



GUJARAT TECHNOLOGICAL UNIVERSITY

CERTIFICATE FOR COMPLETION OF ALL ACTIVITIES AT ONLINE PROJECT PORTAL

B.E. SEMESTER VII, ACADEMIC YEAR 2019-2020

Date of certificate generation : 16 October 2019 (12:32:00)

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Periodic Progress Reports (PPR)	Completed
Design Engineering Canvas (DEC)	Completed
Patent Search and Analysis Report (PSAR)	Completed
Final Plagiarism Report	Completed
Final Project Report	Completed

Name of Student : Deep Pancholi

Name of Guide : Mr.Khem Dhawal Punamchand

Signature of Student : _____

*Signature of Guide : _____

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Patent Search and Analysis Report (PSAR)	Completed
Final Plagiarism Report	Completed
Final Project Report	Completed

Name of Student : Patel Jinal Manharbhai

Name of Guide : Mr.Khem Dhawal Punamchand

Signature of Student : _____

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Design Engineering Canvas (DEC)	Completed
Patent Search and Analysis Report (PSAR)	Completed
Final Plagiarism Report	Completed
Final Project Report	Completed

Name of Student : S h a h D h a r m i k
Bharatkumar

Name of Guide : Mr.Khem Dhawal Punamchand

Signature of Student : _____

*Signature of Guide : _____

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A Project Report On

REVAMP

Submitted by **Team ID- 64175**

Deep Pancholi (160130107018)

Dharmik Shah (160130107102)

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Students of

Bachelor of Engineering (B.E.)

in

Computer Engineering

under

Mr. Dhawal P. Khem, Professor

From

Government Engineering College- Gandhinagar

Gujarat Technological University, Ahmedabad

Acknowledgment

A successful project is a fruitful effort by many people, some directly involved and some indirectly, by providing support and encouragement. We express our sincere gratitude to everyone who had helped us. We would like to thank our friends for their encouragement, inspiration, moral support without which, it would have been almost impossible to complete this project.

We are extremely grateful to our Principal Dr. Sweta Dave which gives us an opportunity to shape our career. Our effort will be incomplete without mentioning our Head of Department Prof. B.V.Buddhadev, who provides us the constant support, which was of a great help to complete this project successfully.

We express our heartfelt gratitude to Mr. Dhawal P. Khem, whose support and guidance was invaluable. We are grateful to him for great knowledge, necessary information suggestion and guidance for the success of this Project. They have been constant source of motivation to us. We also thank all our faculties of CE department for their valuable support.

Abstract

The idea of this project primarily focusses on an Android Based Application ^[1] that uses Deep Learning ^[2] (for object detection system), Machine Learning ^[3] (for recommender system), and Augmented Reality ^[4] (for visualizing the product). It describes the main fields in the application which are applied to ease out the renovating process of users. Some characteristics of the above-mentioned technology systems will be discussed, and this paper will provide an overview of them. Future scopes are also discussed.

Our idea is to make an application that enables the user to visualize his personal space without having to take the troubles for visiting shops/sellers and selecting new items for the space.

We want to make home renovation so easy a procedure that no user will think twice before initiating the renovation/redesigning process because of the troubles faced during such undertakings that it becomes frustrating for the space owners to take it to the next level.

The work of application is divided into four key steps. The first is the detection of existing product which the user wants to remove/ replace with a new product. The second is a recommender system (for the users who wish to install a new one), which recommends a new product with the visual features from a large data set. The third step comprises of visualizing the newly selected product from the options in place of the old one. And finally, the user can see all the available purchase options according to his preset filters. In the domain of renovation, the system will yield more efficiency comparable to the best previous systems.

Used in real-time applications, the app can minimize significant time of users, and help in achieving the best designs without having to step out.

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1. Introduction

1.1 Project Introduction

We are developing **Revamp**, which is an Android Application. Our Idea is to develop an app that can help home/office or any space owners to renovate their space with at most ease and efficiency. Due to the vast customer space, this app will have a very big impact on such users those are willing to undertake renovation projects of their home or any space. And on the other hand, the tremendous wastage of time of selecting various raw materials for replacement or reconstruction by the owners, it is restricting the users from taking up such projects and making their improving the condition and design of their spaces.

Our primary idea is to provide the users with an app that can uses a recommender system using Deep Learning algorithms that recommends new and latest products from the nearby market that match their existing color schemes. And an application that will provide all these features together. A recommender system will work on the image scanned or uploaded by the user, and recommend new products from the nearby market or any other location as selected and filtered by the user using GPS to eliminate all the travelling the user has to undergo, thereby saving valuable time and making efficient use of resources.

For example, if any home owner wants to renovate his home using our app, he will have to scan the items he wants to replace in his home, which our machine learning algorithm will capture and scan the dataset for items related to the scanned item in color and size. The Deep Learning algorithm will then recommend new items. And then the user can visualize the newly selected item in place of his old product using Augmented Reality. The user can also see his nearby places to check buying options.

1.1.1 Our Project Goal:

Our Primary goal is to target the following class of users to make their home renovation hassle free and easy:

- Commercial Property Owners
- Homeowners
- New Site Constructors/ Builders

1.1.2 Users and User activities:

The users of our App are divided into two main categories:

- Admin (Developer Team)
 - Admin manages the application.
 - Admin can remove suspicious Users.
 - Can see user's location.
 - Login using Username and Password
 - User Management and Logs

- User
 - User can use the app for personal uses.
 - Signup Process:
 - First Name
 - Last Name
 - Password
 - Confirm password
 - Mobile no.
 - Login Process:
 - Username
 - Password
 - Reset password
 - Using the app:
 - Choosing the mode of operation (replace an existing item or install a new product)
 - Replacing an existing item:
 - i. Scan the present item.
 - ii. Wait for the app to recommend similar new products based on the product details scanned by the user.
 - iii. If the user likes any of the recommended items, he can choose to install it.
 - iv. The user will also be provided with the visualization of the product that he chose in his present space/scenario.
 - v. In the last step, the user will be provided with the details of the nearby sellers or dealers of the product that he chose so that he can enquire about the pricing and availability of the product directly with the dealers.
 - Installing a new item:
 - i. If the user wishes to install a new product, he will have to select a new product from the catalogue.
 - ii. After that, he will have the option of visualizing the new product that he chose

- in his place.
- iii. And similar to the above step, he will also get the details of the nearby sellers of that product.
- iv. The user can then save all his visualization images in his library so that he can access them whenever he wants without having to repeat the above steps again.
- Logout

1.2. Requirement of New System

The main purpose of this project is to overcome the time wasted and resources' inefficient utilization of users. And even after having undergone so much efforts, still there are faults and perfection glitches. Once the idea caught up the pace, later, it was decided to include a playful factor to our application by providing visualization through Augmented Reality. So that they could also enjoy and take benefit of the advancing technology and visualize and choose the perfect product that suits their present surrounding and color schemes.

This app can bring many of the hard tasks and missions to be achieved easily also reducing the time taken to do so.

Before we jump into the problem's solution to be achieved by this app, it is very necessary to understand the scene without the app or say before the app was proposed. So, the thing is, talking about before, there were a lot of missing things, such as selecting the perfect new product, selecting the correct color variant, surveying the market for its cheapest available price, visualizing the new product at the place it needs to be installed, and other factors such as extensive and unnecessary travelling in the market, time wastage, etc....

With the proposition of this app and by looking at the capabilities it can accomplish, it has wide opened various new possibilities. If we look at it in hands of homeowners, they can use it for all the above-mentioned tasks. Also, it can as effectively be used by commercial space owners. It also supports GPS which can give the exact location of the dealer or shop where the selected product is available at cheapest price, making it less hard to find such dealers physically. And it uses camera and real time visualization through Augmented Reality with the perfect view.

But with every new thing, there comes the pros along with the cons with it, which can't be ignored. This thing too has some cons which we will try to take care in the future enhancements. One of its disadvantages is that some fraud sellers may use it to take data of the customers and use it for undesirable purposes. But we will try our best to protect our customers data from such fraudulent users.

