

[Pabio Product Design Report]

[Group 26]

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1 Design Problem

The problem that Pablo aims to solve is the lack of high-quality interior design and furniture options for renters that is also affordable. As mentioned on the website of Pablo, a lot of renters struggle with the cost and uncertainty of furnishing a full apartment interior, and often have to resort to cheap furniture that does not match or fit well in their apartments. This leads to a lack of beautiful and functional living spaces for renters and a lot of dissatisfaction. This app aims to solve this problem by offering rent-to-own furniture and a personalized interior design service to make beautiful living spaces more affordable and accessible to renters.

The output that we hope to achieve with this application is to provide affordable and high quality furniture and designs to renters. Specifically, our aim is to: Offer a plethora of furniture options that match any styles and preferences of our customers, Provide personalized interior design services to help renters create beautiful living spaces that they would not have been able to with conventional methods, Implement a rent-to-own business model

The target users of this app are renters, possibly university students and people early in their careers, who desire to have a beautiful home space but the costs and commitment of purchasing high quality furniture hinders this goal. This app is also meant for people who move frequently and even general homeowners that may want to experiment with new styles and tastes or just get interior design advice. Directly impacted by this business will be the renters themselves, who will be using the application to rent furniture. On the other hand, landlords will be impacted indirectly as they may benefit from renters being more willing to move as their furniture problems are solved. Furniture stores will also be indirectly affected as they could see a decline in sales with a service like this present.

2 User Research Planning

This section focuses on the preparation required to gather user research information. It involves identifying a focus area to determine which problem needs to be addressed. Additionally, a discussion guide is necessary to aid in gathering information related to the focus area. By the end of this process, a comprehensive understanding of the problem is obtained, and a method for acquiring information from users is established.

2.1 Focus Setting

When conducting user research, creating a focus setting is crucial. This means identifying and defining the particular area that the research aims to address, whether it's a

problem, opportunity, or a question to explore. Having a clear focus helps to give direction and clarity to the research. Without that, the research could become too broad or vague, making it very difficult to get useful insights. That's why creating a focus setting helps to ensure that the research is specific and relevant to the objectives.

For our focus setting, the goal was to understand how furniture owners make decisions on where to buy their furniture, what to buy, and methodology used to make that process happen. We also sought to understand how they characterize their whole experiences, identify the barriers and obstacles they face throughout this process accommodating their time, schedule, and preferences.

2.2 Discussion Guide Creation

A discussion guide is a document that describes, in detail, questions and activities we will utilize during the interview process. The purpose of a discussion guide is to ensure that the research stays on track and that the researcher covers all the relevant topics. It also helps to ensure consistency in the research, as all participants will be asked the same questions or presented with the same topics. A well-designed discussion guide is critical for effective user research. It should be carefully crafted to ensure that it covers all the key topics and questions that the researcher wants to explore.

There are multiple different parts in the discussion guide such as the introduction we give to our interviewees, key demographic questions to get the basic information from them such as their name, age, profession, etc. Some warm up questions that are more based on getting factual answers to questions which will make the interviewee feel comfortable and set them up to give good answers for the main questions that are open ended in their structure and involve participants in sharing their personal experiences to answer the questions. To give an idea of what the questions look like, here are some examples: How long have you been renting/owning your current place of living?(Demographic question), Did you purchase the furniture in your house/apartment or did it come with the place?(warm up question, and Walk us through your step-by-step process of buying furniture online? (main question).

The general rule of thumb for a discussion guide is to make questions as open-ended as possible. The more in depth questions should always be broken down into multiple parts so that the participant can understand the question thoroughly and answer them to their full potential. Our group kept in mind to keep the questions neutral and also employed layman's terminology to help the users answer the questions. We also focused on keeping the discussion guide centered around stories and experiences.

3 User Research: Focus Groups/Interviews

In this section, the goal is to cover the method of data collection, including how interviews were organized and participants recruited. This section also explores information acquisition and

recording, and the participation of group members. Additionally, we will discuss the overall outcomes of the interviews, which will be presented in the form of transcripts, notes, recordings, and signatures as evidence of participation.

3.1 Recruitment Process

To gather up information from the questions in the discussion guide, target users and participants are needed. Recruiting the participants allows us to have a discussion about our focus questions. The target users of this app are renters, possibly university students and people early in their careers, who desire to have a beautiful home space but the costs and commitment of purchasing high quality furniture hinders this goal. This app is also meant for people who move frequently and even general homeowners that may want to experiment with new styles and tastes or just get interior design advice. The methods that we followed to recruit users was to put the word out there amongst family and friends to find the perfect participants that fit the target users criteria. Most of our participants were college students and around the same age as us. The challenges that we faced due to this was that we were not able to get much input from early professionals and homeowners, who may have a different viewpoint or experience than the college students. This challenge was overcome as we tried to incorporate the participants talking about how their experience was going with their parents and such, which helped us visualize a broader perspective. Another challenge we had was accommodating everyone's time constraints as not all the participants and facilitators had time to come together for one focus group. We solved this issue by conducting 2 focus groups accommodating everyone's time and kept the focus groups around 20 minutes. In total we recruited a total of 6 participants.

3.2 Participants

Whenever conducting focus groups you would always want the most feedback and inputs to get a successful outcome. For those reasons we had a total of 6 participants participate in our focus groups/interviews. We held 2 interviews with 3 participants each to accommodate everyone's time frame. The key demographics of most of our participants were college students who rented apartments or college students who lived with their parents house or apartments. All of our participants had experience with purchasing furniture, ordering furniture online, and the things they liked/disliked about it. A focus group would not be useful if the participants have no connection to the topic or problem we are trying to overcome, so we had to make sure our participants matched the criteria of our ideal target user and were people who would benefit from us implementing this app. This would include making sure if the participant was either college student, early professional, or a home/apartment owner.

3.3 Focus Groups/Interviews

A focus group can be defined as a group session where people are asked to express their perceptions, opinions, beliefs, and attitude towards an idea/product. They are conducted to uncover user needs and wants. Our hope from the focus groups we conducted was to get as

much input we get from the participants, their likes/dislikes about the whole topic of purchasing furniture, introducing the idea of renting furniture and getting their inputs on that including understanding their needs and what are the things that they would expect out of such an app. In total, we had 2 focus groups conducted each with 3 participants. This was done in order to work around the participants' availability. We wanted to respect our participants' time so we decided to keep each focus group around 15-20 minutes so that it won't bore them out and we will not be able to get their best answers. During the focus group, to confirm attendance the participants were asked to sign their names and signatures on a signature sheet. We did choose a design probe activity just to give a basic concept of what our topic is. We chose an image of a furniture inventory warehouse, this was just used to show the participants that they will be renting from our own inventory and not some other seller. The first focus group was conducted by only one experimenter (Anupreet) and the second one included all three experimenters (Avi, Allen, and Anupreet). The role of Avi and Anupreet's in the focus group was to conduct the interviews and ask the questions and Allen was responsible for taking notes and transcribing the interview. Each of the focus groups were audio recorded through the phone and also recorded over zoom so that we have a backup recording if anything goes wrong. The recordings were then transcribed with the help of the notes taken and with the help of an online transcriber that converted it into a detailed pdf with time stamps.

The questions that really worked for us and were received well within the participants were questions that seemed to make some connection to their personal lives such as talking about their furniture shopping experiences, when was the last time they furniture shopping and talk about that, talking about if they would prefer renting furniture over buying them and what would be the things that they would like it to have. Some questions that just had surface level responses were the warm up questions as they did not have much open end option to continue. The main thing that we need to do better for future focus groups is to diversify the demographic of our participants as most of the participants were people close to our age and not too many older people. Another thing to keep in mind for next time is to make sure that there is as much discussion amongst the participants as possible. This would help us get the best results and buildup on conversations instead of reaching a dead end.

4 User Research Data Analysis: Affinity Diagramming

This section will discuss the process of affinity diagramming in the context of user research data analysis. This process helps organize large data and identify patterns. The output of the affinity diagramming phase is a visual representation of the data, which can be used to generate design concepts and the creation of user personas and scenarios in the next design phase.

Affinity diagramming is a method used in the design process to organize large amounts of data into meaningful categories or themes based on their shared characteristics or relationships. We are using it

in our design process because it helps identify common themes or patterns in user feedback or observations and generate new ideas or solutions based on the insights gained from the diagram. The first step was to define the problem and then gather relevant user data based on feedback and observations and categorize them into sticky notes.

Do's: Encourage collaboration, use sticky notes, try to find patterns and relationships between ideas, natural grouping

Don'ts: Never start with a theme label, don't use words like "feature", "implement", "develop".

First theme in the affinity diagram represents a user group which cares about the style of the furniture. Second theme represents the user group who care more about the price. Third theme focuses on the user group who already have a pre-furnished apartment but in need of upgrading. Fourth group discusses the flexibility they can get, like changing and returning; and the last one cares about the quality of the furniture on par with the price.

- The **first theme** represents a user group that cares about the style of the furniture. These users discuss their personal style preferences and what types of furniture and decor items would fit their taste. The breakdown of this theme includes discussions about classic, modern, and minimalist furniture styles. Based on these discussions, design ideas include having various filters that group items together by specific style and allowing users to easily browse and select items that match their personal preferences. One hole to consider is whether users would like the option to combine multiple styles in a single rental order.
- The **second theme** represents users who care more about the price of furniture. These users correlate price and quality and are interested in finding high-quality furniture at an affordable cost. Design ideas to address this theme include considering having quality ratings for each item and offering filters that allow users to sort items by price. However, one hole to consider is what the average amount a user is willing to spend per month is.
- The **third theme** focuses on users who already have a pre-furnished apartment but need to upgrade their living space. The breakdown of this theme includes discussions about options for smaller household items such as lamps, photo frames, clocks, and decorations. Design ideas to address this theme include offering a variety of smaller decor items for rent, allowing users to upgrade their living space without having to buy new furniture. One hole to consider is what key items people with pre-furnished apartments would like to rent.
- The **fourth theme** discusses users' flexibility needs, such as changing and returning furniture. The breakdown of this theme includes discussions about delivery, moving, and return needs. Design ideas to address this theme include keeping track of the items the user is currently renting and allowing them to easily request a return or exchange. One hole to consider is whether there should be different membership plans that include sets of services such as delivery, return pickup, and an interior designer.
- The **fifth theme** focuses on users who care about the quality of the furniture on par with the price. The breakdown of this theme includes discussions about the current options available and their problems. Design ideas to address this theme include having various style presets that users can filter through and allowing users to easily select high-quality items at an affordable cost. One hole to consider is what level of quality upgrade will be considered good by the user.



