

PRD Outline: Virtual Home Decor

Team: Group 6

List all students who actively worked on this Assignment:

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Vision

Sometimes, people buy furniture online but they have to return the items because it's not a good fit in their place. Our vision is to resolve this problem by providing visualizations for their place. Using our app, customers can see how any particular item will look in their house and they can buy the best suitable item.

Motivation

Customer Segments

Decorating your own house is one of the most fun but one of the most tedious jobs that everyone has to do and with the need of convenience and time efficiency, there is a vast and fast growing market of data visualisation via AR that we have narrowed down the most likely and top target customers into three segments

Segment 1: Interior Designers (People with a profession of designing houses) These segments are people who are Interior designers by profession and who struggle to convey their ideas to their customers. Customers usually find it difficult to understand what the Interior designer is trying to visualise and the Interior designers then have to make a 2D plan which is very time consuming. So this app will help customers to understand exactly what the Interior Designer is trying to make them visualise. Also, it will save the time and efforts of Interior Designer.

Segment 2: TechSavvy people (People who prefer/enjoy online shopping) These are our tech-savvy customers who are made for the digital era. Technology freaks and Social media influencers are the two subcategories that we are targeting in this segment. TechFreaks are the

digitally confident and active shoppers meanwhile the power of social media increases exponentially so does the power of the social media influencers that can help us market about the product in an entirely different way and on a whole different level.

Segment 3: Retailers (Most underrated consumers) This segment includes the shops who want to increase their sales by investing and therefore being a part of the app itself, we believe that this will help them reach out on a digital level and on the other hand, this will help us with resources. This is a two-way segment focusing on targeting a larger customer segment.

Sandra stays with her family of 5,

She has 3 kids, Sandra and her husband both work from 8 am to 5 pm. Both of them are busy and only on weekends they have time, but that time they utilize it by going out with their children and helping them with their homework. So they prefer an app which while helping their children doing their homework with some clicks will show them via AR the furniture that can fit into a particular space, which saves their time and money.

Footballer Brown,

Brown loves playing football. And he is a TechSavvy student so he doesn't earn much to afford to hire an Interior Designer to decorate the house so an app which will show him the cheap and best quality options via AR would save his money.

Unmet Needs

According to the report, 83% of the citizens are online shoppers and nearly 20% of the sale is of furniture items. But, around 49% of the furniture items are returned because they don't fit well in the house. What might be the reason? This is covered in our unmet needs.

1. Availability of options: Other E-commerce apps have a lot of areas to focus on that's why they have a less variety of decor items. Our app is primarily focused on home decor and it's necessary parameters. We will make sure that the user is explored to a variety of furniture with various parameters such as Color Palette, Texture etc.
2. Integration with Economical sellers: This is a key feature that makes our app stand out in the current market. All the existing apps have their tie-ups with leading retailers/sellers such as Amazon, IKEA, Walmart, Pottery Barn etc. It doesn't encourage small business owners and it's not an economical option for every buyer. We are focusing on integrating our app with Economical sellers to give them business as well as to provide cheaper options for the customers.
3. Quality: Many of the returns are requested because the customers are not satisfied with the quality of an item. We will make sure that all the Economical sellers are selling the best quality products to the users.

4. Other Parameters: We will provide a feature where the users will be able to resize the dimensions and see the results. This will help them to get the most accurate visualization. Also, we are planning to make the app more user interactive. In future, we will make a few updates according to user feedback to make it even more user friendly.

Existing solutions and Differentiation

The Internet is the medium for almost all resources. It's easily available and very useful thus it is no news that a virtual home decor app has already set foot in the ecommerce industry for quite a long time. Companies like Ikea, Magic, etc. are very well established in the industry by providing different perks but in the end serving a platform to help people to be their interior designer. Let's take a peek through the comparison of these existing solutions.

Company Name	Compatibility	Features	Plans	Integration with companies
Magic Plan	IOS	Allows to save the plan	4 Types of Pricing model	No
Room Planner by Ikea	Desktop only	Ikea catalogue can be visualized in 3D	Paid expert advice	Yes
Artfully Walls	IOS & Android	3D view of art specific to walls	Free consultation	No
Roomy	IOS	Integration with top retailers like Amazon	No plans	Yes
Art.com	IOS	Walmart catalogue can be visualized in 3D	Expert advice	No