2. Backend Design

2.1. Entity-Relationship Diagram:

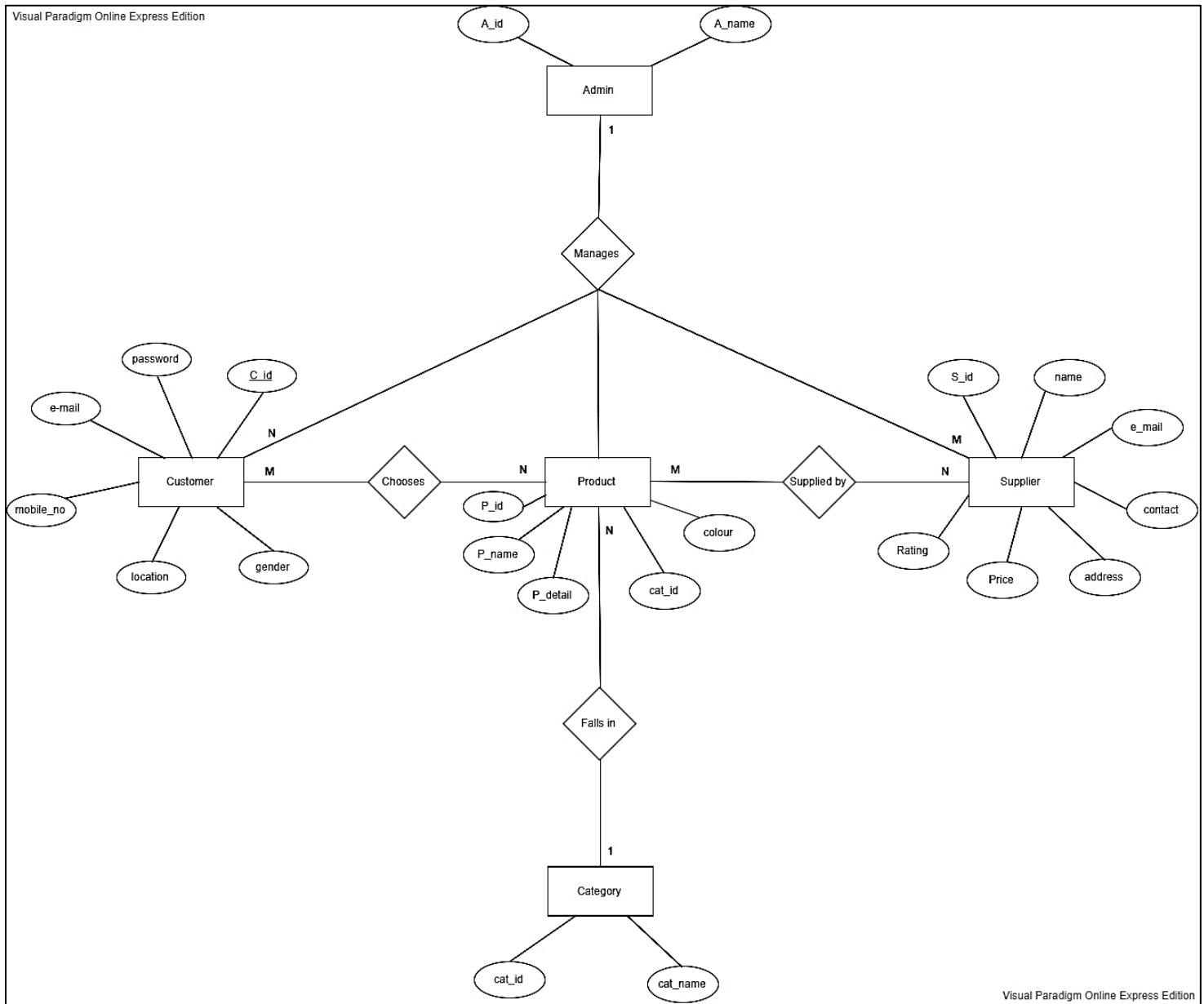


Fig. 2.1.1. E-R Diagram

The Entity-Relationship Diagram shown above shows the relationship between various entities involved in the operation of our application such as Admin, Customer, Category, Supplier, and Product and the various attributes associated with it like- C_id, cat_id, S_id, P_id, and A_id that also form the Primary Keys of the respective relations. The ER Diagram shown above helps in constructing the relation schema, that would be helpful when implementing the backend of our system in the future phase.

2.2. Database Design (Relation Schema):

2.2.1. Admin Table:

<u>A_id</u>	<u>A_name</u>
1	X

Table 2.2.1. Admin Table

```
CREATE TABLE Admin(A_id int NOT NULL,  
A_name varchar(255)  
);
```

```
INSERT INTO Admin (A_id, A_name) VALUES ("1", "X");
```

2.2.2. Customer Table:

<u>C_id</u>	<u>password</u>	<u>email</u>	<u>mobile_no</u>	<u>location</u>	<u>gender</u>	<u>A_id</u>
1	xyz	abc@xmail.com	9999999999	Link1	male	1

Table 2.2.2. Customer Table

```
CREATE TABLE Customer(C_id int NOT NULL,  
password varchar(255),  
email varchar(255),  
mobile_no varchar(255),  
location varchar(255),  
gender char,  
PRIMARY KEY (C_id)  
);
```

```
INSERT INTO Customer(C_id, password ,email ,mobile_no ,location ,gender)  
VALUES("1", "xyz", "abc@xmail.com" , "9999999999" , "link1" , "male");
```

2.2.3. Product Table:

<u>P_id</u>	<u>P_name</u>	<u>P_detail</u>	<u>colour</u>	<u>cat_id</u>	<u>A_id</u>
1	Fan	Electronics	Brown	1	1

Table 2.2.3. Product Table

```

CREATE TABLE Product(P_id int NOT NULL,
    P_name varchar(255),
    P_detail varchar(255),
    colour varchar(255),
    cat_id int,
    PRIMARY ID(P_id);
);

```

```

INSERT INTO Product(P_id , P_name , P_detail ,colour ,cat_id );
VALUES("1", "Fan", "Electronics", "Brown", "1");

```

2.2.4. Supplier Table:

<u>S_id</u>	name	email	contact	address	price	rating	A_id
1	abc	abc@smail.com	1234567890	City1	3000	4	1

Table 2.2.4. Supplier Table

```

CREATE TABLE Supplier(S_id int NOT NULL,
    name varchar(255),
    email varchar(255),
    contact varchar(255),
    address varchar(255),
    price float,
    rating float,
    PRIMARY KEY (S_id)
);

```

```

INSERT INTO Supplier(S_id, name, email, contact, address, price, rating)
VALUES("1", "abc", "abc@smail.com", "1234567890", "City1", "3000", "4");

```

2.2.5. Category Table:

<u>cat_id</u>	cat_name
1	electronics

Table 2.2.5. Category Table

```

CREATE TABLE Category(cat_id int NOT NULL,
    cat_name varchar(255),
    PRIMARY ID(cat_id)
);

```

```

INSERT INTO Category(cat_id,cat_name)
VALUES("1", "electronics");

```

2.2.6. Supplied_by Table:

<u>P_id</u>	<u>S_id</u>
1	1

Table 2.2.6. Supplied by Table

```
CREATE TABLE Supplied_by(P_id int NOT NULL,  
                        S_id int NOT NULL  
);
```

```
INSERT INTO Supplied_by(P_id,S_id)  
VALUES("1", "1");
```

2.2.7. Chooses Table:

<u>C_id</u>	<u>P_id</u>
1	1

Table 2.2.7. Chooses Table

```
CREATE TABLE Chooses(C_id int NOT NULL,  
                      P_id int NOT NULL,  
                      );
```

```
INSERT INTO Chooses(C_id, P_id)  
VALUES("1", "1");
```

Chapter -3: Front-end Design (UI)

