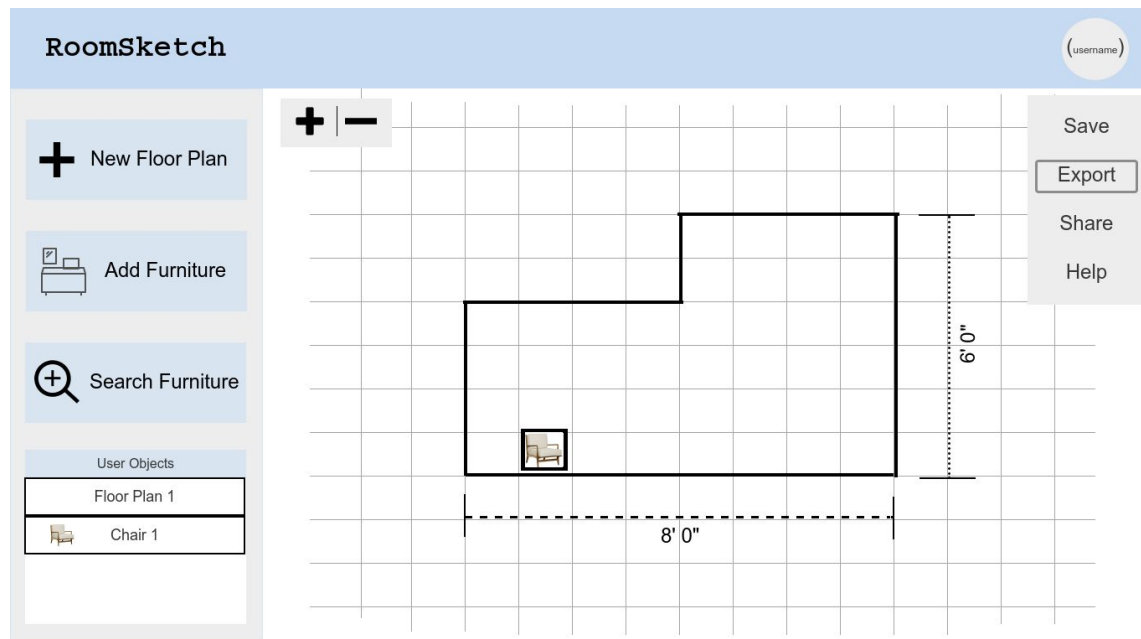
Share

Help

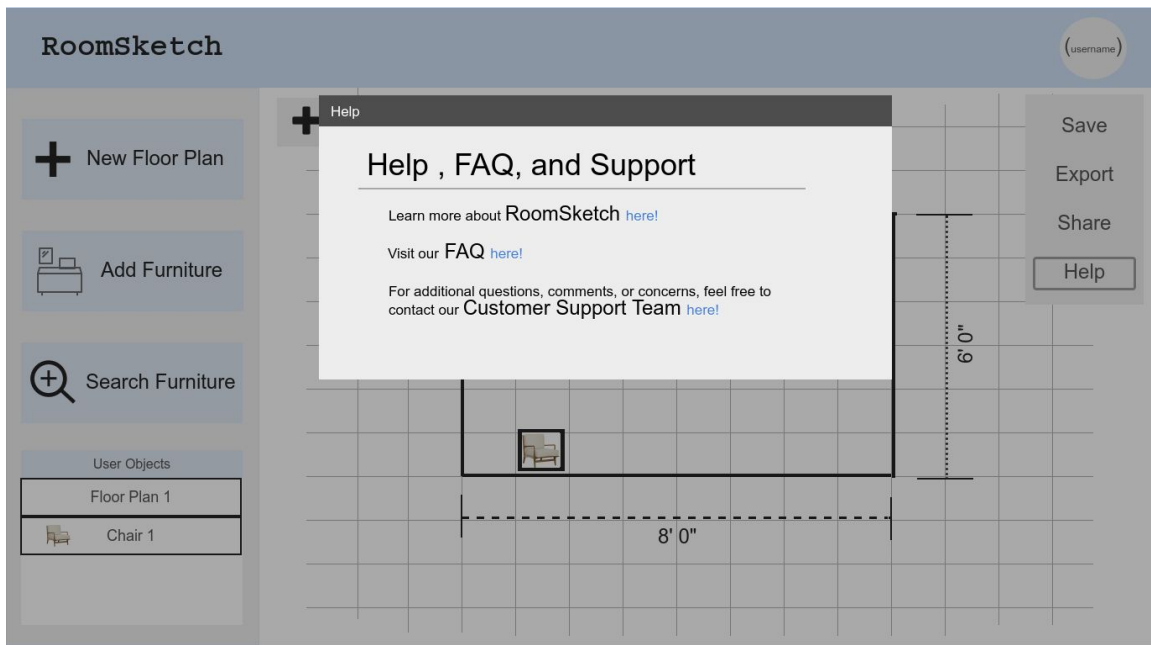
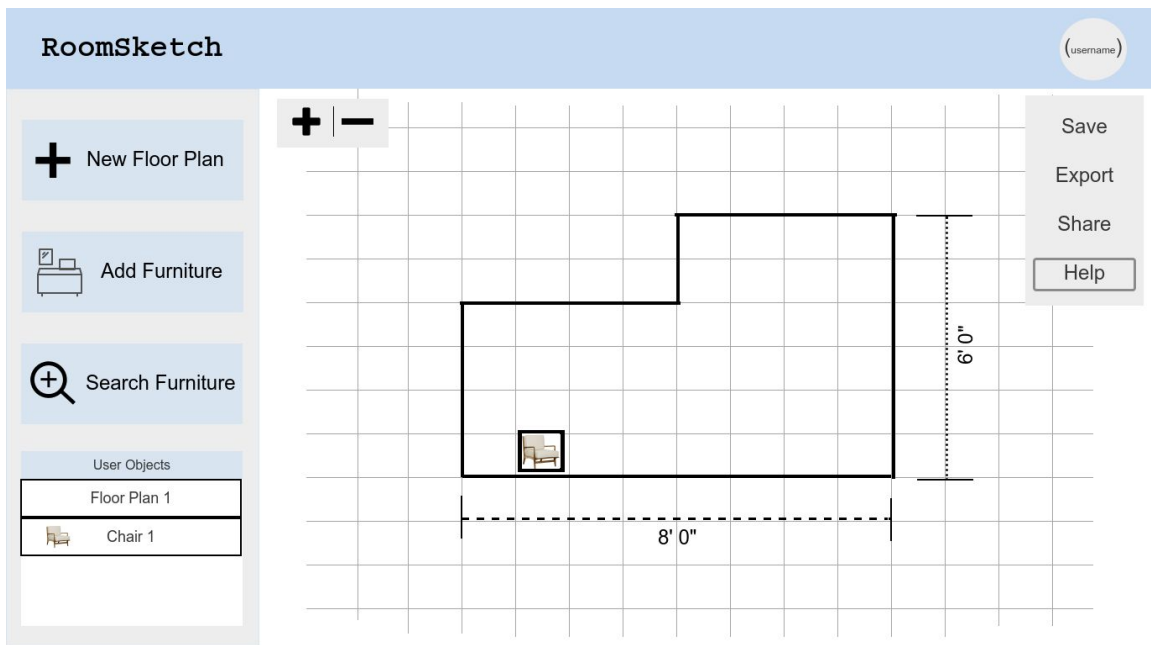
6' 0"

8' 0"

**Save and export your floor plan.** Layout for saving and exporting are the same with exception for the directory section which will either contain the directory of documents on the website or local ones on the user's computer.



