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1.0 Abstract

Online shopping is extremely common nowadays due to its convenience. Consumers have a wide selection of products at their fingertips while being able to save travel time. On the other hand, sellers benefit by reaching customers from all over the world at any given time, thus boosting revenue of the company while saving costs that come with a retail store. The only problem that comes with online shopping is consumers not being able to try on the clothes before purchasing them. The aim of this project is to create a website that allows detailed sizing, ensuring consumers receive the right sizes, while also providing brands and clothing styles that can suit every consumers' taste.

2.0 Expanded Project Description

After realizing that in today's e-commerce websites, users can only search for clothing in general sizes which do not account for specific body measurements, Custlr, a clothing company and the group's client, tries to solve this matter with an idea to build an e-commerce website. This website caters to the aforementioned problem, creating a catalogue of clothing products from different e-commerce websites in a single website, with a variety of brands for users selection. The website is accessible to all ages of users conveniently due to its minimalistic design and easy navigation. The data for the website are retrieved from weekly web scraping on multiple clothing companies done by the backend side. Users can filter the specific item searched i.e the type of clothes, price range according to their own budgets, brands and size, helping avoid an overwhelming experience for them and wasting their time. Plus, it goes against the rules of user interface (UI) and user experience (UX) design, that a good impression matters in the first ten seconds, else the users will leave, and the company will not gain any profit. [Nielsen, 2011] Users also have an option to go to a page that will query the user for their size in a detailed manner, converting it into a standard size from multiple regions, to tell the user whether the item will fit perfectly on the user or not. This was done by using a scoring system that calculates how well a clothing item could fit on a user based on their measurements. These scores were based on a few sizing charts from multiple websites to give the best fit possible to the user.

3.0 Background Information, Literature Review and Research

The motivations behind the project were when the group realised that there is a gap in the market, where companies carry a variety of brands for users to shop from, but the sizing for clothing between them is inconsistent, varying from region to region in their naming convention, as well as measurements from website to website, and requires the user to click through different pages to find the information they need for an educated decision on which size to choose. The project's goal is to simplify this process, making sizing measurements a one-time thing, where the users insert the detailed measurements for themselves to get best fit clothes from multiple sites. Therefore, before creating the website and implementing the backend system, some research had to be done on the existing e-commerce websites that have similar designs.

3.1 FashionValet and Zalora

Firstly, the group looked at two clothing websites, FashionValet and Zalora, as they were shown to be similar in a few aspects. Firstly, both being e-commerce clothing websites, consisting of several web pages from the home page to checkout page. Like how other e-commerce clothing websites did it, the group adopted the flow of pages from these sites when building the project. Secondly, these two websites provide a range of brands for users to choose from and allow for users, and provide sizing options - but to accurately get these sizes to fit them, the user would have to find the sizing charts. The process of looking up sizing charts takes a long time as each website has it stored behind a multitude of different links and pages, which is generally an unpleasant user experience when looking for information on clothing sizing for each specific product. This seems to be inconvenient in a fast pace era as users have to find the charts, then measure themselves instead of having a system take an input of a user's measurements and giving them the best sizes for said measurements. Thirdly, both websites allow for searching categories

i.e type of clothes, the occasion of clothes, best sellers, etc and the group realised that this idea should be adopted as the project could provide a convenient search for users to search for an item as it narrows down to specific categories. Next, the group realised that the text on the websites seems to be relatively small, which does not cater to older and visually impaired users, therefore, one of the priorities was to ensure that the text is readable for every demographic to use the website without issue. For FashionValet specifically, the home page is clearly too cluttered with information that would overwhelm the users, therefore, that was avoided when designing the group's idea of the website. FashionValet also caters to modest fashion brands for women and the brands offered are mostly local brands, which mean a lack of variation for other categories to buy from the website. On the other hand, Zalora offers a wide range of brands from premium brands to local brands and caters to all ages of consumers and both genders. In terms of design of the website, Zalora allows their users to choose the gender of the products on the home page - that being men, women, and kids - hence allowing the users to navigate the site easily and in a categorized manner. Last but not least, the information displayed on Zalora's website seems to be organised and pleasing to the eyes. Given that, all of the advantages and disadvantages observed above were taken into consideration when building the website to give the best user experience in a clean yet functional user interface.

3.2 H&M and Zara

Observations were also made on two fast fashion websites, H&M and Zara. Both of these websites provide a variety of clothes for various occasions, caters to all genders and categories of consumers i.e kids, men, and women. The websites have similarities in functionality to the websites previously mentioned, providing a convenient way for the users to search for clothes. However, a few new items made the H&M and Zara websites stand out. Starting with Zara, images used on the website were large with high resolutions. This allows the users to see the items more clearly, at the cost of users taking more time to scroll through the page to look at each product. Additionally, if users do not have a good internet connection, images

would take longer to load. However, images displayed with a reasonable size, such as 264×396 on the shop grid page for H&M website, result in more items listed on the page making it easier for the user to look for an item. In regards to the information displayed on every page, an organised and minimalistic design was seen, so the group took the idea to prioritise that as well when building the website.

3.3 Fit Analytics

A website with similar functionality to what the group hopes to achieve was Fit Analytics, which is a machine learning platform built to reduce the frequency of product returns, therefore increasing sales for companies. This platform is made to solve sizing issues, and the group took some inspiration from it for the site. While similar in functionality, Fit Analytics uses height, weight and general body size for getting the best sizes. The group aims to work with exact body size measurements instead, which help with people who do not fall into the general sizes set by Fit Analytics. Along with that, the final product would be a combination of all items previously mentioned - an e-commerce website that would allow for users to search and filter for products, with an accurate measurement-to-size conversion, allowing for users to find clothes that best fit their body shape and size.

3.4 Trivago and Booking.com

Some observations were also made on the search engine websites known as Trivago and Booking.com. Trivago provides a platform where users can compare prices of the same room from many online booking websites to get the best price from them. Besides, the “cost-per-click” model is used which means once the users click on the best price, they will be redirected to the booking site that has the actual room, and profit will be gained by Trivago for ‘hosting’ these other booking sites. [trivago, n.d] Booking.com on the other hand helps hoteliers sell their rooms to the end users and profit is earned by charging from the booking price at no extra cost to the user. [Seemann, 2019] However, even though the concept was ideal, user reviews stated issues with Trivago on lost booking, and change of booking dates

during their usage, resulting in major inconvenience. [highya, n.d] When building the website, the team decided that data will be scrapped from multiple clothing websites, and these clothes would be sold on just the group's website, without any linking with the original site. This allows for consistency and reliability on the website as it has an advantage of providing clothing that fits the user right, along with a proper e-commerce experience, all in one place.

4.0 Requirements Specification

4.1 Functional Requirements

1. The website will give full freedom to the users to filter based on custom sizing, generic sizing or none at all at the shopping page.
2. Search page is used for users to search for type of clothes, and to specify if custom sizing either for tops (shirts) or bottoms (pants) is needed.
3. Users have the option to insert body dimensions i.e. arm length, waist size, etc. for their upper and lower body from anywhere in the website, these measurements should be used to suggest items that best fit the users using a scoring system to recommend products with their ideal size.
4. The backend should be able to filter through clothes with matching dimensions, brands, type of clothes and price range from the user's search before listing out the products, so the user is able to save some time looking for the desired items.
5. Once the user clicks on a product listed in the shop-grid page, the user will be redirected to a product page which will allow the user to look at size charts, select the number of items to be bought, adding the product to a wishlist, and select clothes sizing before purchasing the item.
6. Some way of storing the variables has to be implemented, for storing wishlist, cart, and user body measurements, without logging in or using a database.
7. Products that are not available from the search will be omitted from the user as they are not available.
8. Searches made by the user for the desired item will filter data and query the database before listing out the items on the shop-grid page.
9. The web scraper should run weekly only to keep information relevant, yet preventing strain on the website by running too frequently.
10. Every request for data made from the front end page will be sent to the back end to retrieve information.
11. Pages should load quickly, and the UI and UX should be pleasant and not overwhelming for a user. [Woodland, n.d]

12. Sales and deals should be recommended to the user in the search page.

4.2 Non-Functional Requirements

1. The response time for each query should be as fast as possible to avoid losing visitors on the website due to frustration while waiting for the website to load.
[Moffat, n.d]
2. The website should be easy to maintain because it's built upon a modern framework with lots of support, comments, and documentation, and generally the best practices were used when designing the code base for it.
3. Website is catered for every demographic interested in shopping for clothes, therefore the ease of use should be ensured throughout the building process by making sure the text is easy to read, data is not cluttered, navigation is clear, and at the same time, the website should be visually appealing and responsive on all devices.
4. The website could be improved in the future easily because best practices were used as mentioned before, providing an easy way to follow the code as it runs, and along with that, newer frameworks get constant support and ease of implementation with other packages.
5. The website should be reliable because extensive testing should be done regularly to ensure every function works as intended and works with other parts of the page.

