PUSL3190 Computing Individual Project

Project Proposal

Material-related Size Recommendations

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Problem statement

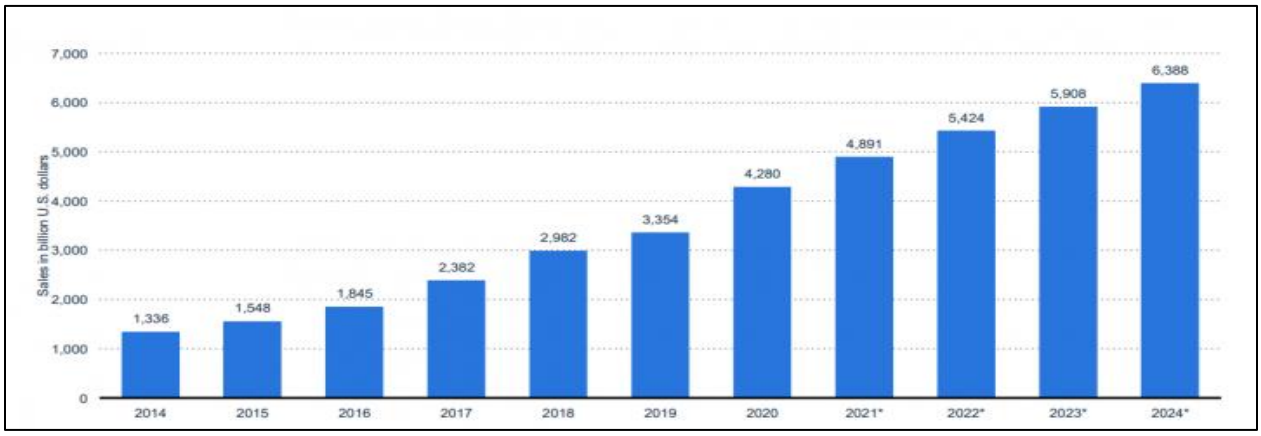


Figure 1 *(Administration, 2021)*

After the covid19 pandemic in 2019, the worldwide online shopping sales has rapidly increased as shown in the above figure 1. Furthermore, 8 percent of increment in online shopping sales can be seen within the next couple of years in comparison to past few years, for all sectors including fashion clothing (Administration, 2021).

However, compared to the huge online clothing purchasing rate, the return rates of the clothing items also claimed to be high.

According to a survey conducted by Coresight Research, within US apparel brands and retailers, discovered that the average return rate of the online apparel sales in US is about 24.4% (Coresight & Zheng, 2023). The reasons for high return rates in online clothing are people having different body shapes and compared to the user body measurements the clothing brand's size chart measurements with clothing item specifications being different. Besides the material of the clothing item should also be considered when considering the sizes.

In a study that collected data from the in-person interviews were asked about the online apparel shopping and its feedback. Both 'product quality' and 'return and exchanges' topics were mentioned 18 times each. Which mentioned more often than the other topics (Yin & Xu, 2021).

According to Statista, comparing to other retail product categories such as shoes, bags and accessories, the highest returned rate which is 26% is for the clothing items among all the categories. (Dopson, 2023).

All these researches show that customers are not happy with the purchases made through online mostly in clothing apparel category. For this problem, developing a system which can recommend the suitable clothing size for the user would be the best solution.

According to an analyze, found that once people are satisfied with the (online) shopping experience, the customer would be loyal to the brand in a behavioral way or an attitudinal way (Al-dweeri, et al., 2017). Using this system, can improve the customer satisfaction on online clothing experience.

Data from several surveys found that men have more trust in online shopping (purchases) than women who reported have lesser trust (Kumar & Singh, 2014). Therefore, this system would be mainly focused on women and in age range of 20-55.

Chapter 02

Project description

Project Objectives

- Recommend the best fitting clothing size for the user according to the body measurement, and the material attributes.
    - According to the Coresight Research Analysis based on the survey, more than half of the respondents which is about 53% selected size or fit as the reason for the online apparel returns. Most returns included shirts and blouses (Coresight & Zheng, 2023).
    - Both mobile application and a web application are used in this system. Mobile application is for the user to enter the one user-specific body measurement which is the chest size. Then that data would be sent to the related database.
    - The brand's size charts with its measurements, such as small (S) , medium (M) , large (L) , extra-large (XL), etc.. are stored in another database as in the chart shows below. Thus, the material attributes for each clothing items are also stored in the same database.