Help Pages



## ANALYTICAL EVALUATION A

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### Victoria Dmyterko - Heuristic Analysis

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#### Questions:

1. Does our system provide feedback to the user so they know what is happening?  
How so?
2. Does our system use terms and concepts that are common to the real-world? Are we avoiding jargon and system-oriented terms?
3. Is our system easy to navigate?
4. Is our design consistent?
5. Does our system avoid user error when possible? Do we provide enough clear information to the user so they can understand and resolve the issue?

#### Notes:

1. Yes, our design for the website should give immediate feedback to the user when they draw their designs on the grid or drag and place an object such as furniture onto the layout. They should be able to see their layout come together in real-time as they create it.
2. Yes, I believe we used wording that was simple and easy to understand. That way people can use the website without confusion.
3. For the most part, we could add a few more transitions or tutorial sections to really make clear how to use the site. Also, the menu is small and unlabeled, so it is possible for people to not find it or know what it is.
4. Yes, we keep the color and style relatively consistent.
5. Buttons are large and clear which helps avoid user error. We could add more functionalities that might help reverse errors such as an undo button, a delete function (for furniture), and an erase feature (mostly for the layout outline). We would want to include help documentation, and do provide a help section on the menu.

6. Are the icons we use intuitive? Are tasks and icons clearly labeled?

7. Is our site intuitive to use? How long does it take for the user to perform a basic task (i.e. create a layout)?

8. Did we design the website with only the necessary items displayed? Did we avoid the use of irrelevant information?

9. If an error occurs do we provide a solution? Is the solution easy to follow and understand?

10. Can the user find help when they need it? Is the help section concise and complete?

6. I think several of them are intuitive, however, the menu could be better labeled or pointed out and the measurements could be better labeled. For instance what if the user would like to use a different metric such as meters rather than feet? I think the desk icon could be better on the add furniture button, but it was the best one I could find on the prototyping site.

7. Yes, our site is pretty simple and straightforward. It should be super quick for the user to create a layout because they simply need to click and draw the lines to create a basic shaped outline of their living spaces. It might take longer if they have to delete and redraw lines due to mistakes. Adding furniture will take a bit more time because they will either have to search for the right piece of furniture or create their own.

8. Yes, our website only has the bare necessities. In fact, in might even need a few more things added to make it more enjoyable for the user.

9. At this point in time it is difficult to anticipate errors since this isn't a working product. We try to make our buttons and design simple and easy to understand to mitigate possible user errors. As mentioned, we can add undo/delete/erase options so that users can correct errors. If they have questions then we have provided the help section in the menu to redirect them to FAQs or customer support.

10. If they know where the menu button is, then they can easily find help since there is a help button available. Once clicked on it presents a pop-up that gives more information about the website, the FAQ

section, and a way to contact customer support. The actual help documentation is not actually made at this point in the prototype, so the last question can't be fully answered. We also don't yet know what common issues or questions will come up, so we can't create an adequate help document quite yet.

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## ANALYTICAL EVALUATION B

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### Alison Jones - Heuristic Analysis

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#### Questions:

1. Does our system provide feedback to the user so they know what is happening?  
How so?
2. Does our system use terms and concepts that are common to the real-world? Are we avoiding jargon and system-oriented terms?
3. Is our system easy to navigate?
4. Is our design consistent?

#### Notes:

1. Feedback is provided through the interactive interface. **There aren't any direct notifications for help or warnings. This might be good to include for edge cases (drawing off the grid or entering invalid requests).** Smaller help notification or request for help might be useful as well as a (short and simple/ or skippable) tutorial for new users.
2. Our system as a whole doesn't have a lot of words on the interface. A few things that I have been cautious around are sharing terms. This means using terms like 'shared with,' 'can edit,' and 'can view' instead of 'can read,' and 'can write'. While these terms are pretty easy to understand, they may confuse readers not used to them (the latter are more programming oriented words that can be made easier to understand for everyday users).
3. For the most part, our system is pretty limited and it would be difficult for a user to get lost or be unable to figure out the actions they can take. A simple and straightforward help section or even a simple beginner **tutorial** could assist with this.
4. Color and style are consistent and often replicated.