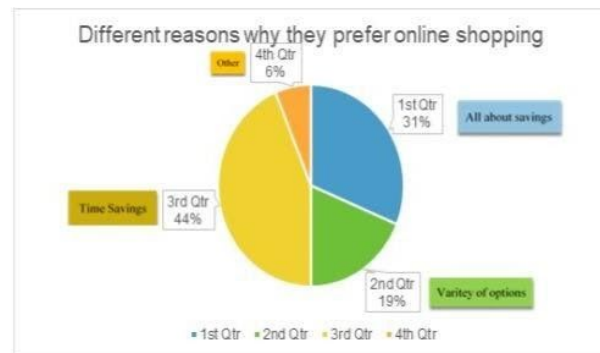
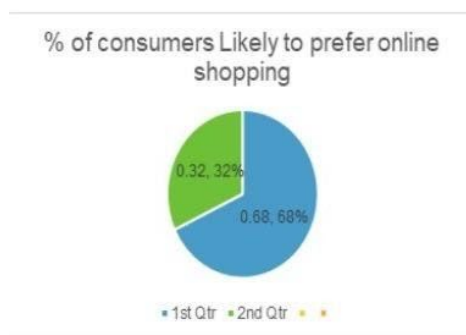
The above table shows the comparison of 5 existing competitions in market over 4 parameters:

- Every company covers only one strength like saving a plan or just viewing arts for walls.
- These solutions are pretty much compatible only IOS

Our goal for Virtual Home Decor is to include as many features like color options, furniture options and integration with economical companies (a feature very different from existing solutions in the market) and to make sure it is accessible over all platforms.

Why now?

Even though almost every furniture industry has a good online sales amount, if we consider the returns rate it is high too. We believe that the Furniture Industry in terms of returns is still at its peak waiting to make its breakthrough. Why is it that most Americans (80%) shop online but when asked about satisfaction there is only 25%-30% who actually don't have any issues after buying online. But when our team interviewed a few people and asked if they would consider shopping online keeping its strengths in mind almost more than 65% responded as yes. Here are a few numbers to depict our analysis. The first pie chart shows (in blue): Number of people who would prefer/consider online shopping. And the second pie chart on the right shows a few reasons why!

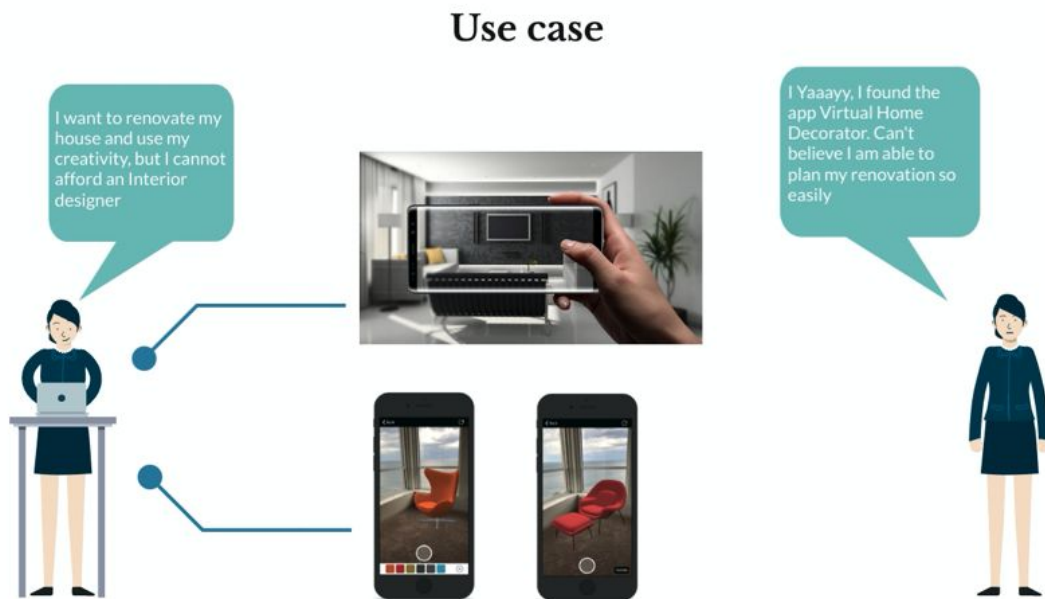


Use Cases

Use Case 1: #Convenience Ease

Dane stays in Seattle for 3 weeks every month and loves waking up to cloudy weather in Seattle. He works for a company in Boston and has to come and stay in his Boston's house for a week every month. He has decorated his Seattle house but finds it very inconvenient to decorate his Boston house since he comes only for a week. But when he got to know about Virtual Home Decorator, he could decorate his Boston house within a week with ease and convenience.

Use Case 2: #SmartSavings



Katie usually decorates her house hiring an Interior Designer which would cost almost 10k USD but when she got to know about Virtual Home Decorator she could do it on her own with her own choice saving almost 10k USD.