4.3 Use Case Diagram

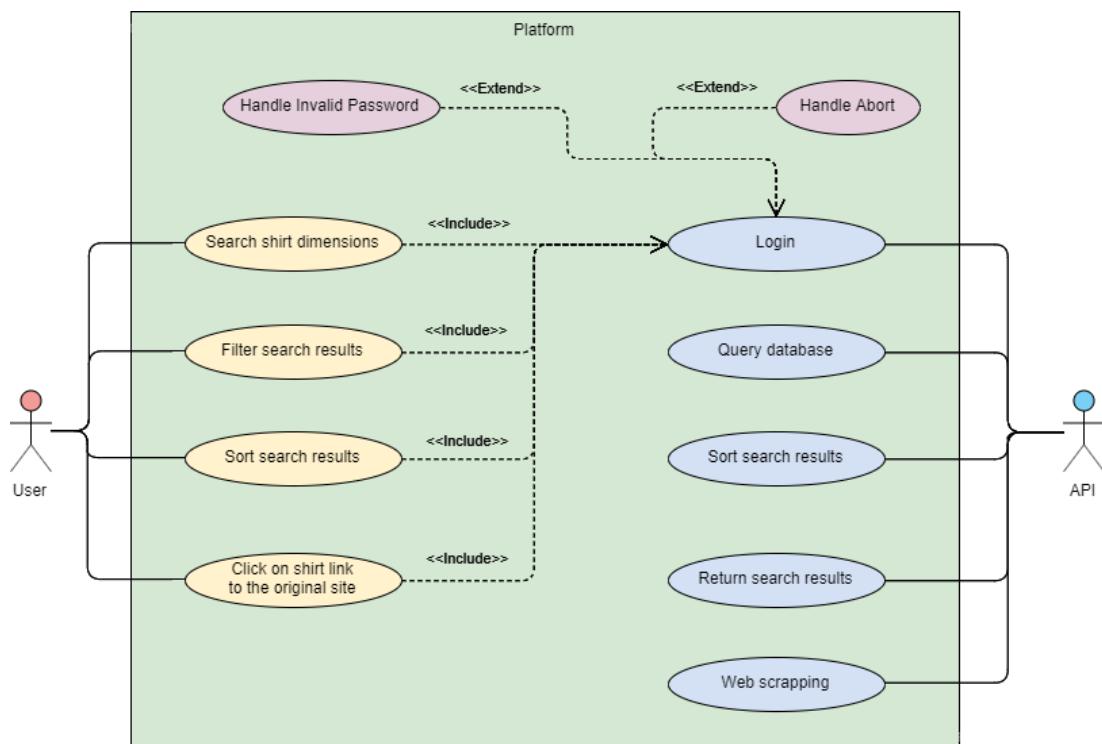


Figure 1.1: Use case diagram describing how the system functions

4.4 Entity Relationship Model Diagram

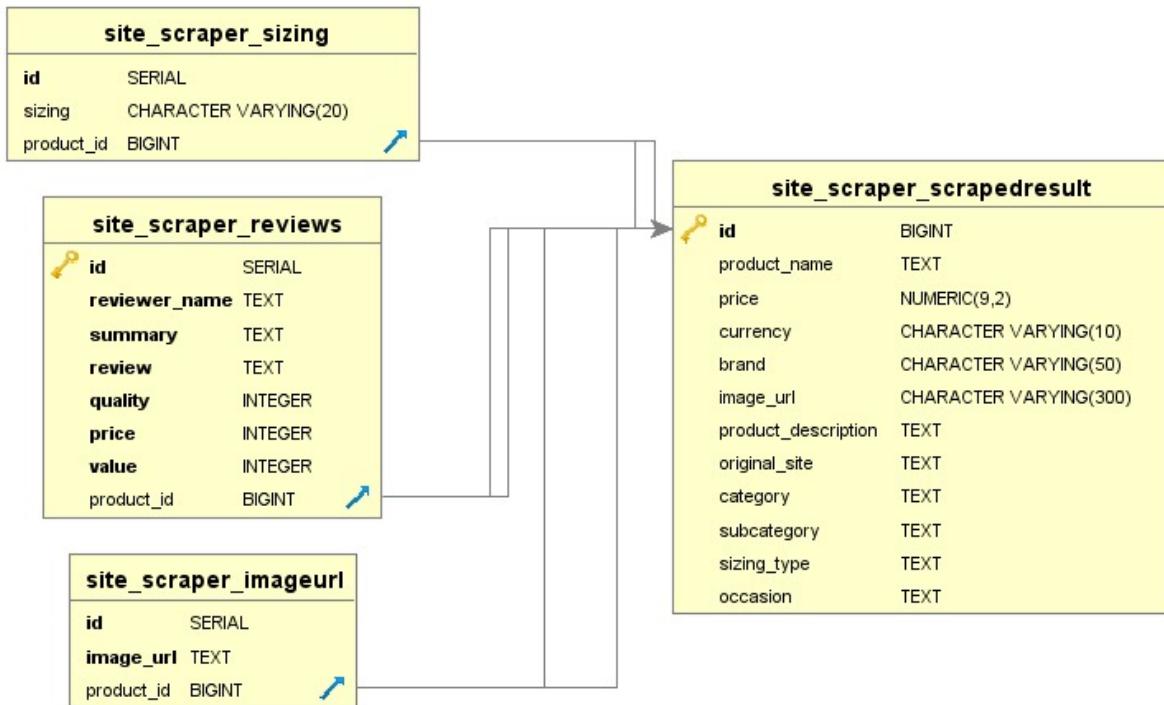


Figure 1.2: ERD showing the main tables and their relationships

5.0 Prototypes

5.1 Low-Fidelity Prototype

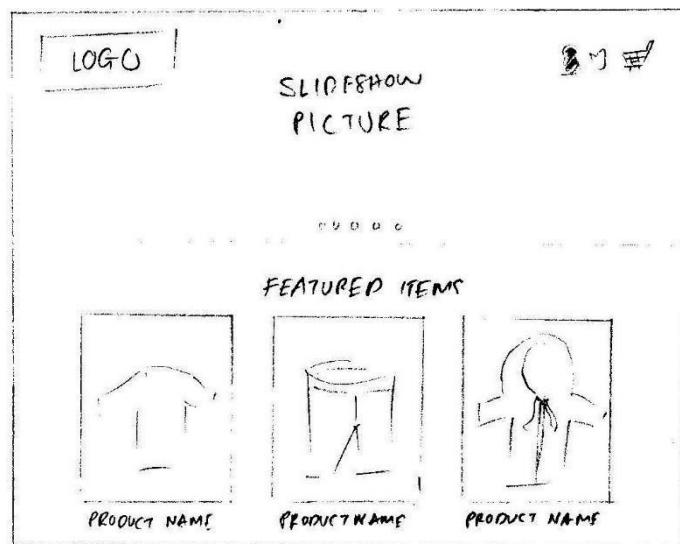


Figure 2.1: Home page

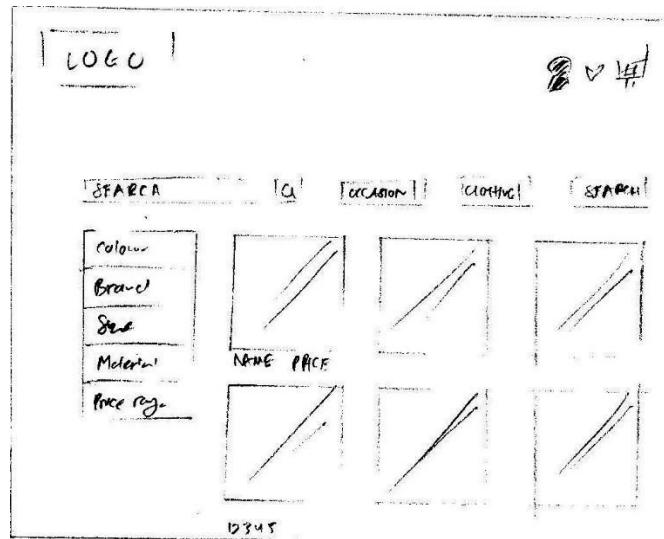


Figure 2.2: Shop grid page

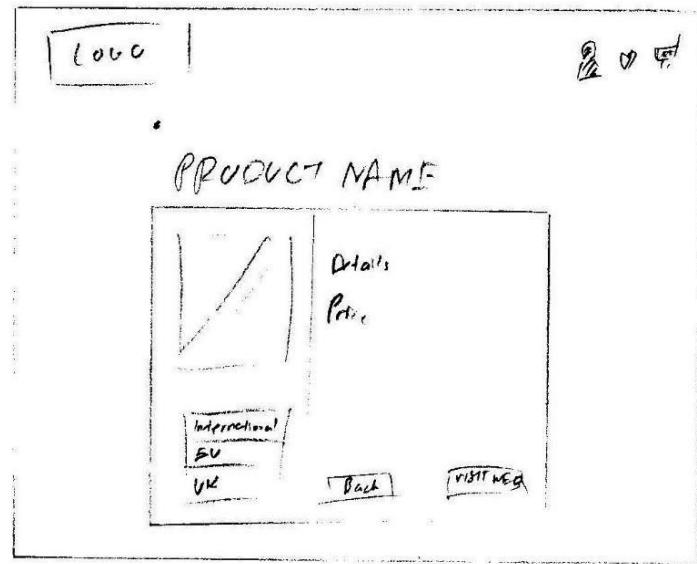


Figure 2.3: Single product page

The home page of the website displays featured products based on available deals and popularity. Users can peek at the product, with options to purchase or add the product to their wishlist. The header of all pages on the website consists of the logo of the website, icons for account management, wishlist and cart. The account icon is linked to a management page, while the wishlist icon will allow users to check their wishlist. The cart icon allows users to be able to check products in their cart. Branded items like Adidas, Zara and Billabong can promote their products to users through a slideshow here. Users can view searched products on the shop page. Products can be filtered by colour, brand, size, material, price, name, occasion, and clothing type. Once the user clicks on a product, it will redirect them to a single product page. Here, information about the product such as pictures, name, description, price, and sizing are shown. There is also the option to choose size based on different regions.

