

SW Engineering CSC648-848-01

Summer 2023

Project Title: Jewelry Shopping Site: ArtisanAura

Team 05

Cassia Reddig, creddig@sfsu.edu (Team Lead)

Denean Le (Github Master)

Tamer Senan (Back End Lead)

Yitian Cai (Front End Lead)

Daniel Moorhatch (Editor)

James Donnelly

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1. Data Definitions

- User
 - General user: Do not require logging in.
 - General users are able to view, search, purchase, and customize products.
 - Attributes: ID
 - Approved user: Require logging in.
 - Approved users inherit privileges from general users, with the addition of many more features offered by our application.
 - Attributes:
 - ID
 - Account
- Account: Every approved user has an account that contains user information.
 - Customer account
 - Customer accounts have access to saved product customizations and past orders.
 - Attributes:
 - User ID
 - Name
 - Email
 - Password
 - Admin account
 - Admin accounts have access to privileges like creating and removing product pages and reviewing customer orders.
 - Attributes:
 - User ID
 - Name
 - Email
 - Password
- Product
 - Ready-made product
 - Ready-made products are products that do not offer any options for changing the way the product appears with the exception of size adjustments.
 - Attributes:

- ID
 - Name
 - Type: refers to type of jewelry such as ring, bracelet, etc.
 - Material
 - Gemstone
 - Description
 - Price
 - Images
 - Images will only be in PNG format with a maximum size of 3MB each
 - Size
 - Created_at
- Customized product
 - Customized products are products that have options for the general user to change the way the product appears.
 - Attributes:
 - ID
 - Type
 - Design
 - Material
 - Gemstone
 - Packaging
 - Size
 - Created_at
- Cart
 - Cart is similar to a shopping cart where the user will be able to add one or more products for purchase.
 - Attributes:
 - ID
 - User ID
 - Product ID
- Order
 - Order is referring to the user information and list of products within a single transaction. It is used to keep track of what products are purchased and by who.
 - Attributes:
 - ID

- Cart ID
 - Created_at
- Review
 - Reviews are posts created by users who have purchased a product and would like to share their opinions about that specific product.
 - Attributes:
 - ID
 - Product ID
 - User ID
 - Description
 - Rating
 - Created_at
- Payment
 - Payment is the card information used to purchase an item. This will be associated to only one user.
 - Attributes:
 - ID
 - User ID
 - Name
 - Billing address
 - Card number
 - Expiration date
 - Security code

2. Prioritized Functional Requirements

Priority 1:

1. User
 - 1.1. General user: Does not need to login/register.
 - 1.1.1. (1) A general user shall be able to have unrestricted access to the website and view product details from many devices.
 - 1.1.2. (1) A general user shall be able to purchase many products by adding them into their shopping cart and completing the checkout process.
 - 1.1.3. (1) A general user shall choose at most one type of jewelry per product customized.
 - 1.1.4. (1) A general user shall have the option to register one and only one account by providing account registration details through the account creation form.
 - 1.1.5. (1) A general user shall be able to add many items into their shopping cart for purchase at a later date while being able to continue shopping.
 - 1.1.6. (1) A general user shall be able to track the status of their placed orders using an order ID provided through their order confirmation page or email.
 - 1.1.7. (1) A general user shall be able to search for specific products by entering relevant keywords or product names into the search bar.
 - 1.1.8. (1) A general user shall be able to filter products by applying many filters to narrow the displayed products based on their preference.
 - 1.1.9. (1) A general user shall have a tracking id provided once their order has been completed which allows them to check the shipment status with the postal service.

- 1.1.10. (1) A general user shall choose at most one design per product customized.
 - 1.1.11. (1) A general user shall choose at most one metal per product customized.
 - 1.1.12. (1) A general user shall choose at most one gem stone per product customized.
 - 1.1.13. (1) A general user shall choose at most one size per product customized.
 - 1.1.14. (1) A general user shall choose at most one engraving per product customized.
 - 1.1.15. (1) A general user shall choose at most one packaging per product customized.
 - 1.1.16. (1) A general user shall choose to make a customized product or purchase a normal product.
- 1.2. Approved user: Needs to login/register.
 - 1.2.1. (1) An approved user shall be able to log into the system which will grant access to save customizations and retrieve these customizations.
 - 1.2.2. (1) An approved user shall be able to edit customizations that have been previously saved.
 - 1.2.3. (1) An approved user shall be able to view current/past orders through the system displaying order history along with relevant information such as dates, items and price.
 - 1.2.4. (1) An approved user shall be able to delete the account after confirming deletion through a prompt, allowing removal of their profile and data from the system.
 - 1.2.5. (1) An approved user shall be able to manage shipping address(es) by editing, adding or deleting shipping addresses.

- 1.2.6. (1)An approved user shall be able to manage their payment methods by editing, adding and deleting payment options from their account.
 - 1.2.7. (1)An approved user shall be able to log into the system using their approved credentials that will verify user identity.
 - 1.2.8. (1)An approved user shall be able to log out from the system, which removes their current session from their account data.
2. Employee: Needs to login
 - 2.1. (1)An Employee shall be able to make changes to product details by modifying product descriptions, price and images.
 - 2.2. (1)An Employee shall be able to create and post many new products into the system.
 - 2.3. (1)An Employee shall be able to remove many products from the system allowing data of the product to be removed.
 - 2.4. (1)An Employee shall have access to store transactions that include user information and order details.
 - 2.5. (1)An Employee shall be able to manage product inventory allowing adjustment of stock levels.
 3. Account:
 - 3.1. (1)An account shall be owned by one and only one user per email provided during creation of account.
 4. Products
 - 4.1. (1)The system shall be able to display many products.
 - 4.2. (1)A product shall have a quantity selection in respect to the amount of product available in the database.
 - 4.3. (1)A product shall have a unique identifier to accurately track the product's information.

- 4.4. (1)A product shall have only one main image to be displayed on the catalog page.
 - 4.5. (1)A product shall have at least one price.
 - 4.6. (1)A product shall have zero or many stock availability.
 - 4.7. (1)A product shall be ordered by many users.
 - 4.8. (1)A product shall be able to be added to one and only one cart.
 - 4.9. (1)A product shall be ordered many times.
 - 4.10. (1)A product shall be reviewed many times.
5. Shopping cart
 - 5.1. (1) A cart shall be associated to at most one general user.
 - 5.2. (1) A cart shall be able to contain many products.
 - 5.3. (1) A cart shall calculate the sum of at most one price per product placed in the cart.
 6. Order
 - 6.1. (1) An order shall be associated to at most one general user.
 - 6.2. (1) An order shall have at most one unique order number.
 - 6.3. (1) An order shall contain at least one product.
 - 6.4. (1) An order shall have at most one total price.
 - 6.5. (1) An order shall include at most one shipping information.
 - 6.6. (1) An order shall include at most one billing information
 7. Review/Rating
 - 7.1. (1) A review shall have at most one title.
 - 7.2. (1) A review shall have at most one description.
 - 7.3. (1) A review shall be associated to at most one product.
 - 7.4. (1) A review shall be associated with at most one approved user.
 - 7.5. (1) A review shall have at most one rating.