5 User Research Data Analysis: Walking the Data

“Walk the data” is a process of analyzing data after the affinity diagramming to gain insights and identify patterns which may not be visible easily. During this process, it is important to focus on what the users care about, what problems they have with the interface, and how they use it. We were hoping to gain deeper understanding and identify underlying trends. The step-by-step process was first to analyze data then organize it by creating visual representations in the form of sticky notes then go over data one by one and identifying patterns and categorizing them by themes. The outcome of walking the data involved categorizing data based on their problems and needs, which were expected.

Theme 1:

Breakdown: Users discuss their style tastes

Design Ideas: Have various filters that group items together by specific style

Holes: Should we allow users to combine styles?

User care about: Classic, modern, minimalist looking furniture

Theme 2:

Breakdown: Users correlate price and quality

Design Ideas: Consider having quality ratings for each item and filters

Holes: What is the average amount a user is willing to spend per month?

User care about: Price

Theme 3:

Breakdown: Users discuss having pre furnished apartments

Design Ideas: Have options for smaller household items such as lamps, photo frames, clocks, decorations, etc

Holes: What are some key items people with pre furnished apartments would like to rent?

User care about: Upgrading living within a pre-furnished apartment

Theme 4:

Breakdown: Users discuss delivery, moving and return needs

Design Ideas: Keep track of the items the user is currently renting, and allow them to easily request a return or an exchange.

Holes: Should there be different membership plans that include sets of services such as delivery, return pickup and interior designer.

User care about: Having flexibility of returning and changing furniture

Theme 5:

Breakdown: Users discuss current options and their problems

Design Ideas: Have various style presets that users can filter through

Holes: What level of quality upgrade will be considered good

Users care about: Low cost, good quality

User needs:

User need#1: View various styles and assorted brands

User need#2: Be able to view many furniture items of the searched type

User need#3: View related items that match their needs and go well with chosen items

User need#4: Be able to place an order viewing all terms and conditions about quality maintenance and return policies.

User need#5: Furniture categories and price

6 Design Artifacts: Personas, Scenarios, and Storyboards

This section discusses three important design artifacts: personas, scenarios, and storyboards. The section will cover what each artifact is, how it is created, and its use in the design process. With the help of these artifacts we expect the output that will help understand user needs, goals, and behaviors, as well as the product's intended features and functionality.

6.1 Persona

A persona is a fictional character of a target user group that helps designers and teams to better understand and identify the needs, goals, and behavior of their users. Personas can be very helpful during the design process as they provide a shared understanding of who the users are, what they need, and how they are likely to interact with a product or service. Personas should be created as detailed profiles which should include information about the user's characteristics such as user's background, ability, attitude to computer. Each persona should be given a name, photo, and a brief narrative that describes their goals and challenges. So our personas include fictional characters of a student which is our focal persona and a full-time employee, which is secondary persona. Our focal persona is of students because throughout the year there are lots of students who move in/move out of their apartment into new ones with a constant need of new furniture. As being full-time, most of them either have minimum paying jobs or no income at all. So affording furniture can be very expensive and after they move out they don't know what to do with their old furniture either. That's why Pabio comes in and satisfies all of their needs. Secondary personas are full-time employees, which have almost the same needs as users, I think the main key differentiating is the difference between their incomes. Full-time employees usually have a lot more income than students, which can make affording furniture a little easier.



Brittany Newton

Student

I am a full-time student and I also work a minimum wage job. Therefore, as a renter near the university, I cannot afford high quality furniture items that suit my style and will help my place feel like home.

Key Details

University: Northwestern University

Major: Biological Sciences

Living Situation: Rents apartment with 3 friends

Monthly Rent: \$1100

Device Preference: Mobile Phone

Job: Cashier at Target

Photo Credit: DepositPhotos

Day in the life

Ever since I have moved away from my parents' house for college, I have been very unhappy with my environment and the quality of my furniture. Using plastic chairs for my small desk, that does not match my eye level height, is really not good for spending so much time studying biology as a premed major. The living room is subpar with low quality couches from Ikea and the TV is placed on a small shelf. It does not excite me to relax here after a long day of studying.

Key Goals

I would really like to have some quality furniture with the styles that I want so that I can make this place feel like home. This will really improve my quality of life everyday.



Mark Petrungaro

Full-time Employee

"Always on the move: A full-time employee navigating the US one relocation at a time."

Key Details

Company: Amazon

Position: Product Manager

Living Situation: Studio Apartment

Interests: Travel, Coding, Chess

Background: MBA

Photo credit: SchiffGold

Key Goals:

Mark is a full-time employee who have to relocate every 8-10 months because of job and don't want to spend money on buying furniture every time he relocated

Day in life:

I love working as a product manager at one of the biggest companies in the world, but my job involves lots of moving every year. Each city I move to I need to find new apartment as well as furniture and buying and moving furniture city-to-city again and again is really expensive. Additionally, there's no guarantee that the old furniture will go along with new apartment.

6.2 Scenario

A scenario is a story that describes how a user will use a product to accomplish a goal. It describes how a user might interact with a product or service in a specific context or situation. As scenarios are created to illustrate the different ways users might interact with a product or service, and they can help designers and teams to better understand the needs, and behavior of their users.

List of 4-5 tasks:

- Identify the people involved
- Identify the starting state / context

- List the goals a user may have, as they pertain to your product or service
- Prioritize the goals based on your understanding of your users

The following Scenarios presented all showcase different colored texts throughout and those colors resemble to these ideas:

Red colored-text refers to Problem: What's the current state of the experience for the user?

Green colored-text refers to Introduce new tool

Blue colored-text refers to Walk through the user's tasks, highlighting ideas that meet user needs.

Violet colored-text refers to Wrap with positive impact of the tool on the user's experience

Scenario 1:

“Brittany uses a plastic chair to sit on while studying for countless hours, she has an uncomfortable and low quality sofa along with a tv stand that is not even at a good height. Having such sub-par furniture in her apartment just does not excite her college life. When she was introduced to Pabio’s furniture rental website by her friend who was also in this situation, she is able to search through a plethora of high quality furniture options that will lighten up her apartment and make it the way she likes for a minimal price. She can go on to the website and create a personal account where she can save all the furniture she likes. From there she is able to go through a wide variety of chairs, sofas, and shelves each in different price points. Once she finds something she likes at the right price, she is then able to put that furniture on rent agreement for however many months she would like to rent. Once she has placed the order, the furniture will be delivered right to her door step and once her term comes to an end, the company will come and retrieve the furniture. She can additionally also take an insurance on the furniture if the furniture was to get damaged, a new one will be brought to her. Just by sitting home and browsing on her computer, Brittany was able to upgrade her low quality furniture to a high quality budget friendly furniture that she likes and will make her apartment beautiful.”

Scenario 2:

“Mark is a young professional who recently relocated for employment. Although the living room is vacant and boring, he managed to find a fantastic apartment to rent. He wants a warm, comfortable home where he can relax after work and host guests on the weekends. He decided to give Pabio a try after learning about it from a friend. Pabio offers her individualized interior design services, and she arranges a meeting with a designer. He expresses her preferences and ideas to the designer during the consultation, and they collaborate to build a unique layout for her living space. In his living area, Mark arranges the furniture and accessories she ordered from Pabio. He throws a small gathering for several friends because he is so happy with the outcome. Everyone compliments Mark's renovated living area, and he is proud of it and grateful for Pabio's assistance.”

6.3 Storyboard

A storyboard is a visual illustration of a user's experience with a product/service. A visual illustration can help designers understand interactions in a more simpler way and because it enables designers and teams to effectively visualize and communicate the user's experience, storyboarding can be a useful tool during the design process.

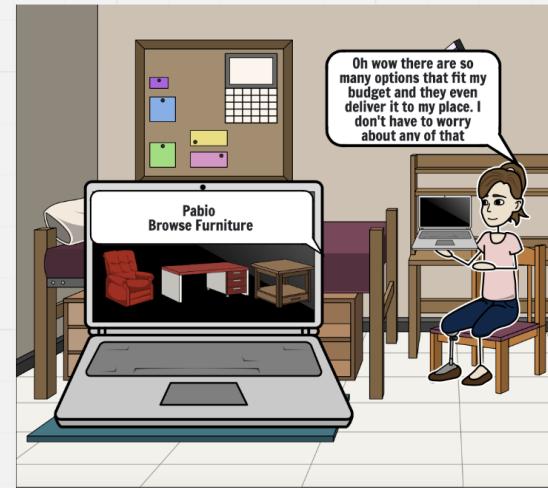
Storyboard 1:

The storyboard consists of two panels. The left panel shows a bedroom with a single bed, a wooden dresser, and a chair. The right panel shows two people in a room with bookshelves; one is holding a phone and talking to the other.

Panel 1: Brittany uses a plastic chair to sit on while studying for countless hours, she has an uncomfortable and low quality sofa along with a tv stand that is not even at a good height. Having such sub-par furniture in her apartment just does not excite her college life.

Panel 2: Hey Brittany! Checkout this app called Pabio. I think this will really help you find what you need
Wow! This app has all the styles I need at such an affordable price!