5.2 Mid-Fidelity Prototype

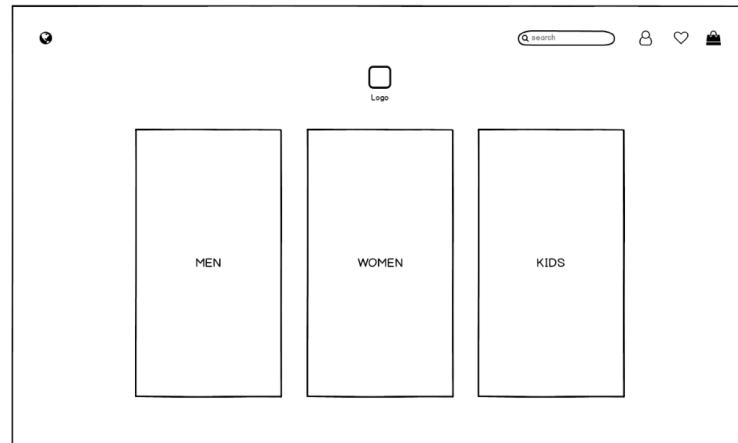


Figure 3.1: Home page

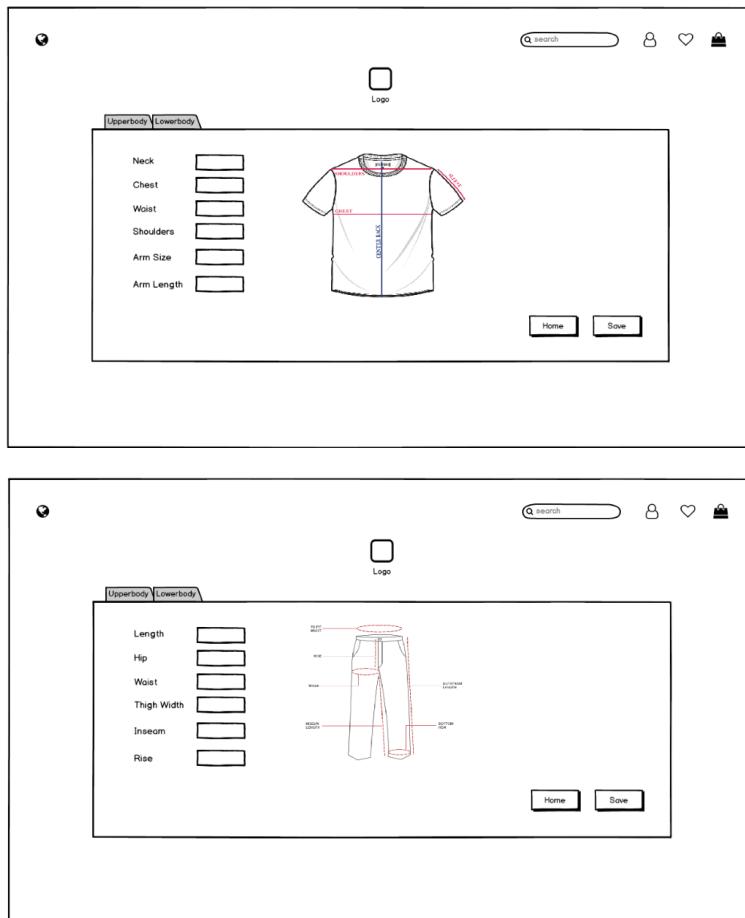


Figure 3.2: Custom sizing page for upper and lower body

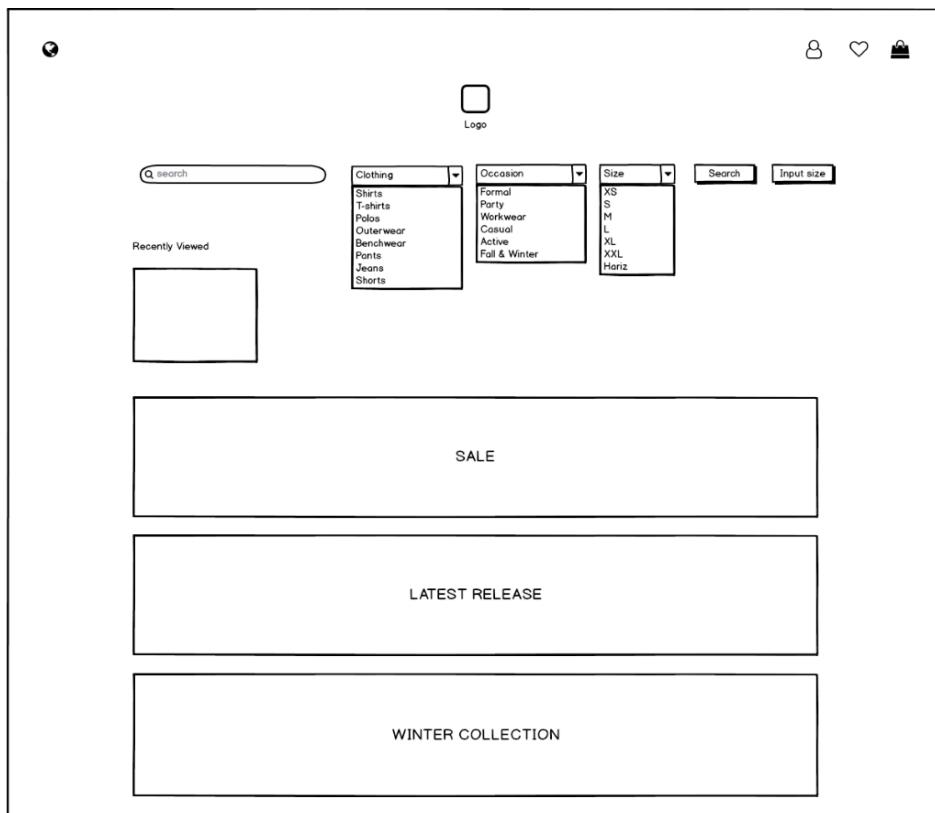


Figure 3.3: Search page

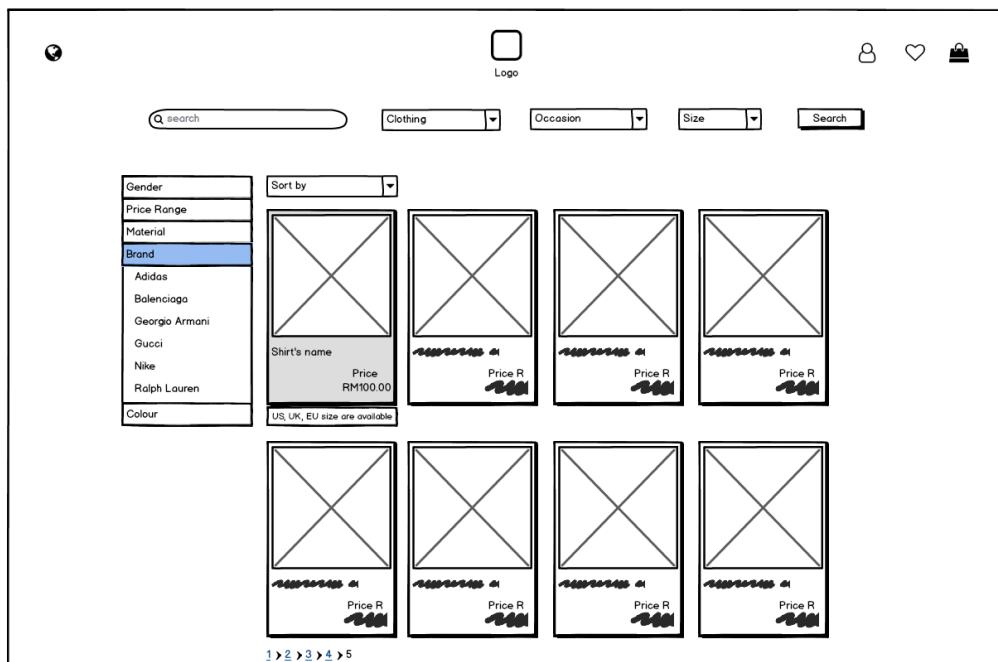


Figure 3.4: Shop Grid Page

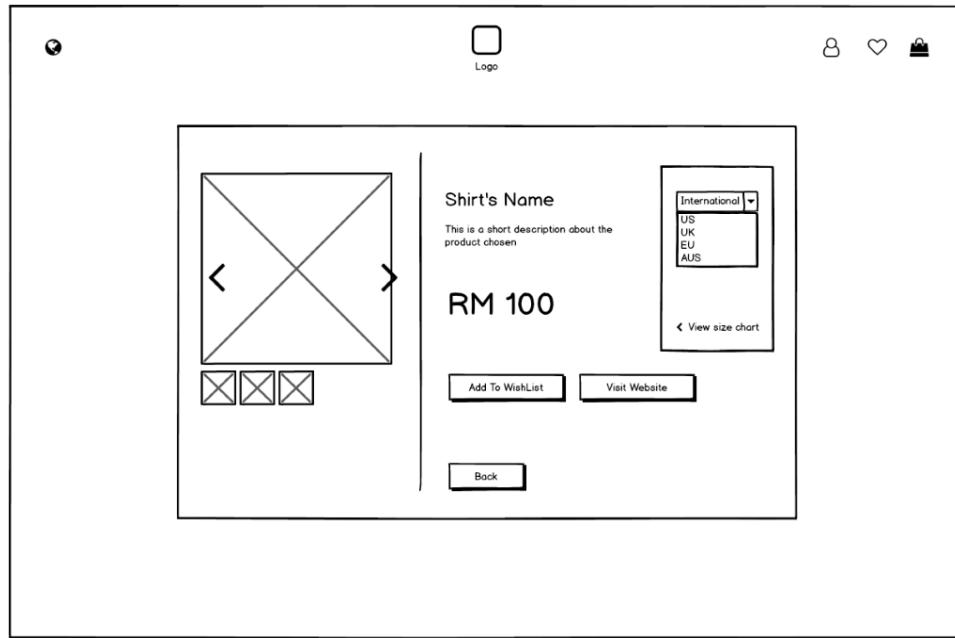


Figure 3.5: Single product page

The header of every page consists of the search bar and icons such as language, account, wishlist and cart. The language icon allows users to change the website's language. The account icon is linked to a management page, while the wishlist icon allows users to check their wishlist. Products added to cart can be viewed by clicking the cart icon. The main feature of this page is three buttons that categorizes the products to specific groups.

The custom sizing pages allow users to input their measurements for either the upper or lower body, which will be saved for use on the search page. There are tabs allowing users to switch between tops and bottoms if they want to add to or update them.

The search page will feature animated slideshow pictures of products that are on sale, with other deals as well. Users can search for products based on type of clothing, occasion, and size. If a product was recently viewed, its picture will appear on the page. A button is added beside the search button to link users to the custom sizing page.

The products searched are displayed in the shop grid page. Every product is displayed with its picture, name, price and size availability. Filters are available for the products based on gender, price, material, brand, colour, name, type of clothing, occasion, or size. If the number of searched products exceed the size limit of a single page, pagination will be applied. The proposed input size button from the low-fidelity prototype was moved to the search page because users must input their custom measurements before searching for products.

A single product page displays its information such as pictures, name, description, price and sizing. Users can choose a specific size from regions such as US, UK, EU, and international. A size chart is provided for the user's specific body measurements. There is the option to add the product to the wishlist using the 'Add to Wishlist' button. A link to the original website of the product is provided. The option to go back to the search page is possible by clicking the 'Back' button.

6.0 System Design and User Interface

In the design of the system, the backend was initially built with Django first, with focus on the database for storing information of products. After that, upgrades were planned for the server, to change it into a Django REST API, so that the frontend can work individually without having to deal with backend structure, working with only a JSON file for easy data access. This output of JSON could also be formatted using code, after making changes in the views.py file.

Development began on the linking of the frontend and backend around the time of the upgrade to Django REST, and the MySQL database was changed to a PostGreSQL one. Data inserting scripts had to change packages and some of its syntax to insert into the new PostGreSQL database. Eventually everything was changed to flow with the new database. With this change, the backend has the full capability that Django provides in filtering and querying, allowing for powerful layers of filters to be done in just a few lines of code. The results of these data queries will then be serialized and structured into nested JSON objects by Django REST. All that's left is for the frontend to request for the data and the server will send it.

For the user interface, the low-fidelity prototype is a sketch-based prototype created to possess the minimal characteristics of the planned product in a manner that is minimalistic and quickly created to review broad concepts. The frontend team created this prototype to convey the initial ideas of the application, in a more practical form to obtain feedback from other members in order to be implemented and developed in the mid-fidelity prototype. The mid-fidelity prototype is slightly more refined, based on the initial feedback from the low-fidelity prototype, with restricted functionality but clickable areas which showcase the interaction and navigation options of the application that the user will experience. A practical representation of the prototype shows a clearer understanding of how the functionality should be modified to allow a streamlined and seamless user interface in the final product by identifying possible areas of complications in the user interface that could overwhelm, confuse and frustrate the user.

The frontend contains all the files for the page elements and their styling, along with the code for the functions on each page for handling clicks and searches. Along with this, scripts were added to calculate the best-fit sizes based on a scoring system for the measurements. Each body part was given a score, and the parts which were considered higher scoring were likely more important to the user - the chest would be considered a higher score for the upper body, while the waist and hip would be slightly less, with arm length being the lowest. The higher the score, the higher the priority of the body part. If a user's body measurement is within range of a size's measurement of the same body part, it would get the point, and this would be tested for all body parts, on all sizes. At the end of the testing, the script will return an array of sizes from best to worst. This is one of the major key features of the website and took a significant amount of time to design. However, this script was not part of the backend, which was originally planned, as user data such as measurements would not be saved on the database, therefore the script was written in the frontend, and storage of the data was done with methods available to the frontend only. The same script also had functions to convert each size from one region to another, with a similar method - however, this just used basic string matching rather than a scoring system for sizes.

6.1 User Interface

The home page improves from the low and mid-fidelity prototype with added functionalities and elements styling. Instead of having a search bar, users will be directed to a specific search page by clicking the large buttons for each gender. Top brands can be found in the header section, resulting in an organised view throughout the website. The custom size page can be visited to input a user's custom sizing – in this page, there is an option to switch to another tab where they can input their upper or lower body measurements once measurements are saved. These results can be used to search specific products according to their custom sizing. Contacting customer service is possible if there are any issues encountered as well. Icons such as account, wishlist and cart are implemented for logging into an account or tracking orders, checking wishlist items and products in the cart. The footer has links to the website's social media pages and all products for specific genders. The and footer section of the page is found at each page on the website. The language icon proposed from the mid-fidelity prototype was removed because modern web browsers contain options to translate the website's language to a specific language.

Users can search for the brand or type of clothes on the search page. The buttons below the search bar allow users to search specifically for tops or bottoms by enabling their custom sizing measurements. If users enable custom sizing without inputting their measurements, a popup with a link will show on the bottom right of the website alerting the user to input their measurements. After searching the users will get redirected to the shop pages. The proposed animated slideshow pictures and a pop-up of recently viewed products in the mid-fidelity prototype are removed to minimize the content and clutter in the page.

The shopping page displays only products searched. Each product has an image of the product, name, and price displayed. Sizing availability for each product proposed in the mid-fidelity prototype was moved to the single product page to keep the page minimalistic. Products can be filtered by brand, size, price range and by ascending or descending order based on name, brand name and price. If the custom sizing button

was enabled in the search page, only products that fit their custom sizing measurements are shown. Based on the mid-fidelity prototype, colour and material filters were proposed, but the backend could not scrape enough data to acquire this information.

Every idea proposed in the prototypes were implemented in the single product page, meeting the specific requirements for the page. Detailed information of a product, such as image(s), name, description, reviews, categories and price are displayed. There is the option to view similar products from the same brand by clicking the product categories below. A button is provided to users to add the product to their wishlist for future reference. Regional sizing is made available to choose from based on availability. Before deciding on which size to choose for the product, users can check their specific body measurements for sizes by clicking the size chart pop-up button. The product can be added to cart once users have entered the quantity and size of the product. If custom sizing measurements have been inputted previously, a label will appear above the details section, providing recommended sizes of the product for the user. At the right side of the page, a list of other brands related to the current product and user's search is shown. Furthermore, reviews can be written below for other users to check in the review section. In the mid-fidelity prototype, a link to the original website was proposed. However due to the inconveniences of moving back and forth between sites, the button was removed from the user interface design. The product description is unavailable due to insufficient information scraped from the backend server.

In the wishlist page, every product that has been added to the wishlist, along with its image, name, and price is shown. The product can be either removed, or added to the cart - however this would only be the first available size, not something chosen by the user. Clicking on the product's name or image will redirect users back to the product's page.

In the cart page, chosen items will be displayed prior to checkout for payment. Items are displayed with their image, size, price, etc. The number of items to be bought can be adjusted and the price will update accordingly. Users can click on the image to view the product. The item can be added to the wishlist if the users want to wait for sales. Users can also remove the item from the cart or add it to the wishlist. Coupon codes can be used for discounts and the total amount will be updated. Lastly, different methods of payment are displayed for user convenience.

A mini-cart that lists the items with the current total price, item quantity and clothes name can be accessed from the cart icon on the header anywhere on the website. This allows users to see current items in the cart at any given time.

To fulfil the non-functional requirement of an e-commerce website, login, sign up, cart checkout, order tracking, FAQ, Privacy and Policy, and Terms and Conditions pages were included without functionality. Rather than leaving the website feeling incomplete with only some functional pages, these pages were added to maintain the design and consistency of an e-commerce website.

6.2 Web Pages

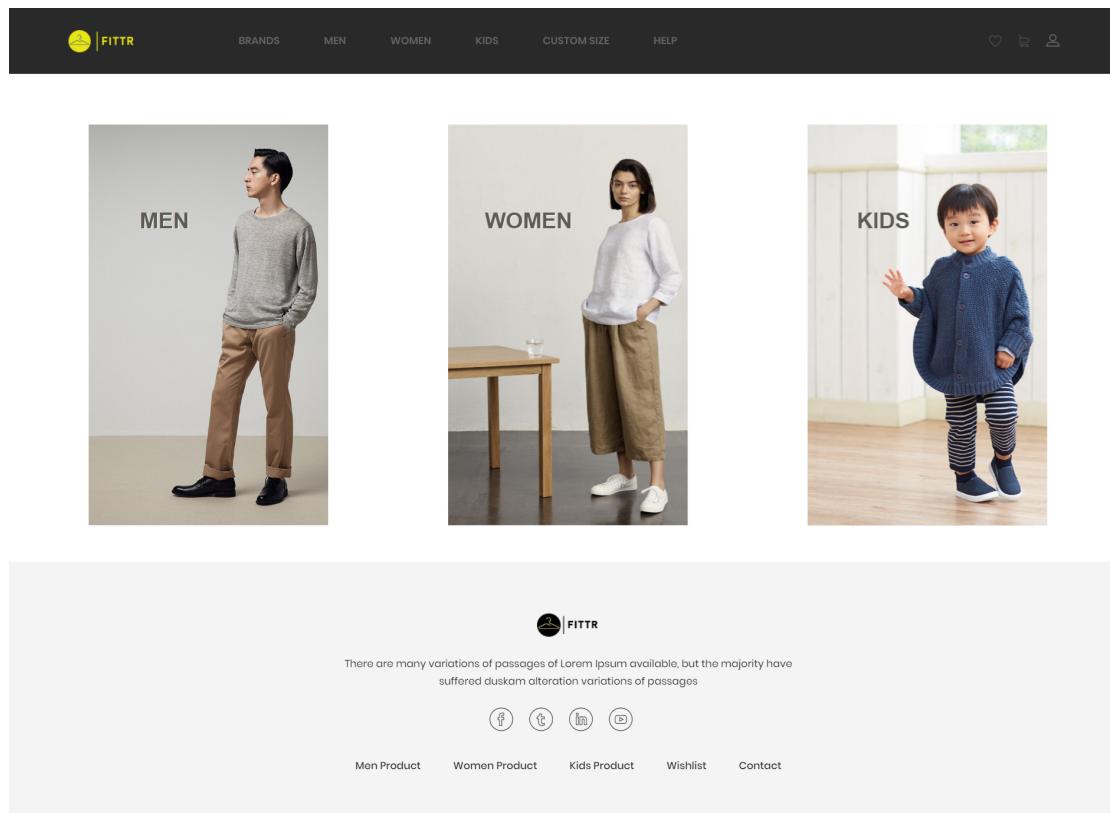


Figure 4.1: Home page

BRANDS	MEN	WOMEN	KIDS	CUSTOM SIZE	HELP
TOP BRANDS MEN		TOP BRANDS WOMEN		TOP BRANDS KIDS	
Tommy Hilfiger	Banana Republic	Abercrombie & Fitch			
The North Face	FOREVER 21	Poney			
Polo Ralph Lauren	H&M	Disney Baby			
Gucci	Mango	KIKO			
Cotton On	Zalora	Akarana Baby			

Figure 4.2: Top brands based on genders

BRANDS	MEN	WOMEN	KIDS	CUSTOM SIZE	HELP
		FORMAL	CASUAL	SPORTS	
Esprit		Champion		Adidas	
Pacolino		Converse		Nike	
Tommy Hilfiger		Gucci		Puma	
BOSS		Fendi		Under Armour	
Dockers		GAP		Kappa	

Figure 4.3: Brands for men based on occasion

BRANDS	MEN	WOMEN	KIDS	CUSTOM SIZE	HELP
		FORMAL	CASUAL	SPORTS	
Zalora		ESPRIT		Adidas	
Mango		London Rag		Nike	
AX Paris		Polo Ralph Lauren		Puma	
Guess		Zalora		Superdry	
GAP		Forever 21		Under Armour	