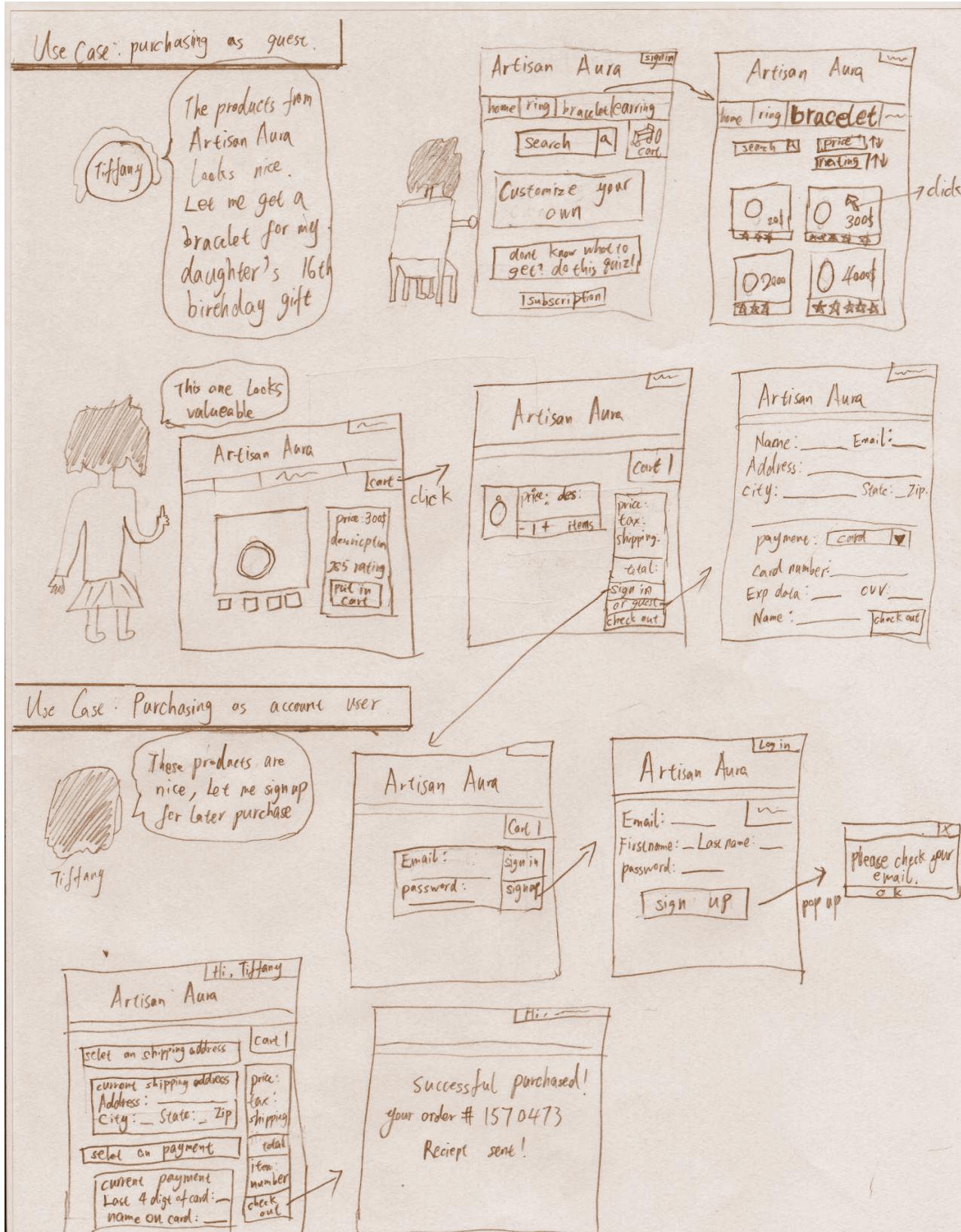
Priority 2:

1. User
 - 1.1. Approved user: Needs to login/register.
 - 1.1.1. (2) An approved user shall be able to provide feedback for products purchased by them through a star rating and text based reply.
2. Employee: Needs to login
 - 2.1. (2) An Employee shall be able to track sales on each product in the system.
3. Account
4. Products
 - 4.1. (2) A product shall have one or multiple images associated with it.
 - 4.2. (2) A product shall have one and only one description.
 - 4.3. (2) A product shall be able to be compared with at most one product.
5. Shopping cart
 - 5.1. (2) A cart shall be able to be saved for later by at most one approved user.
6. Order
 - 6.1. (2) An order shall have at most one order status.
 - 6.2. (2) An order shall be able to be returned at most once.
 - 6.3. (2) An order shall be able to be canceled at most once.

Priority 3:

6. Order
 - 6.1. (3) An order shall include at most one shipment tracking details.
7. Payment
 - 7.1. (3) A default payment method shall be associated to at most one approved user.

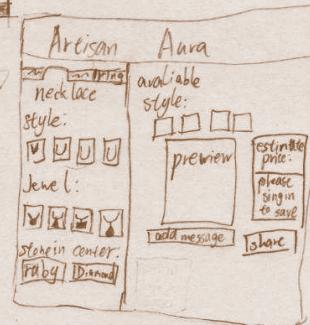
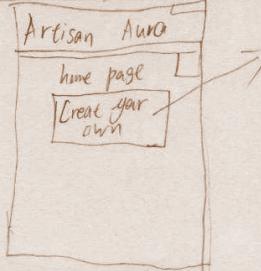
3. UI Mockups and Storyboards (high level only)



Use Case: Customizing a necklace on our website



Finally, I found a website that can create your own



- style; materials made
- available style: different style that made of that materials. steel, string, etc ...

→ after sign in:

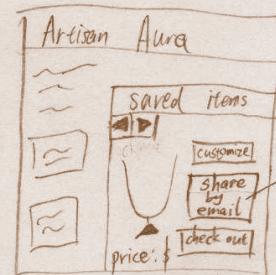
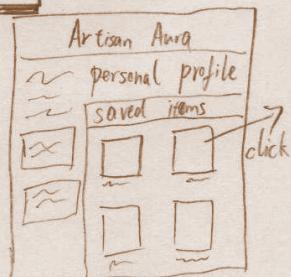


Use Case: Saving & sharing Designs

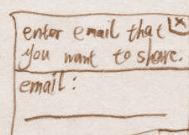


Let me share my designs to my friends

→ after sign in then click on personal profile



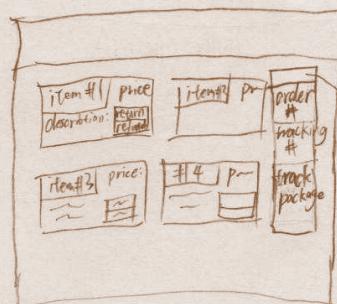
pop:



Use Case: Checking status of an order



Let me sign in and check my order

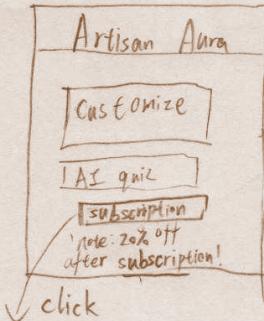


- status
 - arriving tomorrow
 - delivered
 - arrived

Use Case : Joining mail subscription newsletters

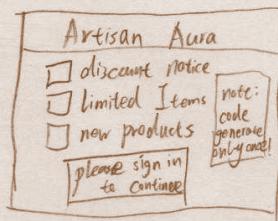


Artisan Aura have some good designs!
Let me subscribe for promotion code and more discount!



