Software Design Documentation

> **Software Name:** Capstone
> **Version:** 1.0.0
> **Date:** May 9, 2023

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Software summary

Emerging technologies like AI, virtual reality and augmented reality are sure to change the way in which we engage as consumers moving forward. Capstone is an ecommerce platform MVP made to demonstrate the potential uses of AI and AR in a ecommerce context. The web-app is configured as a T-Shirt vendor, levering a customizer tool which lets shoppers personalize and customize their apparel. The customizability is limited only by the customer's imagination!

How will it work?

Capstone is be a full feature ecommerce platform complete with a product database, a clean and modern user interface, payment flow using stripe and a 3D customizing tool which will allow customers to modify the color, textures, patterns and fit, size of their apparel. In addition, the tool will communicate via prompts with an AI image generation engine to conjure up custom and unique logos, patterns and designs.

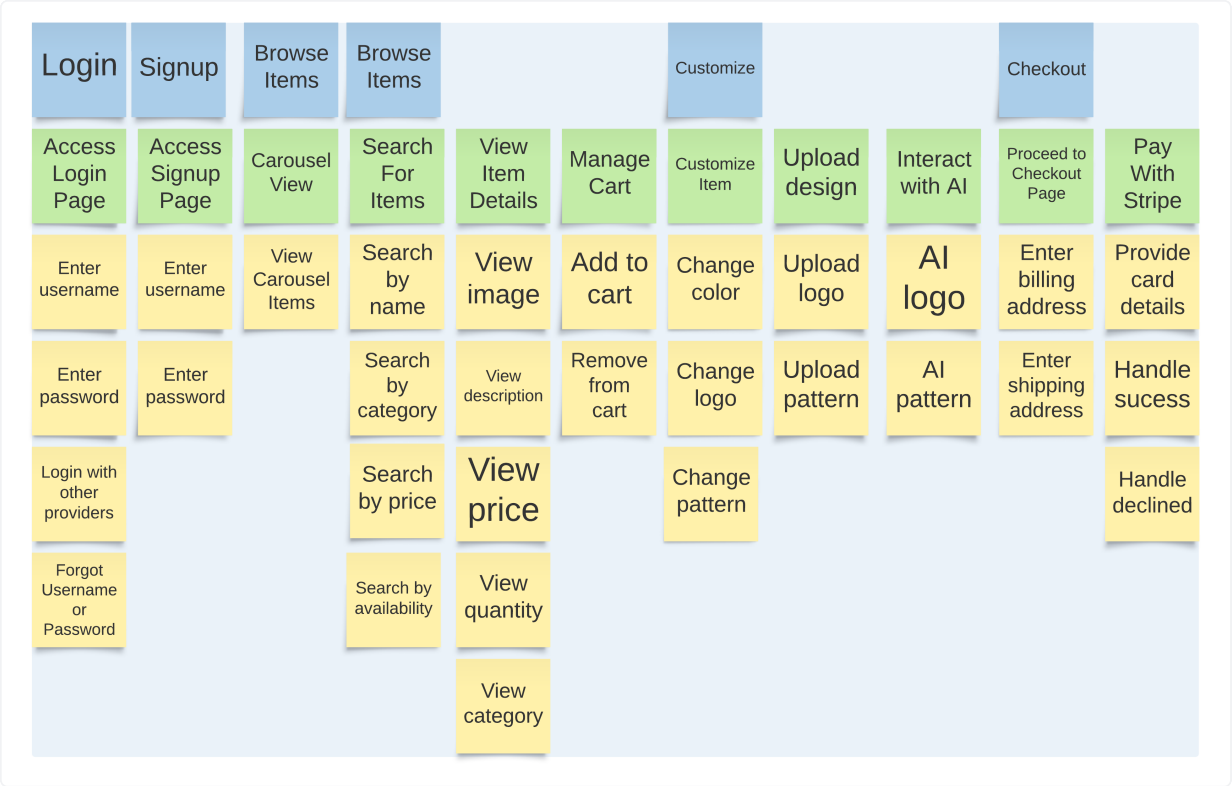
Development Timeline

What follows is a general breakdown of tasks over the 9 weeks allocated to this project.