5. Does our system avoid user error when possible? Do we provide enough clear information to the user so they can understand and resolve the issue?
6. Are the icons we use intuitive? Are tasks and icons clearly labeled?
7. Is our site intuitive to use? How long does it take for the user to perform a basic task (i.e. create a layout)?
8. Did we design the website with only the necessary items displayed? Did we avoid the use of irrelevant information?
9. If an error occurs do we provide a solution? Is the solution easy to follow and understand?
10. Can the user find help when they need it? Is the help section concise and complete?

5. Help sections are the main form of user error avoidance. The interface is also simple enough where buttons are pretty obvious. A few that are symbols and not labeled (like the options button) have been given common symbols (gear for settings) that are often used on other websites for similar purposes. We do lack a few tools for object manipulation such as **undo and delete features** (these definitely should be added!!!)
6. As said in question 5, many of our icons used either match the label (chair for furniture) or are similar to other icons used for similar actions in other interfaces.
7. Tasks are pretty quick to complete. The user can make a layout before even signing up if they just want a quick tool to check measurements without the hassle of making an account.
8. Our site has only necessary things (some extra items were taken out since the original design and the prototype is more streamlined. The problem is that we may be missing features. Ultimately, no unnecessary items are shown, however some items might need to be added to make usability easier.
9. A user can make a new document and consult help about confusion or errors, but something to note is a lack of undo or delete options. These could be added to the 'object frame' to delete objects in case a user messes up.
10. Users can easily find help by going to the options > help section. Links for Documentation, FAQ, and Support are available. Additional page-specific help

comments and mini tutorials may help  
introducing a new user to the tool.

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## ANALYTICAL EVALUATION C

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### Jonathan Chen - Heuristic Analysis

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#### Questions:

1. Does our system provide feedback to the user so they know what is happening? How so?
2. Does our system use terms and concepts that are common to the real-world? Are we avoiding jargon and system-oriented terms?
3. Is our system easy to navigate?
4. Is our design consistent?
5. Does our system avoid user error when possible? Do we provide enough clear information to the user so they can
6. Are the icons we use intuitive? Are tasks and icons clearly labeled?

#### Notes:

1. Yes, the user will be able to see the visual changes made to their furniture objects being made while they edit them. Users will also be able to move their furniture by dragging it around the space.
2. Yes, the main terms being used have to do with the furniture itself. Our target users would be homeowners or renters, and the language used would be easy to understand.
3. Yes, there are menus with direction and indication of their function, however a tutorial system could be implemented. Either a video tutorial showing how to use the website, or a pop-up that explains how to use each menu function and what it does as the user clicks on the menu items.
4. Yes, the interface doesn't change drastically while the user is using it and does stay consistent.
5. There aren't many items on the menu, and they are spread out enough to show very clear buttons.
6. The icons do indicate the menu functions clearly, they could still guide users without labels. The labels are short and concise. Although the "User Objects" label that shows the user's current layout could be renamed to "My Furniture" or "My Layout".

7. Is our site intuitive to use? How long does it take for the user to perform a basic task (i.e. create a layout)?
8. Did we design the website with only the necessary items displayed? Did we avoid the use of irrelevant information?
9. If an error occurs do we provide a solution? Is the solution easy to follow and understand?
10. Can the user find help when they need it? Is the help section concise and complete?

7. Yes, the main three actions can be created with one click of the corresponding button, this leads them to the rest of the steps needed to finish their layout organization. The labels give enough information for the user to figure out how to finish the process of creating furniture and adding to their layout.
  8. Yes, only necessary information and buttons are presented. There is nothing unnecessary or extra displayed on the page. The buttons are placed in ideal spots so that the user is able to navigate and locate them easily.
  9. The current prototype has a dropdown menu that gives access to a FAQ and tutorial that will help prevent errors.
  10. Yes, the drop down menu gives them access to the Help menu which will give access to the FAQ and customer support for the website.
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## **EMPIRICAL RESEARCH RESPONSE**

### **Interviewee:**

The interviewee is Zhuohong Gu's roommate. He major in Political Science major and Education minor. He is not a tech-savvy person but still has general knowledge of how modern mobile/web application works. The empirical research was conducted in his room, using interviewer's iPad as the prototype.