click

* after account sign in

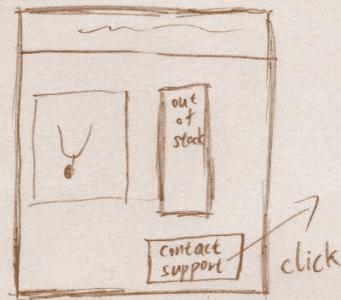


Use Case: Contacting Customer Support

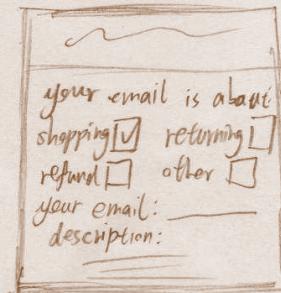


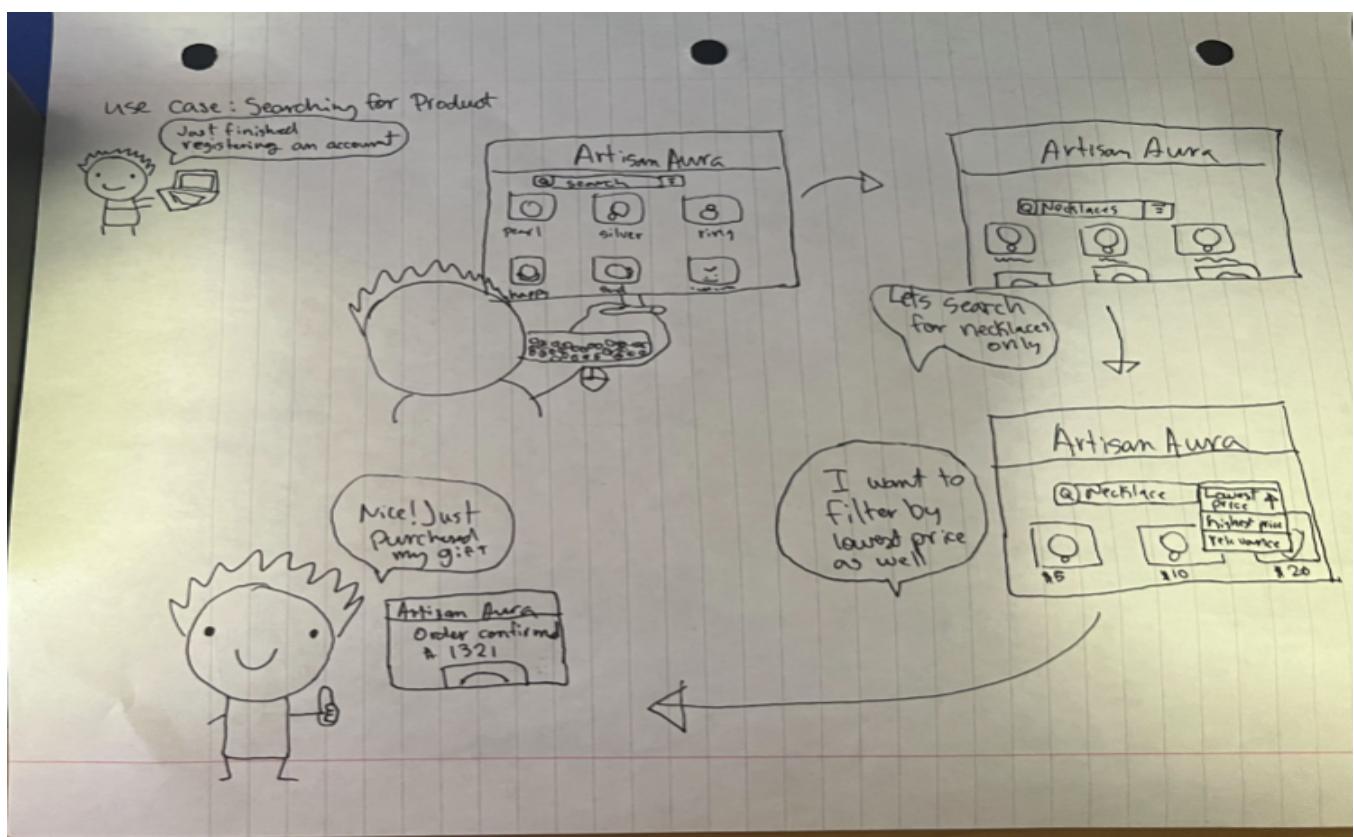
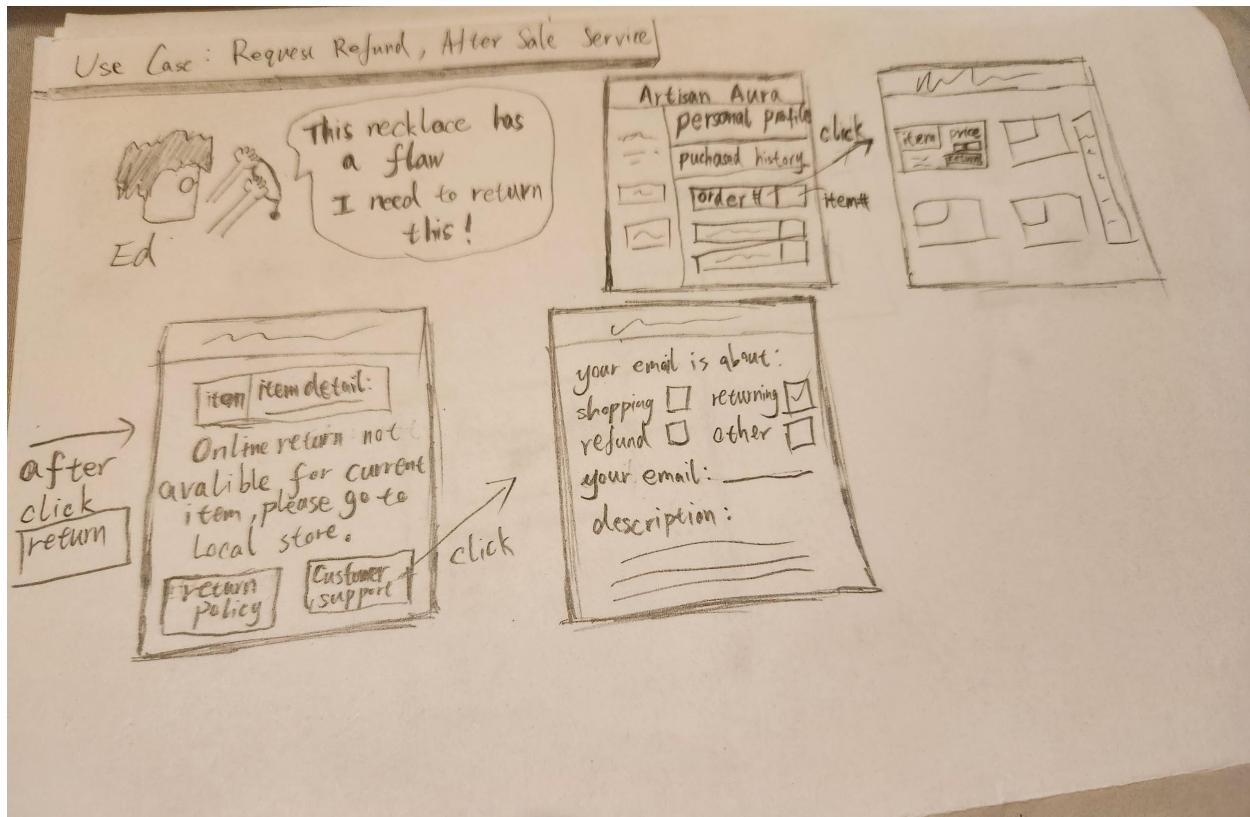
This item is out of stock!
Let me contact their employee