Figure 4.4: Brands for men based on occasion

WOMEN	KIDS	CUSTOM SIZE	HELP	
		BABY	CASUAL	SPORTS
Baby Poney		Abercrombie &		Adidas
Disney Baby		Fitch		Nike
GAP		Babybol		Puma
Mango Baby		GAP		Under Armour
Poney		GUESS		
		Little Nuuna		

Figure 4.5: Brands for kids based on age and occasion

Custom Size

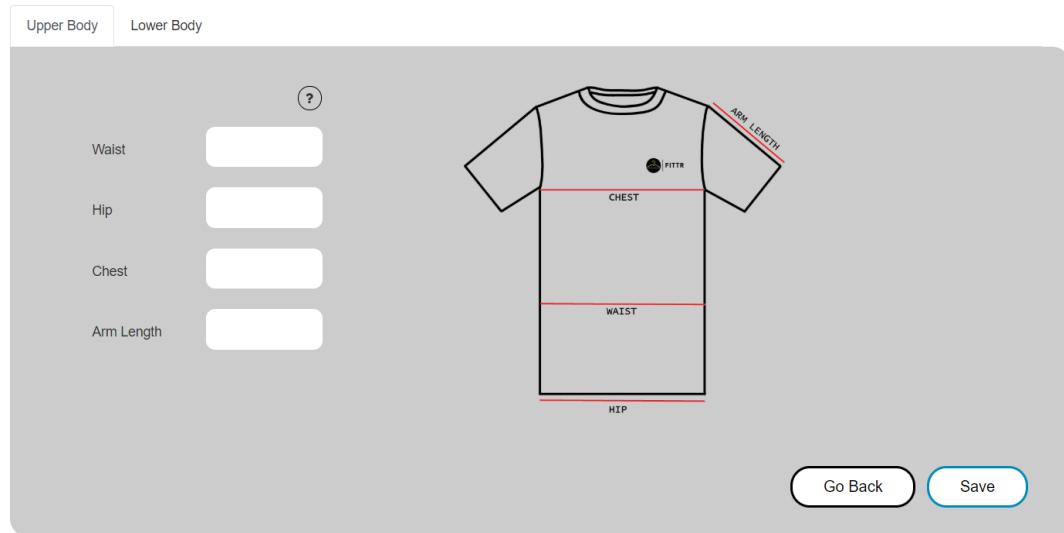


Figure 4.6: Upper body custom sizing

Custom Size



Figure 4.7: Lower body custom sizing

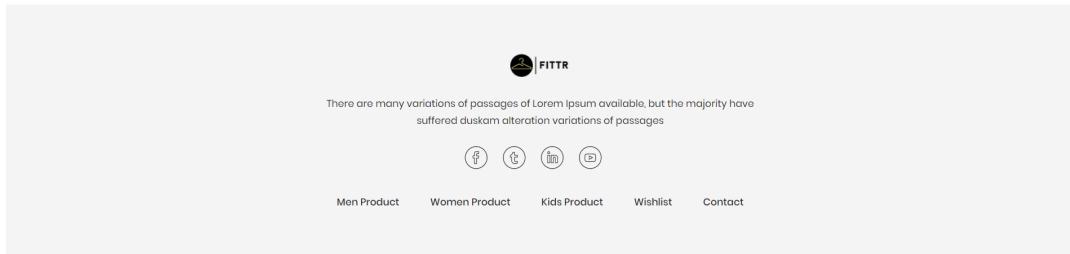
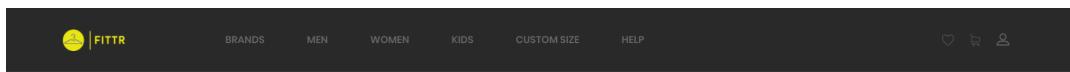


Figure 4.8: Login page

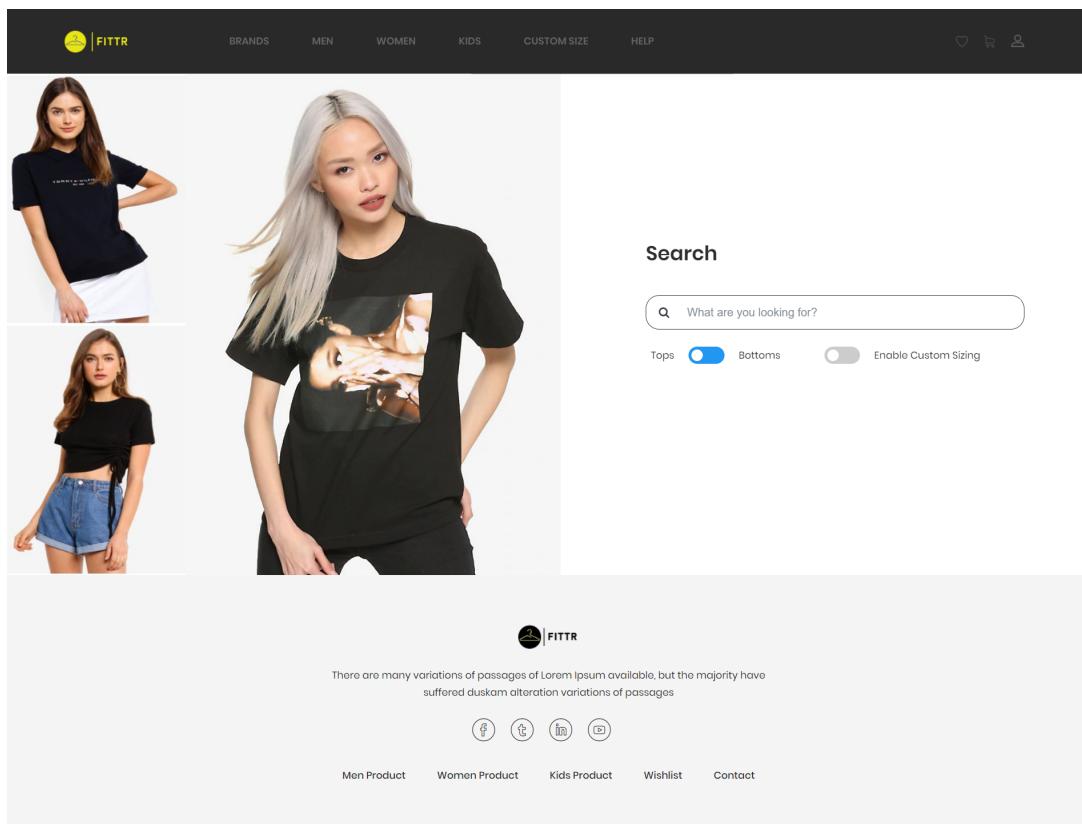
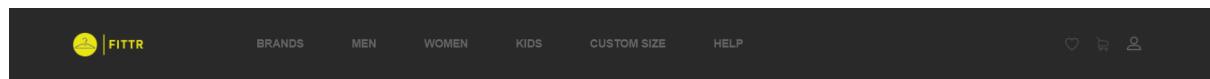


Figure 4.9: Search page



Sign Up

Email Address *

Password *

Already have an account? [Login](#)

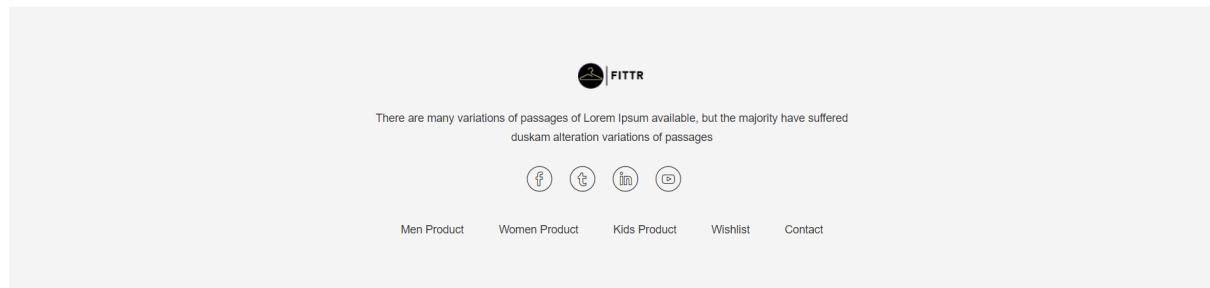


Figure 4.10: Signup Page

 FITTR

BRANDS MEN WOMEN KIDS CUSTOM SIZE HELP

Home / Search / Shop Grid

Shop Grid

Searching for something else?

Tops Bottoms Enable custom sizing

PRODUCT CATEGORIES

Brand ▾ (15)

Size ▾

FILTER BY PRICE

Price: RM39 - RM420

Showing 1-4 of 4 results Sort By ▾



High Waisted D-Ring Belted Wide Leg Trousers

RM 74.90



Soft Ribbed Flare Trousers

RM 58.80



Slinky Wide Leg Trousers

RM 79.90



Belted Cigarette Trousers

RM 67.90

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There are many variations of passages of Lorem Ipsum available, but the majority have suffered dustam alteration variations of passages

[!\[\]\(06de5ea54041bf9435c82798800f5a0f_img.jpg\)](#) [!\[\]\(34028cf61118ce786389734a4af30310_img.jpg\)](#) [!\[\]\(df89669c282a9f250a17814181b509ef_img.jpg\)](#) [!\[\]\(1e4c2ecac2d2f041ef33770452bae46a_img.jpg\)](#)

[Men Product](#) [Women Product](#) [Kids Product](#) [Wishlist](#) [Contact](#)

Figure 4.11: Shop Grid Page

Home / Search / Shop Grid / Women's Classics T7 Crewneck Sweatshirt

Product

Tops
 Bottoms
 Enable custom sizing

P
(2)



**Women's Classics T7 Crewneck
Sweatshirt**

★★★☆☆

RM 265.00

No product description available

Categories: Women, Puma

SELECT SIZE
[Size Chart](#)

Qty
International **▼**
S **▼**

Add to Cart

Recommended sizes (based on your measurements):
International - S, UK - 8, US - 4, EU - 36

DETAILS
REVIEWS

No product description available



There are many variations of passages of Lorem Ipsum available, but the majority have suffered duller variations of passages.

[Men Product](#)
[Women Product](#)
[Kids Product](#)
[Wishlist](#)
[Contact](#)

Figure 4.12: Single product page (with recommended sizes)

 FITTR

BRANDS MEN WOMEN KIDS CUSTOM SIZE HELP

Home / Search / Shop Grid / Belted Cigarette Trousers

Product

Searching for something else?

Tops Bottoms Enable custom sizing



Belted Cigarette Trousers
★★★★★
RM 67.90

No product description available

Categories: Women, Boohoo

 **SELECT SIZE** 

Qty UK Add to Cart

BRANDS WITH 'TROUSERS'	
B	(2)
D	(1)
E	(1)
H	(1)
L	(2)
M	(3)
P	(1)
S	(1)
T	(1)
W	(1)
Z	(1)

DETAILS REVIEWS

Customer Reviews

Gerald Kan

Quality ★★★★★

Price ★★★★★

Value ★★★★★

Summary Trousers smells like cigarettes

Review Highly recommended for tall women

You're reviewing:
Belted Cigarette Trousers

Quality ☆ ☆ ☆ ☆ ☆

Price ☆ ☆ ☆ ☆ ☆

Value ☆ ☆ ☆ ☆ ☆

Name *

Summary *

Review *

SUBMIT REVIEW

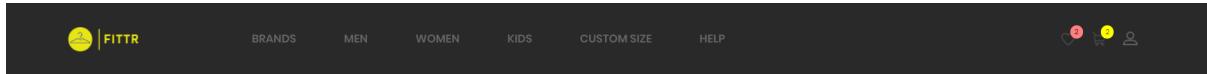


There are many variations of passages of Lorem Ipsum available, but the majority have suffered dustcorn alteration variations of passages



Men Product Women Product Kids Product Wishlist Contact

Figure 4.13: Single product page (without recommended sizes)



Wishlist

IMAGE	PRODUCT NAME	PRICE	
	Women's Classics T7 Crewneck Sweatshirt	RM 265.00	 Add to cart
	GUCCI LOGO WASHED T SHIRT-WHITE	RM 3570.00	 Add to cart