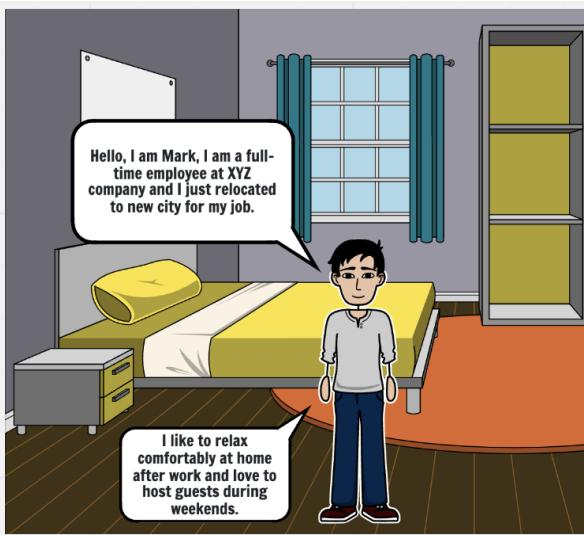
When she was introduced to Pabio's furniture rental website by her friend who was also in this situation, she is able to search through a plethora of high quality furniture options that will lighten up her apartment and make it the way she likes for a minimal price.

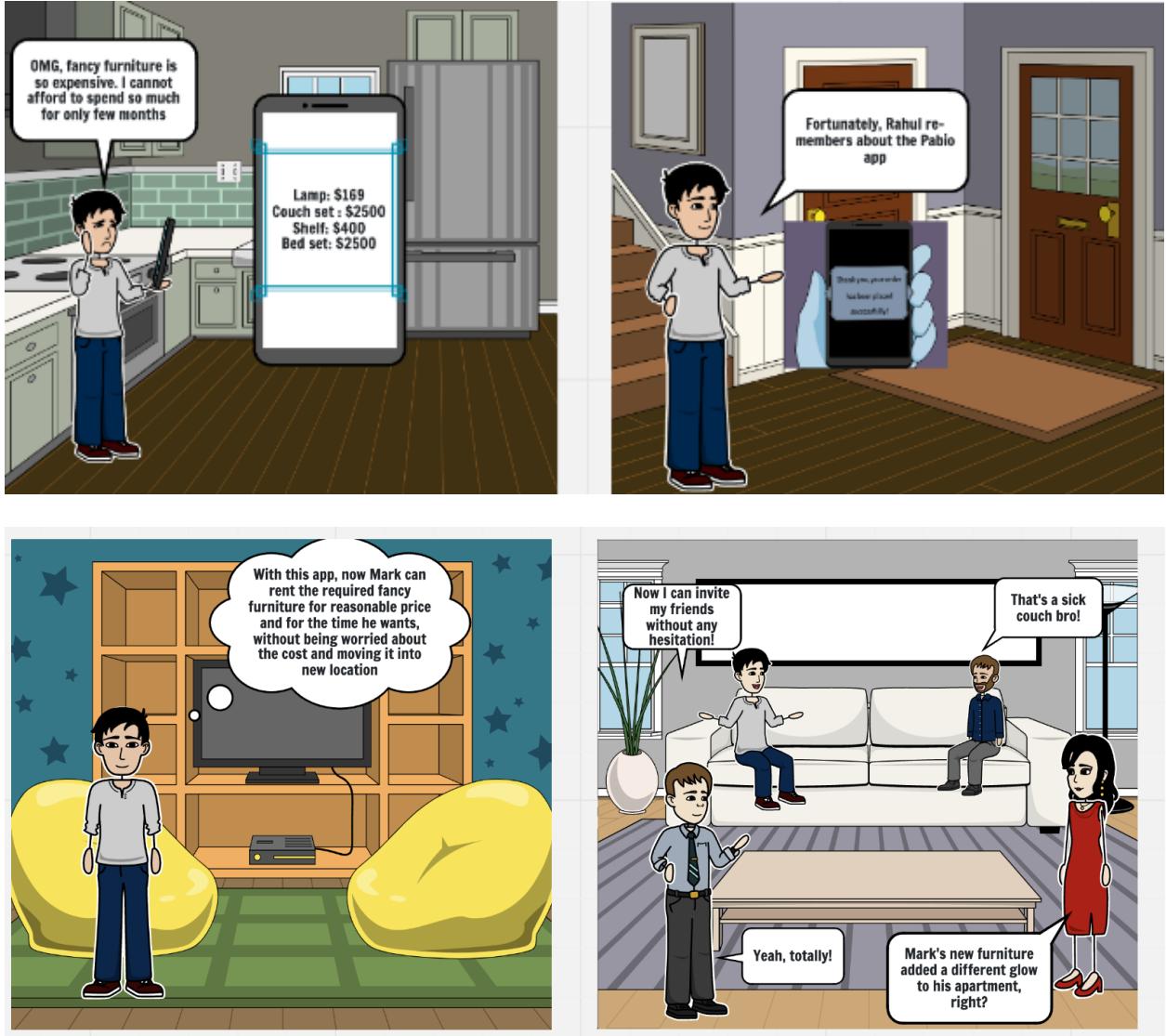


She was surprised by the amount of furniture she found at Pabio. She was able to find some that she liked and get it on an agreement. She did not have to worry about the delivery and pickup of the furniture either as Pabio would take care of that.

Just by sitting home and browsing on her computer, Brittany was able to upgrade her low quality furniture to a high quality budget friendly furniture that she likes and will make her apartment beautiful.

Storyboard 2:

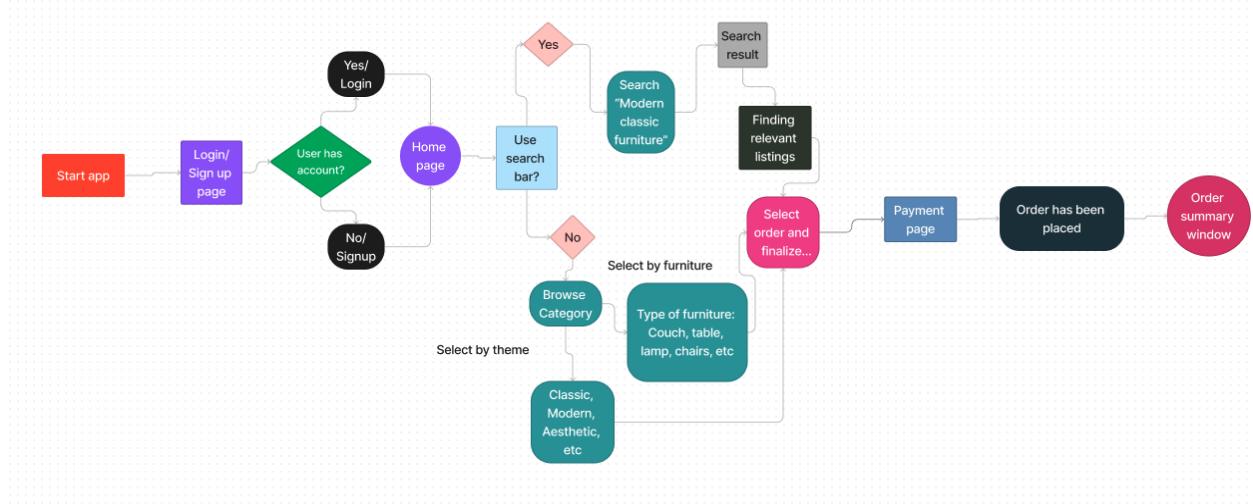




7 Task Analysis and Task Flow Diagram

Task flow diagrams are utilized to comprehend how users execute particular tasks within a system or application. This section's output aims to recognize any potential inefficiencies or usability problems in the user's workflow.

A Task Analysis is basically a way to represent and create a conceptual model for the system. It is used to break down complex tasks into smaller steps and understand how people perform them. Whereas a task flow diagram shows how tasks are ordered to flow from one to the other naturally according to the user's mental models. Both of these techniques help greatly as designers use them to understand how users will interact with the application and what tasks they will need to perform in order to design a more efficient and user friendly system. Here is a link to the task flow diagram for a clearer view [Task Flow Diagram](#).

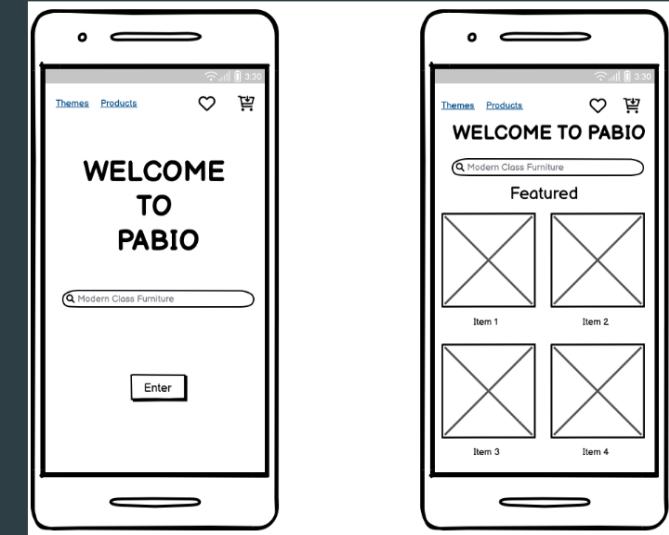


8 Wireframe Flow Diagram

This section will be covering wireframe flow diagrams, which is a visual representation of the basic structure of the design and how the user interacts with the website. The output of this section will be a detailed diagram of the user's journey with the tasks and interactions the user has to go through.