Use Case 3: #TimeEfficiency

Jessica stays with her husband. They both work 8 am to 5pm 5 days a week. Jessica loves to decorate her house but she doesn't have enough free time to look for ideas on the internet on weekends. While surfing on google, she got to know about Virtual Home Decorator which helped her visualise all the decor materials with ease , saving her all the time of the weekends she used to invest searching for ideas on google.

Design Principles

Our main aim with Virtual Home Decor is to make decorating your home easier and cheaper for everyone. Following are the design principles:

1. It helps visualize the product using VR
2. Easy to use and suggests you with similar products to make your search easier

3. It's integrated with many bank accounts for the transaction and ensures data security
4. Offers many deals for subscribed customers

Features/information architecture

User sign in/sign up – Applicants will be able to login to the Virtual home Décor website with the username (or email address) and password to set up by them while registering on Virtual Home Décor. The username and password will be validated.

Categorization of Products:-

1. Vanities
2. Desks
3. Beds
4. Wooden Closets
5. Paints
6. Chairs
7. Mirrors

Price comparator – it will compare the prices with other websites so that he will understand he is getting better quality at a cheaper price.

Quality – all the products sold by Virtual Home Décor are recognized and marked as good quality

Customer Feedback – users can share their experience so that we can improve our application

Easy Order Placement –

- Visa/Debit Card
- Credit Card
- Apple/Google pay

Order Scheduling – Subscribed members special deals – it's an automated reminder or suggestion of matching items when a particular item is added to cart to make it easier for the customer and also saving the time of the customer. Like when a desk is added to cart, suggestions of matching chairs are given.

Dual Deals – A person having a coupon on a particular brand can add the coupon of Virtual Home Décor and purchase that item. If a particular brand has a sale going on and Virtual Home Décor also has a sale going on at the same time then they can combine the two offers and do their

purchases. Users can ‘favorite’ items to save for future references.

V1 aka Minimum Viable Product (MVP):

Priority 0-The Must have Features

For the Virtual Home Décor the three most important things that it must include its

1. Main goal
2. Key features and Benefits
3. Contact Information

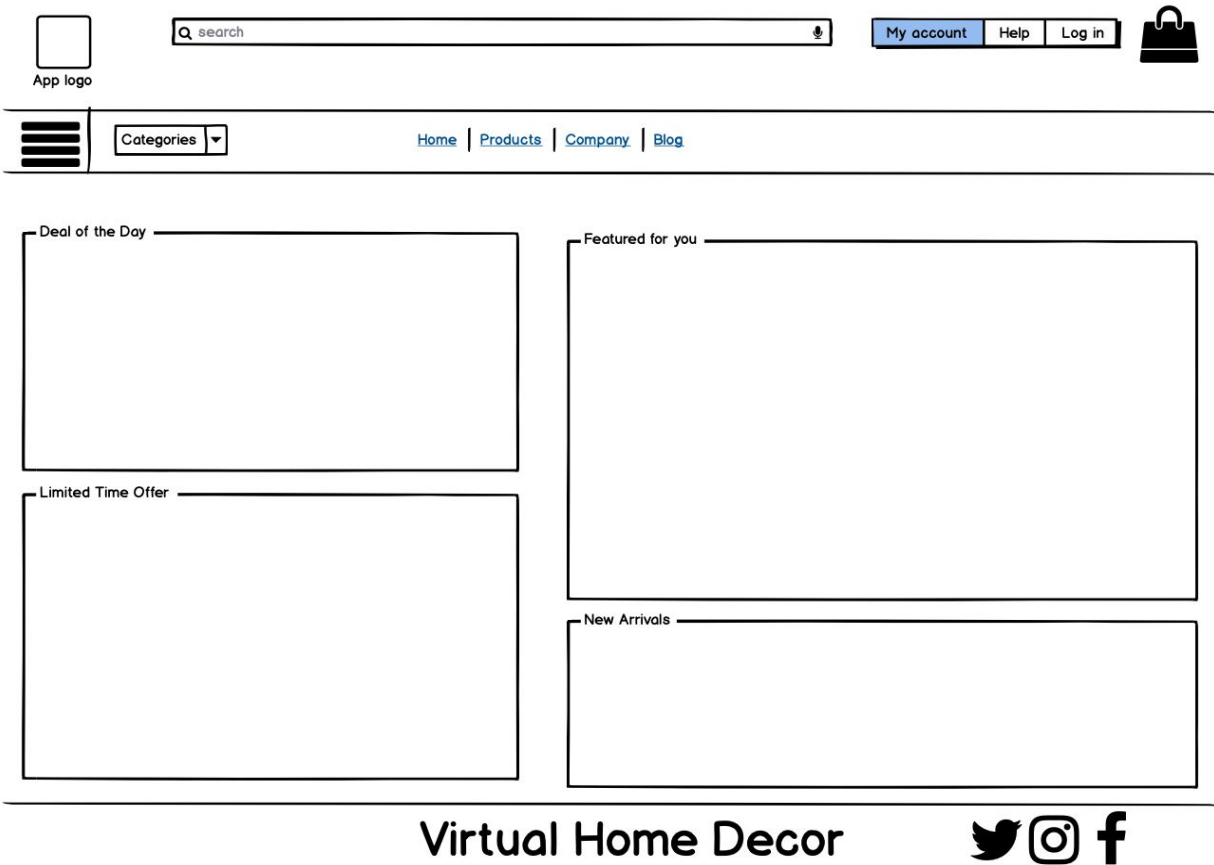
All of this is the essence and has been included from the start including in its websites landing page <https://dudhea.wixsite.com/mysite-1>