3.1. Use-Case Diagram

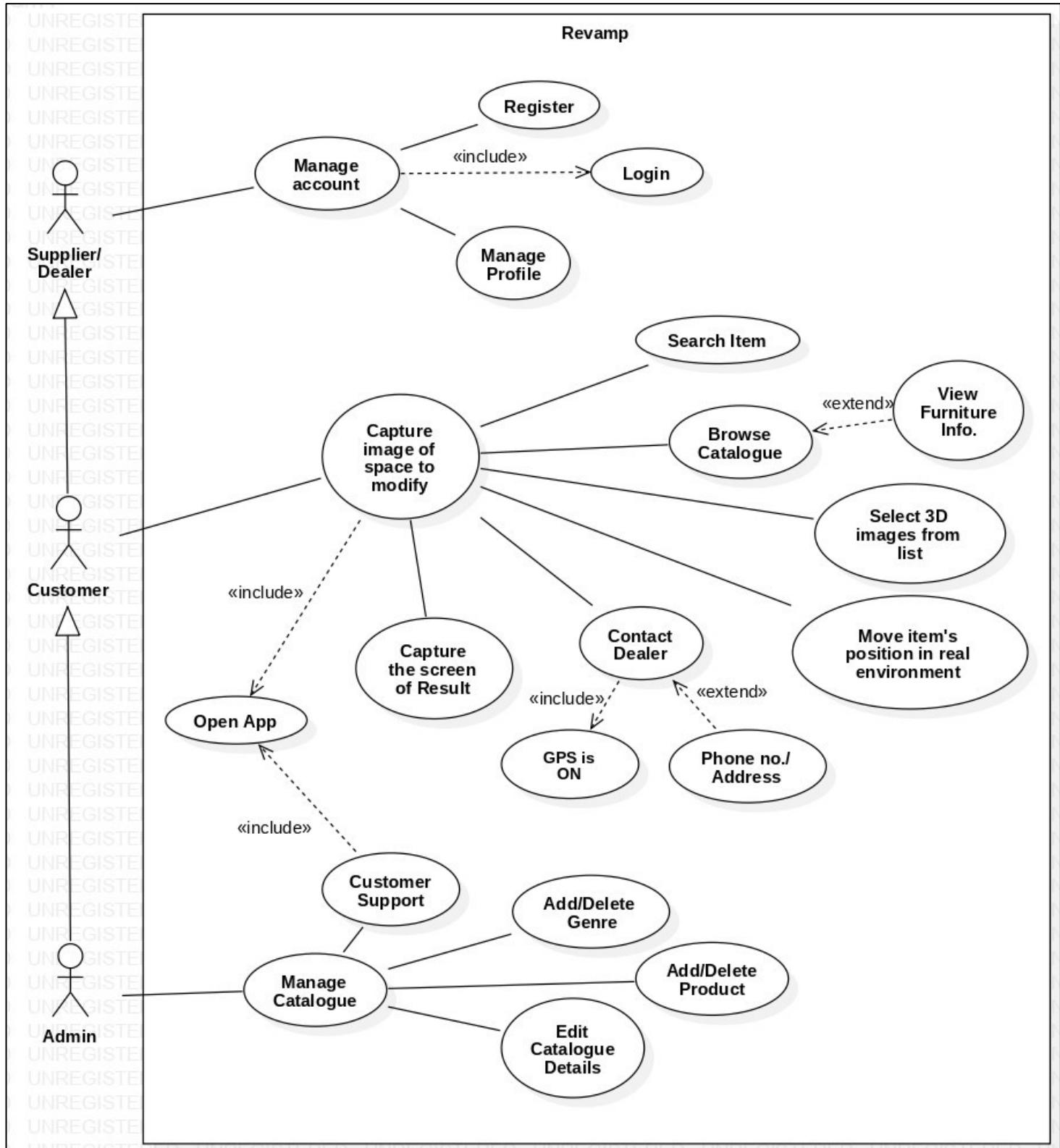


Fig. 3.1.1. Use Case Diagram

The Use-Case Diagram of our project shows the different categories of users that may use our application and the probable tasks/activities that they may/should perform with our application to make the most out of it. It also shows the *includes* and *extends* relationship between various activities.

For example, in the above diagram it can be seen that Admin extends the Customer and the Customer extends the Supplier. That means the Admin can by default perform all the activities that a Customer can and similarly, the Customer can perform all the activities that a Supplier can.

3.2. Proposed User Interface Screens:



Fig. 3.2(a). Welcome Screen



Fig. 3.2(b). Login Screen

The above two screens show the welcome screen once the app is opened and the login page for the existing users.

And if the user is not already registered, he may do so by clicking the bottom-most button on the second screen.

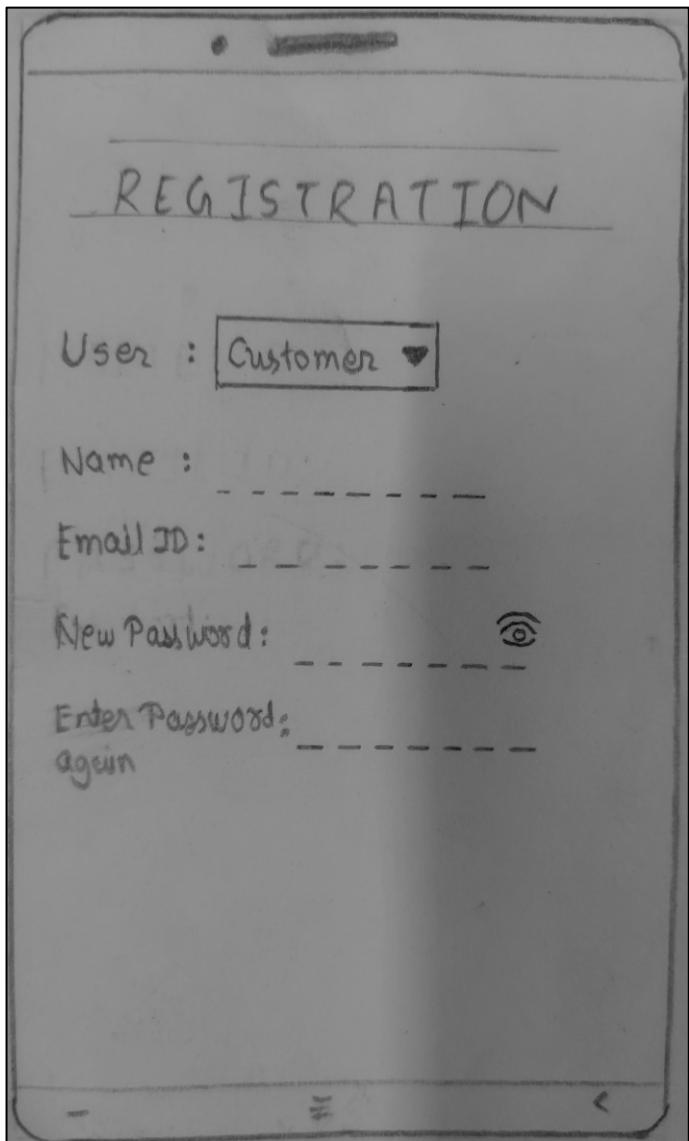


Fig. 3.2(c) Registration Screen

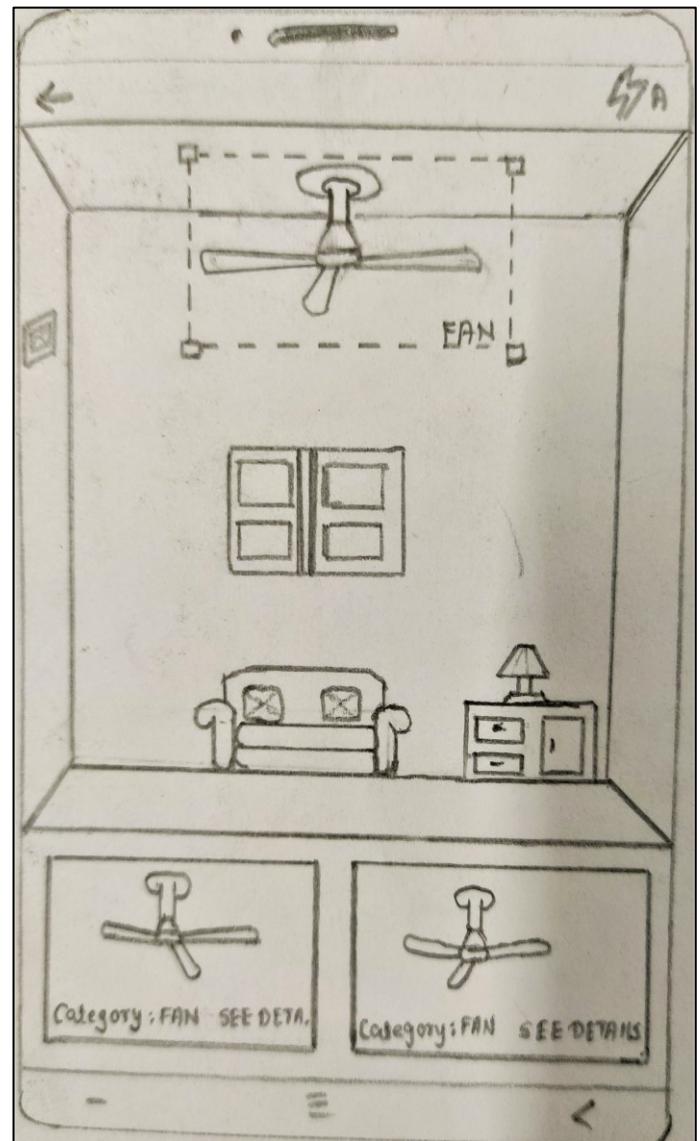


Fig. 3.2(d) Object Scanning by User Screen

The above two screens show the Registration page for new users and the object scanning of an already installed object by the user respectively.