Sketches cannot currently be displayed in exports

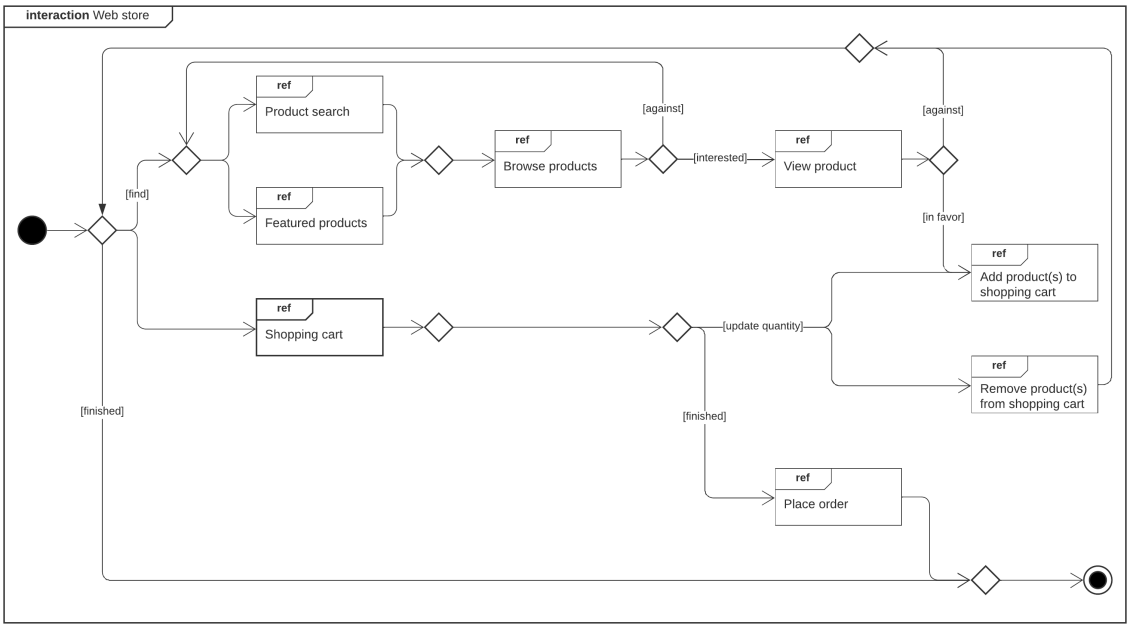
User Stories

Below is a general overview of the desired interactions in the form of user stories.



Interaction Diagram

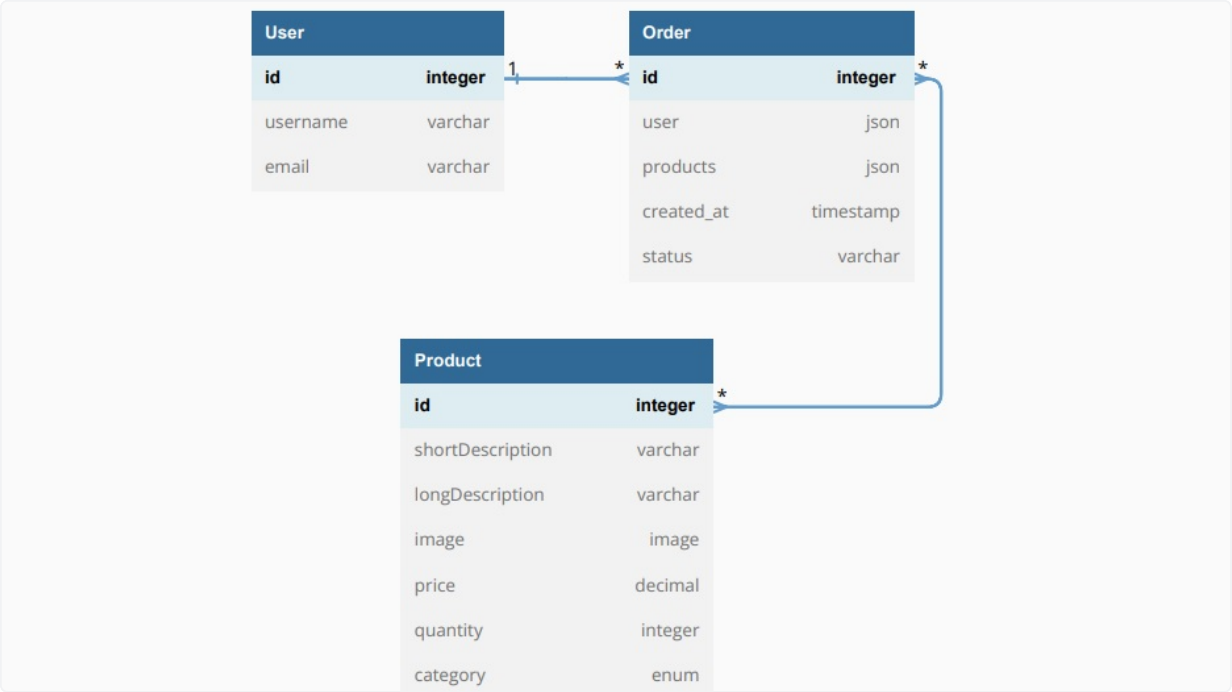
Below is a interaction flowchart diagram detailing the flow of actions and outcomes.