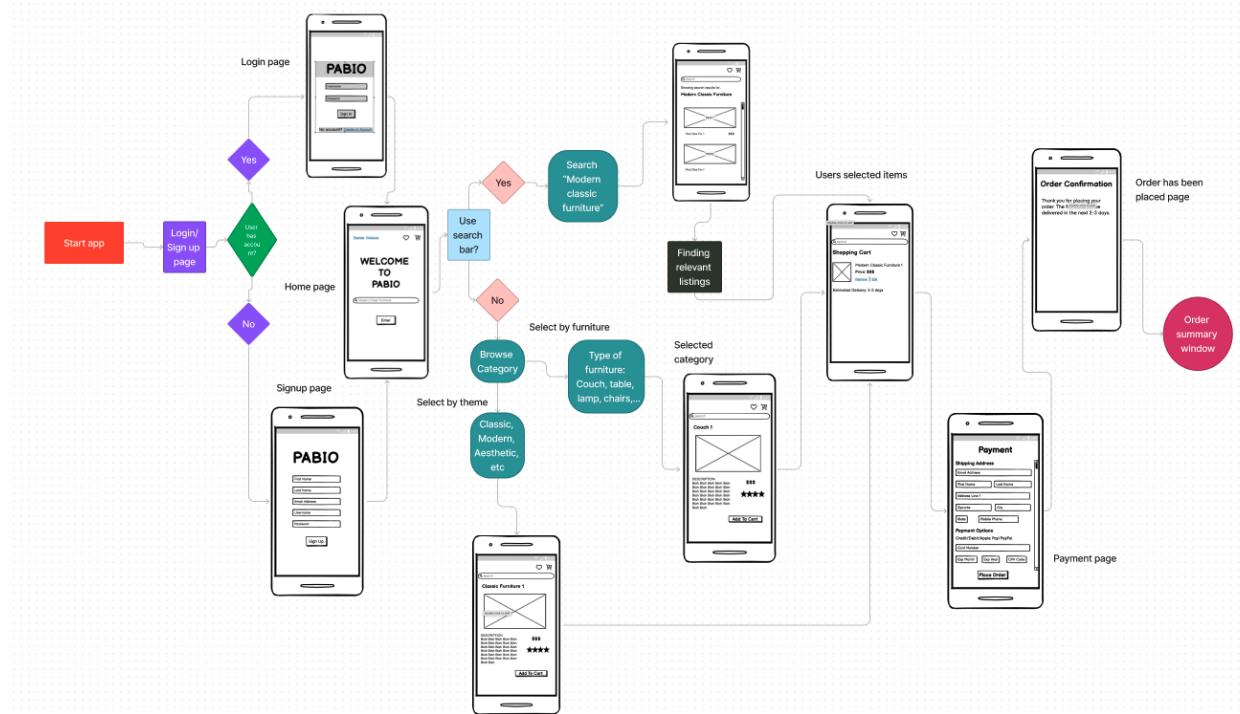
A wireframe flow diagram is the combining of individual wireframes and the task flow diagram to show the system structure and to give a much more detailed context as to how a product will function. Wireframe flow diagrams are used to represent the overall layout and navigation of an application, while task flow diagrams are used to represent the steps users will take to complete specific tasks within the application. Our group decided to use Balsamiq software to make the individual wireframe screens and then we used figma to create the wireframe flow diagram. We also incorporated InVision to get a smoother transition with the linking of the screens. Each individual screen started off with a phone container and then we added icons and text to each screen depending on the type of design we wanted it to have. We had a couple of alternate design solutions for some screens but they were discarded as they did not meet our design goals but there was one solution that really interested us more than the original solution.

Alternate design solutions



We initially chose the screen on the left. The reasoning behind this was that the stand-alone search bar allows the user to focus on what they are looking for and look at relevant results.

However, we decided to choose the screen on the right because a lot of users might be exploratory, using the app to get a sense of our catalog and would not know what to search. Therefore, the screen on the right is more intuitive to use as it follows the convention of e-commerce websites and gives the users a glimpse of our popular assortments, while still maintaining a highlighted search bar for our goal-oriented users.



Here is the [Link To Wireframe Flow Diagram](#) as well. In terms of user needs and experience, our app satisfies all the requirements as it keeps the layout in each screen minimalistic with all the required functionalities, so that the user does not get overwhelmed

with everything going on in each screen. The app caters to users needs and wants on how they want their usage of such an app which is supposed to be quick and easy.

9 Responsive Wireframes

In this section we will go over responsive wireframes. These are a type of wireframe that adjusts to fit various screen sizes and devices. These wireframes can change size based on the orientation of the screen. The output for this section would be to assist in designing an application that provides a smooth user experience across all devices.

Responsive wireframes are simple web pages, created with HTML and CSS, that use the principle of responsive web design to illustrate the layouts. They are dynamic and take device resolution and dimensions into account. This really makes it simpler to visualize and understand the final design product and test out how each layout looks on different screen sizes.

Wireframe interface screens

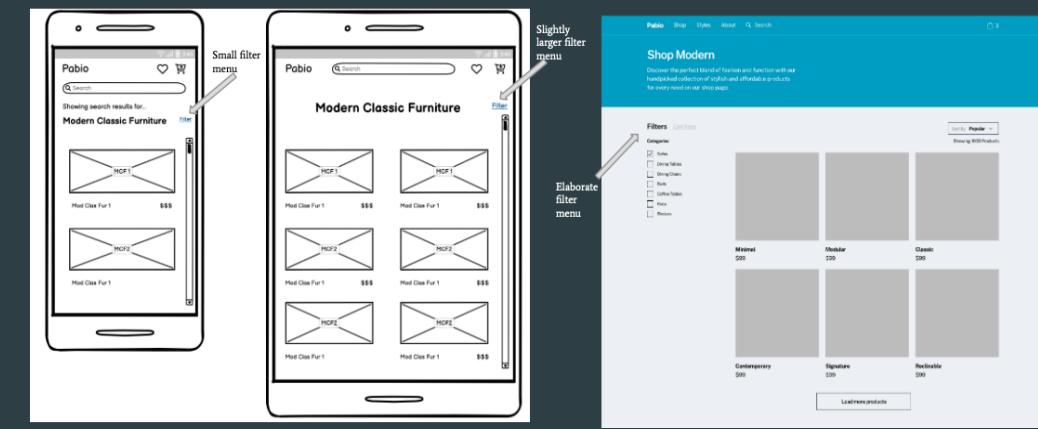
The figure displays three responsive wireframes illustrating a shopping cart interface across different screen sizes: mobile, tablet, and desktop. The mobile screen shows a clean layout with a search bar at the top, followed by a 'Shopping Cart' section containing two items. The tablet screen adds a 'Related Items You Might Like' section below the cart. The desktop screen provides the most detail, including an 'Order Summary' table, 'Order Information' fields, and a 'Related Items You Might Like' section with larger images. Yellow annotations highlight specific areas: 'Space only for cart items' on the mobile screen, 'Space for new section' on the tablet screen, and 'Space for elaborate information' on the desktop screen.

Did not change: Search bar, liked items, cart
Did change: Shopping cart body space for more information and related items

The goal of this screen is to keep the interface clean and make it easy for the user to see key information. On the phone screen we see small buttons, images and concise information to optimize the interface's focus. As the phone and the tablet are likely running the same application infrastructure, the pages are similar, but the extra room allows us to show related items that could enhance user experience. The 4k desktop screen has the most room, so we see large nav bars, images, buttons, comprehensive information to give the user all needed information while still keeping the screen uncluttered.

Wireframe interface screens

Did not change: Search bar, Cart
Did change: Filter section, Columns, Sorting Option



The primary purpose of the item listing screen is to present a clear and organized view of the catalog, making it easy for users to browse and select items of interest. On mobile, the list features single column, compact images and buttons to maximize screen real estate. Tablets provide more room, allowing 2 columns and increased image and button size. The wider screen of desktops allows us to add more features such as an entire section of filters, large product images, comprehensive descriptions and 3 columns, allows users to quickly scan through a large number of products.

10 Early Design Feedback

In the process of designing, it's important to get feedback early on to know what aspects of the design are successful and which need improvement. In this section, we will be going the importance of Early Design Feedback. The next steps in this section is the in-class critique session which is an opportunity to review the design and receive constructive feedback from users. The output for this section aims to provide feedback and to make necessary improvements to the design.

10.1 In-Class Critiques

During the in-class critique session which lasted the whole class time, each group presented their projects to different groups to get their feedback. There were a total of 2 sessions, in each session the groups were able to show their projects to 2-3 other groups. While each group was presenting, the groups were responsible for filling out a google form evaluating each section of this deliverable. The projects were evaluated on the basis of the design problem, the user needs, task flow diagram, individual wireframes, wireframe flow diagram, alternate designs, and key responsive screens. Some feedback included how the other groups like the minimalist approach to each screen and how well spaced each screen

was. Some also critiqued on having an order history page, have featured items shown in the main page, etc. Here are some of those feedbacks:

'I liked how there was a filtering option that allowed users to choose. They could improve on relaying more recommended options.'

'It was simplistic, but in a good way. I thought that the payment page on the mobile interface seemed a little cluttered.'

'I thought their shopping cart area was nice and organized. Everything was nicely placed out. They could use a place to view their previous orders. Mentioned they wanted to put it in the shopping cart, but I think it would be good placed somewhere outside of the shopping cart that can be accessed anytime using the app.'

'Every button seems intuitive and makes sense. They could add some more features to clean up their design even further.'

10.2 Next Steps

Our group plans to address these feedbacks by making the changes asked in some of the screens and just overall make it a cleaner design. Planned Change #1 would be to add an order history page where the user can see their previous orders. Planned Change #2 would be to add a feature/recommended options for the user to have an easier time seeing what's new and selling well. Planned Change #3 would be to space out the payment page a little more and not keep it cluttered together.

11 Low-Fidelity Prototyping and Testing

Our group created low fidelity interactive prototypes by using Balsamiq and creating the different screens with all the necessary functionalities we needed. Balsamiq worked the best for us as it was easy to use when adding different features and helped us give it a premium look. We also took the liberty of using InVision in order to connect all the screens together and make it interactive.

Here is the link for our interactive low fidelity prototype:

<https://allenthomas531729.invisionapp.com/console/share/3XJS7EG5T6P>

11.1 User Feedback on Low-Fidelity Prototype

Process of user feedback session: For our user feedback session we had 2 participants who were both asked to perform the same key tasks. The first task the user was asked to do was to act as a new customer who does not have a login for the app to create an account and to choose the first item in the themes list, add it to their cart, make the purchase, and get the order confirmation. The second task was to add the item from the search bar to the wishlist, from there add it to the cart, delete that item, and then add it back to the cart. Then finish the payment process and get order confirmation.

Notes from user feedback: Our participants were able to navigate through the wireframes pretty easily as it was made to be minimalistic and hassle free. One feedback the users had was to not have a wishlist screen as they don't seem to use it much when you have the shopping cart to add the stuff to. Another feedback was to change the layout of the homepage as it seems very basic and does not attract the customer to move forward. The final feedback was that the payment page was way too cluttered and not spacious enough.