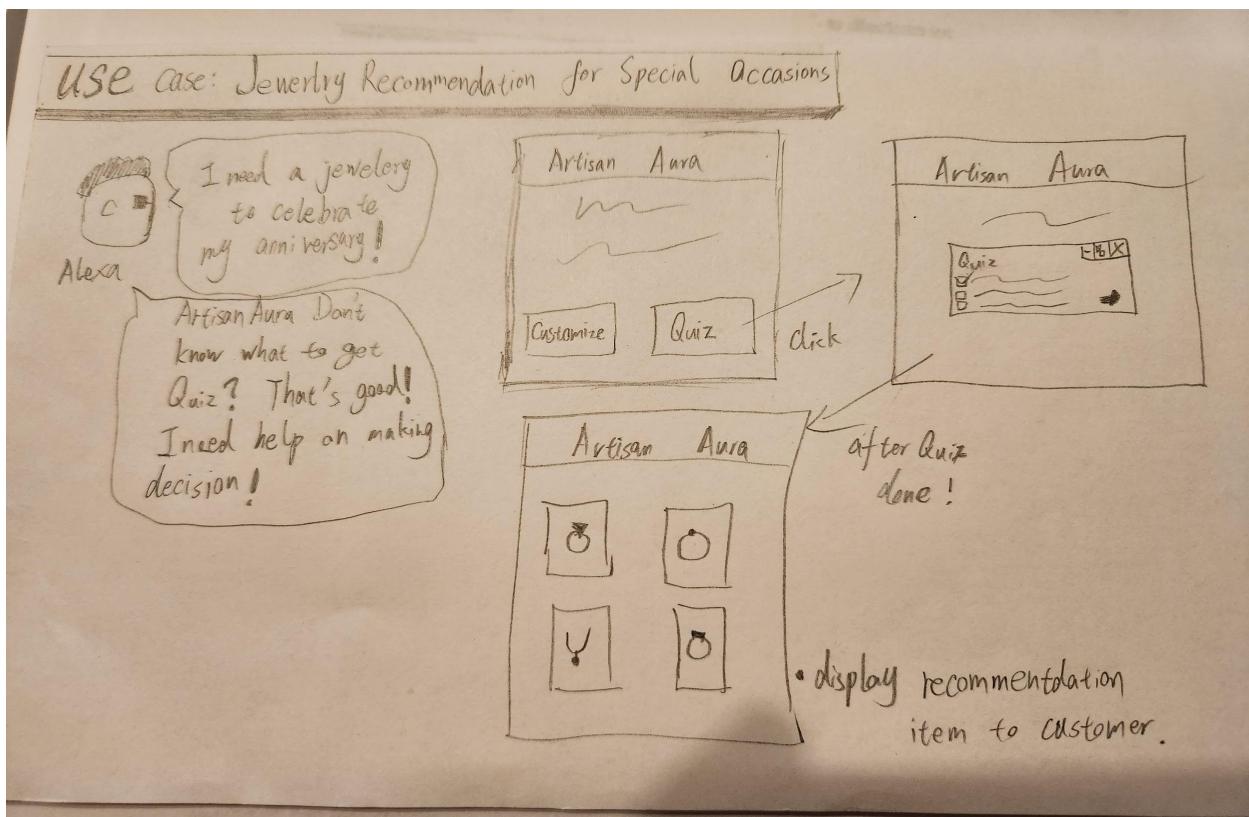
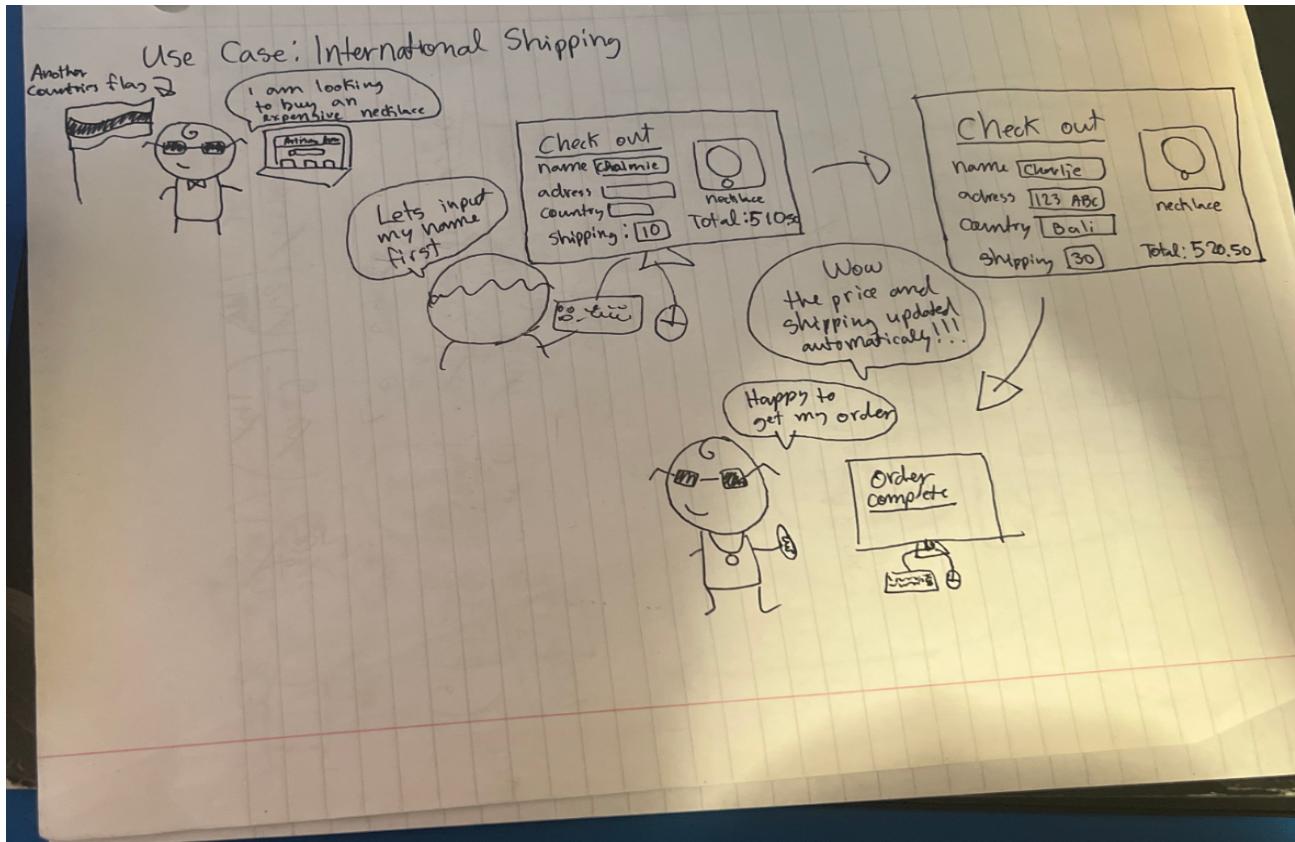
Steven