The bottom-part of the second screen shows the detected objects by our algorithm in the frame scanned by the user through his camera lens.

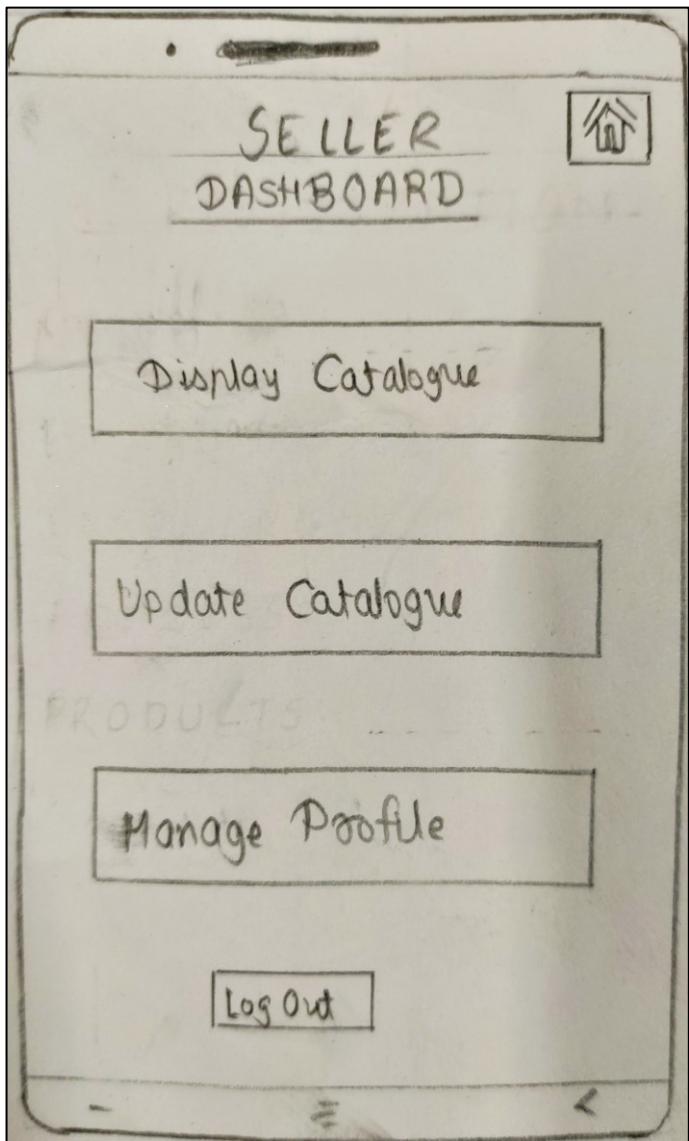


Fig. 3.2(e) Seller Dashboard

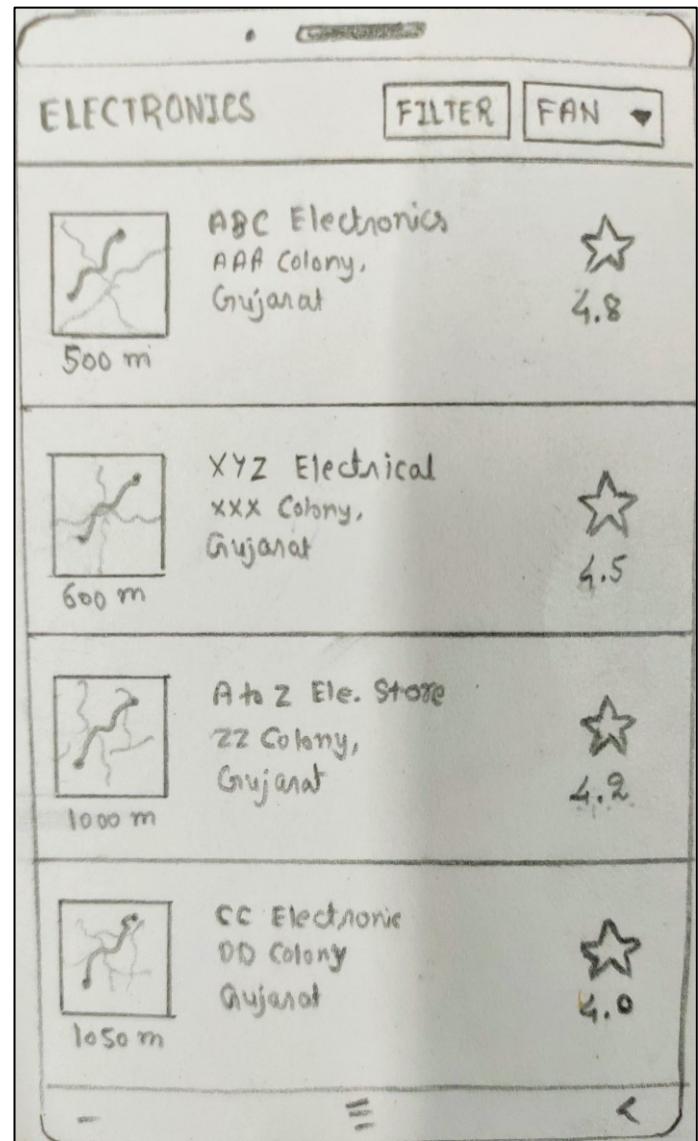


Fig. 3.2(f) Nearby Sellers List

The above two screens show the seller dashboard in our application and the nearby sellers list once the user selects which new item he wants to install at his place.

As shown in the second screen, the user may also see the nearby sellers name and the respective ratings for that seller, which may form an integral part of any user's decision-making process before buying an actual product.

Chapter -4: Conclusion & Future Scope

4.1. Conclusion

Our product was a great success when proposed and discussed with our faculty guide. It received a great success also when the idea was kept in front of other people. Everyone was happy and liked the new innovative idea. We will now try our best to fulfill the demands and develop the proposed application to give a peaceful home renovating experience to our users. We hope to open doors to new latest technology to the needy people.

4.2 Future Scope

We have tried our best to analyze the needs of the users and have tried to fulfill them. Though in future, if demanded by users we can put our mind and money in fulfilling their new needs, requirements and wishes. Also, we will try to overcome and solve the issues found by our customers while demonstration of the product. We will try our best to serve the people, which in return will open doors to more advanced and useful form of technology. We will always be open to constructive criticism from our users or guides.

In the proposed idea of the application, there are no new features that our team can think of as if now that can be added to make the app more and useful and responsive for our users.

But, in future if there is scope for any further development or improvement, we will surely contribute to it.