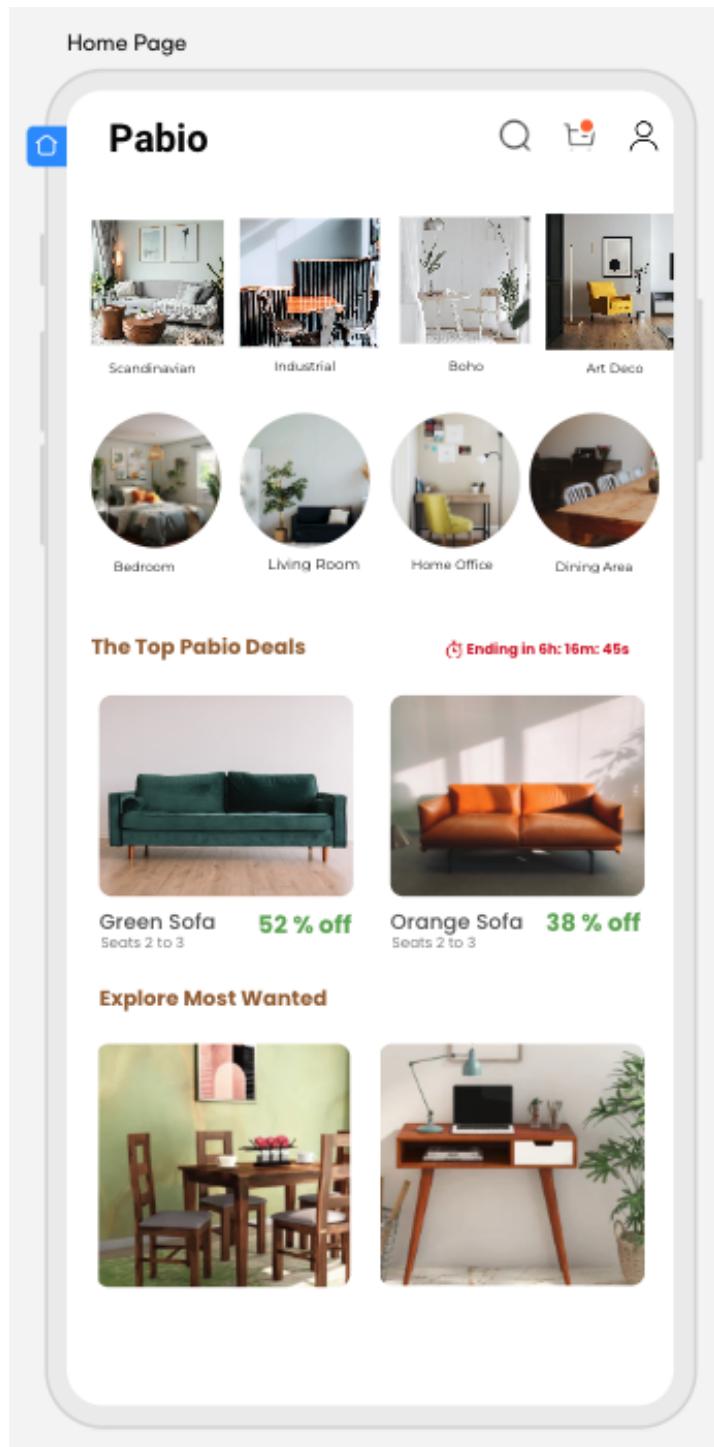
11.2 Resulting Design Changes

Changes Made: Based on the user feedback, we removed the add to wishlist and wishlist screen. Instead, we added a buy now button which automatically takes you to the payment page for an item and the add to cart button will add stuff to the cart for later viewing or if you wanted to buy multiple items at once. The other change we made was to change the entire layout of the homepage which now shows the popular deals, furniture for different rooms, different aesthetics, and most wanted furniture. In the end we also made changes to the order confirmation page, because it was all empty and we thought that space could be utilized. So, we added personal recommendations "recommended for you" and "Most Popular" sections. The final change made was to the payment page, where we again changed the whole layout to make it more spacious while still providing the same amount of information.

12 High-Fidelity Prototyping and Testing

Based on the feedback our group received from the low fidelity prototype, we moved to create a high fidelity prototype. To do this, we analyzed other UIs from the same industry that are already on the market to be able to provide our consumers with a conventional and familiar experience and then optimized it for our use cases and user feedback. To build the screen designs, we used a tool called 'Uizard'. Then we made this interactive using InVision. The output of this process was a pixel perfect final version of our application UI.

12.1 High-Fidelity Prototype



Pabio

3 Seater Sofa in Green Color



Introducing our sleek and stylish minimalistic sofa, perfect for those who appreciate simplicity and understated elegance. With its clean lines and neutral color scheme, this sofa will seamlessly blend into any modern living space. The plush cushioning and soft upholstery provide ultimate comfort, while the sturdy frame ensures durability and longevity. Whether you're lounging with a good book or entertaining guests, this minimalist sofa will be the perfect centerpiece for your living room.

Price \$99.99

[BUY NOW](#) [ADD TO CART](#)

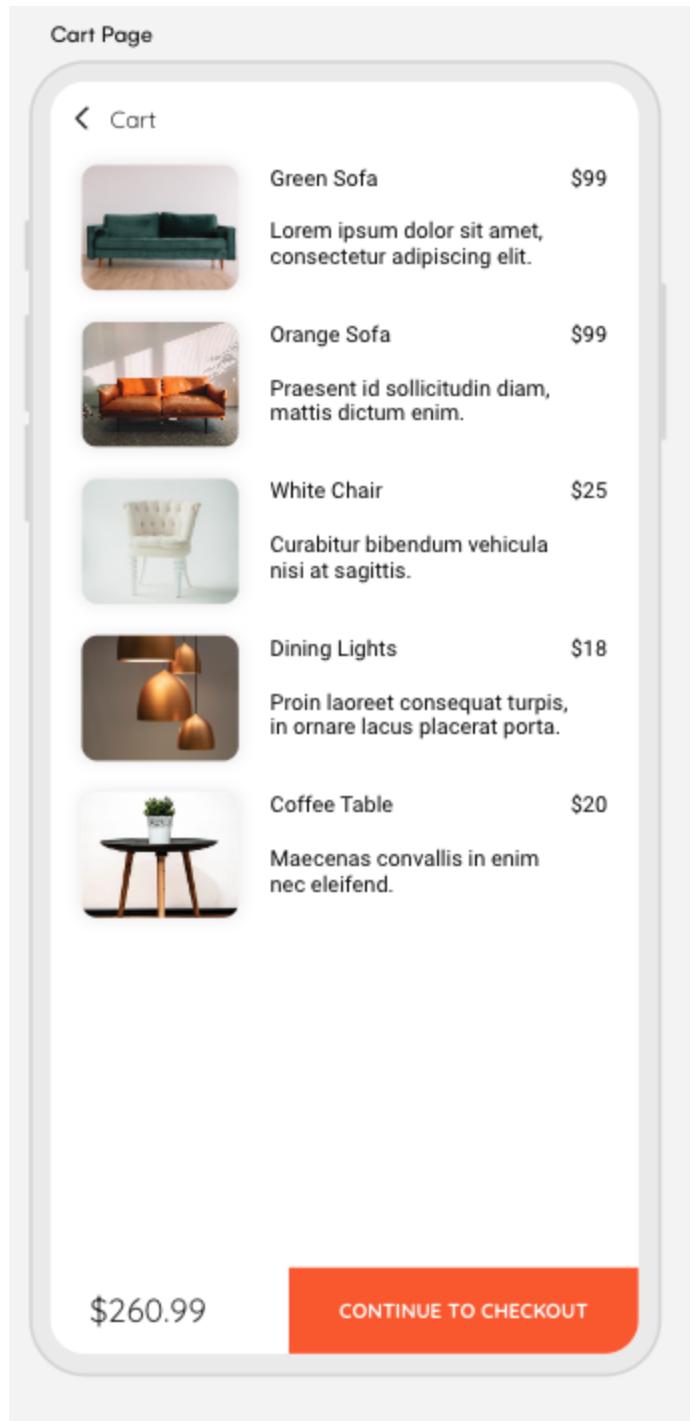
Similar Items you might like

Art deco theme Sofa in yellow



Modular Coffee Table

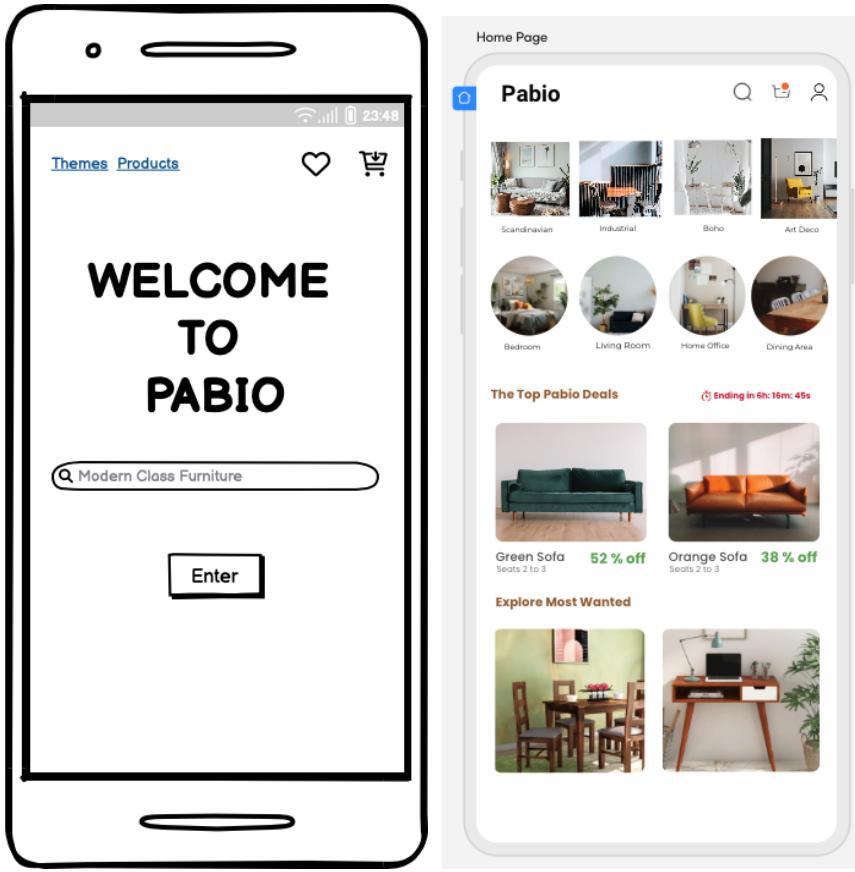




<https://allenthomas531729.invisionapp.com/console/share/79TRUKNQVWB>

12.2 Implementing Design Changes Based on User Feedback

Home Page Changes



In the home page, you can observe that the entire layout has been modified. It more reflects a traditional ecommerce application page, and we made changes to include popular deals, furniture for different rooms, different aesthetics, and most popular furniture. You will also notice that we have removed the wishlist feature and moved the search feature to the AppBar.