Priority I-The nice to have Features

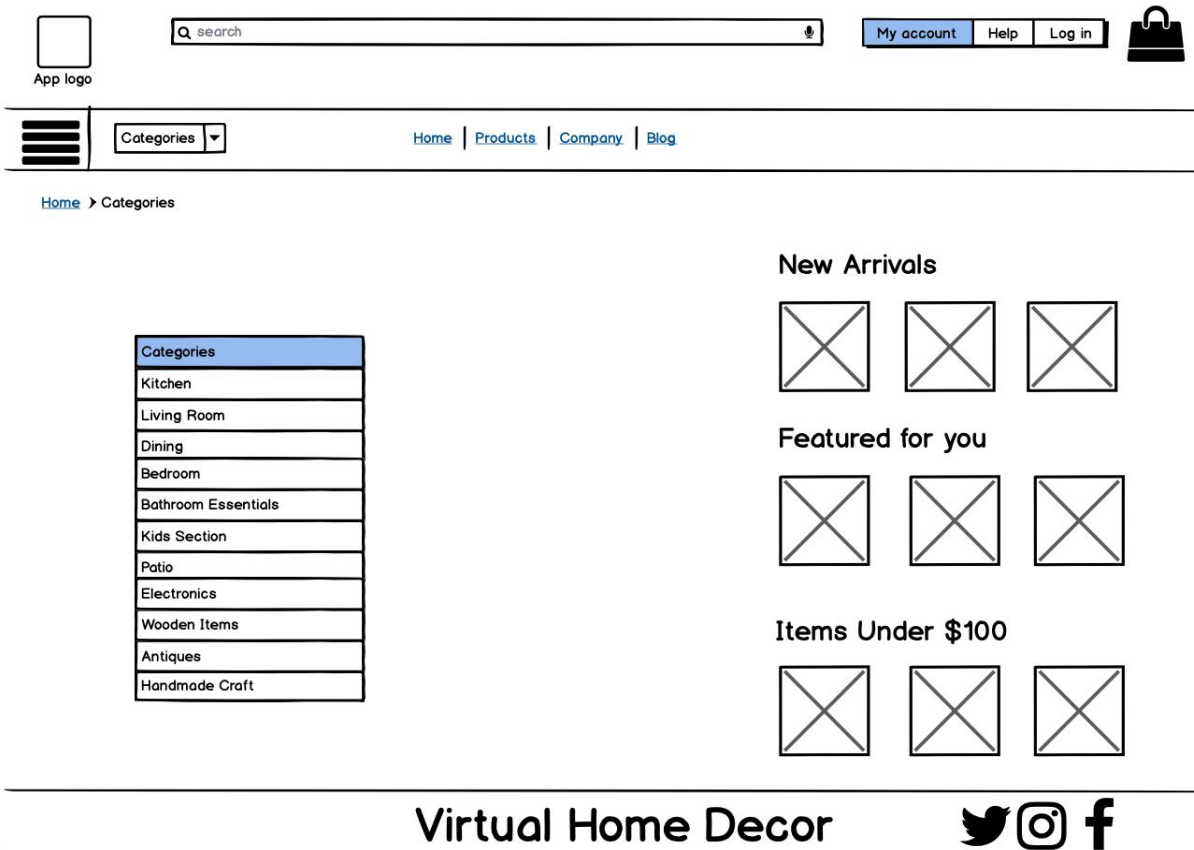
These are the features that we plan to include in the alpha and beta launch of the product , these are the highlighting features of the product important for its critical success.