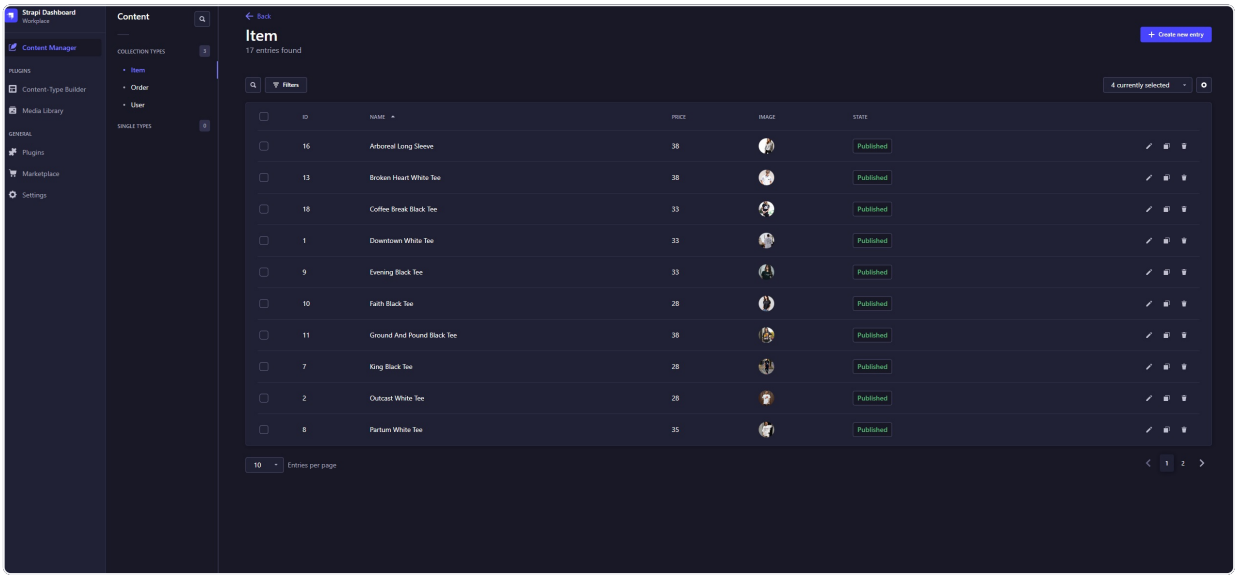
Database

The database will be made made using Strapi headless CMS using an SQLite3 back end. This choice was made because ease of use and MVP purposes. Strapi comes with a built in admin dashboard, and an API endpoint handler to that CRUD operations can be made via RESTful API calls rather than standard SQL queries. This makes data fetch, retrieval, and creation much simple.

Below is a basic DB diagram showing the table relationships because the entities needed for this MVP. A user may have many orders. An order many have only 1 user. An order may have many products, and a product may have many orders. The primary keys of each table are the table's respective ID attributes.



When accessing the Strapi dashboard, the user is presenting with the following interface. Allowing the user to create new content types (SQL tables), content entries (tuples), and modify the attributes of any of the content types or individual content entries. Moreover, Strapi provides built in security features, all of which are accessible via the dashboard. What follows is a view of the dashboard:



Manual

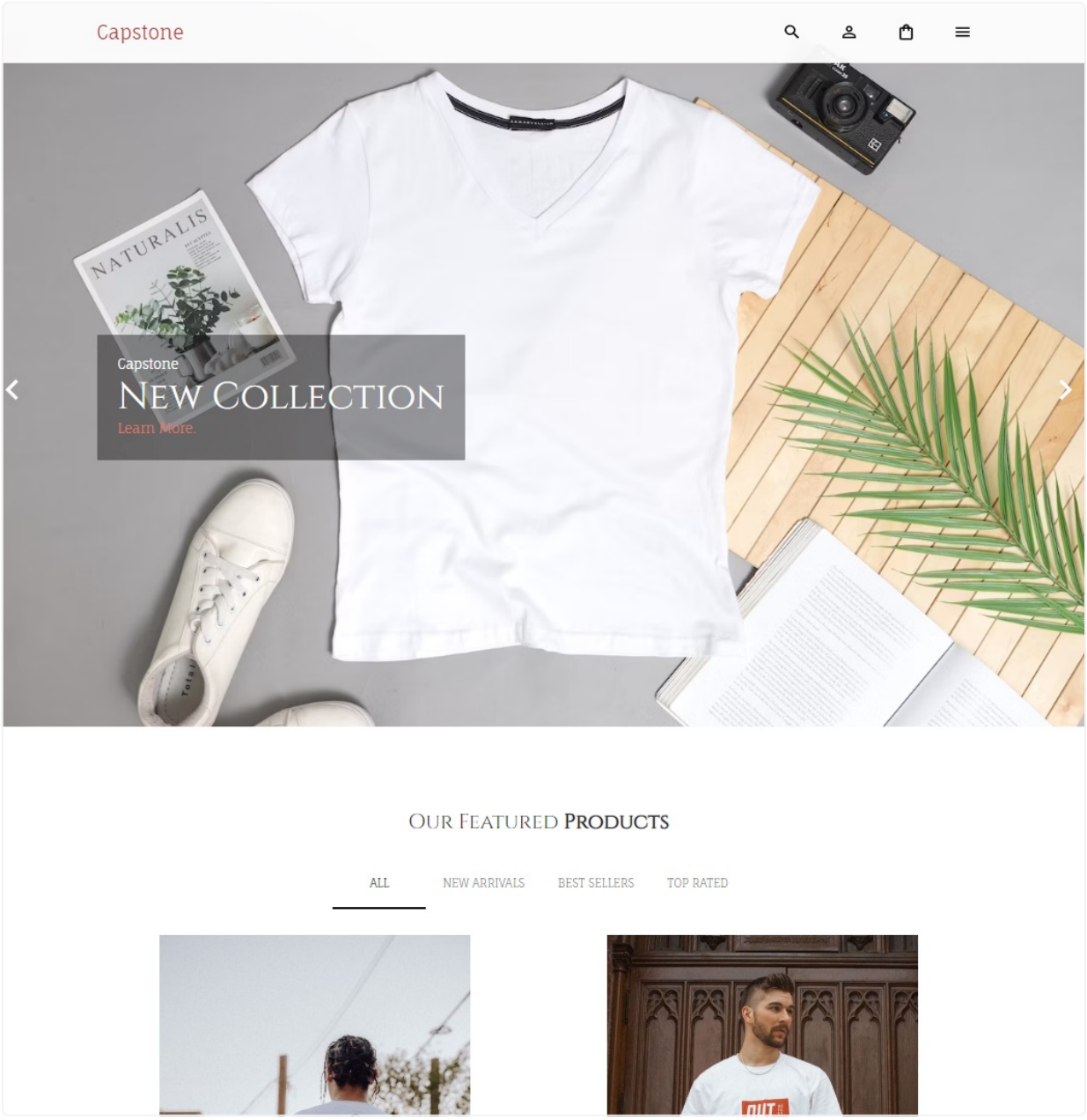
What follows are installation instruction along with a general user guide for using the application.

Step 1 - Installation Guide

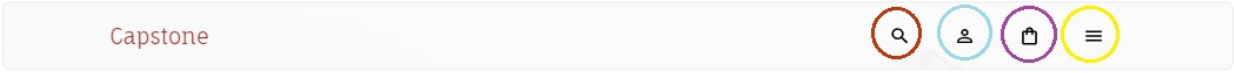
```
// Navigate to project root directory

cd server
npm install || yarn install
npm run develop

cd client
npm install || yarn install
npm run dev
```

Step 2 - Home Page

Upon an initial visit, the user is greeted by the home page ('/'):