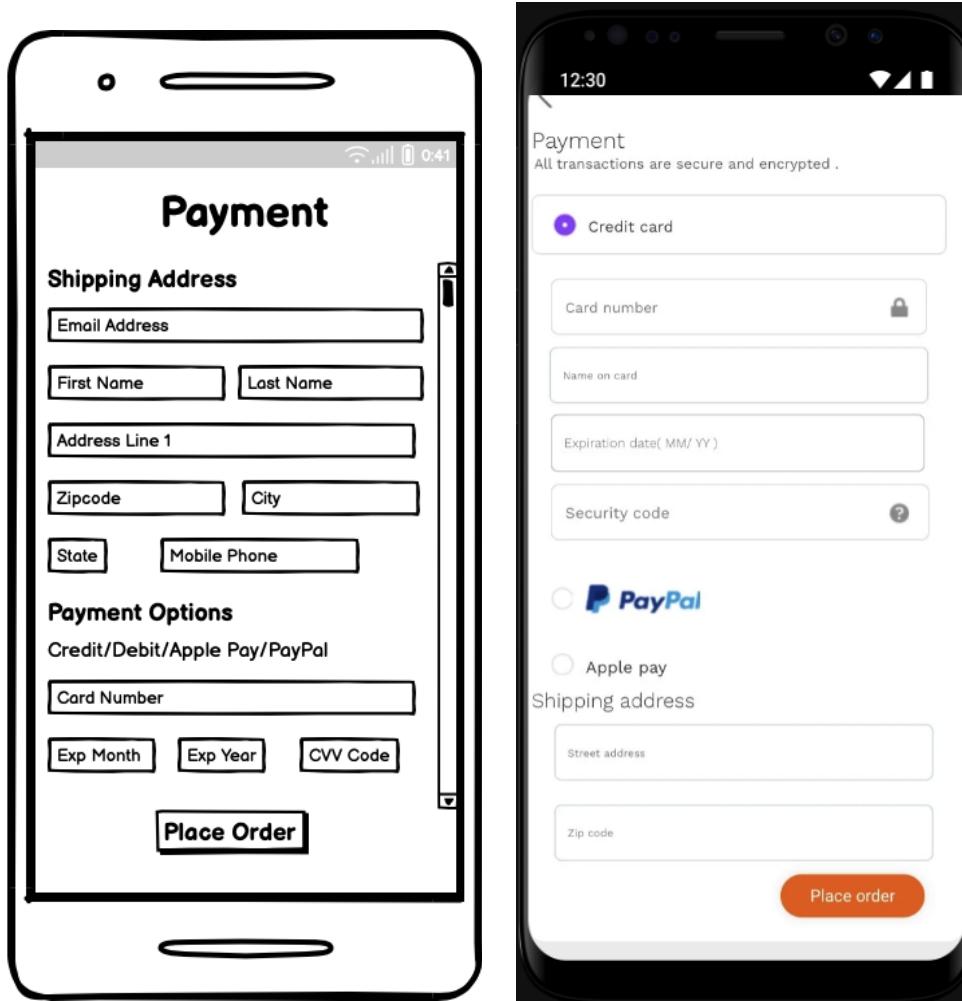
User Need #1: The change addresses User Need #1 by providing users with a better browsing experience that enables them to view various styles and assorted brands of furniture. By including popular deals, furniture for different rooms, different aesthetics, and most popular furniture, users can quickly find what they are looking for and easily navigate through the site.

User Need #2: The change also addresses User Need #2 by allowing users to view many furniture items of the searched type. By showing a range of options for different types of furniture, users can explore and find the best fit for their needs.

User Need #3: The change addresses User Need #3 by providing users with related items that match their needs and go well with chosen items. This feature enables users to make informed decisions while browsing through the site and showcases most popular and relevant items.

User Need #5: The change addresses User Need #5 by providing furniture categories and prices. Users can easily filter and find products based on their preferences and budget.

Payment Page Changes



For the payment page, we initially received a lot of feedback saying the page looked very cluttered. Therefore, for the high fidelity prototype, we made sure to make it more spacious and visually appealing.

User Need#4: The change addresses User Need #4 by making the payment page more spacious and visually appealing. By simplifying the page, users can easily understand the terms and conditions of their orders, making it easier for them to complete their purchase.

13 User Testing

In this section, we'll explore the topic of user testing, taking a closer look at why it's so important and the different methods used to carry it out. We'll discuss the main goals of user testing, which include pinpointing usability problems, collecting valuable feedback, and gaining a deeper understanding of user behavior.

User testing is a research method that involves evaluating a product, interface, or system by having target users interact with that interface. The purpose of user testing is to identify

potential usability issues, gather feedback, and gain insights into user behavior and preferences. This information can then be used to refine the design, improve functionality, and enhance the overall user experience.

The type of user testing we conducted was one on one testing where we gave a target user some tasks to complete, asked the users to think out aloud while looking at the interface, tell everything they see on that screen and walk us through their thought process of accomplishing those tasks. This helps us in understanding their first impressions, flow of control and information, input and output, and system responses.

From this user testing, we were hoping to learn more about how easy our interface is to interact with, if there is trouble navigating any of the features, if the UI is visually appealing to the user, the layout of the interface satisfies the user, and if there is any fault in the interface.

13.1 Participants

The majority demographics of our participants were that they were college students living off campus/renting apartments. In total we had 6 users who participated in the user testing.

13.2 Method

- The process of our user study was to meet with the target user over zoom or any other means, read out the introduction script to the participant and help them understand what this testing is all about. The experimenter's role was to introduce the tasks to the user and explain what would be considered as success, record the time for each task the user takes to finish, update the excel sheet with all the information for each user throughout the testing process, and administer the questionnaire at the end of the testing.

Task 1: Making an account	<p>Task description: Assume that you are a new user to the app and need a new account. Create a new account and sign up which takes you to the home page.</p> <p>Task deemed completed: When the user is brought back to sign in and they are sent to the home screen.</p>
Task 2: Order a piece of furniture, remove it, and purchase another piece of furniture that is in the cart already.	<p>Task description: Order the green sofa from pabio's top deals, add it to cart, then go to the cart and remove the green sofa, and then buy a furniture that's already in there and place the order</p> <p>Task deemed completed: When the green sofa is removed and the user has purchased another furniture from the shopping cart..</p>
Task 3: Go to the search bar and purchase an	<p>Task description: User will hit the search bar and choose one of the popular searches, then they can either choose Scandinavian furnitures</p>

item	<p>or themes, this will take them to the green sofa page, from where they can choose the coffee table in the similar items you might like section and buy it now instead of adding to the shopping cart.</p> <p>Task deemed completed: When the user has purchased the coffee table and on the confirmation page.</p>
-------------	--

- Our data logging method consisted of filling out an excel sheet that consisted of all the parameters which were filled out as the testing process was going on. The parameters that were logged in the sheet were User Name, Task ID, Success, Failure, Completion time of the tasks (in seconds), behaviors of the user during each task, intention of the users, and the errors/problems they came across each task.
- Here is the link to the Questionnaire that was used for our user testing:
<https://forms.gle/CuuNRYia4yNNKUHb6>

13.3 Findings

- From the results of the questionnaire, we were able to find out that the majority of our participants were satisfied with the interface presented in front of them. For questions asking “I think I would like to use this system frequently” and “I thought the system was easy to use.”, participants strongly agreed with it showing that the interface was user friendly and easy to use. Questions such as “I found this system unnecessarily complex” and “I think that I would need the support of a technical person to be able to use this system”, participants strongly disagreed with this showing that the interface has been well designed and does not have many flaws.
- The results of the data logging sheet were similar to the questionnaire as all the participants successfully completed all tasks in great time. Each participant's behaviors noted down showed that they did not have much trouble navigating through the interface as everything was easily visible. There were some errors caused for a few participants but that was due to not understanding the given task fully or in a hurry clicking the wrong button. Some participants did show dissatisfaction with the fact that they were directed to the login page after signing up instead of taking them straight to the homepage. Another participant had some trouble functioning the search as the layout was messing it up.
- The evaluation involved six users: Sneha, Mark, Chris, Sam, Hardik, and Suyash. They each performed three tasks related to navigating the website, using the cart, and searching for items. Here are the basic statistics and a summary of the results:

Task Completion Time:

1. Mean: 18.5 seconds, Range: 10 - 29 seconds
2. Mean: 35.0 seconds, Range: 20 - 50 seconds
3. Mean: 62.8 seconds, Range: 45 - 1:40

Task Success Rate:

1. 100% (6/6 users successfully completed the task)
2. 83.3% (5/6 users successfully completed the task as intended)
3. 66.7% (4/6 users completed the task exactly as intended)

The majority of users found the system easy to use, with a high success rate in completing tasks, and a low perceived complexity. Most participants did not feel the need for technical support. Overall, the results indicate that the system is user-friendly and has the potential to be adopted by users frequently.