1. Price Comparator
2. Variety
3. Unbeatable Prices

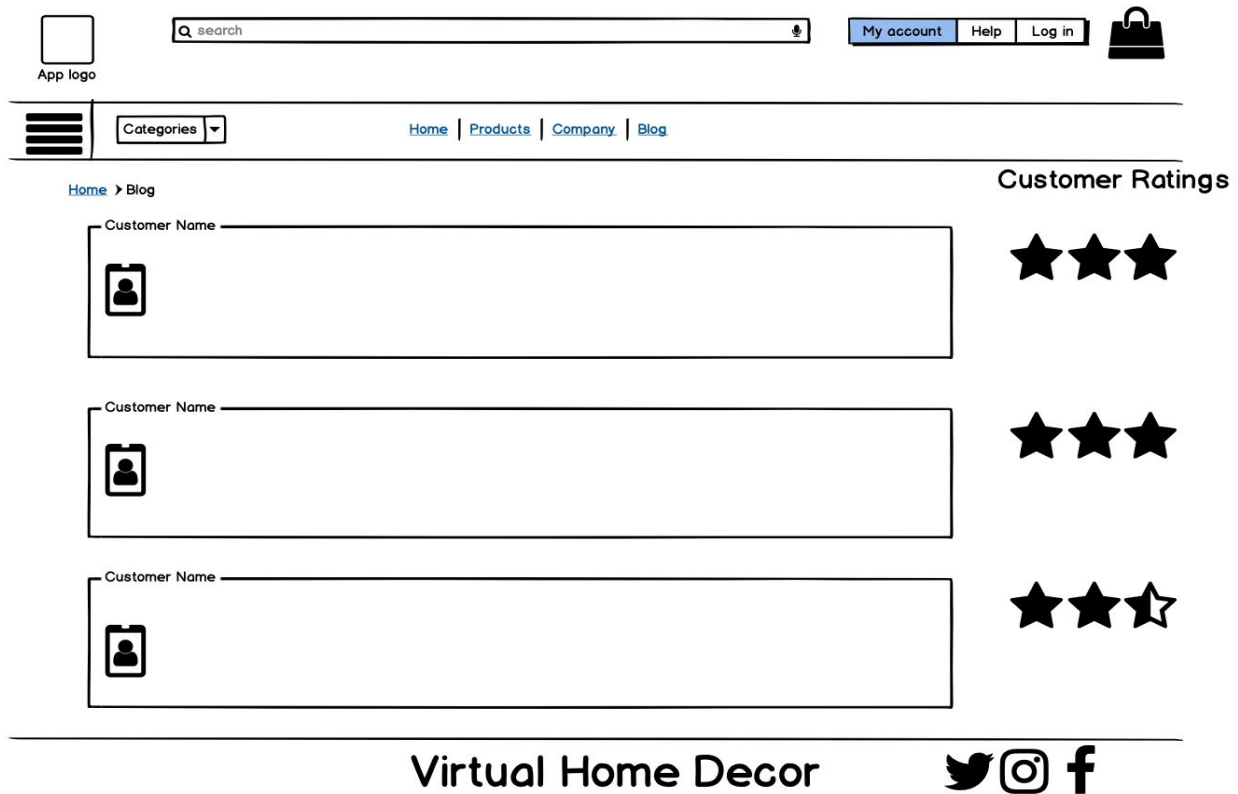
All these products are included in the products mockups since the products initiation launch as shown below:



- Various options to get feasible deal
- Various options in variety of products



- Various options of product according to categories
- All the categories will have the 'New Arrival', 'Featured for You' and 'Items under \$100' sections



- The review written by customers
- Customer ratings out of 3 Stars

vNext

- Better and advanced quality VR
- 2 day delivery
- A social media platform for feedback and Marketing
- A wide connected platform dedicated to customer service