References:

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Appendix A: Files Uploaded on PMMS Portal

A.1. Canvases:

A.1.1. AEIOU Canvas:

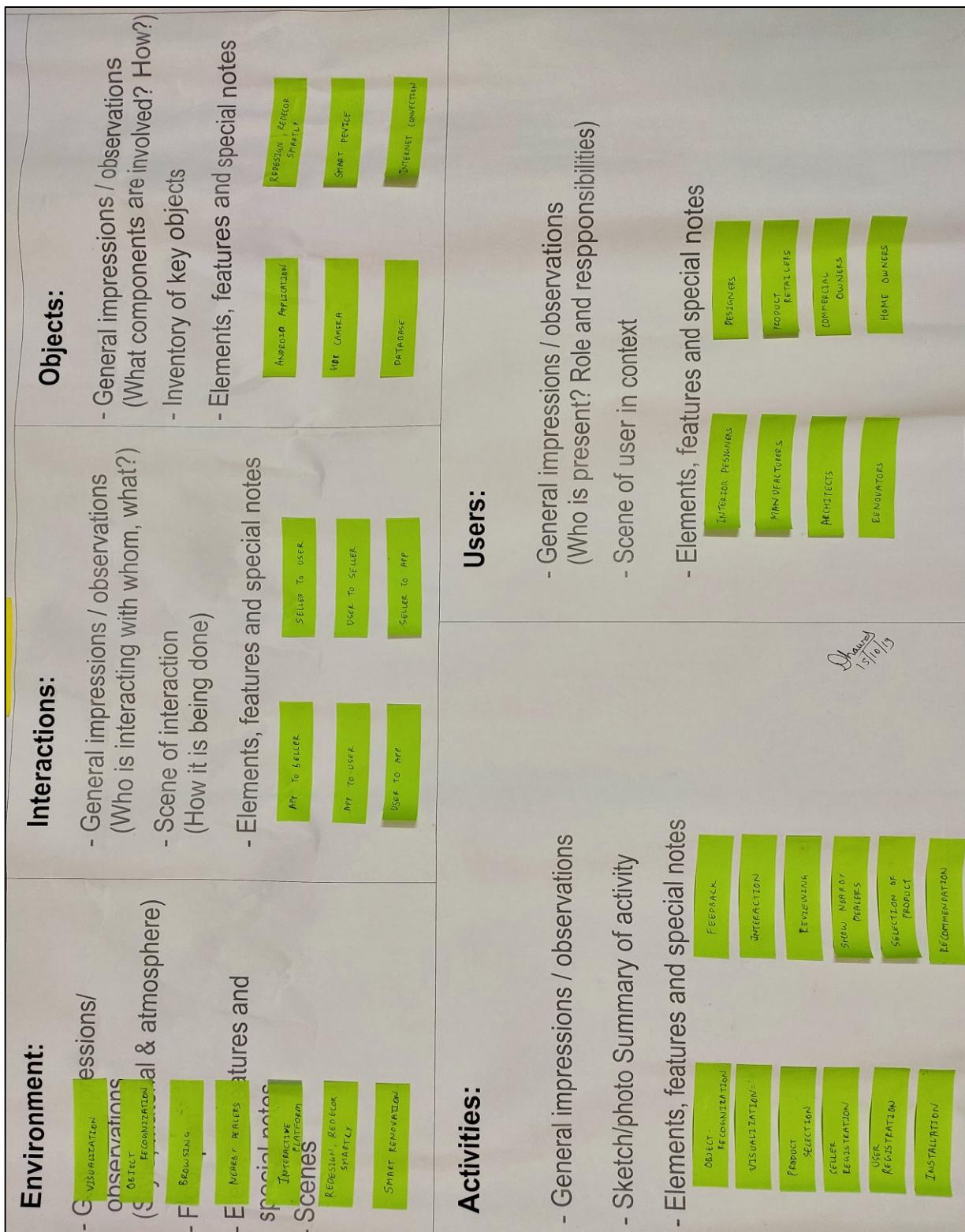


Fig. A.1.1. AEIOU Canvas

A.1.2. Empathy Canvas:

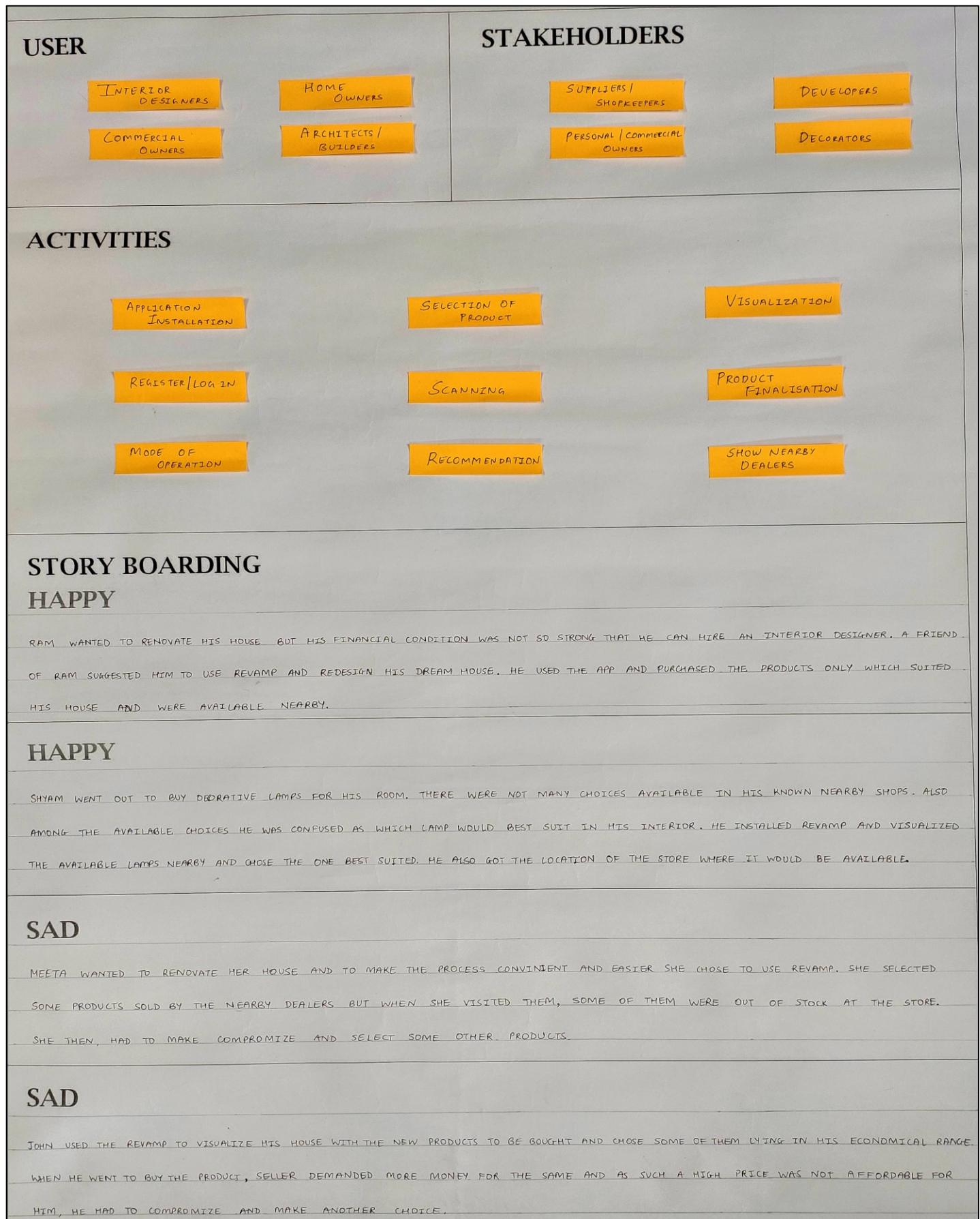
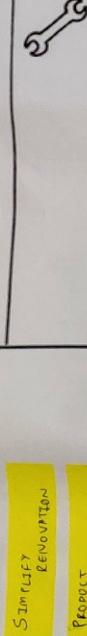


Fig. A.1.2. Empathy Canvas

Product Development Canvas

Purpose

What is the purpose of this concept you're developing?
Does it solve a problem, or it enhances a certain experience?
Is it serving a need or it is trying to create a new need or tap an unmet need?



Product Experience

Define what your customer should feel like when he uses your product/service? What emotions/ feelings would define his experience? Feeling of comfort, convenience, or feeling of buying more with less(cost conscious) or feeling of greater security/safety etc.



Customer Revalidation

Once you're inspried with your feature set, test with the customer / user if the features/functions are useful. Speak to the customer/user.