13.4 Design Changes

- Based on the evaluation results and user feedback, the following concrete suggestions for improvements can be made during the final implementation. These design changes are annotated with the corresponding User Need numbers they address:

- Streamline Account Creation and Login Process (User Need #1):

We noticed that some users expressed dissatisfaction with having to click the login button again after signing up. So we decided to simplify and streamline the account creation and login process by automatically logging users in after successfully creating an account. This will enhance the onboarding experience and encourage new users to explore the website further.

- Optimize Search and Recommendations (User Need #3):

A few users faced challenges while using the search bar and navigating through recommendations to find specific items. So our plan is to enhance the search functionality by making it more prominent and ensuring that popular searches are relevant to users' needs..

- Enhance Navigation and Usability (User Need #1, #3):

Some users struggled with completing tasks as intended, suggesting that certain aspects of the website navigation could be improved. So we have decided to evaluate and iterate on the information architecture, menus, and visual cues to ensure a more seamless user experience. This will help users accomplish tasks more efficiently and enhance the overall usability of the website.

14 UI Implementation

The UI Implementation section is about the process of building the user interface of a software system. In this section, we will discuss the web framework used, the design patterns and important design decisions made in the implementation, and how implementation problems may have affected the usability of the interface. The output of this section will be a detailed overview of the UI implementation process, highlighting key decisions and considerations made in the design and development of the user interface.

For UI implementation, we used React Js framework along with JavaScript, HTML and CSS. In terms of design patterns, we followed the Model-View-Controller (MVC) pattern for our UI implementation. This pattern helped us to separate the concerns of our UI, making it easier to maintain and update. The model represents the data and business logic of the application, the view is responsible for displaying the UI to the user, and the controller acts as the intermediary between the model and the view.

One of the important design decisions we made was to use reusable components in our UI. This helped us to achieve consistency in the look and feel of our application, as well as improve the overall efficiency of our development process. We also made sure to follow a consistent layout and color scheme throughout the application to enhance the user experience.

Another design decision we made was to use a responsive design approach, which allowed our UI to adapt to different screen sizes and devices. This helped to ensure that our application was accessible to a wider range of users and provided a consistent experience across different platforms.

Finally, we incorporated user feedback and usability testing into our UI implementation process. This helped us to identify and address any implementation problems that may have affected the usability of our interface. For example, we adjusted the placement of certain buttons and improved the navigation to enhance the overall user experience. Overall, our UI implementation process focused on achieving a clean and intuitive user interface, while ensuring that it was scalable and maintainable.

During the UI implementation process, we encountered several implementation problems that could have potentially affected the usability of our interface. Some of these issues included inconsistent user interface elements, and poor navigation.

Inconsistent user interface elements can also cause confusion among users, leading to a poor user experience. To address this issue, we made sure to follow a consistent layout and design throughout the application. This included using consistent fonts, colors, and design elements across all pages of the application. We also used reusable components to ensure consistency in the UI.

Another problem that may have affected usability was poor navigation as it can make it difficult for users to find what they are looking for, leading to frustration and potentially impacting the usability of the interface. To address this issue, we designed a clear and intuitive navigation system that made it easy for users to find the information they needed. This included using clear and descriptive labels for buttons and links, and ensuring that the navigation flow made sense for users.

Appendix A: Discussion Guide

Group 26 Discussion Guide

[Avi Bhatnagar, Anupreet Paulkar, Allen Thomas]

Focus Statement (include research context and target users)	understand how college students, early career professionals, and homeowners get their furniture from, if it is easy for them if they are moving places, and their experiences. We also want to identify if they have trouble finding a place with furniture that they like and the price they are happy about.
Discussion Guide	
- Introduction	<p>Hello, I'm [group member], and today we're here to do a focus group for our in-class project. This focus group is to discuss how College students, home owners, and professionals make decisions about where to buy furniture from, what type of furniture they like, and how is their experience doing so.</p> <p>I will lead the conversation about your experiences, while other team members record your answers.</p> <p>We will also be audio/video recording this focus group if that is fine with you so we can refer to it later. All the records will be kept confidential.</p> <p>This focus group will be 50 minutes long. Feel free to share your experiences and thoughts. Do you have any questions for me before we get started?</p>
- Key demographic questions	<ol style="list-style-type: none"> 1. Can you introduce yourself? Please tell us your: 2. Name 3. Age 4. If you are a college student, early professional, or home owner 5. How long have you been renting/owning your current place of living?

- Warm-up questions (factual answers)	<ol style="list-style-type: none"> 1. Did you purchase the furniture in your house/apartment or did it come with the place? 2. Are you someone who likes having modern furniture at their place? 3. Has the presence of online apps/websites helped your furniture purchase? 4. Does the price of purchasing furniture affect your decisions sometimes? 5. Does going furniture shopping take a lot of your time and effort?
- Main questions (open-ended discussions)	<ol style="list-style-type: none"> 1. Tell us about the last time you went furniture shopping? 2. How was your experience at the furniture store and did you end up buying any furniture? 3. What could have been better during this experience for you? 4.. Does having an online app/website that caters your needs help during furniture purchase?

CS422 User Interface Design and Programming -- Deliverable #2 – User Research

	<ol style="list-style-type: none"> 5. Walk us through your step-by-step process of buying furniture online? 6. Adding on to the previous question, what were some of the good and bad experiences that came along this process? 7.. Would you prefer buying or renting furniture that could be more cost friendly?
Design Probe(s)	

Here is also the link: [Discussion Guide](#)

Appendix B: Transcripts and Signature Sheet

[Focus Group 1 Transcript](#)

[Focus Group 2 Transcript](#)

CS422 User Interface Design and Programming Participant Signature Sheet

Submitted by:

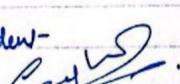
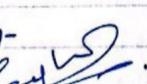
[Pabio]: Anupreet Paulkar, Avi Bhatnagar, Allen Thomas]

Participants: By signing this form, you acknowledge that you have participated in a focus group or user test for the above group related to the above course on the date indicated below.

Printed Name of Participant	Signature of Participant	Date of Participation	Printed Name of Participant	Signature of Participant	Date of Participation
Bella Salazar		02/09/2023			
Juan Delgado Maldonado		02/09/2023			
Shriniwas Shitole	Shriniwas Shitole	02/09/2023			

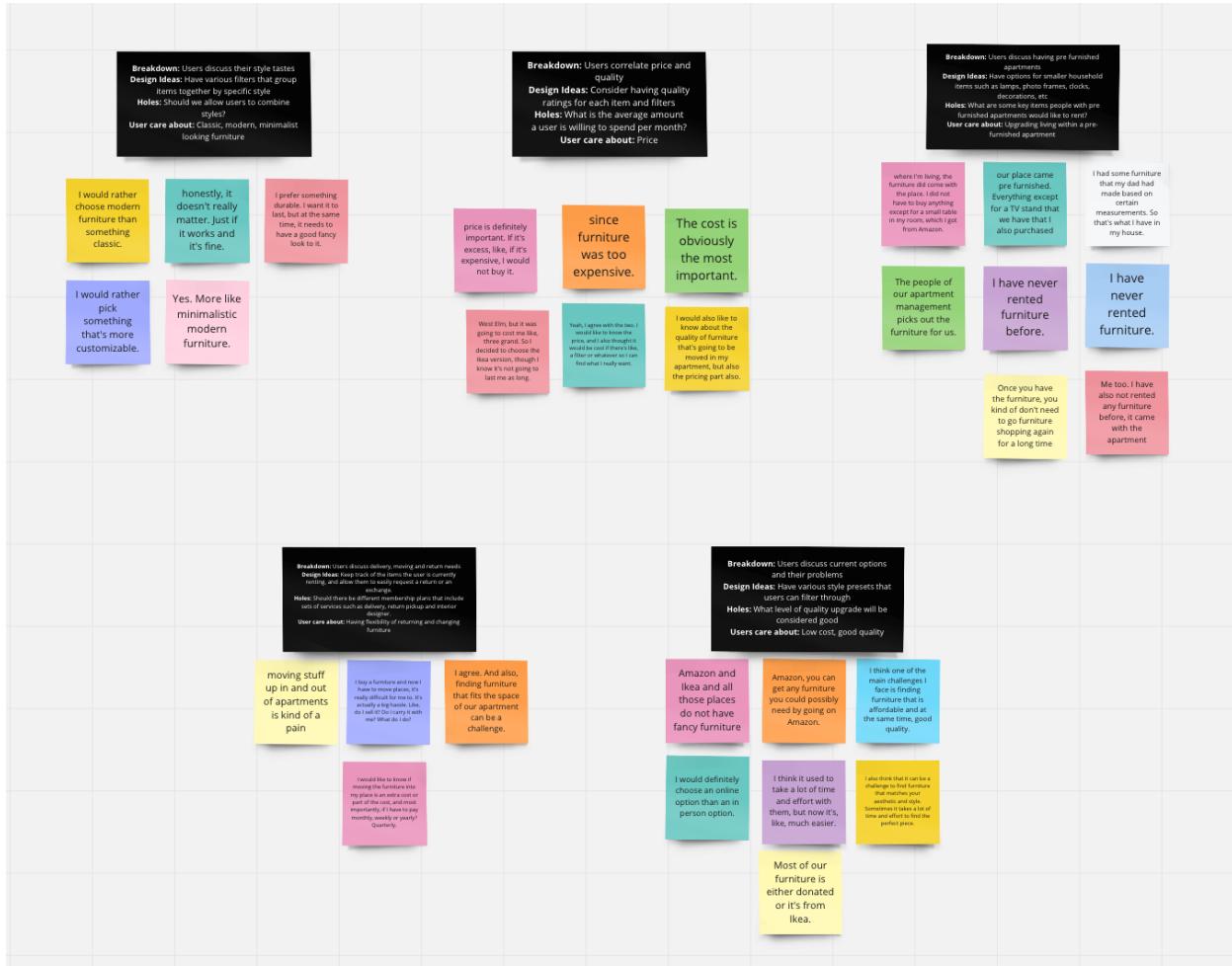
Group Members: please initial below to indicate that your group members acknowledge that you are aware that you are bound by UIC's honor policy in letting participants sign this form only if they have actually participated in a focus group or user test for the class as required.