v Longterm

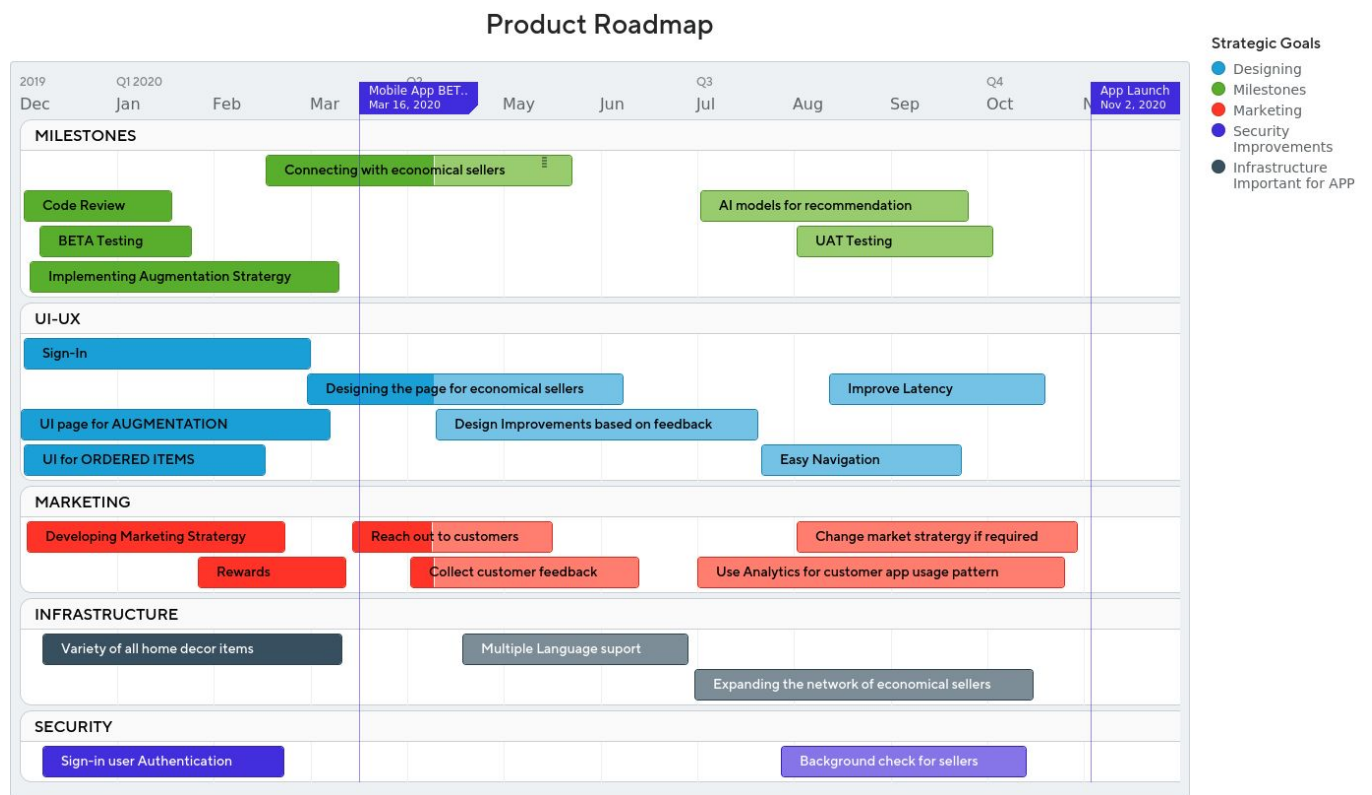
- Expand nationally
- Smart Storefronts
- International reachout

Roadmap/Timing

Please find below the image which is an elaborated image of our roadmap and following its Goals for the final launch and it's priorities. We are following an agile approach

Assumption:

1. Beta version is launched
2. Basic app features have been implemented
3. Marketing strategies have been formed.



Goals	Lane	Legend	Strategic Importance
Code Review	MILESTONES	■ Milestones	High, Completed in Q1
Connecting with economical sellers	MILESTONES	■ Milestones	High, In progress which Q2
AI models for recommendation	MILESTONES	■ Milestones	High for Q3 - Recommendations are trending these days
Implementing Augmentation Strategy	MILESTONES	■ Milestones	High, Completed in Q1
BETA Testing	MILESTONES	■ Milestones	Moderate, Completed in Q1
UAT Testing	MILESTONES	■ Milestones	High for Q3
Design Improvements based on feedback	UI-UX	■ Designing	Moderate for Q2
UI page for AUGMENTATION	UI-UX	■ Designing	High, Completed in Q1
Sign-In	UI-UX	■ Designing	Moderate, completed in Q1
Designing the page for economical sellers	UI-UX	■ Designing	Moderate for Q2
UI for ORDERED ITEMS	UI-UX	■ Designing	Low for Q2
Easy Navigation	UI-UX	■ Designing	Low for Q2
Improve Latency	UI-UX	■ Designing	Low
Use Analytics for customer app usage pattern	MARKETING	■ Marketing	Moderate for Q3
Developing Marketing Strategy	MARKETING	■ Marketing	High, Completed in Q1
Collect customer feedback	MARKETING	■ Marketing	High in Q2
Change market strategy if required	MARKETING	■ Marketing	Low for Q3

Goals	Lane	Legend	Strategic Importance
Rewards	MARKETING	■ Marketing	High, Completed in Q1
Reach out to customers	MARKETING	■ Marketing	High for Q2
Variety of all home decor items	INFRASTRUCTURE	■ Infrastructure Important for APP	High for Q2
Multiple Language support	INFRASTRUCTURE	■ Infrastructure Important for APP	Low for Q2
Expanding the network of economical sellers	INFRASTRUCTURE	■ Infrastructure Important for APP	High for Q3
Sign-in user Authentication	SECURITY	■ Security Improvements	High, Completed in Q1
Background check for sellers	SECURITY	■ Security Improvements	High for Q3

Metrics

1. Number of orders placed over a period of a month
2. Customer conversion rate, the customers who subscribe to the newsletter or be a member
3. How many customers refer their friends or family?
4. Monitoring app downloads, either organically or through paid ads
5. No. of times saved designs are viewed
6. Amount of time spent by the user on the in-app augmentation platform
7. Average revenue generated from sellers in a month
8. Number of Customers directed to the item when directed via marketing campaign
9. Number of returns to sale ratio per month

International

The team of Virtual Home Decor has a long term goal of launching the product worldwide. This app will be useful for people everywhere. We are planning to go global within the next 3 years. The world is closely connected these days. The next step is to launch the app in Europe and the UK simultaneously.