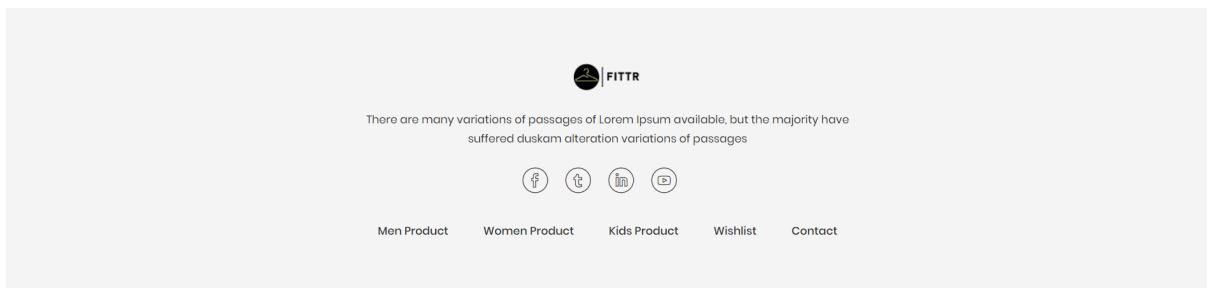


Figure 4.14: Wishlist page



Cart

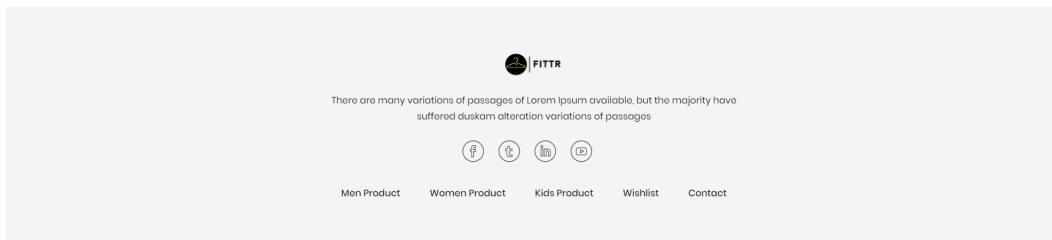


Figure 4.15: Cart page

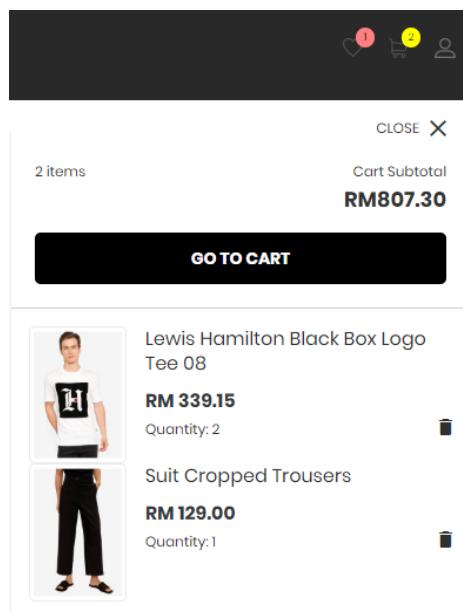
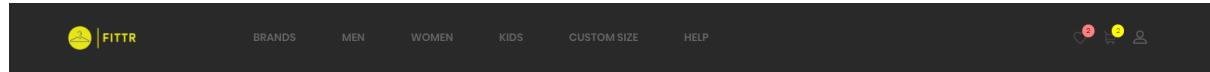


Figure 4.16: Mini cart pop-up



Checkout

Returning customer? [Click here to login](#)

Billing details

First Name *	Last Name *
<input type="text"/>	<input type="text"/>
Phone Number *	Email Address *
<input type="text"/>	<input type="text"/>
Address *	
Street Address	
Apartment, Suite, Unit	
District *	Postcode *
Select State	<input type="text"/>

YOUR ORDER

Product	Total
Women's Classics T7 Crewneck Sweatshirt x 2	RM 265.00
GUCCI LOGO WASHED T SHIRT-WHITE x 1	RM 3570.00
Cart Subtotal	RM 4100.00
Delivery	RM 10.00
Add a discount code	
<input type="text"/>	<input type="button" value="Add"/>
ORDER TOTAL	RM 4110.00

Delivery Method

Direct Bank Transfer

Make your payment directly into our bank account. Please use your Order ID as the payment reference. Your order won't be shipped until the funds have cleared in our account.

Cheque Payment

Cash on Delivery



There are many variations of passages of Lorem Ipsum available, but the majority have suffered duller variations of passages



[Men Product](#) [Women Product](#) [Kids Product](#) [Wishlist](#) [Contact](#)

Figure 4.17: Checkout Page

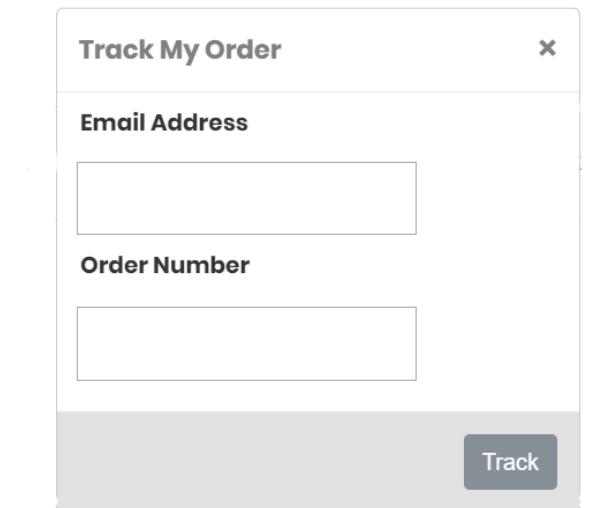


Figure 4.18: Track my order pop-up

The contact page features a dark header bar with the FITTR logo, navigation links for BRANDS, MEN, WOMEN, KIDS, CUSTOM SIZE, and HELP, and social media icons for Facebook, Twitter, and Instagram.

GET IN TOUCH

Nam liber tempor cum soluta nobis eleifend option congue nihil imperdiet doming id quod mazim placerat facer possim assum.

First Name* _____ Email* _____

Subject* _____

Description* _____

Order Number _____

OFFICE INFO.

Claritas est etiam processus dynamicus, qui sequitur mutationem consuetudium lectorum. Mirum est notare quam littera gothica, quam nunc putamus parum clararam, anteposuerit litterarum formas humanitatis per seacula quarta decima et quinta decima.

ADDRESS:
Kuala Lumpur, Malaysia

PHONE NUMBER:
018-2213226

EMAIL ADDRESS:
admin@custir.com

WEBSITE ADDRESS:
www.custir.com

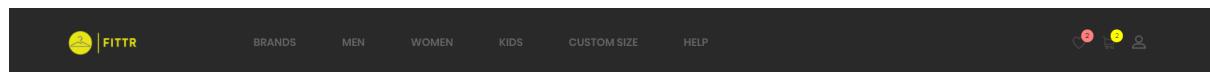
SEND EMAIL

FITTR

There are many variations of passages of Lorem Ipsum available, but the majority have suffered dusklam alteration variations of passages

[Men Product](#) [Women Product](#) [Kids Product](#) [Wishlist](#) [Contact](#)

Figure 4.19: Contact page



Frequently Asked Questions

Below are frequently asked questions, you may find the answer for yourself

Donec mattis finibus elit ut tristique. Nullam tempus nunc eget arcu vulputate, eu porttitor tellus commodo. Aliquam erat volutpat. Aliquam consectetur lorem eu viverra lobortis. Morbi gravida, nisi id fringilla ultricies, elit lorem eleifend lorem

Mauris congue euismod purus at semper. Morbi et vulputate massa?

Donec mattis finibus elit ut tristique. Nullam tempus nunc eget arcu vulputate, eu porttitor tellus commodo. Aliquam erat volutpat. Aliquam consectetur lorem eu viverra lobortis. Morbi gravida, nisi id fringilla ultricies, elit lorem eleifend lorem

Djanj sit amet, consectetur adipisicing elit, sed do eiusmod tem pororem ?.

Vestibulum a lorem placerat, porttitor urna vel?

Aenean elit orci, efficitur quis nisl at, accumsan?

Pellentesque habitant morbi tristique senectus et netus?

Aenean elit orci, efficitur quis nisl at?

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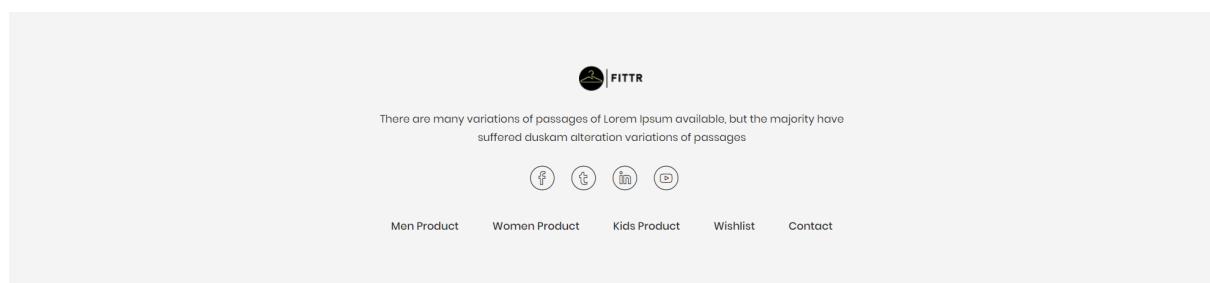


Figure 4.20: Frequently asked questions page



BRANDS MEN WOMEN CUSTOM SIZE HELP

Heart icon (with 2 notifications) | Shopping cart icon | User icon

Terms and Conditions

Morbi

Et

Vulputate

Massa?

Morbi Massa?

1. Morbi

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec id erat sagittis, faucibus metus molesuada, eleifend turpis. Mauris semper augue id nisl aliquet, a porta lectus mattis. Nulla at tortor augue. In eget enim diam. Donec gravida tortor sem, ac fermentum nibh rutrum sit amet. Nulla convallis mauris vitae congue consequat. Donec interdum nunc purus, vitae vulputate arcu fringilla quis. Vivamus iaculis euismod dui.

2. Et

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec id erat sagittis, faucibus metus molesuada, eleifend turpis. Mauris semper augue id nisl aliquet, a porta lectus mattis. Nulla at tortor augue. In eget enim diam. Donec gravida tortor sem, ac fermentum nibh rutrum sit amet. Nulla convallis mauris vitae congue consequat. Donec interdum nunc purus, vitae vulputate arcu fringilla quis. Vivamus iaculis euismod dui.

3. vulputate

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec id erat sagittis, faucibus metus molesuada, eleifend turpis. Mauris semper augue id nisl aliquet, a porta lectus mattis. Nulla at tortor augue. In eget enim diam. Donec gravida tortor sem, ac fermentum nibh rutrum sit amet. Nulla convallis mauris vitae congue consequat. Donec interdum nunc purus, vitae vulputate arcu fringilla quis. Vivamus iaculis euismod dui.

4. massa?

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec id erat sagittis, faucibus metus molesuada, eleifend turpis. Mauris semper augue id nisl aliquet, a porta lectus mattis. Nulla at tortor augue. In eget enim diam. Donec gravida tortor sem, ac fermentum nibh rutrum sit amet. Nulla convallis mauris vitae congue consequat. Donec interdum nunc purus, vitae vulputate arcu fringilla quis. Vivamus iaculis euismod dui.

5. Morbi massa?

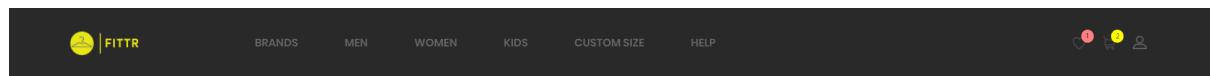
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec id erat sagittis, faucibus metus molesuada, eleifend turpis. Mauris semper augue id nisl aliquet, a porta lectus mattis. Nulla at tortor augue. In eget enim diam. Donec gravida tortor sem, ac fermentum nibh rutrum sit amet. Nulla convallis mauris vitae congue consequat. Donec interdum nunc purus, vitae vulputate arcu fringilla quis. Vivamus iaculis euismod dui.

There are many variations of passages of Lorem Ipsum available, but the majority have suffered duskan alteration variations of passages

Men Product Women Product Kids Product Wishlist Contact

Figure 4.21: Terms and conditions page



Privacy and Policy

Interpretation And Definitions

Last updated: February 27, 2020

Collecting And Using Your Personal

This Privacy Policy describes our policies and procedures on the collection, use and disclosure of your information when You use the Service and tells You about your privacy rights and how the law protects You. We use your Personal data to provide and improve the Service. By using the Service, You agree to the collection and use of information in accordance with this Privacy Policy.

Data

Use Of Your Personal Data

Retention Of Your Personal Data

Transfer Of Your Personal Data

Disclosure Of Your Personal Data

Security Of Your Personal Data

Children's Privacy

Links To Other Websites

Changes To This Privacy Policy

Contact Us

Interpretation and Definitions

Interpretation

The words of which the initial letter is capitalized have meanings defined under the following conditions.

The following definitions shall have the same meaning regardless of whether they appear in singular or in plural.

Definitions

For the purposes of this Privacy Policy:

You means the individual accessing or using the Service, or the company, or other legal entity on behalf of which such individual is accessing or using the Service, as applicable.

Company (referred to as either "the Company", "We", "Us" or "Our" in this Agreement) refers to FITTR.

Affiliate means an entity that controls, is controlled by or is under common control with a party, where "control" means ownership of 50% or more of the shares, equity interest or other securities entitled to vote for election of directors or other managing authority.

Account means a unique account created for You to access our Service or parts of our Service.

Website refers to FITTR, accessible from <https://www.fittr.com>

Service refers to the Website.

Country refers to: Malaysia

Service Provider means any natural or legal person who processes the data on behalf of the Company. It refers to third-party companies or individuals employed by the Company to facilitate the Service, to provide the Service on behalf of the Company, to perform services related to the Service or to assist the Company in analyzing how the Service is used.

Third-party Social Media Service refers to any website or any social network website through which a User can log in or create an account to use the Service.

Personal Data is any information that relates to an identified or identifiable individual.

Cookies are small files that are placed on your computer, mobile device or any other device by a website, containing the details of your browsing history on that website among its many uses.

Usage Data refers to data collected automatically, either generated by the use of the Service or from the Service infrastructure itself (for example, the duration of a page visit).

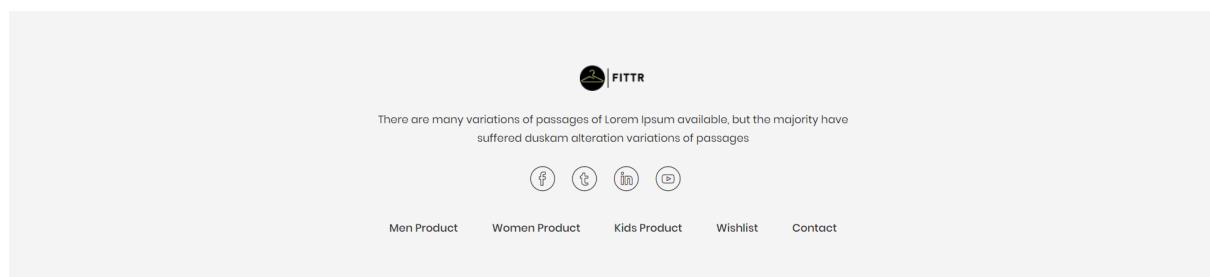


Figure 4.22: Privacy and policy page

6.3 Mobile View of Website

MEN

WOMEN

KIDS

Shop Grid

PRODUCT CATEGORIES

Brand ▾ (2)

Size ▾

FILTER BY PRICE

Price : RM95 - RM543

Filter **Reset Filter**

Home / Search / Shop Grid

Search for something else?