A.1.3. Product Development Canvas:

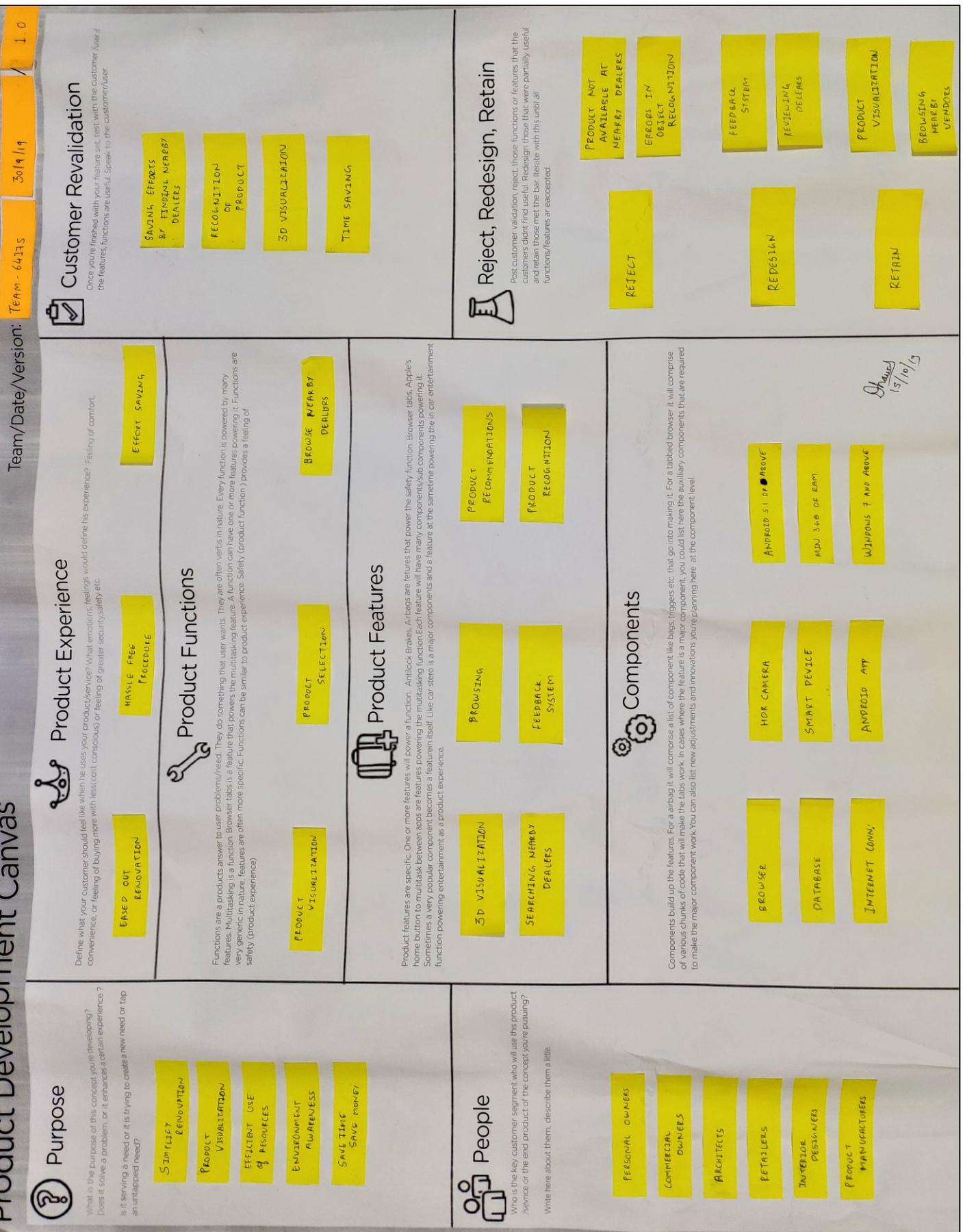


Fig. A.1.3. Product Development Canvas

A.1.4. Ideation Canvas

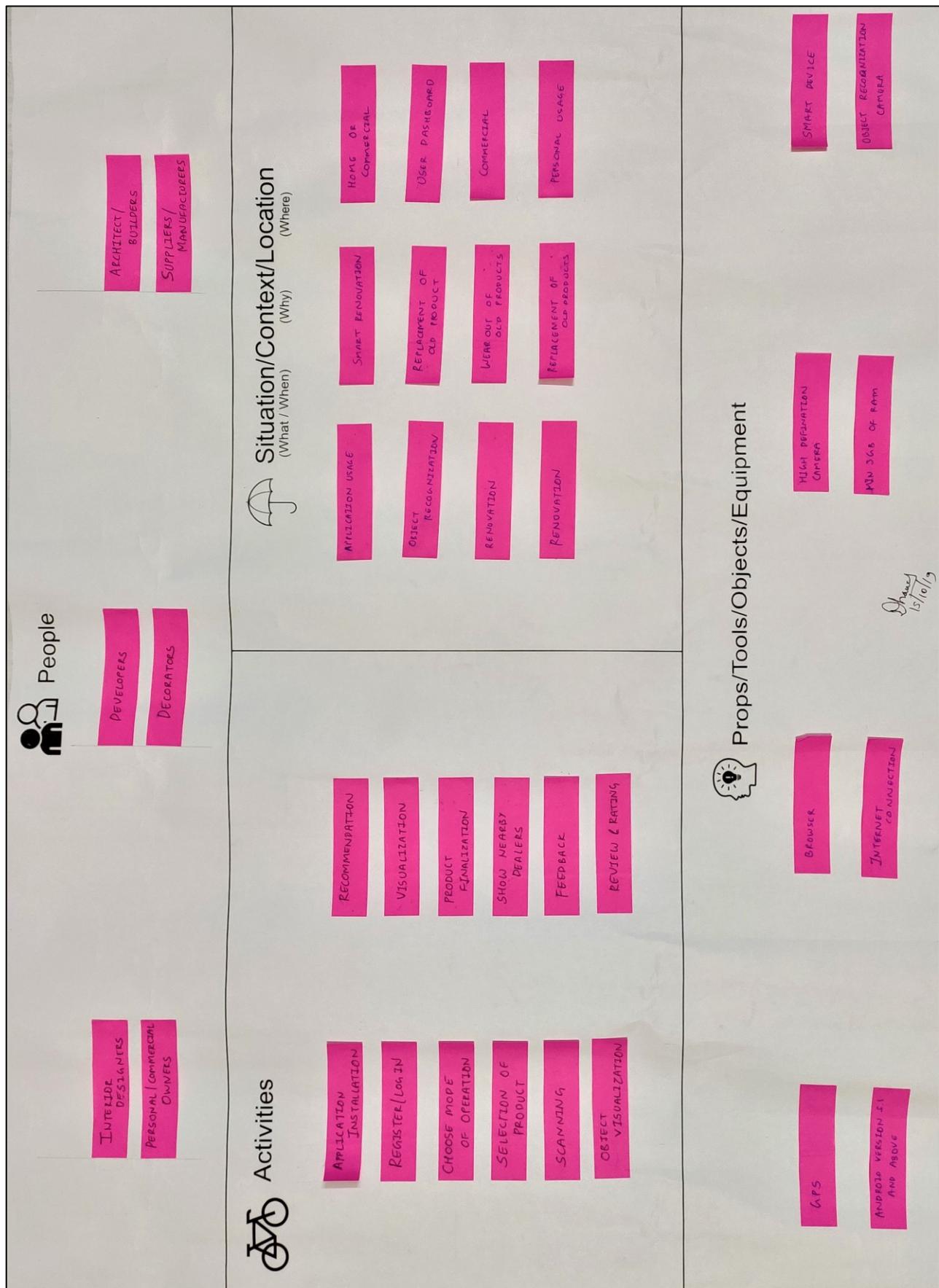


Fig. A.1.4. Ideation Canvas

A.1.5. Canvases Description

The AEIOU Canvas of our project enlists the Environments of our app such as visualization and an interactive platform for object recognition, various interactions such as seller to customer and our app to customers, objects required for the app such as the android app itself and a good quality camera to support object recognition. It also enlists the various users of our app and the activities that they may perform using our app.

The Empathy Canvas of our app contains the different probable responses that our team might expect from the various categories of users. Based on the possibilities of positive or negative responses that can be expected from the users, we have mentioned 2 stories each of a happy response and a sad response respectively to understand the feedbacks of the users better and improvise on the development stage accordingly.

The Product Development Canvas of our project contains the general purpose of our application such as simplifying renovation process and product visualization, some product features, functions, and experience such as browsing for items, feedback component, and components such as a smart mobile phone with a good quality camera.