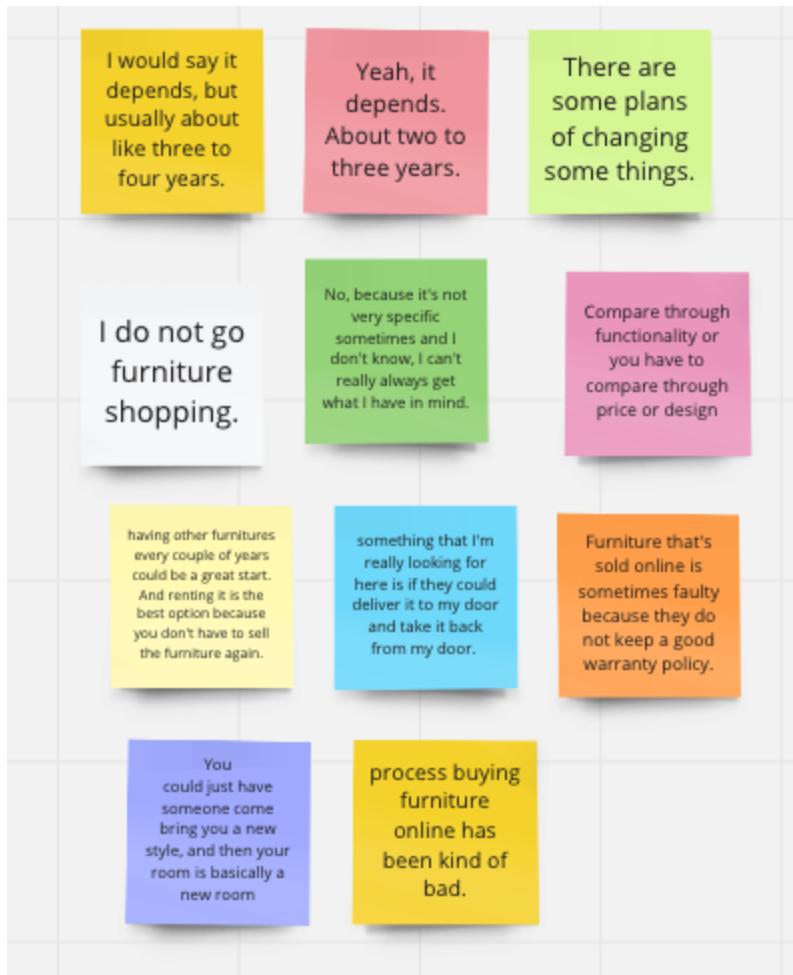
(group members' initials)	AP	AB	AT		
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2.	Ryan Bottens Age: 22 Occupation: Student	
3.	Hardik Groel AGE: 21 OCCUPATION: Student-	
4.	Sarthak Hans Occupation:	

Focus Group Signature Sheet

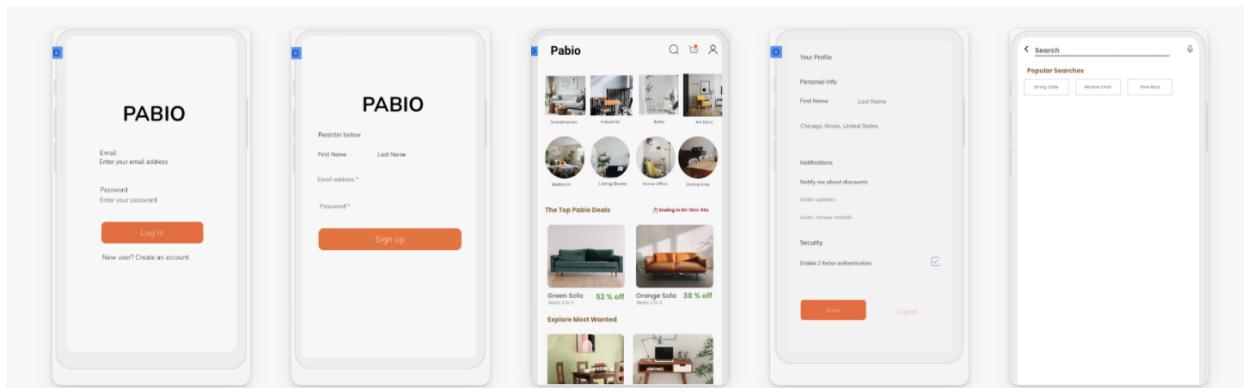
Appendix C: Affinity Diagram





Affinity Diagram

Appendix D: Annotated High-Fidelity Prototype



Login Page

1 month ago

Sign up Page

1 month ago

Home Page

1 month ago

Profile Page

1 month ago

Search Page

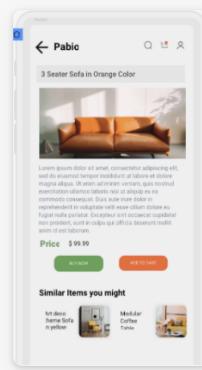
1 month ago



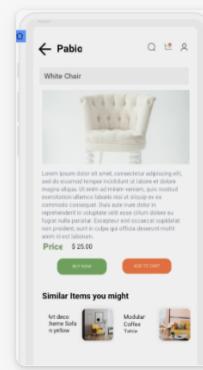
Furniture page



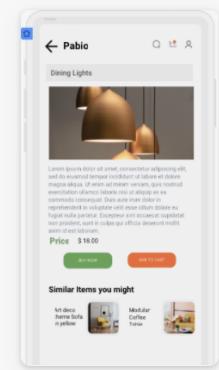
Themes Page



Orange Sofa



White Chair



Dining Lights

Coffee Table
1 month ago

Green Sofa
1 month ago

Shopping Cart
1 month ago

Remove Cart
1 month ago

Payment Page
1 month ago

Confirmation

Appendix E: User Testing Script

User Test Script

<p>- Introduction</p>	<p>Hello, I'm [Allen, Avi, or Anupreet]. Today we are going to test Pabio, which is focused on allowing users to find furniture to rent in an affordable way. We will also be recording or taking notes of this user test to refer to later. All the records will be kept confidential. This user test will be no more than minutes long.</p> <p>This app is an early prototype of a design concept. You're helping us by trying out this product in its early stages. We're looking for places where the product may be difficult to use. If you have trouble with some of the tasks, it's the product's fault, not yours. Don't feel bad, that's exactly what we're looking for. If we can locate the trouble spots, then we can go back and improve the product. Remember, we're testing the product, not you. Do you have any questions for me before we get started?</p>
<p>Task 1: Making an account</p>	<p>Task description: Assume that you are a new user to the app and need a new account. Create a new account and sign up which takes you to the home page.</p> <p>Task deemed completed: When the user is brought back to sign in and they are sent to the home screen.</p>
<p>Task 2: Order a piece of furniture, remove it, and purchase another piece of furniture that is in the cart already.</p>	<p>Task description: Order the green sofa from pabio's top deals, add it to cart, then go to the cart and remove the green sofa, and then buy a furniture that's already in there and place the order</p> <p>Task deemed completed: When the green sofa is removed and the user has purchased another furniture from the shopping cart..</p>
<p>Task 3: Go to the search bar and purchase an item</p>	<p>Task description: User will hit the search bar and choose one of the popular searches, then they can either choose Scandinavian furnitures or themes, this will take them to the green sofa page, from where they can choose the coffee table in the similar items you might like section and buy it now instead of adding to the shopping cart.</p> <p>Task deemed completed: When the user has purchased the coffee table and on the confirmation page.</p>

Appendix F: Data Logging Sheet

Pablo UserTestingDataLogging.xlsx

	A	B	C	D	E	F	G	H
1	User ID	Task ID	Success	Failure	Amount of time (in	Behaviors	Intention	Error
2	Sneha	1	X		29 seconds	Followed the instructions correctly	Sign up and get to the homepage	No error
3	Sneha	2	X		50 seconds	Selected the green sofa and added it to the cart, from where	Buy one item from the cart	She bought the whole cart
4	Sneha	3	X		1:40	She found the search bar then clicked one of the popular	Had to press buy now	She pressed add to cart
5								
6	Mark	1	X		15 seconds	Created account and signed up	Sign up to get to the homepage	None
7	Mark	2	X		42 seconds	Searched for green sofa	To add item, remove that item and then buy a single item	None
8	Mark	3	X		1:26	Easily found the search bar	To buy one of the similar items	Was going to add to cart but pressed
9								
10	Chris	1	X		21 seconds	Clicked on sign up, signed up and went back to log in page	Create a new account to get to the home page	None
11	Chris	2	X		44 seconds	Clicked on the green sofa from the homepage, added it to	To add a furniture to the cart, remove it, and purchase a fur	None
12	Chris	3	X		1:10 minutes	Found the search bar and popular searches section right	Buy the coffee table directly instead of adding to cart	Put it into the shopping cart first
13								
14	Sam	1	X		24 seconds	Found sign up button and created account	To create an account and reach homepage	None
15	Sam	2	X		40 seconds	Tried finding for green sofa and ordered the item	To add a furniture to the cart, remove it, and purchase a fur	None
16	Sam	3	X		58 seconds	Easily found search bar, selected popular searches and	Buying instead of adding to cart	None
17								
18	Hardik	1	X		10	Saw the new user prompt and clicked to create an account.	Create an account and reach the homepage	None
19	Hardik	2	X		23	Clicked on the green sofa image on the home page.	Learn the features of the cart and the basic navigation of hc	None
20	Hardik	3	X		45	Clicked on the search bar, selected a popular search, clicked	Use the recommended items feature and do a direct purch	None
21								
22	Suyash	1	X		12	Saw the new user prompt and clicked to create a new	Create an account and reach the homepage of the app	Did not like having to click login again
23	Suyash	2	X		20	Found the green sofa item on the home page, proceeded to	Learn the features of the cart and the basic navigation of hc	None
24	Suyash	3	X		50	Clicked on the search icon, selected one of the placed search	Learn the features of the application and also see what kind	None
25								
26								
27								

Attached is also the link to the Data Logging Sheet for better view: [Data Login Sheet](#)