Tops Search for Tops / Bottoms

Disabled Search with Custom Sizing?

Showing 1-2 of 2 results

Sort By ▾

Silk Luxurious Women Long Robes L8005 (Beige)
RM 95.00

Luxe Fuji Jacket
RM 542.90

Product

Searching for something else?

Tops Search for Tops / Bottoms

Disabled Search with Custom Sizing?

Luxe Fuji Jacket
RM 542.90

No product description available

Categories: Women, Superdry

SELECT SIZE **Size Chart**

UK ▾ 14 ▾

Quantity 1 **Add to Cart**

DETAILS **REVIEWS**

No product description available

BRANDS WITH 'LUX'

7.0 Discussion on Implementation

7.1 Front End

At the beginning of the autumn semester, the frontend team leader decided to use VueJs framework to create the website due to its simplified framework to help in developing powerful single-page web applications. [Pisuwala, n.d] Thus, the team agreed on the idea and started learning implementations of the framework. The team leader tried to search for a suitable template to develop with the framework. However, the templates that were chosen based on minimalistic and responsive web design only offer Vanilla Javascript as their JavaScript framework instead of VueJs. Therefore, the team aborted the initial idea and decided to use Vanilla Javascript as the project's Javascript framework. The templates also provide Bootstrap as their frontend framework which makes it easier for the team to customize and configure the website's design and functionalities. A mockup was created using Balsamiq Mockup to provide a rough view on the website's flow and design. After presenting, amendments were made based on the feedback received. The team leader distributed specific tasks to team members on modifying the contents of the template based on the mockup through Trello. Tasks are given at the beginning of each week, and team members would be notified via email. A meeting is done occasionally to check each member's progression on development and help other team members if they have encountered problems. During the development phase, each member will encounter problems such as errors. Nevertheless, these errors can be solved with the help of StackOverflow, online documentation, or programming educational websites such as Tutorialspoint, W3Schools and Geeksforgeeks. Designing a minimalistic view is the most important aspect in a website as users do not feel overwhelmed when they enter a website. [Brinker, 2020] To ensure an enjoyable online shopping experience, where a page is not cluttered with information, making it difficult for the user, basic CSS files from the templates were modified. This enhances the styling of the website as well as improving the user's ability to navigate through it.

7.2 Back End

For the backend aspect, there were two main sections, which were web scraping and database management. A few sites chosen data to be scraped from were Zalora, UNIQLO, H&M, Zara and eShakti. Priority was given to sites which provide their data in JSON format as any non-JSON format data had to be converted before getting inserted into the database. JSON, otherwise known as JavaScript Object Notation, is a standard format for data-interchange on the web, and it is easy for both humans and machines to manipulate data with - it is preferred for this reason. [MDN, 2020] Starting from Zalora, all data was in JSON format, speeding up the process of data retrieval as only one file is processed, without any extra web scraping required. eShakti posed a slight challenge, with its data in JSON format, but the images of products can only be obtained from their respective HTML pages. This made web scraping for eShakti slower, requesting an additional HTML page each time to obtain images. In the case of H&M, data is in two JSON files and one HTML page. As expected, scraping for H&M is much slower as three requests are needed now for each product. A third file is needed to obtain the size availability so that only products in stock are inserted into the database.

For database management, MySQL was implemented initially. The web scraping scripts were also built for MySQL - however, halfway through the project, it was noticeable that MySQL does not have the features required for the functional requirements of filtering from the user's side. The switch was made to PostgreSQL, providing the missing features that were required. The syntax of PostgreSQL was simple, and very similar to MySQL, so there were no issues during the migration, which was done in a shorter time than expected. The changes to the PgAdmin UI however, did take some time to get familiar with. Three tables were created in the database, to store the products, sizing and the images. Separate tables had to be made for sizing and images as sizing and images usually come in multiples for a single product. They were linked back to a single product in a many-to-one relationship using foreign keys, keeping the database tidy. A database clearing script

is also created, to clear the database weekly, so that all newly obtained data can be inserted into the database again without duplicates.

To manage the database and handle requests between the frontend and the backend, Django and Django REST Framework (DRF) were used. The REST framework is an addition to Django, the base for most things in the backend. It links to the database and allows for an easy way to view database entries in a usable, simple UI without compromising on security. DRF repackages the data into a JSON formatted output from just a URL - this URL can be given parameters and arguments to specifically filter the database, all done in the views.py file inside the backend. The resulting data is lightweight, and can be accessed just like regular .json files. Additional features to order and search results were added, resulting in information that could be easily filtered rather than building long, complex queries in SQL syntax.

7.3 Linking of Front End and Back End

The architecture of the website is client-server, meaning a user who accesses the website makes a Hypertext Transfer Protocol (HTTP) request from the website. The website to the user is an interface, designed to get a result from the server, which in this case is hosted using one of the group member's computer that manages the database as well, storing data from web scraping. [Encyclopedia, n.d] A HTTP request is made to the server, then a response in JSON format is sent back from the server to the website, which transfers data over. The format then will be parsed, and the information on it will be displayed to the user, formatted into CSS-styled HTML using JavaScript. JSON is the default option for data serialization from DRF, and since the website uses JavaScript, there is no issue with the structure and the syntax of the data, which is time saving.

8.0 Key Implementation Decisions

8.1 Language and Frameworks

Python was chosen for backend due to its ease of use, and the simple high-level syntax allowed for ideas to be implemented directly when needed. The language is suitable for many things, including web server design, as well as web scraping and data handling, two very vital features to the project. [MDN, 2020] A Python framework known as Django was chosen to manage the database with a simple, secure interface, and Django REST Framework was utilised to output the data in a simple JSON file format, as setting up the backend was simplified with just a few commands. The reasons why Django was chosen was because it is simple to implement and is flexible to adapt to needs and functional requirements of the project. Other frameworks with similar structure, such as Flask, that could have been utilised, but prior knowledge and experience made Django a preferable choice. Django also scales up easily to process any amount of data, which is very crucial when web scraping is involved.

Some of the main Python libraries used during web scraping are BeautifulSoup, regex, JSON and JS2Py. BeautifulSoup parses HTML and XML documents to create a parse tree that can be used to extract information from it. Regex or regular expression is widely used during search queries and getting information by matching a pattern. If the data from a website is in JSON format, the JSON library is able to parse it, else the data is converted one-by-one into JSON. If a situation arises where JavaScript needs to be used for data extraction from some websites, JS2Py is used - this applies to sites which generate dynamic content using JavaScript or even AJAX.

Initially, the server used the SQLite3 default database included, but after some time, it was switched to MySQL for a way to view the database without going into Django's Admin panel - this did not mean that the Admin panel provided by Django was unsatisfactory, but more of a need for more specific features found in MySQL. It was switched again to PostGreSQL after, as better compatibility and

querying options with Django became more relevant to the design of the backend server.

On the frontend, Hypertext Markup Language (HTML) is the markup language used to develop the website. Cascading Style Sheets (CSS) is used to design the styling of elements in HTML. Along with that, Vanilla JavaScript (JS) is used in the project, due to its simplicity in building solid, yet powerful JS applications on web browsers. The behaviour of the website depends on the implementation of JavaScript. The group has also decided on using Bootstrap, a frontend framework that includes all the languages that are mentioned above for web and mobile web development in a way which does not compromise on quality or efficiency in development, especially when there is a requirement of certain common layouts of an e-commerce site such as the navigation bar, tables and so forth. This framework provides CSS and JavaScript templates for such interface elements in a web page. There is also the option to style and implement functions in JavaScript to develop a user-friendly website. JQuery is an additional library for JavaScript to handle events such as CSS animations. It is used occasionally in some pages of the website for event handling, such as click or drag events.

8.2 Operating System (OS)

The project's requirement calls for a web application, and on most OS's with browsers that support ECMAScript 5, the website should work. For the back-end server and web scraping, it can be done on any OS with Python and PostgreSQL support. Because of the nature of a web application, OS plays a less role for the website to run successfully. However, all the software development was done on Windows as all members only have Windows installed on their personal computers, with no experience on other OS's.

8.3 Server and Database

In order to scrape information from source sites, a computer was needed to host the Django server, periodic web scraping scripts, and a database to store all

scraped information. As most services for hosting databases required payment, one of the team members offered their computer to be used as a server for the project. The database and scraping scripts are all hosted and stored in this server.

8.4 Version Control System

GitHub is used as the project's version control system. It is one of the most popular version control service providers that helps manage code versions and facilitates collaboration between team members. As the project code is centrally stored in GitHub, it serves as a backup for all the files. Moreover, the integrated development environment (IDE) software (Visual Studio Code) used has built-in functionality to perform Git-related activities. Thus, using GitHub saves time that can be spent on improving other parts of the software.

8.5 Collaboration and Communication

The team uses Trello, which uses the Agile Kanban Method of managing and tracking tasks. In a quick glance, the members of a board can view the full board at any place and time from their device. Any new tasks and changes are updated to all members of the board, which there are three of - Backend, Frontend and Linking. These three boards have their own specific members and tasks related to them. It was effective in tracking and creating tasks as the project developed throughout the year.

The members communicated through Whatsapp, which had a group for everyone to discuss and informally notify each other on topics related to development, as well as Microsoft Teams during the final parts of the project for planning on the presentation and speaking. There was also the use of Discord, a platform similar to Teams that allowed for collaborative work during the linking of the frontend and backend. Along with that, the VS Code Live extension on Visual Studio Code allowed for editing of the code from multiple devices on a single computer simultaneously. With the combination of communication via Discord and live collaboration via VS Code Live, this meant that the group would still be able to do

work even with the circumstances of Covid-19 and MCO, without miscommunication or issues with merging code.

9.0 Summary of Achievements and Completeness

Since the academic year comes to a close, so does the development process in building the website that caters to consumers who would like to buy clothes specific for their size. One of the big achievements the team has is in building an e-commerce clothing website with a minimalistic design for the users to have an enjoyable browsing experience while they are on the website. The web pages consist of several pages from the home page to a checkout page, much like various e-commerce clothing webpages do. What was done differently however, is that the team prioritised the data presented to the users on every page, organised in a readable text displayed alongside visually stunning images that were used when designing the website to give users a great experience.

The aim of the website was to provide a one-stop shop for users, and the backend team managed to create a system which scrapes data weekly - such as the product name, price, currency, brand, sizing, product category, product URLs and image URLs to be used on the website. The data that has been scraped is stored in the database, and it can be accessed using the API created. The scraping is done on multiple websites such as Zalora, H&M, and eShakti, providing a wide range of brands for the user.

The team has also managed to allow filtering products on the website by price, brands, and international sizing i.e. S, M, L, XL. Each user can also search for the type of clothes that they intend to buy. Therefore, this allows the searched items to be easily found by the users, as these days people prefer a quick and convenient option hence, we did put that into consideration when building the website.

Other than that, users can also have the option to search for clothes based on their gender e.g. for men and women. The project includes a header bar where users can search for formal, casual and sports clothing, while in the kids sections, available categories are baby, casual and sports clothing.

Since the website also aims to provide a platform for users to buy clothes that fit them well, detailed measurements for both upper and lower body can be inserted and only products that fit the user will be displayed. The detailed measurements will also be converted by the system to generic sizes so that users can still find clothing in the sizing labels they know best. Along with that, a proper system to recommend the best-fit sizes to the user is also created, helping the user make informed decisions on the optimal size for the product they're looking at

Last but not least, an item can also be searched using generic sizing from multiple regions i.e. UK, EU, US, and International in each product's page. When users insert their size from one of these regions, it will be converted using external sizing charts obtained from multiple sites. The team has successfully managed to create a system that converts the sizes from one region to another.

Overall, most of the software requirements were met and completed in this project. The only unmet requirement was sales and deals for clothing products, which could not be shown due to it being not possible to scrape the sales and promotions from the websites with the current system. However, changes can be made and this could be a future development.

10.0 Reflective Comments

The group felt grateful that finally, all the items that needed to be done were able to be completed despite the ups and downs throughout the module. Workloads from other modules put the group members in a position where they needed a high level of time management in balancing all the modules and their respective workloads, as well as the global health crisis of Covid-19 at the end of the semester making it challenging to communicate and work at times. The solutions for a situation such as the pandemic were quite satisfactory however, as the group still managed to work together and progress at a decent rate, regardless of the issues with quarantine. In addition to that, the group did halt development at times when there were deadlines coming for other modules, as well as tests, which helped and generally was appreciated by all members, but did require some project-related deadlines to be pushed ahead. Better time management ahead of time could have been done to prevent this, so that more could have been done for the final product.

At the beginning of the autumn semester, assigning a leader went smoothly, which guided the group in a good direction throughout the whole project. The split into frontend and backend teams also made it easier for focus and specialisation on specific parts. However, the downside to this is that both teams did not have hands-on experience on implementing other team's parts.