We are planning to take care of issues like shipping facilities, taxing scheme, marketing and integration with local businesses before scaling up the application and going live.

Projected Costs

A basic development team may include:

- Project Manager
- Programmer
- UI/UX designer
- Data Scientist
- QA engineer

Extended development team:

- 1 Project manager
- 2-4 app developers
- 1 back-end developer
- 1-2 UI/UX designers
- 1 QA Engineer
- 2 Data Scientist

Duties and costs are represented in the table below:

Team Members	Duties	Hourly Cost
Project Manager	Prevents any miscommunication and misconduct within the team to avoid pitfalls and abide by deadlines	\$20+
Developer	Writes the code of an app, integrate it with the data source and fixes bugs	\$30+
Back-end developer	Ensure that the application,the database and the server communicate with each other in a right way and the whole app works correctly	\$25+
Designer	Works on how an app interface would be laid out and how it would be felt by users. Solves different optimization tasks	\$15+
Data Scientist	works on analysing user trends through AI models. Then build recommendation system through user data leveraging Machine Learning Algorithms	\$45+
Tester	Monitors each part of the app , control code and design quality, ensures the end - product meets all project requirements.	\$20+

Cost by key mobile app features:

User login:

In order to use the App ,App users have to register and log in. Registration via email or phone, while signing in through social media accounts is the most popular option. Social Media sign in makes it convenient for the user as the app uses all the data on its own to create and account. This is a standard practice in app development, and it takes around 25 hours. It translates into \$500-1,000 cost.

Push notifications:

Must-have feature for all the apps today. These are ongoing updates that keep clients educated about any exercises identified with an application or administration. The stunt here is that there are a few kinds of notices: straightforward content, the ones with pictures or ones with activity catches. Additionally, application rationale matters – when and to whom (for instance, in talk applications) the notifications are conveyed.The development timeline is between 20 and 200 hours. The cost may range from \$1,000 to \$10,000.

Navigation:

The entire client moves through an application that ought to be imagined and structured before the advancement. App route characterizes how clients move between different screens, how they return to the fundamental menu, how they take activities, close the application, etc. Looking over, swiping, action catches, bolts, symbols and then some, imply that UI engineering is the reason for an application to be based on. This logic demands 10+ hours, which may cost \$250-500.

Geolocation:

It depends on the telephone's GPS and constant client authorizations (required and discretionary). As to cost, it relies upon geolocation administration exactness and is normally partitioned into general territory, medium range closeness and precise area. Expect no less than 50 hours of development, thus \$1,250-2,500 cost.

Mobile ads:

Mobile advertising seems to individuals utilizing an application, as a basic book, flag or full-screen pop-ups. Advertisements can be uniquely grown, however there are a lot of outer administrations and systems (Google AdMob, InMobi, Tapjoy, Flurry and that's just the beginning), SDKs and APIs, helping designers significantly. Thus, this feature should take around 20 to 50 hours, depending on the type. The cost range may be \$1,000-2,500.

In-app purchases:

Promotions inside applications clearly suggest buying alternatives directly from the client's cell phone. It could be different substance or things in the mood for buying – items or administrations, memberships, new/premium highlights, and so on. Developing this feature should not be hard for a hired agency or a developer, and time to do it basically depends on the number of items and should be about 30 hours. The estimated cost is \$750-1,500.

Payments integration:

Obviously, for clients to have the option to buy something inside an application an installment framework ought to be introduced as well. There are a lot of framework choices to browse – Android Pay, Google Wallet, Apple Pay, Stripe, PayPal, Intuit, Square, Braintree and numerous others. Engineers can incorporate the vast majority of them into an application legitimately through passage APIs. The extent of this undertaking relies upon a few variables: how installments are procedures, how and where the information is put away, how secure the exchanges are, what level of PCI consistency (installment card industry) is given, and so on. Our own Android and iOS engineers admit to us that they need around 50 hours or more to incorporate one installment framework. So if we take an average of 2 mobile payment methods, the cost of this feature would range from \$2,500 to \$5,000.