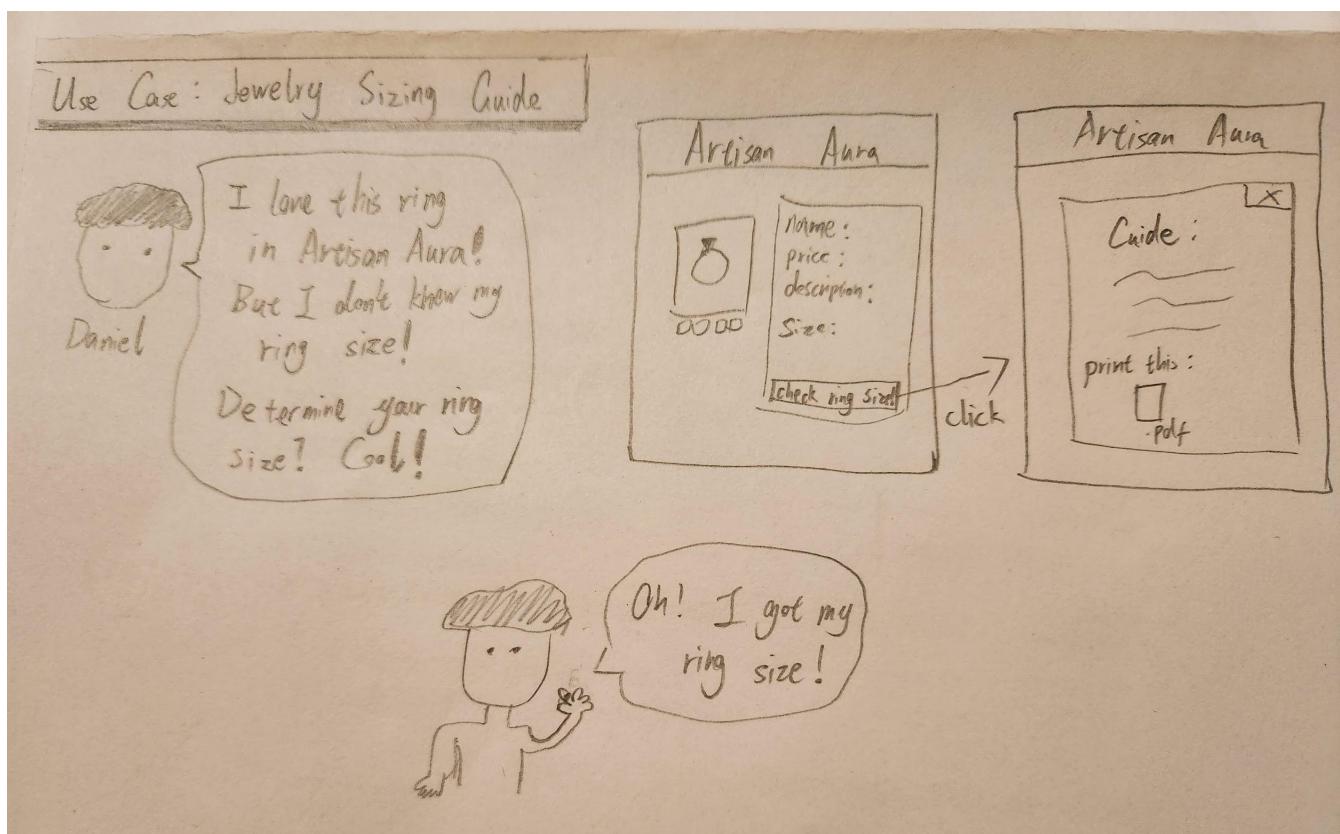
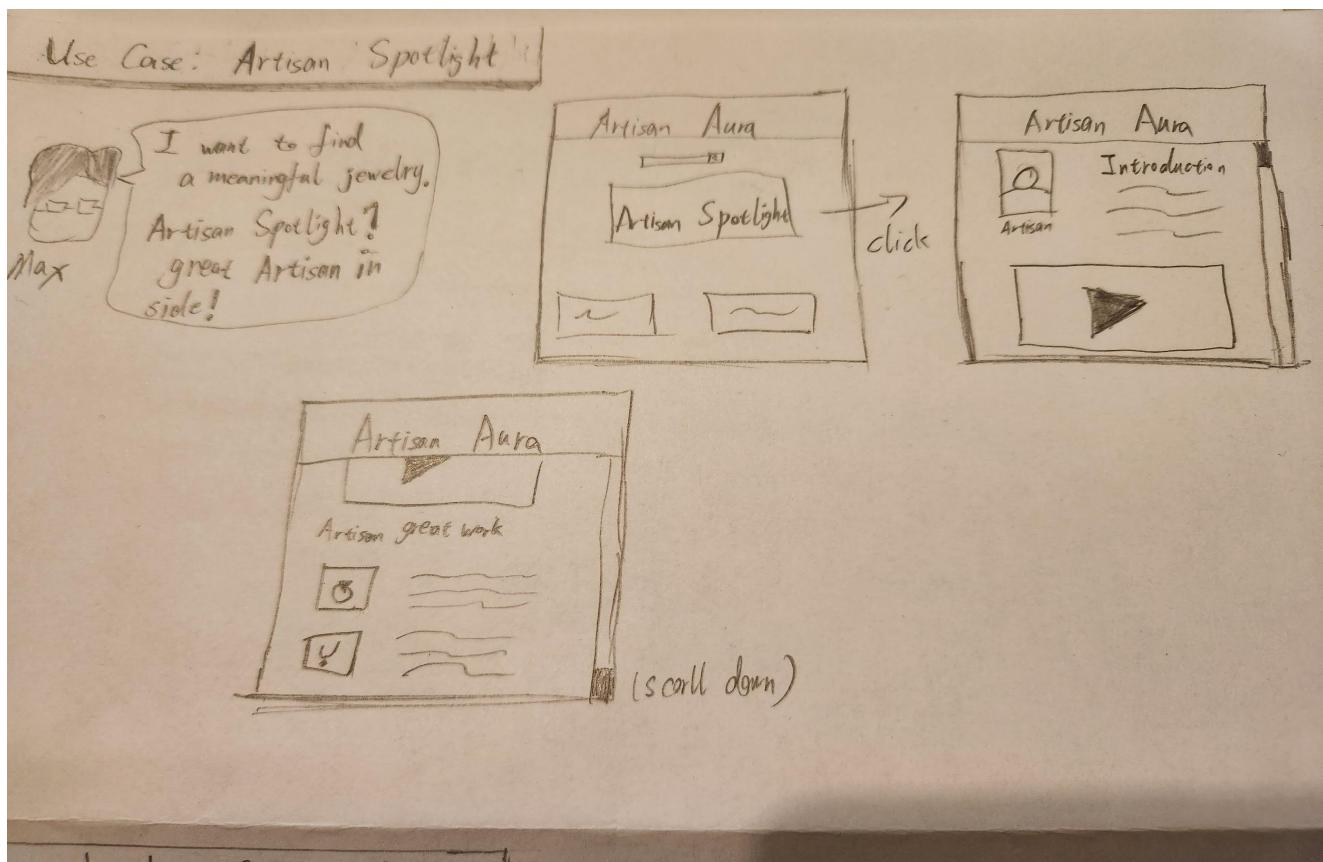


click





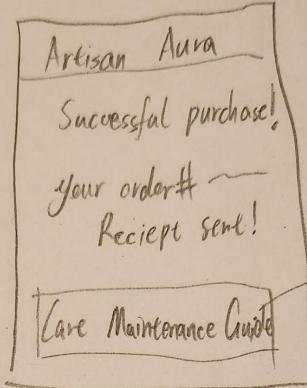




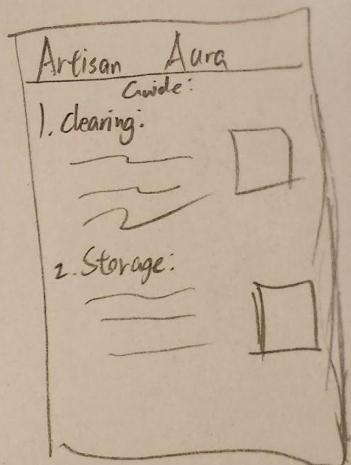
Use Case: Jewelry Care and Maintenance Guides