The Ideation Canvas of our project contains the people involved in the development such as developers and interior designers, activities performed in the application operation such as app installation and object recommendation and also the tools and equipments essential for the development/usage of the app such as GPS and a basic internet connection.

A.2. Periodic Progress Reports (PPR):

A.2.1. Periodic Progress Report: First PPR

Project: Revamp

Status: Reviewed

1. What Progress you have made in the Project?

In the initial phase of our project, we have referred to various research papers and project reports that we find suitable for our project. we have also listed out the possible technologies we will be using in the development of our application. In this semester, we plan to complete all literature surveying and referencing work so that we can easily start developing the project.

2. What challenge you have faced?

During this phase, we faced several challenges like- initially we were not able to decide how will we set up our workstation as our project includes deep learning and machine learning usage on a large set of images. we also had a hard time searching for relevant research papers to begin referencing with.

3. What support you need?

We request our college to provide us with a computer system with the minimum requirements so that our development stage of application will be hindrance free.

4. Which literature you have referred?

We have referred to some research papers on image recognition, augmented reality, recommendation system using deep learning, and also a textbook of deep learning- Deep Learning for Computer Vision by Rajalingappa Shanmugamani.

A.2.2. Periodic Progress Report: Second PPR

Project: Revamp

Status: Reviewed

1. What Progress you have made in the Project?

In the first phase, we referred to project-related literature. in this phase, we prepared a partial project presentation and listed the abstract and also the introduction and usage of our application.

2. What challenge you have faced?

We thought a lot about the user interface of our application and prepared a presentation related to the same.

3. What support you need?

In the next phase, we will be progressing towards preparing the canvases of our project, and also the project report. so, we will need our college to provide us with a computer system with the minimum requirements so that our development stage of application will be hindrance free.

4. Which literature you have referred?

We referred to various project presentations to get an idea about the contents that should be provided by us in the ppt.

A.2.3. Periodic Progress Report: Third PPR

Project: Revamp

Status: Reviewed

1. What Progress you have made in the Project?

in this phase, we have prepared a canvass - empathy canvas, user interface diagram of the proposed application and product development canvas, and AEIOU canvas.

2. What challenge you have faced?

we faced many challenges including thinking for the features of the application and how will we implement them in the final phase of the project.

3. What support you need?

for the upcoming phases, we need college support in the form of a computer system and also the internal faculty guide to provide us with appropriate support as and when needed.

4. Which literature you have referred?

in this phase we have referred to various online research papers, sample project reports and also searched for project teams who have worked in the same field and how much they have worked. in this way, we also planned the highlighting features of our app which will differentiate it from the rest.

A.2.4. Periodic Progress Report: Forth PPR

Project: Revamp

Status: Reviewed

1. What Progress you have made in the Project?

In this phase, we have prepared the final project report and also the canvasses.

2. What challenge you have faced?

We faced many challenges when designing the canvasses like thinking for the users and acceptance by the target audience.

3. What support you need?

Even in this phase, we need our college support and internet support to search for the resources we need.

4. Which literature you have referred?

We searched for existing patents that match our field of work.



**GUJARAT TECHNOLOGICAL UNIVERSITY
(GTU)
INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)**



Date of Submission : 11/10/2019

Dear Patel Jinal Manharbhai,

Studied Patent Number for generation of PSAR : 19BE7_160130107072_1

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : Home renovation using app,Redesign,Revamp
3. Search String Used : Renovate home using application
4. Number of Results/Hits getting : 200

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Android Application
- 6 (a) : IPC class of the studied patent : Human Necessities
7. Title of Invention : Houzz
8. Patent No. :
9. Application Number : 13/472,409
- 9 (a) : Web link of the studied patent : <http://patft1.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahm%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=9230223.PN.&OS=PN/9230223&RS=PN/9230223>
10. Date of Filing/Application (DD/MM/YYYY) : 05/15/2012
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filed Country : Albania : 284

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Cohen Alon	Palo Alto
2	Shaviv Guy	CA

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Cohen Alon	Palo Alto
2	Shaviv Guy	Zichron Yaakov

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

The prior technology does not enable the users to see the nearby dealers or sellers of the product they have selected.

20. Specific Problem Solved / Objective of Invention

We intend to solve the above mentioned problem as well as enabling the users to visualize the product they select with our app and where they can buy the same, without having to roam to find their desired product.

21. Brief about Invention

A platform allows experts, for example home improvement professionals, to upload their portfolios, i.e. content such as photos, videos, text, and sound, to a publicly available resource, such as a Web browser accessible, network based commerce system. Users may then browse the content, for example by room, style, and metro area. The content is arranged in collections that are in part passively sorted, based upon user relevance. Tags are shown on objects, for example within photos, for which there is more information. In the case of a movable display device, the tags can simulate the physics of real tags, for example they can move back and forth when the device is shaken. In another embodiment, a snap point is set to impart either a scrolling transition or a step transition between display pages, based upon user scroll activity.

22. Key learning Points

The key learning points from this application are the use of exact databases, and merging the user activity on the app with visualizing it and buying the same product from the nearby dealers after comparing prices with other dealers.

23. Summary of Invention

The system monitors the user selection process to determine relationships between items within photos in selected categories. The system collates this information across the many users of the system and, thus, passively determines user relevance. For example, in the embodiment concerning residential interior design, photos may be organized in categories that correspond to the different rooms of a house, such as the bedroom, living room, etc. A user may proceed at the room level, adding design elements, furniture, and the like to an idea book for a particular room, for example the living room. Here, there are many styles available to the user, such as classic, modern, European, Asian, and the like. The user's idea book selections are that user's opinion as to design elements that may coordinate with each other, even if they are selected from a variety of styles. The system makes note of these connections for each user and, in the process, identifies user-based groupings that may then lead to new categories and/or suggestions to other users.

24. Number of Claims : 1

25. Patent Status : Granted Patent & In-force Patent

26. How much this invention is related with your IDP/UDP?

71 to 90%

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

we intend to improve the above patent by adding an important feature to it- seeing the available nearby buying options to the users of the product that they have selected.



**GUJARAT TECHNOLOGICAL UNIVERSITY
(GTU)
INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)**



Date of Submission : 11/10/2019

Dear Patel Jinal Manharbhai,

Studied Patent Number for generation of PSAR : 19BE7_160130107072_2

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : houzz ,Redesign,Revamp
3. Search String Used : houzz
4. Number of Results/Hits getting : 10

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Mixed Reality
- 6 (a) : IPC class of the studied patent : A
7. Title of Invention : INTERACTIVE ITEM PLACEMENT SIMULATION
8. Patent No. :
9. Application Number : US10347049B2
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/US10347049B2/en?assignee=houzz&oq=houzz>
10. Date of Filing/Application (DD/MM/YYYY) : 07/09/2019
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

along with the features it provides, we wish to provide users with the available buying options of the same product that they chose to visualize.



**GUJARAT TECHNOLOGICAL UNIVERSITY
(GTU)
INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)**



Date of Submission : 11/10/2019

Dear Patel Jinal Manharbhai,

Studied Patent Number for generation of PSAR : 19BE7_160130107072_3

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : houzz ,Redesign,Revamp
3. Search String Used : houzz
4. Number of Results/Hits getting : 10

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Item recommendations
- 6 (a) : IPC class of the studied patent : A
7. Title of Invention : TECHNIQUES FOR RECOMMENDING AND PRESENTING PRODUCTS IN AN AUGMENTED REALITY SCENE
8. Patent No. :
9. Application Number : US 20190197599A1
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/US20190197599A1/en?assignee=houzz&oq=houzz>
10. Date of Filing/Application (DD/MM/YYYY) : 12/22/2017
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Khurram Zia	Palo Alto
2	Sanjay Raman	Palo Alto
3	Aaron Yip	Menlo Park

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Houzz Inc	Palo Alto

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

the existing system does not enable the users to see the nearby purchase options

20. Specific Problem Solved / Objective of Invention

A computer-implemented method performed by one or more server computers, the method comprising:
receiving and storing information from a mobile computing device executing an augmented reality application, the information including an image of a real-world physical space captured by an image sensor of the mobile computing, and a data representation of a virtual space corresponding to the real-world physical space

21. Brief about Invention

Embodiments of the present invention , as presented herein , relate to an augmented reality application - based service , which facilitates techniques for aiding a first end - user (e . g . , a room designer) with the selection and placement of objects(e . g . , images of home furnishing and related products) in an augmented reality scene that is being , or has been , generated via mobile computing device that is remote from the first end - user , such that a second end - user (e . g . , a potential consumer) operating the mobile computing device can view objects , in the augmented reality scene , as placed by the first , remote end - user.