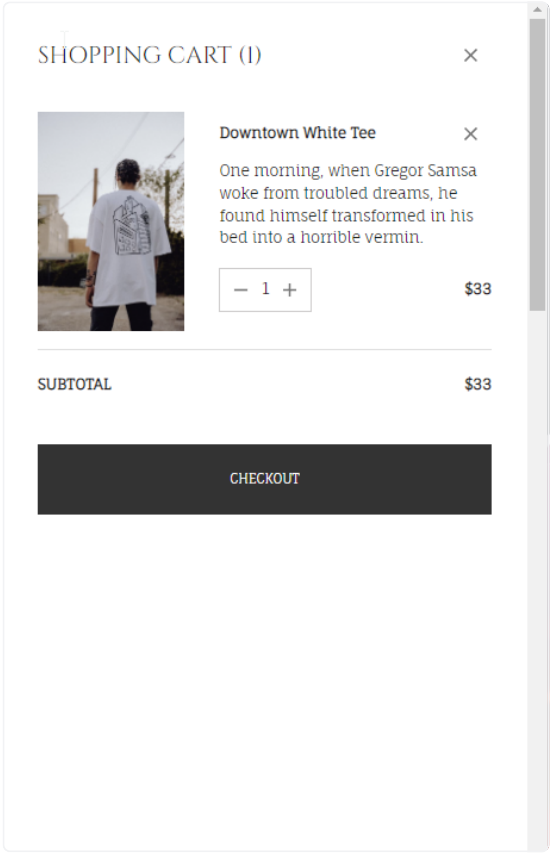


At first glance, the user will notice a navigation bar with various icons. The Capstone logo acts as a link and returns the user to the home page ('/') whenever clicked. The navbar is a persistent element. The user will have access to its features throughout the web-app.



- The yellow circle highlights a hamburger menu, which expands a modal when clicked to reveal additional functionality. On mobile devices, the other icons are collapses into the hamburger menu for a more responsive design.
- The shopping cart is highlighted by the purple circle. The shopping cart model lets the user increase or decrease the quantity of any items, remove any unwanted items, view the price

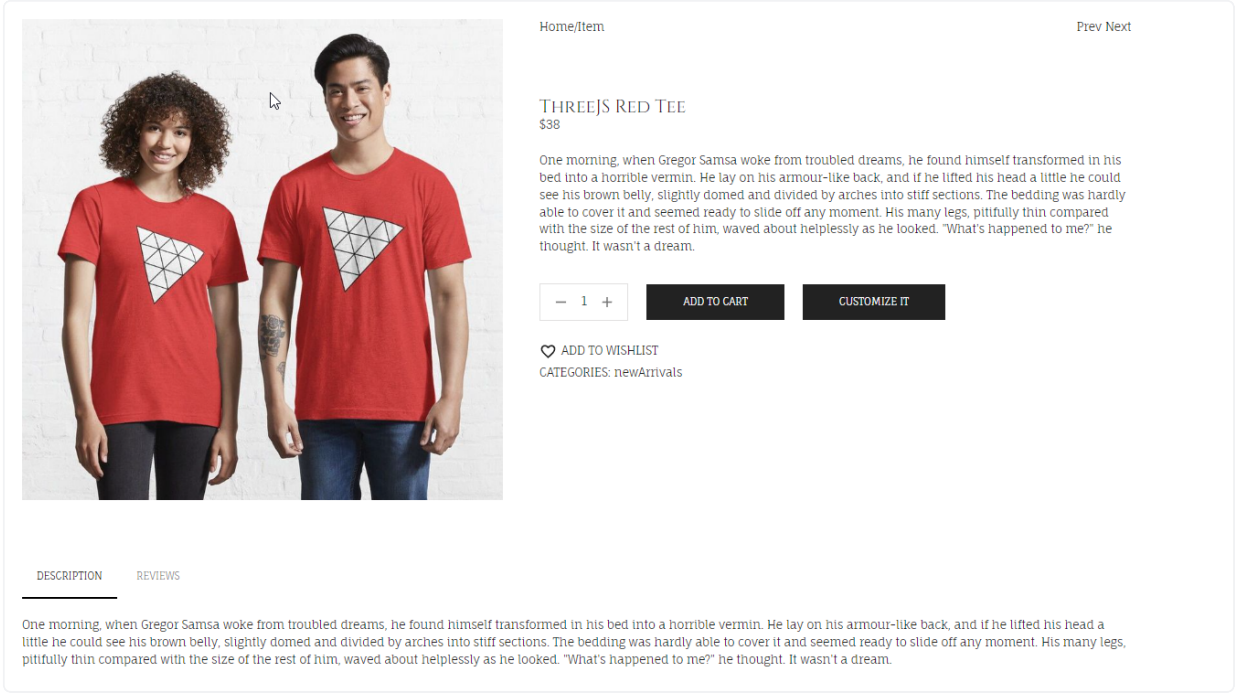
along with a short description of the item, or proceed to the checkout page ('/checkout').