Communication within the group usually was no issue, with group members responding within the next day or so usually. There were some issues with work being delayed due to personal reasons, but at the end of the day they get resolved and the group can carry on with the next task. If the group could change one thing, it would be a better way of maintaining communication between the frontend and backend, rather than only discussing implementation when the linking process began. Only during the process of linking both frontend and backend did the two teams find out about the specifications and requirements of each part. However, most of these issues were resolved within a short period of time, and eventually the team in charge of linking got everything done and caught up to the original time plan without issue or delay.

Furthermore, Dr Iman, our group's supervisor, gave critical feedback on the design, and along with the feedback received from the team members, the website got improved tremendously from the initial idea. The client also helped in guiding the team by giving a project flow, along sample sizes as a guide for custom sizing that is expected on the website when the users would like the searched item to be filtered based on their measurements. Overall the experience with the client was satisfactory, and they gave the group a strong base to work with for the project.

A good practice learnt during the development of the project was to utilize Agile software development methods - Kanban in particular. The group would meet up occasionally to discuss the progress so far, and also made use of the Trello boards created for the project to track and make sure everyone is doing something. This would definitely be used to a greater effect if the group were to redo the project, as during the start the method was not followed as extensively, but as the scale of the project grew, more and more the group grew reliant on it, as it was impossible to follow tasks by memorizing them. If the group had used the boards to the full capacity, the final product could have been even better, with more features, as well as faster completion.

The amount of skills, frameworks and languages the group had to learn to develop the full project was wide, and generally everyone took away some new skills and knowledge from this, which will hopefully benefit them in the future. Experimentation, and trial and error on different tools for the job did help the group understand many new things and learn from it as a result.

Finally, the group is grateful that the module convenor and other members understood the situation at hand with the pandemic and eased the workload, by having deadlines extended, allowing the group to have more time in producing excellent work.

11.0 Conclusion

Ultimately, the group managed to finish the work with everything initially planned in the set time and the final result was satisfactory to everyone. Time management wise, most of our estimates were correct and we completed tasks in the time set for each, and most of the work was properly following the schedule as the project went by. Certain parts took longer than expected, but it was balanced by other parts being done quicker. Management wise, splitting the group into two groups of three was a good decision in the end, as it meant more focus could be put in both parts, which helped a lot in the quality of each part, but did cause some minor issues when linking both up, however after some time to adapt and learn, the project linked up into a single final product. The best was done in everything related to the development, and while some parts could have been achieved in better and efficient ways, the current implementation of the work is still in a good state and it did do its job, so it is kept as is, but the group would probably revisit and improve on it in the future.

12.0 References

<www.booking.com> [Accessed 10 May 2020].

Brinker, M., 2020. *Research Shows Having A Bad Website Can Hurt Your Business - Mark Brinker*. [online] Markbrinker.com. Available at: <<https://www.markbrinker.com/a-bad-website-can-hurt-your-business>> [Accessed 10 May 2020].

Encyclopedia Britannica, n.d. *Client-Server Architecture | Computer Science*. [online] Available at: <<https://www.britannica.com/technology/client-server-architecture>> [Accessed 10 May 2020].

<www.fashionvalet.com> [Accessed 10 May 2020].

<www.fitanalytics.com> [Accessed 10 May 2020].

highya, n.d. *Trivago Reviews - Is It A Scam Or Legit?*. [online] Available at: <<https://www.highya.com/trivago-reviews>> [Accessed 10 May 2020].

<www.hm.com> [Accessed 10 May 2020].

MDN Web Docs, 2020. *Introduction To The Server Side*. [online] Available at: <https://developer.mozilla.org/en-US/docs/Learn/Server-side/First_steps/Introduction> [Accessed 10 May 2020].

Moffat, B., n.d. *E-Commerce Alert! How Non-Functional Requirements Impact User Experience*. [online] The Future of Customer Engagement and Experience. Available at: <<https://www.the-future-of-commerce.com/2018/05/02/how-non-functional-requirements-impact-ux/>> [Accessed 10 May 2020].

Nielsen, J., 2011. *How Long Do Users Stay On Web Pages?*. [online] Nielsen Norman Group. Available at: <<https://www.nngroup.com/articles/how-long-do-users-stay-on-web-pages/>> [Accessed 2 May 2020].

Pisuwala, U., n.d. *Why Vue.js Is A Growing Sensation Among International Development Community?*. [online] Peerbits. Available at: <<https://www.peerbits.com/blog/vuejs-is-growing-international-development-community.html>> [Accessed 10 May 2020].

Seemann, K., 2019. *The Ultimate Guide To Using Booking.Com [Will You Save Money?]*. [online] UpgradedPoints.com. Available at: <<https://upgradedpoints.com/booking-com>> [Accessed 10 May 2020].

<www.trivago.com.my> [Accessed 10 May 2020].

trivago., n.d. *Get Listed - Trivago - Company*. [online] Available at:
<https://company.trivago.com/get-listed/> [Accessed 10 May 2020].

Woodland, C., n.d. *14 Ecommerce Website Requirements For 2019*. [online] Hitachi Solutions. Available at:
<https://us.hitachi-solutions.com/blog/ecommerce-website-requirements/> [Accessed 10 May 2020].

<www.zalora.com.my> [Accessed 10 May 2020].

<www.zara.com/my> [Accessed 10 May 2020].

13.0 Appendices

Appendix A: Problems Encountered

Throughout the development process, some problems were encountered which have been resolved. Below are the problems encountered and solutions:

Problem	Solution
Lack of experience in coding with Python causing inefficiencies and bugs.	Extensive research is done to resolve the bugs encountered, as well as simplifying the code to increase the project's efficiency.
Lack of a hosted server to facilitate the storing and running of the database.	One of the group member's PC was used to host the server.
Lack of experience in implementing JavaScript functions into HTML files causing bugs and run errors.	Extensive research was conducted using forums, such as StackOverflow and websites like GeeksForGeeks in order to develop a solution to the bugs and errors encountered.
Movement Control Order caused by Covid-19 prevented the group from conducting face to face meetings making communication difficult.	Social media, such as WhatsApp and Discord, as well as collaboration software, such as VS Code Live were used to allow for more effective communication and maintain the efficiency of the group in the given circumstances.

Poor communication affecting the development of the website due to collaboration restrictions.	Live Share was installed in Visual Studio Code to allow for live collaboration without merging conflicts.
Inconsistency in sizing charts due to differing websites utilizing different measuring standards for Small, Medium, Large, etc. and error tolerances make it difficult to sort items according to size when compared to the simplicity of sorting items according to price.	The algorithm was redesigned to not look up shirt sizes based on nominal variables such as small, medium and large, the algorithm will retrieve results based on ratio and ordinal variables, which are the dimensions provided on the listings of each website either via sizing charts or item descriptions.

Appendix B: Time Plan

The table below shows each task duration, start date and end date.

No.	Title	Duration	Start Date	End Date
1	Research on e-commerce website	9 hours	14/10/2019	18/10/2019
2	Research on Django	5 hours	19/10/2019	19/10/2019
3	Research on Django REST Framework	1 hour	19/10/2019	19/10/2019
4	Learn how to use Git and Git Commands	1 hour	21/10/2019	21/10/2019
5	Learn how to use Balsamiq mock-up	1 hour	21/10/2019	21/10/2019
6	Developing a mock-up	6 hours	22/10/2019	29/10/2019
7	Research on Python packages for web scraping	2 hours	01/11/2019	01/11/2019
8	Django setup	3 hours	03/11/2019	03/11/2019
9	Firebase setup	2 hours	03/11/2019	03/11/2019
10	Backend testing	5 hours	04/11/2019	05/11/2019
11	Finding a template for the website	6 hours	04/11/2019	05/11/2019
12	Learn how to use Bootstrap, JavaScript and JQuery	11 hours	05/11/2019	12/11/2019
13	Django development	5 hours	11/11/2019	13/11/2019
14	Start graphical user interface development	10 hours	13/11/2019	26/11/2019
15	Writing interim report	18 hours	27/11/2019	02/12/2019
16	Review on interim report	3 hours	03/12/2019	03/12/2019
17	Continue to create basic e-commerce website pages that are not available in the template from semester 1	47 hours	03/02/2020	29/02/2020
18	Building web scraper for Zalora	37 hours	06/02/2020	26/02/2020
19	Upgrading backend from Django to Django REST	5 hours	12/02/2020	13/02/2020
20	Moving from SQLite to MySQL	2 hours	15/02/2020	15/02/2020
21	Research on searching in Django	3 hours	18/02/2020	25/02/2020

22	Implementation of search function	6 hours	28/02/2020	29/02/2020
23	Building web scraper for UNIQLO	25 hours	02/03/2020	17/03/2020
24	Begin JavaScript development on linking frontend and backend	62 hours	02/03/2020	04/04/2020
25	Changing to PostgreSQL for Django filtering	6 hours	05/03/2020	08/03/2020
26	Building web scraper for custom clothing site	59 hours	08/03/2020	05/04/2020
27	Building web scraper for eShakti	21 hours	24/03/2020	30/03/2020
28	Writing group report	40 hours	07/04/2020	04/05/2020
29	Styling the website	28 hours	09/04/2020	25/04/2020
30	Building web scraper for H&M	17 hours	24/04/2020	24/04/2020
31	Making final checks on website's functionalities	13 hours	26/04/2020	30/04/2020
32	Review on group report	5 hours	04/05/2020	05/05/2020

The graph below is a burndown chart showing the work progress and the planned for each work that is meant to be completed on each day.

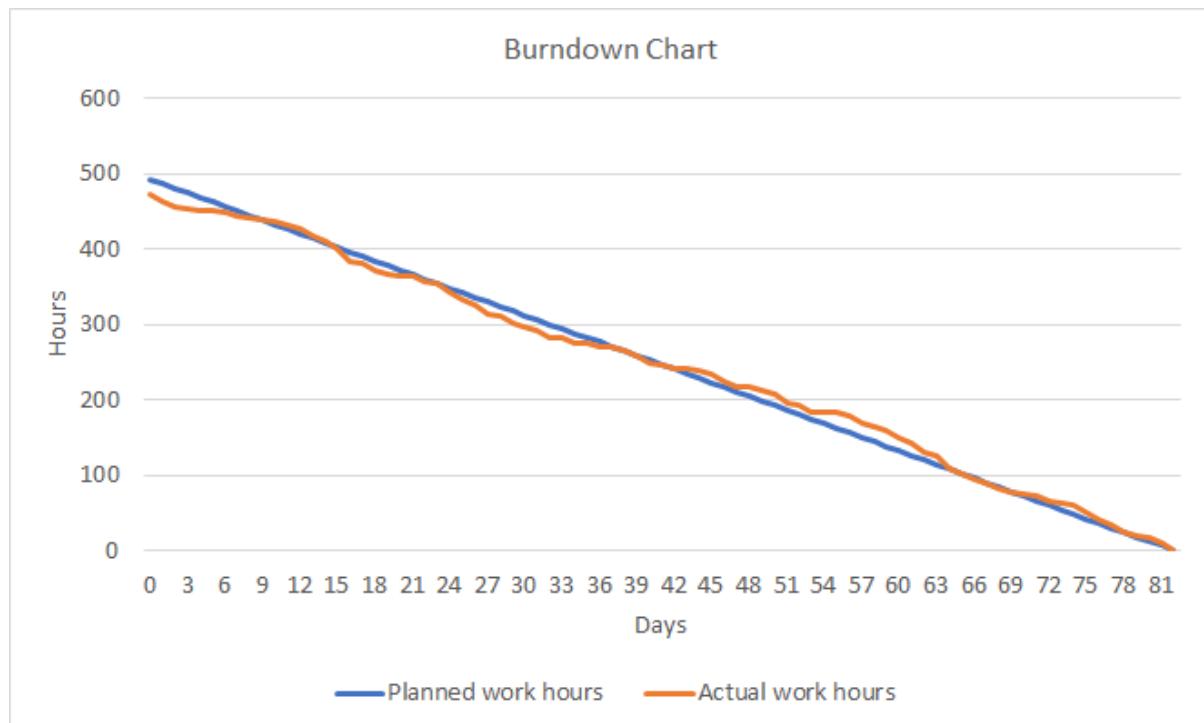


Figure 5: Burndown Chart

Appendix C: Testing Results

Requirement	Test	Expected Outcome	Result
Functional	The website gives full freedom to the users to filter sizing	Users can filter clothes based on generic sizes - S, M, L, XL, etc. from each page, as well as custom sizes based on their body measurements, or not at all. Filtering by brand and price is also available	PASSED
Functional	Search page is made for users to find any type of clothing, and further filtering for tops (shirts, etc.) and bottoms (pants, etc.) is available.	Users can find clothing using a search bar from a page, and the option to filter for tops or bottoms is available, should the user require it when searching using their custom measurements	PASSED
Functional	Users can insert body measurements in a page using a link	Link can be found in the header, which is on every page of the website. The	PASSED

		measurements are split into two groups, upper and lower body, so that the user can look for specific products	
Functional	The backend can filter through products in detail	The backend can filter the products based on their sizing, brand, whether the clothes are tops or bottoms, as well as gender	PASSED
Functional	Page should redirect from the shop to the product's page	The backend returns data for frontend to load a page with product details and information	PASSED
Functional	Storing data of wishlist, cart, and user measurements without using the database	The usage of localStorage and sessionStorage allows for data to be passed through pages and sessions without taking database space, and works on most modern browsers	PASSED
Functional	Unavailable products will be removed from the database	The web scraper will not be searching for each specific item as it will cause strain to the website if simultaneous requests are made. It is likely that if the item is not available in the database, it will not be available on the original sites too, as the data stored is guaranteed to be scraped within the past 7 days	PASSED
Functional	Searches filter and query the database before results are sent back.	The REST API created by the backend team should allow for URL parameters to filter the	PASSED

		database, so requests are easily made from a single URL	
Functional	Web scraper runs weekly for relevant products	Using Windows Task Scheduler, this was achieved, and the data is scraped every week, keeping data consistent	PASSED
Functional	Every piece of data should be in the database, requested from the frontend, provided by the backend	Most of the relevant data for the website is stored and sent to the frontend from the backend via HTTP requests	PASSED
Non - Functional	Page load times - should be quick and UI/UX should be pleasant	Testing with group members for feedback should give ideas on how to improve	PASSED
Functional	User can find sales	Sales should be shown on the search page for each group with relevant products.	FAILED - Data couldn't be scraped or was incomplete
Non - Functional	Adding new features without affecting other parts of the website	Final products shouldn't have bugs that affect user experience	PASSED
Functional	Sizes should convert from region to region (UK to US, EU to International), without issue	Sizes should properly convert on every page	FAILED - Some conversions resulted in duplicates due to how matching the size matching code was written
Functional	Users can login to the site	When a user types in their username and password, they will be logged into the site	FAILED - Login functionality was not implemented due to time constraints
Functional	Users can checkout their products from the cart and checkout page	Users are able to use their credit cards or other financial accounts to pay for the items added to cart	FAILED - There was no implementation of Fintech as it was a large aspect that was not something

			that the group wanted to focus on
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Appendix D: Meetings Overview and Minutes

1.	Date: 18 th October 2019	Type: Formal	Attendees: Group members (Hariz, Gerald, Brandon, Hanis and Nooh), Client and Supervisor
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Objective:

To get an idea from the client on what is expected from group members in the project.