Jewelry is too
expensive! AH!
This Care and Maintenance
Just right to me!



click



4. High level database architecture and organization

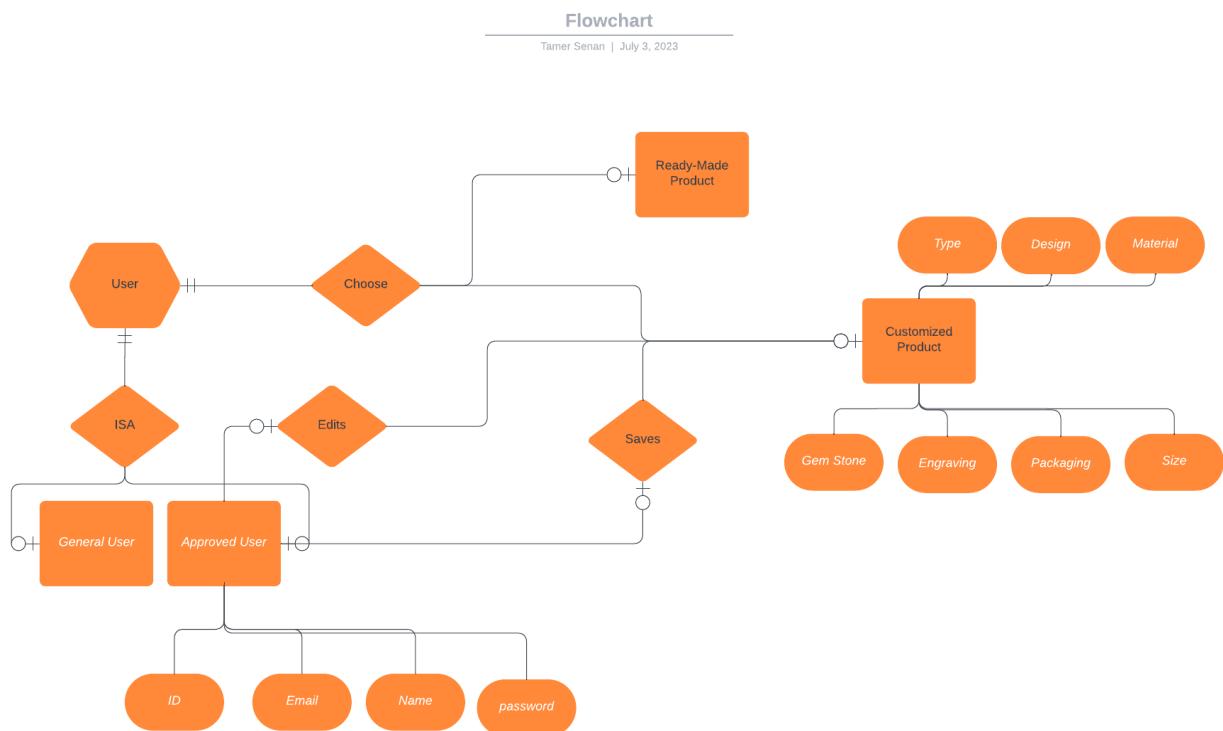
Database requirements:

- 1.1.3. (1) A general user shall choose at most one type of jewelry per product customized.
- 1.2.1. (1) An approved user shall be able to save many customizations.
- 1.2.2. (1) An approved user shall be able to edit at least one previously saved customizations
- 1.1.10 (1) A general user shall choose at most one design per product customized.
- 1.1.11 (1) A general user shall choose at most one material per product customized.
- 1.1.12 (1) A general user shall choose at most one gem stone per product customized.
- 1.1.13 (1) A general user shall choose at most one size per product customized.
- 1.1.14 (1) A general user shall choose at most one engraving per product customized.
- 1.1.15 (1) A general user shall choose at most one packaging per product customized.
- 1.1.16 (1) A general user shall choose to make a customized product or purchase a normal product.

Entities, attributes, relationships, and domains at the high level:

- User (Domain)
 - General User (Entity)
 - Attributes:
 - Approved User (Entity)
 - Attributes: id, email, name, password
- Customized Product (Entity)
 - Attributes: Type, Design, Material, Gemstone, Size Engraving, Packaging
- Ready-Made Product (Entity)
- Relationship: Choose, Save, Edit
 - General User chooses between customized product or ready-made product
 - Approved User saves customization
 - Approved User edits saved customizations

Entity Relationship Diagram (ERD) based on DB requirements:



DBMS:

- MySQL is the DBMS we will choose because we believe it is the most efficient and the team is more familiar with it.

Media storage:

- Our database will have images in the format of PNG or JPEG file with a maximum size of 3MB. Images will be used in association with products and stored in a file called “images”. We will store references to the images in the database.

Search and filter architecture and implementation:

- To search for a product, the string typed into the search bar will be used to compare with product names in the database. The database will give back a list of products that match the string, starting from the newest products added to the database to the oldest products added.

Example search query:

```
SELECT * from Product p  
WHERE p.name=?  
ORDERBY p.created_at DESC;
```

- To filter products, there will be a side panel to allow for filtering. The inputted choices from the user will be used to compare with product attributes in the database. The database will give back a list of products that match the constraints given by the general user, starting from the newest to oldest products added to the database.

Ex. If the user decided that they would only like to view gold rings:

```
SELECT * from Product p  
WHERE p.type="ring" AND p.material="gold"  
ORDERBY p.created_at DESC;
```

5. High Level APIs and Main Algorithms

High Level API features:

- Purchase product
 - To purchase products, the user will be required to provide name, email, address, and card information. The frontend will send a request to the backend, where the backend will store the information into our database and generate a “created_at” date and order ID. The backend will then respond to the request by sending the frontend the order ID for order confirmation. By giving the user the order ID, the user will be able to search and view their order details.
- Post reviews
 - To post a review, the user will be required to provide title, description, and a rating ranging from one star to five stars. The frontend will send a request to the backend, where the backend will store the information into our database and generate a “created_at” date and review ID. The backend will respond to the request by sending back the information along with the date generated to the frontend. The frontend will display the information for all users to view on the associated product page.
- Upload product page
 - To upload a product page, the user is required to be an employee. The page required the employee to enter the product name, description, type, material, and images associated with the product. Once the information is submitted, the frontend will send a request to the backend, where the backend will store the information into our database and generate a “created_at” date and product ID. The backend will respond to the request by sending a message indicating success or failure. If successful, the frontend will display the product page for all users to view.