Database:

Obliging disconnected mode, by and large, your application would presumably require a database to store information locally on a gadget. Portable application engineers for the most part use a specific open-source answer for setting up a database. SQLite, for instance, is a minimized implanted database/library that spares all the information in a solitary record on a gadget. The task depends on the data type, and takes about 30 hours, which, in turn, costs \$750-1,500.

App maintenance costs:

Sadly, your costs don't end with the application discharge. Be that as it may, for what reason would it be a good idea for you to put resources into application support? The minute when you distribute your application in the App Store as well as GooglePlay isn't the cheerful end. It's simply the finish of a section. As a matter of fact, it's simply the start. Incidentally, it isn't the end when you get two or three hundred thousand downloads either. You should focus on your DAU (day by day dynamic clients). As it were, you need to cause individuals to download your application and continue utilizing it as regularly as possible. The normal expense of keeping up an application is about 20% of the improvement cost every year. For instance, if your application improvement costs \$200,000, you can gauge that application upkeep will cost you around \$40,000 every year. Additional features may drive up the cost of app maintenance, which may include:

powerful servers – \$20-\$60/month

push notifications – \$10/month

payment gateways – up to \$150/month (plus a fee on each transaction)

emergency maintenance – depends on the nature of emergency

third party APIs charges

bug fixing

app stores developer fee – \$25 at Google Play, \$99 at Apple App.

Operation Needs

Archive any help or operational help that will be required for the undertaking (client support, sourcers, contractual workers). Will the responsibility be limited or continuous? Discharging a local portable application requires presenting your application to the application stores including the Apple App Store for iOS applications and the Google Play for Android applications. Hence, we will require an engineer account with Apple App Store and Google Play Store before propelling our versatile application.

Once submitted in the Apple App Store, iOS applications experience a survey procedure which may take from a couple of days to half a month relying upon the nature of our application and how intently it follows Apple's iOS improvement rules. In the event that our application expects clients to sign in, at that point we should give Apple a test client account as a major aspect of the discharge procedure.

Once the app becomes available in the app stores, we will monitor its usage through mobile analytics platforms and track Key Performance Indicators (KPIs) for measuring our app's success.

We will require solid ties with the neighborhood style stores and clients to keep us refreshed with issues they face so that the application can be made effective and simple to utilize.

For conveyance purposes a solid coordination and supply group will be expected to transport arrangements over the territory where the application is worked.

Risks/Key Dependencies

1. **Alliance with Retail stores:** This is a key dependency in our app. There should be good communication between the stores and application employees to maintain the updated records about the availability of items.
2. **Decor items availability:** In scenarios where items requested by customers are not present in the storage, the information should be available for customers. All the information including price fluctuation and availability of decor items should be updated from time to time in coordination with integrated sellers.
3. **Application Latency:** In the current situations, the application might take longer than expected to provide the appropriate visualization as we have many color, texture, size and furniture options. We aim to remove the lag and make the application faster by using advanced database strategy and augmented reality techniques.
4. **Unverified Sellers:** This is one of the risks currently present in the app. In future we aim to carry out a background check for all the sellers to make sure that they are genuine vendors.
5. **Misleading Recommendations:** It is a possibility that the application might provide some misleading recommendations to the user. We aim to add more parameters in the visualizations so that that customer gets the best quality of the house representation.

Risks and it's Mitigation

Alliance with retail stores	The Marketing team and sales team to strategize considering the views of our economical sellers. Since, many economical sellers might not be educated and not a tech savvy owner.
Décor Items Availability	Combination of both engineering and retail seller warehouse problems. Both teams have to establish metrics and procedures to address these issues.
Application Latency	This is an engineering problem and so application architects along with other developers have to come up with some Database Architecture to store data and pull data on screen with no latency.
Unverified Sellers	This is related to user safety. Thus, economic retail sellers should undergo a background check and post that the product they sell, the quality test. Engineering and legal team should work together to resolve such issues.
Misleading Recommendations	This can be addressed by having a better understanding of customer behavior and developing better AI models. Also, hiring experienced Data Scientists will be beneficial.

Team members

Virtual Home Decor's development team is a good combination of people with technical, analytical and management background. The roles and contact information can be shown as follows:

Name	Role	Contact
Pranjali Doiphode	Team lead, Product Management	doiphode.p@husky.neu.edu
Apoorv Dudhe	Data analyst	dudhe.a@husky.neu.edu
Bhashmi Fatnani	Back-end developer	fatnani.b@husky.neu.edu

References

- <https://www.emarketer.com/content/consumers-are-warming-up-to-purchasing-furniture-online>
- <https://www.ibisworld.com/industry/statistics/businesses.aspx?entid=1016>
- <https://www.statista.com/statistics/183755/number-of-us-internet-shoppers-since-2009>
- <https://www.productplan.com/product-metrics-matter/>