- The profile page is highlighted by the light blue circle, where users can modify the account details.
- The magnifying glass icon highlighted by the orange circle will reveal a search bar

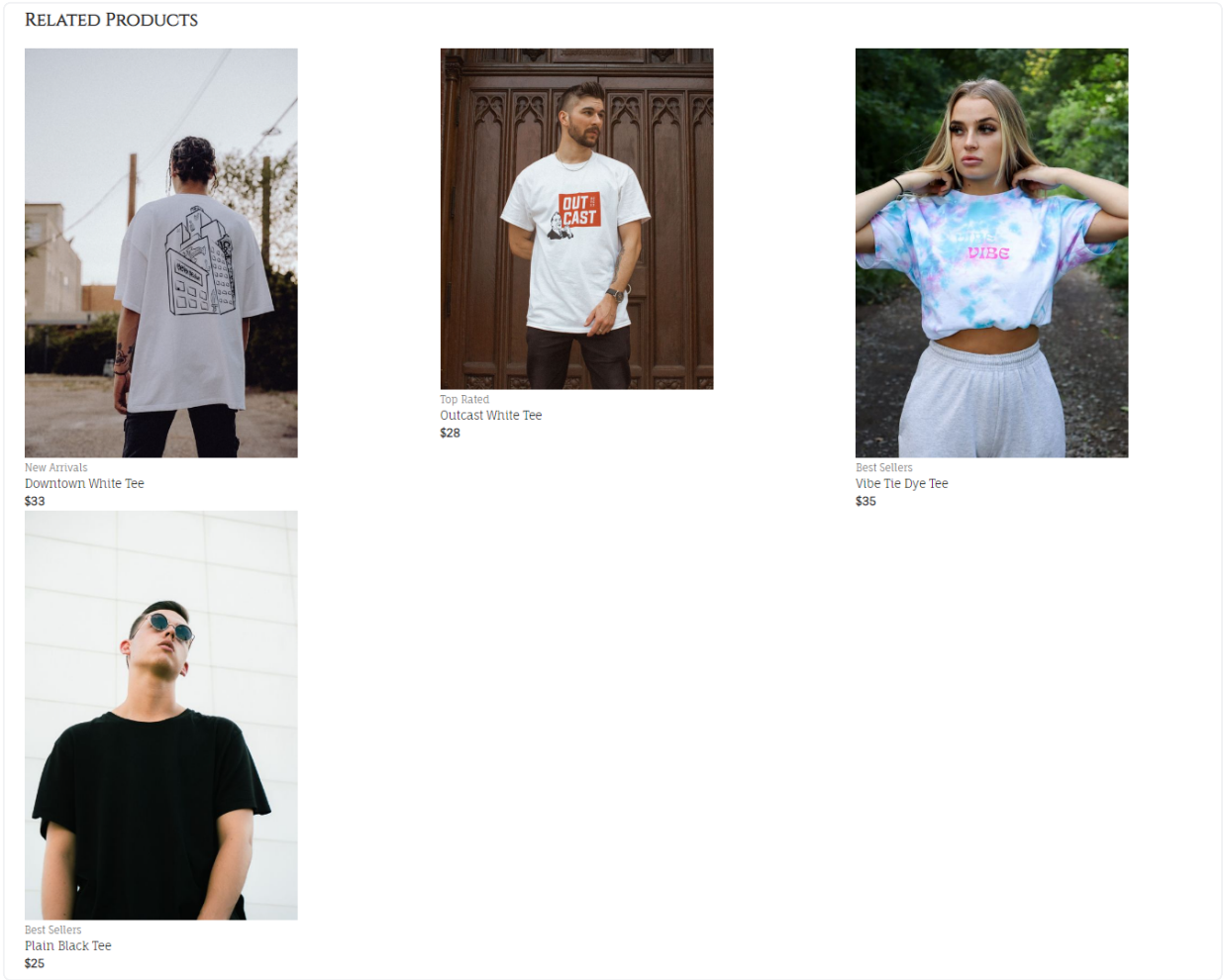
Step 3 - Item Details

Viewing an individual item will reveal the item description page ('/item/itemId')



The user will be able to view a larger product image, as well as a detailed description of the item in question. This page retains some of the functionality of the cart modal, allowing users to add items to the cart, increased and decrease the quantity of items and access customer reviews. Additionally the user can access the customizer by way of the 'customize it' button.