Main Algorithms:

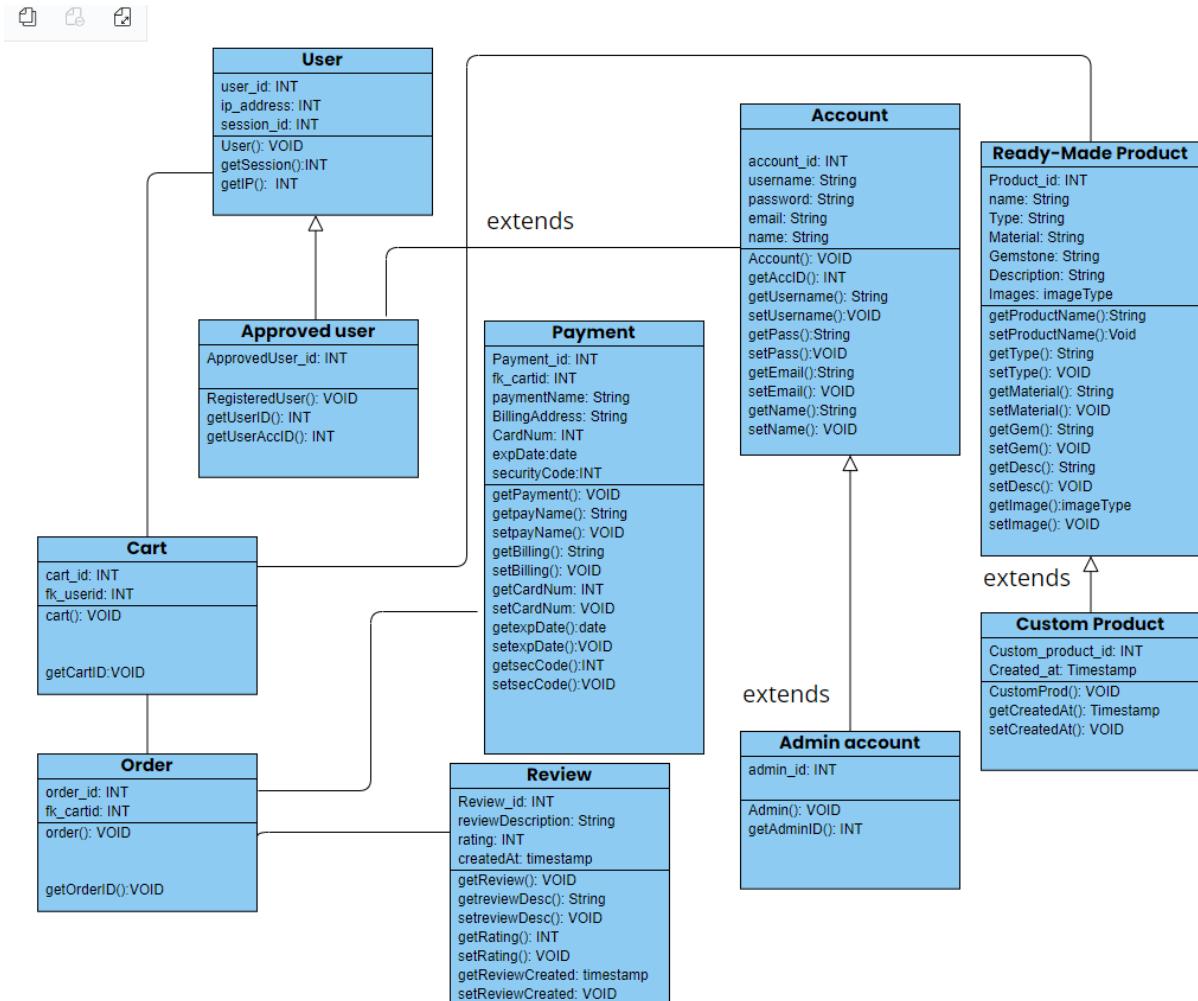
- Products will be posted in the order of newest to oldest by default. The “created_at” dates associated with the products will be used to make this process possible. However, users may change the order in which the products

are posted by selecting from a drop down menu. The options provided will be sorting by date or price in descending or ascending order.

New software or framework:

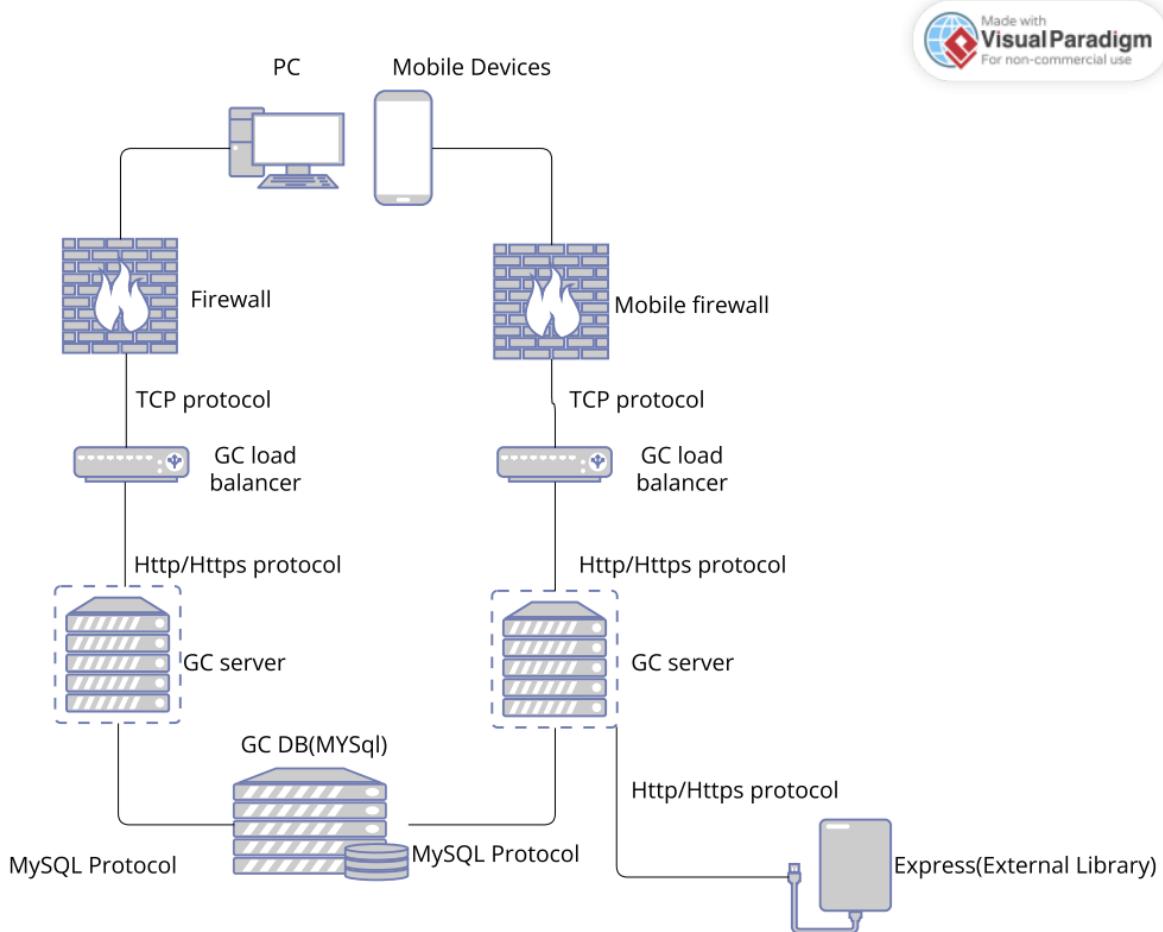
- No changes to software tools and framework.