22. Key learning Points

In the context of computing, augmented reality (“AR”) is a live direct, or indirect, view of a physical, real-world scene whose elements are “augmented” with superimposed, computer-generated sensory input, such as video or graphic images. These added images, which are overlaid upon the real-world scene, serve to enhance the scene and provide an enriched visual experience for the end-user. Advancements in various computing and sensor technologies have made it possible to have mobile computing devices (e.g., mobile phones, tablet computers, head-mounted displays and glasses) capable of executing AR applications. As an example, modern versions of mobile operating systems, such as iOS® from Apple® and the Android® operating system from Google®, provide software frameworks and development tools that allow developers to create AR applications for mobile phones, tablets and other mobile computing devices.

23. Summary of Invention

The subject matter disclosed herein generally relates to data processing systems and computer-based, user interfaces for intelligently selecting and presenting objects (e.g., products, such as furniture and home furnishings) for placement in an augmented reality scene. More specifically, the present invention relates to computer program products, methods and systems that facilitate techniques for aiding a first end-user (e.g., a room designer) with the selection and placement of objects (e.g., images of home furnishing and related products) in an augmented reality scene that is being, or has been, generated via a mobile computing device that is remote from the first end-user, such that a second end-user (e.g., a potential consumer) operating the mobile computing device can view objects, in the augmented reality scene, as placed by the first, remote end-user.

24. Number of Claims : 10

25. Patent Status : Published Application

26. How much this invention is related with your IDP/UDP?

> 91 %

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

yes we plan to improvise on the existing app by adding the before mentioned features to it.



**GUJARAT TECHNOLOGICAL UNIVERSITY
(GTU)
INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)**



Date of Submission : 14/10/2019

Dear Patel Jinal Manharbhai,

Studied Patent Number for generation of PSAR : 19BE7_160130107072_4

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
- Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : renovation,using,machine learning
3. Search String Used : renovation using machine learning
4. Number of Results/Hits getting : 9999

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Item scanning
- 6 (a) : IPC class of the studied patent : A
7. Title of Invention : Systems and Methods for Competitive Scene Completion in an Application
8. Patent No. :
9. Application Number : US20190304201A1
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/US20190304201A1/en?q=homes+tyler&oq=homestyler>
10. Date of Filing/Application (DD/MM/YYYY) : 10/03/2019
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Scott Cuthbertson	San Francisco
2	Barlow Gilmore	San Francisco

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Glu Mobile Inc	San Francisco , CA(US)

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

this patent is just a part of our application that we will be using in our project to utilize it and make it suitable for use with some advanced steps like a recommender system.

20. Specific Problem Solved / Objective of Invention

The disclosed implementations relate generally to improved systems and methods for competitive scene completion in an application.

21. Brief about Invention

In the disclosed systems and methods for competitive scene completion , a user selects a first scene completion challenge that comprises an image of an initial scene and a plurality of markers . Each marker has a designated set of coordinates within the initial scene and corresponds to a furnishing unit type . For each user marker selection , virtual furnishing units corresponding to the unit type are displayed . User unit selection results in display of a three - dimensional graphic of the selected virtual furnishing unit at the corresponding coordinates within the scene , thereby creating an augmented scene that comprises the initial scene with three - dimensional graphics of selected virtual furnishing units . The augmented scene or user selections of virtual furnishing units is submitted to a remote server . The user is provided with a reward .

22. Key learning Points

Scene completion of user scanned image with a 3d image that is preloaded in the database of the application.

23. Summary of Invention

A method, comprising:
at a client device comprising a display, one or more processors and memory:
in an application running on the client device associated with a first user:
responsive to selection of a first scene completion challenge, displaying an image of an initial scene of the first scene completion challenge and displaying as an overlay on the image a first plurality of markers, each marker in the first plurality of markers having a designated set of coordinates within the initial scene and corresponding to a furnishing unit type within a plurality of furnishing unit types;
for each sequential user selection of a first plurality of user selections on the image, of a respective marker in the first plurality of markers of the first scene completion challenge, performing a first procedure that comprises:
displaying a first plurality of virtual furnishing units corresponding to the furnishing unit type, wherein the first plurality of virtual furnishing units comprises renditions of furnishing units and includes (i) one or more first virtual furnishing units retained by the first user that match the furnishing unit type of the respective marker and (ii) one or more second virtual furnishing units not retained by the first user that match the

furnishing unit type of the respective marker;
receiving a user selection of a selected virtual furnishing unit in the first plurality of virtual furnishing units; and
responsive to the user selection, (i) displaying a three-dimensional graphic of the selected virtual furnishing unit at the designated set of coordinates within the initial scene and (ii) removing the respective marker at the designated set of coordinates from the initial scene;
wherein the performing the first procedure results in a first augmented scene that comprises the initial scene with a plurality of three-dimensional graphics of selected virtual furnishing units, including displaying each of the three-dimensional graphics at the corresponding designated set of coordinates belonging to a marker in the first plurality of markers within the initial scene;
storing a user profile for the first user, wherein the user profile comprises an indication of the first scene completion challenge and the first plurality of user selections;
in accordance with a determination that a predefined completion criterion is satisfied, enabling the first user to submit the first augmented scene or the first plurality of user selections to a remote server; and
responsive to submitting the first augmented scene or the first plurality of user selections, providing the first user a first reward.

24. Number of Claims : 30

25. Patent Status : Applied Patent

26. How much this invention is related with your IDP/UDP?

71 to 90%

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

we will be using this patent project in our application to enhance our application and make use of image scanning and scene completion in our app.



**GUJARAT TECHNOLOGICAL UNIVERSITY
(GTU)
INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)**



Date of Submission : 15/10/2019

Dear Deep Pancholi,

Studied Patent Number for generation of PSAR : 19BE7_160130107018_5

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : homestyler,Redesign,Revamp
3. Search String Used : Renovate home using homestyler
4. Number of Results/Hits getting : 5

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : architectural design
- 6 (a) : IPC class of the studied patent : A
7. Title of Invention : CONGRUENT ITEM REPLACEMENTS FOR DESIGN MOTIFS
8. Patent No. :
9. Application Number : US 20190005159A1
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/US20190005159A1/en?assignee=houzz&oq=houzz>
10. Date of Filing/Application (DD/MM/YYYY) : 06/30/2017
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Sanjay Raman	San Francisco
2	Richard Chen	CA

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Houzz Inc	Palo Alto , CA (US

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

similar to previous PSARs.

20. Specific Problem Solved / Objective of Invention

similar to previous PSARs.

21. Brief about Invention

A design can be composed of multiple physical items , such as a chair , table , vase , and lamps arranged in a certain configuration . Non - expert users can submit a style criteria that specifies a desired style . Expert design users can select items using the style criteria and place the items in a mock - up or simulation of an environment . The non - expert users can request different items based on specified attributes , such as price . Different items that match the specified attributes , e . g . , price , and match the style criteria can automatically be identified and displayed in the simulation

22. Key learning Points

Embodiments of the present disclosure relate generally to search engines and, more particularly, but not by way of limitation, to using a specially configured search engine to generate congruent item replacements for design motifs.

23. Summary of Invention

A method comprising:
 receiving, from a client device of a user, criteria data specifying a design motif for physical items;
 identifying a set of one or more physical items that correspond to the criteria data;
 receiving, from the client device, a request to modify the set of one or more physical items to include one or more different items that satisfy the criteria data and one or more attributes of the different items specified in the request;
 responsive to the request, generating the one or more different items by accessing a data structure to identify the one or more different items that satisfy the criteria data and satisfy the one or more specified attributes; and
 causing, using at least one processor of a machine, a presentation of the generated different items on a display device.

24. Number of Claims : 20

25. Patent Status : Published Application

26. How much this invention is related with your IDP/UDP?

71 to 90%

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

similar to previous PSARs