Discussion:

- The project will be focusing on web scraping on the latest data of clothes and front end.
- Price, size and colour can be the key variables to compare.
- The requirements will be given by 21st October.
- The website will be about searching for clothes from different websites.
- Group members are given full freedom on creativity of the website and are not tied to any specific websites to build off as long as the end goal is achieved which is a functioning website on scraping data from various e-commerce websites and group members are given the freedom on languages used and framework.
- According to Dr Iman, she expects a web app and mobile app.
- Group members are expected to present a mockup in 3 weeks to present to both client and supervisor.
- Group members need to create documentation for API.
- Backend won't be provided so students are expected to produce it.
- The website should include some of the necessary features such as manual body measurements, themes and price.
- Group members need to get a localhost server from university.
- For peer assessment, evidence on communication between supervisor, client and group members can be WhatsApp group chat since it is unnecessary to meet frequently.

2.	Date: 21 st October 2019	Type: Informal	Attendees: Group members (Hariz, Gerald, Brandon, Hanis and Nooh)
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Objective:

Tutorial on git and Balsamiq Mockups 3.

Discussion:

- Group members were taught by the group leaders on how to use git and balsamiq mockups 3.
- Back end group is expected to learn web scraping.
- Front end group is expected to do mockups in 3 weeks to present to the client and supervisor.

3.	Date: 31 st October 2019	Type: Informal	Attendees: Group members (Hariz, Gerald, Brandon, Hanis and Nooh)
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Objective:

Update on front end and back end team progress.

Discussion:

Front – end team:

- Expected to learn VueJS.
- Expected to finish mockups by 4th of November.
- Will be meeting with the Client on 8th of November.
- Discussed on home web page and how to sort the items at the listed items page
- Discussed on the key attributes of the website that can attract more buyers e.g sale and latest collection.
- The website will be for both tops and bottoms.

Back – end team:

- Assignment of jobs on research – Brandon will be researching databases in Django REST, while Gerald will also be doing research on Django REST and Web Scraping.
- No jobs assigned to Raadi as he was not present without prior notice.
- Hariz will also research web scraping.
- Nooh will also research databases.

4.	Date: 7 th November 2019	Type: Formal	Attendees: Group members (Hariz, Gerald, Brandon and Hanis), Client and Supervisor
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Objective:

Getting feedback from both client and supervisor on the mockups.

Discussion:

- The website will scrap the data from 5 Malaysian e-commerce websites
- The website can be able to detect the location of the user.
- For sign in, the user can either sign in from third party e.g. Gmail or Facebook or a user can sign in as a Custlr guest which will give some benefits e.g. it will save the user body measurement for customize outfit purposes, special discounts etc.
- International sizes will be made available on the website.
- For security reasons, input size will only be made available for users who sign in as Custlr guests.
- On the listed items page, the items will be sorted by considering the latest arrival, sale, least expensive to most expensive. However, users can still customize the page on how the user wanted it to be sorted because there will be a list of options of categories to be sorted on the left and on top of the page.
- 25 items per listed page however users can still click more or go to the next page to see more items.
- Put a delivery page on the website.
- Use a drop-down button so it is less hassle for the user.
- The team is allowed to take any random size chart or use web scraping to get the most general size chart.
- Freedom on the color and font of the website as long as it's professional.

- Take user experience as consideration when creating the website and consider little details as the first impression matters.
- Clients will send the logo to the team or the team can make their own logo and create their own name for the website.
- Ask the client for a trousers dataset.
- For the back end part, the back-end team is still doing their research on database and web scraping.
- Recommendation from Dr Iman:
 - 1) The theme of the website and the currency can be changed based on the location of the user.
 - 2) Recommendation for back-up e-commerce websites can be made available, in case the item is out of stock where users can still get the same exact item or almost similar to the item.

5.	Date: 14 th November 2019	Type: Informal	Attendees: Group members (Hariz, Gerald, Brandon and Hanis)
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Objective:

Choosing best templates for the website and dividing tasks for the interim report.

Discussion:

- Choose the best two templates for the website and discuss some details of the website i.e the flow and etc.
- The templates chosen will be shown to the client soon.
- Interim report should be done by 1st December.
- Tasks distributed for interim report are as below:
 1. Abstract (Nooh)
 2. Introduction (Gerald)
 3. Literature Review (Gerald)
 4. Project Description (Radi)
 5. Group Organization Methodology (Brandon)
 6. Requirement Specification (Brandon)
 7. Prototypes and User Interface Design (Hariz)

- | |
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| <ol style="list-style-type: none"> 8. Implementation Description and Problems encountered (Hanis) 9. Software Testing (Hanis) 10. Discussion (Hariz) 11. Time Plan (Hariz) 12. Conclusion (Hanis) <ul style="list-style-type: none"> - Backend: <ul style="list-style-type: none"> ● Backend has now begun, but nothing big has been done yet. ● More research to be done in Firebase implementation for Django. ● Generally, moving forward we will be researching and developing at the same time. |
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6.	Date: 20 th November 2019	Type: Informal	Attendees: Group members (Hariz, Gerald, Brandon, Nooh, Raadi and Hanis)
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Objective:

Assigning tasks for front end and back end teams.

Discussion:

- Gerald and Hariz explained to Hanis on back end functionality for the interim report.
- Front end:
 - Hanis will be doing the toggleable sidebar to be sliding from the right.
 - Nooh will change the website background colour, customize shop grid page and design the logo.
- Back end:
 - Raadi is in charge of Web Scraping Research and Implementation now.
 - Brandon will continue research on Databases.
 - Firebase implementation is now in progress, done by Gerald.

7.	Date: 27 th November 2019	Type: Informal	Attendees: Front end group members (Hariz, Nooh and Hanis)
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Objective:

Halting the frontend team tasks and focus on completing the interim report.

Discussion:

- Hariz will postpone the toggleable sidebar task due to some html issues.
- Every member will allocate this week to focus on the interim report and test.
- New tasks for the front end team will be assigned after 4th December.

8.	Date: 2 nd December 2019	Type: Informal	Attendees: Group members (Hariz, Nooh, Gerald, Brandon and Hanis)
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Objective:

Update on the interim report and discussion on problems encountered during the project.

Discussion:

- Reminded the team to think about the title for the report and put their IDs.

Front end:

- Discussion with Nooh for next few weeks will be via video call since he will be leaving the country this week.
- Toggleable bar task will be postponed until the solutions are found.
- Abort the original plan which is to use Vue JS. So, currently Vanilla JavaScript is used as default JavaScript.

Back end:

- Django REST development starting soon.
- Still on the fence about usage of NoSQL vs SQL, as it might be an issue for queries.
 - Firebase might be switched to XAMPP/WAMP to reflect this, but Django development shouldn't be an issue.

- | |
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| <ul style="list-style-type: none"> o Database development won't be halted too much as well, other than setting up a new SQL database, everything should still progress on schedule. |
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9.	Date: 6 th February 2020	Type: Informal	Attendees: Group members (Hariz, Gerald, Brandon and Hanis)
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Objective:

Update on everyone's part and time plan for the semester.

Discussion:

- Schedule a meeting with Dr Iman soon to give the update.
- References should be in order based on the report instead of alphabetical order.
- Gerald will remind the client on the dummy data for pants.

Front end:

- Hariz will assign a new task by this week and it will be due next week Thursday.
- Merging hanis branch with staging branch.
- Solved single product page issue.

Back end:

- SQL Database set up, everything is moving smoothly now
- Working on logic for web-scraping, starting off as a separate script that will be worked into the Django project in the future
- No longer using Firebase

10.	Date: 17 th February 2020	Type: Formal	Attendees: Dr Iman and group members (Hariz, Gerald, Brandon and Hanis).
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Objective:

To update Dr Iman on the progress of the project and asking for interim report's feedback.

Discussion:

Software:

- It is recommended for the website to have the functionality which the user can add to the cart the interested items, instead of just viewing the items and going to another website.
- Another meeting for reviewing the complete website will be in the middle of March.
- It needs to be different from the market and have a solid reason on why it is being implemented.
- Difficulty and completeness of the work will be considered in order to gain high marks.

Interim Report:

- To produce a good report, the team needs to understand the problems encountered in the project and tell in the report the approach used to solve the problems and when the reader reads the report make sure the reader doesn't come out with a "so what?" question which means the report needs to be crystal clear. The report also should tell the diff
- It is recommended for the team to read a few samples of technical reports in order to produce a good report since the previous report looks more like a user manual.
- Reason for the mark is low for the interim report is because of the result of initial implementation.
- Referencing style should be in order according to the report or alphabetical considering the author and year.

Individual Report:

- It needs to be about the experience and reflection throughout the entire project.

11.	Date: 24 th February 2020	Type: Informal	Attendees: Front-end team (Hariz, Nooh and Hanis)
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Objective:

To discuss the coming expected tasks by the front-end team e.g. functionalities on every page of the website and important pages that should be implemented on the website e.g. About Us and Contact pages.

Discussion:

- Resolved some issues faced by the team.
- The Kids and Junior section is currently on halt and will confirm with the client whether the website needs it.
- The front-end team will get the JSON files by next week.
- Need to decide on the background colour of the website.
- Coming tasks for the team on the website pages:
 - Terms and Conditions
 - Login register
 - Wishlist
 - Checkout
 - Attachment and Track Order
 - Cookies receipt
 - Privacy
 - FAQs
 - Promotion
 - Latest items
 - Transaction payment and Billing
 - Contact us
 - Shop by product brands, new arrivals and etc
 - Categories e.g. dresses, sweatpants and etc

12.	Date: 6 th March 2020	Type: Informal	Attendees: Group members (Hariz, Gerald, Brandon, Nooh, Raadi and Hanis)
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Objective:

Update on next tasks to be completed by the team.

Discussion:

- Hanis, Hariz and Gerald will be having a meeting next week to discuss the report.
- Writing report will start next week.
- The team might want to do a poster for the presentation.
- Nooh, Hariz and Gerald will connect the backend and frontend soon.
- Brandon will do scrapping next week and once he is done, he will join Hanis on frontend tasks.
- Gerald will be partnering with Hariz on frontend tasks while partially doing the backend tasks in case Brandon needs any help.
- Radi is still in progress in his scraping stuff.

13.	Date: 10 th March 2020	Type: Informal	Attendees: Hariz, Gerald and Hanis
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Objective:

Update on the software tasks and distribute the tasks for the final group report.

Discussion:

- Hariz and Gerald are currently connecting the front end and back end and it will be done by this week.
- The website needs to cover for null cases.
- The front end team will be given tasks by next Tuesday.
- Hanis will create a google docs and give the structure of the report.
- The team will need to start brainstorming some ideas by this week on the report so it will be easier to write soon by expanding the points.
- The team is expected to expand the points from the interim report, remove the unnecessary items from the previous report and read the sample report uploaded by Dr Tomas as a reference.
- Gerald will be the editor.
- Our own due date will be on 17th April 2020 then the team will ask Dr Iman to review the report and the report will be submitted by 28th April 2020.
- The report needs to be 7000–8000 words (around 20–25 pages; excluding any appendices)

- Referencing style should be in order according to the report or alphabetical considering the author and year.
- Put a user manual and document of the software functionality in the appendix.
- Code can be included in the appendix as well.
- Nooh will design the template for the poster and the team will write the points after the design of the template is done.
- Distributed tasks for final report:
 1. Abstract. (Brandon and Hanis)
 2. Expanded project description. (Hanis)
 3. Background Information, literature review and research. (Hanis)
 4. Surveys done and market research. (Nooh) ***front-end team will put the market research done for front end design*
 5. Requirements Specification. (Hanis)
 6. System Design and User Interface of the system. (Nooh)
 7. Discussion on Implementation. (Hanis, Brandon and Gerald)
 8. Key Implementation Decisions. (Brandon)
 9. Testing / evaluation and Results. (Nooh)
 10. Problem encountered and Discussion. (Nooh)
 11. Time plan. (Brandon and Raadi)
 12. Summary of Achievements and completeness based on specifications. (Hanis and Raadi)
 13. Reflective Comments on issues of group work. (Hanis)
 14. Conclusion. (Gerald)
 15. References. (Everyone)