Related products are also showcased on the item description page.



Step 4 - Customizer

Clicking on the customize it button will take the user to the customizer's landing page ('/customizer').

Here a 3D model of a T-Shirt object representing the selected piece of apparel is rendered in real time. The user may click the continue button to access the customizing tools.

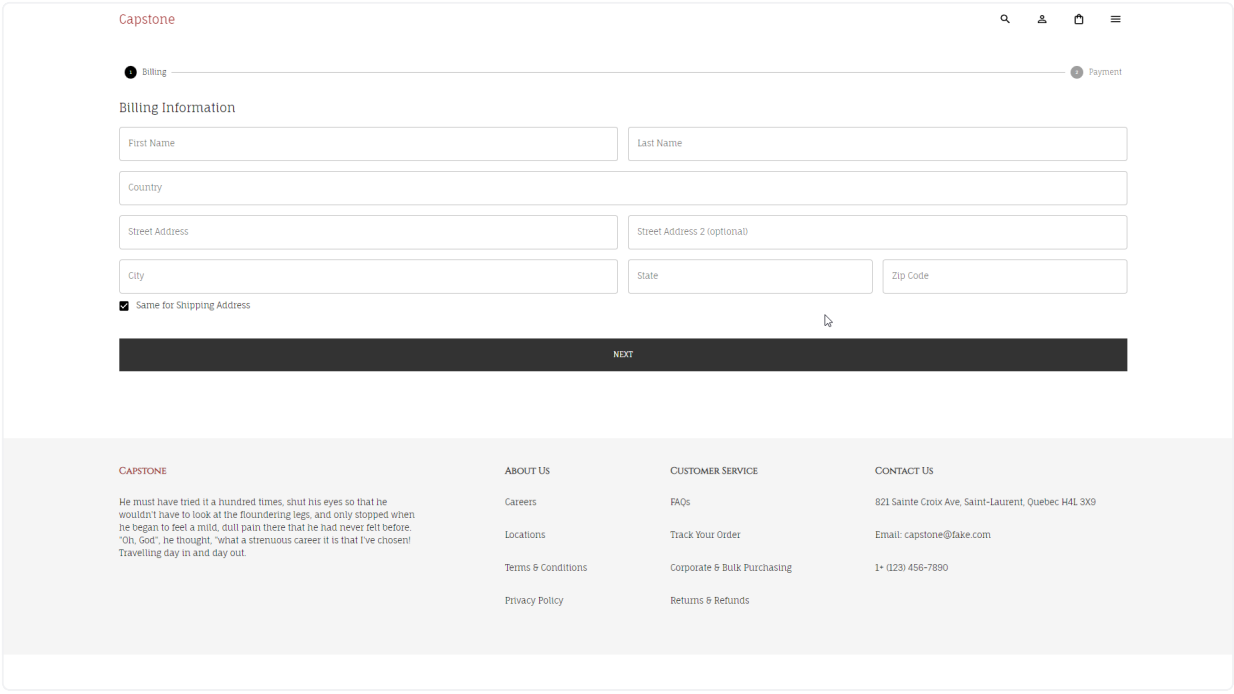
On the lefthand side of the customizer menu are three tabs.

- The first is a color picker, which allows the user to choose any color they would like. The color will be applied to the shirt object in real time.
- The second file icon lets users upload a file to serve as either a logo or pattern rendered onto the shirt.
- The third tab represented by the robot icon will reveal a text box. The user may enter a prompt for either a logo or full pattern, which will then send a request to OpenAI's DALL-E for a image or splash art based on the user's prompt.