6. High Level UML Diagrams

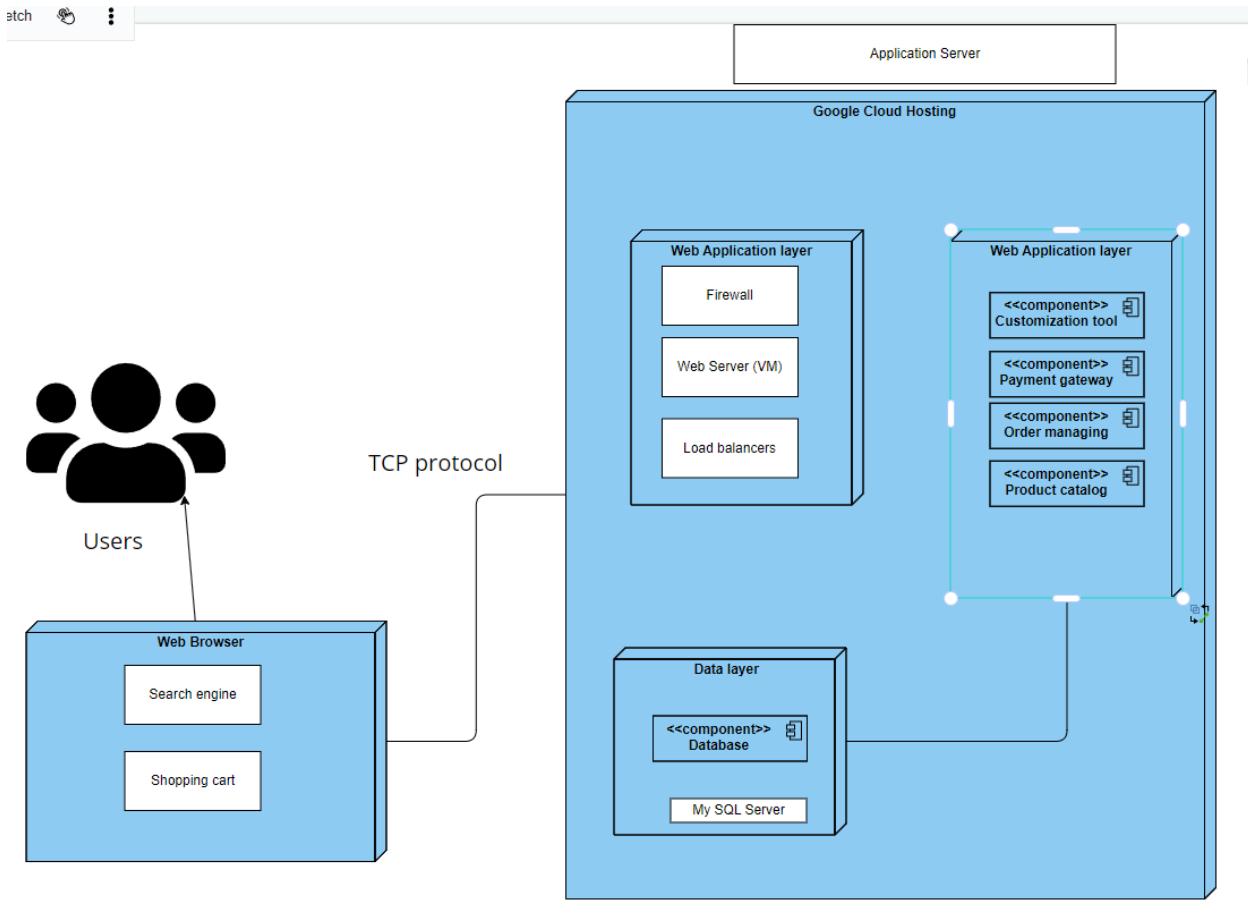


7. High Level Application Network and Deployment Diagrams

Application Networks Diagram:



Deployment Diagram:



8. Identify *actual* key risks for your project at this time

Skills risk: There is a risk that we as a team do not have the skill set or experience to create a feature that allows us to customize our jewelry and features of our products.

Solution: We are going to assess each other's previous experience and current skills to see who has the most experience working with a tool like this. If we conclude that we cannot implement this tool, we will substitute it with something similar that we can complete.

Schedule risk: There is a risk that some of us may not be able to work as much as others due to time conflicts.

Solution: We have scheduled meetings that work with everyone's schedule that allow for quick check-ins and delegation of tasks. We also utilize Trello with task and mini due dates to help us work as individuals outside of our work meetings.

Technical risk: Currently our main technical risk is ensuring that our database ERD diagram is properly implemented.

Solution: We are discussing as a team how we want our ERD entities and relationships to be handled in our database. How we're going to resolve this issue is to try two variations of our ERD and compare between the two seeing where each one fails.

9. Project management

Throughout the M2 phase, our team effectively used various digital tools to facilitate task management and collaboration. Trello was central to our workflow management, where we assigned tasks to team members and tracked their progress. Trello's board and card system allowed us to visualize our workflow, shifting tasks from "To Do", to "Doing", and finally marking them as "Done". Another tool we utilized was Google Docs for our brainstorming space, sharing technical documentation, and sharing notes. Its real-time collaboration capabilities enabled us to simultaneously work on the same documents, boosting our productivity and efficiency. Discord served as our go-to communication tool in our day-to-day interactions. Discord channels helped us categorize discussions by topic, creating a centralized space for quick updates, resource sharing, and answering questions. We used Zoom for regular work sessions and meetings. We held virtual meetings every two days to review progress, address concerns, and strategically plan ahead. For future tasks, we plan to maintain these tools, as they have proven to be effective in managing our workflow, communication, and collaboration.

10. Detailed list of contributions

- Tamer
 - Describe and define APIs, Describe significant non-trivial algorithm/process, Describe changed SW tools and frameworks, Design high level DB and create ERD-Models, Determine media storage, Determine search/filter architecture and implementation, Back-end and Front-end teams connect UI with back-end, Create MySQL databases
- Denean
 - Describe and define APIs, Describe significant non-trivial algorithm/process, Describe changed SW tools and frameworks, Design high level DB and create ERD-Models, Determine media storage, Determine search/filter architecture and implementation, Back-end and Front-end teams connect UI with back-end, Research and document how to create public SSH username and keys, Generate public SSH user and keys, Prioritize and expand functional requirements, Data Definitions and Glossary, Update GitHub branches, Connect GitHub to Google VM, Create MySQL databases
- Daniel
 - Back-end and Front-end teams connect UI with back-end, Prioritize and expand functional requirements, Establish GitHub workflow, Update GitHub branches, Connect GitHub to Google VM, Identify Key Risks, Create application network and deployment diagrams, Create UI mockups and storyboards, Build Home Page for Vertical Prototype, Home Page UI/UX, Home Page scrolling images, UML Diagrams

- James
 - Build Home Page for Vertical Prototype, Home Page UI/UX, Home Page design and handlebars, Home Page quiz, Back-end and Front-end teams connect UI with back-end, Connect GitHub to Google VM, Create use cases based on executive summary in M1, Revise M1 document, Research and troubleshooting connect to DB, Login/Registration function, Database statements
- Yitian
 - Build Home Page for Vertical Prototype, Home Page UI/UX, Back-end and Front-end teams connect UI with back-end, Create UI mockups and storyboards, Research and troubleshooting connect to DB, Search Bar function, Search results page, Database statements

Member	Score
Tamer	2
Denean	2
Daniel	2
James	2
Yitian	2

Total of all scores = 10