### **Task 1: Create a profile.**

When I asked him to create a profile, I was expecting him to click the "Login" button first, since he is not supposed to create layout before providing credentials. He instead clicked the create layout button. It was easy for him to find out the only two buttons he will be choosing from, but he clicked the second button first. In our evaluation plan, user is supposed to push the "login" button and then the "Create Layout" button. However, the fact that these two buttons appear in the same page makes the procedure impossible. The page will have to redirect the user to the login page when they haven't logged in yet and click on "Create Layout".

I brought him to the actual log in page and asked him to log in. He just clicked on the Login button. I reminded him that he does not have any input in the email and password field. He told me that he would then fill in these field. I reminded him again that he does not have a account, so he could not log in even though he fill in the field. It took him quite a while to look for the solution. After waiting for about 30 seconds, I gave him a hint of the "New to RoomSketch? Create a new Profile!" link. He moved the iPad closer to his face so he could actually read the link. Then he clicked that link and filled in his information in the following page and clicked "Join Now!". At this point Task 1 is done.

### **Task 2: Create a new floor plan**

I asked him to create a new floor plan. He saw the button on the side with the text "New Floor Plan", so he clicked on that button. There was supposed to be a naming modal for the floor plan creation, but we don't have the prototype picture for that now, so I just skipped to the picture where the floor plan creation is successful.

### **Task 3: Create a new piece of furniture and place it**

We skipped the part of outlining the floor plan since it's not included in the task. There were actually no pictures for creating new furnitures so we skipped to the searching part. In fact adding a furniture and searching for furniture buttons look generic. Search furniture will get a furniture object from a preset database. It does the same job as "Add Furniture", except it is only able to add a special furniture.

### **Task 4: Search for a piece of furniture and place it.**

I asked him to search for a furniture and place it on the floor plan. He clicked the “Search Furniture” button and chose the last chair to be added. I continue to the next page, where a tutorial shows him the way to place chair onto the map. He easily followed the tutorial and finish the task.

#### **Task 5: Share your floor plan with someone.**

I asked if he could share his floor plan with someone. He said he would screenshot the webpage and share first. I implied that he should use the built-in feature of the website to perform the task. He thought for about minute and tried to click on the “Username” icon on the up right corner of the page. I showed him the dropdown menu, and he chose the export at first. I suggest him to try out share option and he followed. He was a little bit confused about the meaning of the sharing setting modal, so I had to explain the meaning of modal to him. He did that probably because he was still thinking about exporting the floor plan and share it with his friend on social media instead of sharing it inside the platform.

#### **Task 6: Save and export your floor plan.**

There was no indication that he needs to save the floor plan before exporting, so he just went for the export option in the dropdown menu. The UI does not make user feel like they need to save or they will lost their progress. In fact, modern online document processors like Google Doc would not require manual save since the client and server can work together to autosave every changes.

In addition, I asked him to try seek help if he had any problems. He chose the “Help” option in the dropdown and said he would choose FAQ first before going through other options.

## **CONTRIBUTIONS**

Alison Jones, Visual Design:

- Some Formatting
- Analytical Research Goals
- Reviewing and Editing of Documentation.
- Empirical Research Goal and Objective
- Some Results and Insights
- Analytical Evaluation
- Completeness: 5

Victoria Dmyterko, Leadership:

- Introduction
- Analytical Research Description
- Analytical Evaluation
- Part of Results and Insights
- Completeness: 5

Jonathan Chen, Writing:

- Abstract
- Analytical Evaluation
- Completeness: 5

Zhuohong Gu, User Communication:

- Empirical Evaluation
- Results and Insights for Empirical Evaluation
- Completeness: 5