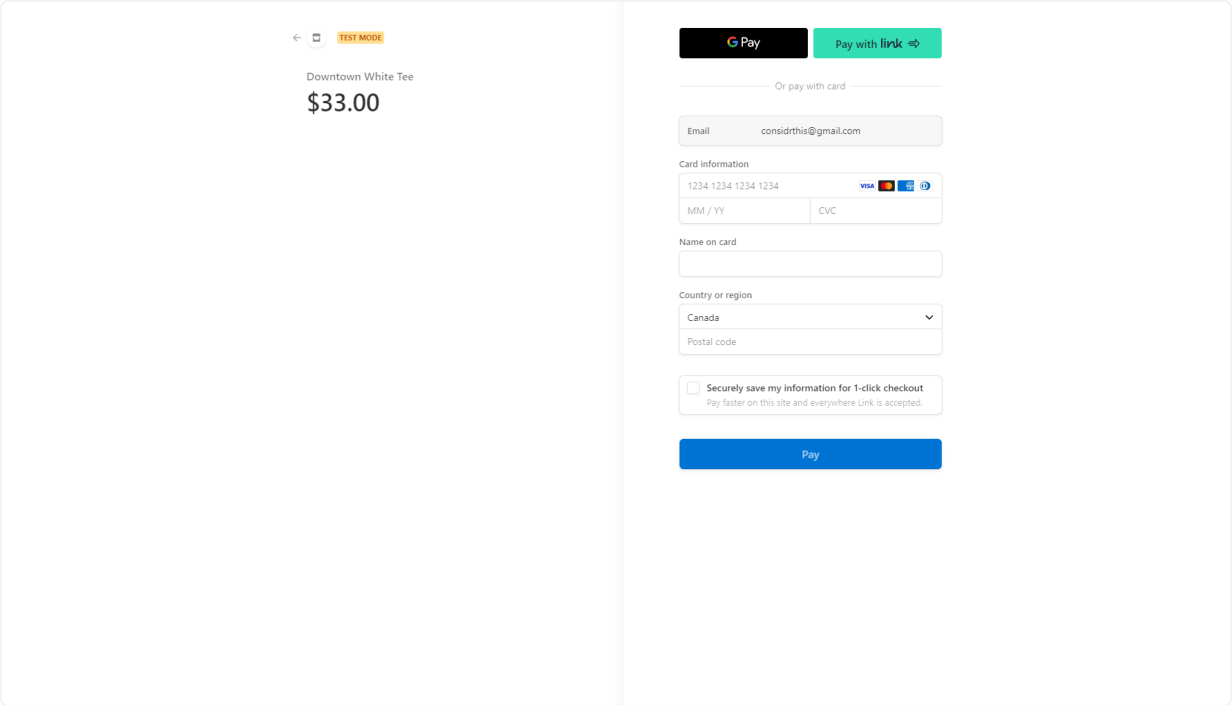
The two toggles at the bottom-center of the page allow the user to toggle either the logo or texture on or off. In the following picture DALL-E generated an animal print pattern that was rendered to the shirt.

Step 5 - Checkout

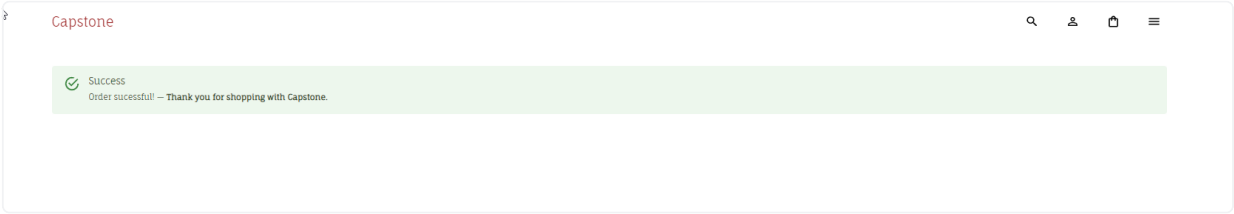
When clicking on checkout from either the cart or item detail pages, the user is directed to the checkout page ('/checkout'). Here the is asked to enter their billing and shipping information in order to proceed to payment. Once the form is validated, if the user is a guest, they are asked to provide a valid email and phone number for receipt and processing purposes.



Once all the required personal information has been validated, the user is redirected to a Stripe payment gateway in order to process their payment. Here the user will be asked for valid payment information from Stripe.



Upon a successful purchase, the user is redirected to the confirmation page ('/checkout/success').



FAQs

What database model does create-strapi-app implement?

Answer: Strapi can implement SQL databases using MySQL, PostgreSQL, SQLite and MariaDB. Capstone uses the SQLite implementation.

How are the images and textures generated?

Images on the e-commerce storefront gathered from Unsplash. Logos and patterns generated by the customizer are generate by OpenAI's DALL-E v1. DALL-E version 2 is not yes supported for public API calls.