Size	Small (S)	Medium (M)	Large (L)	Extra-Large (XL)
Shoulder width (in)	xxx	xxx	xxx	xxx
chest size (in)	xxx	xxx	xxx	xxx
Waist size (in)	xxx	xxx	xxx	xxx
hem size/ Hip size (in)	xxx	xxx	xxx	xxx
sleeve circumference/ Bicep (in)	xxx	xxx	xxx	xxx

    - A mathematical model would compare both the user specific measurement (chest size) and the clothing material with the clothing brand's size chart, then find the best fitting clothing size (S,M,L,XL, etc) for the user.

- The web application is used to collect data from users about the past purchases made from each brand (feedback). From these data, can improve the reliability of the mathematical model and the system.

- Ability to select a clothing material first and based on that searches the available items.
  - A feature for the customer to first select a material such as cotton, linen, silk, etc. Then the user could select/ search for a suitable clothing item from the preferred material.
  - This value-added feature benefits the users to find the exact same material that searching for. When the ordered or selected clothing item is delivered, can find whether it has the exact same material attributes. This minimizes low quality and wrong order delivering. Thus, increases brand loyalty.

- Able to improve online shopping experience.
  - With the high apparel return rates mostly in blouses and shirts as mentioned in the page number 3, this system assists the users to find the best fitting clothing item while reducing the return rates.

- Able to improve the in-person shopping /physical shopping experience.
  - Shopping malls which have different clothing brands, this system can be introduced as a new feature/ development to their already existing mobile or web application(s), which enhances the user experience.

Project keywords

- Mathematical Model
- Android Studio
- Java
- MongoDB
- Nodejs
- Dress fitting
- Online shopping
- Size recommendations

Chapter 03

Research Gap

Using ‘FashionFit’ system, user can virtually try on any unbranded clothing item from any retailers using AI. The 3D pose maps the user’s body and Neural body fit model creates 3D models of the body according to the body shapes. Then able to virtually try on the clothing using GANs framework in machine learning (Hashmi, et al., 2020). In that system it uses 3D body pose to map the user’s body based on an image. Even though the accuracy of mapping can be lesser, the user can get a better virtual experience with this technology for any retail clothing items. The main difference of these projects is that ‘FashionFit’ system is mainly focused on virtualization and in this project, it is more rely on the data of buying history of the users and material-related size questionnaire survey data to mathematically see the accuracy of the fit on.

A system where gathers the data about user’s previous purchases, and with the specific clothing item’s details it predicts the suitable size of for user using the GBM classifier (Abdulla, et al., 2019). While in this ‘material-related size recommendations’ system a mathematical model would be trained to perform this task.

Research about ‘Avatar manager system’, developed a system where the user can try on the clothing item he/she likes on an avatar when do online shopping. Men and women can select a suitable body type which matched for each user from the given options. Then after should select the preferred body size such as small or large or extra-large, etc. In the end of this process user can adjust the avatar’s body measurements compared to the user’s body measurements. Then it would display how the selected clothing item would fit on according to the user’s body measurements (Polke & Kumari, 2018). In that research, it has fully visualized how the clothing item would fit. But in this project the approach is a bit different. Analyzing a collection of data, system would be able to tell the size of clothing that is recommended for the user and without fully need of the visualization. And the reliability of this can be further improved with the customer feedback.

THE FIT (Korea) implemented an AI-based system in online shopping malls, that recommends the suitable shoe size for the customer. This application collects the data about customer's order history and compares that data with the customer's actual foot size and recommends a shoe size from currently available shoe products (Yuan, et al., 2021). In both the systems, a similarity feature can be seen. Thus, in this 'material-related size recommendations' system, to get accurate size recommendations both survey data and customer/ user feedback data are needed. And a mathematical model is used rather than using any Al-based technology.

Chapter 04

Requirements Analysis

Hardware Requirements

- Smart phones and computers with access to internet.

Functional Requirements

- Shows the well-fitting size (as Small/Medium/Large, etc.) from the selected clothing item.
- Searches the clothing items according to preferred materials.
- Shows the available clothing items of clothing brands and its material.
- Able to give user feedback about the past purchases.
- Asks authentication before login to the system.

Non-functional Requirements

- Reliable system for the users (can make accurate predictions).
- Better user experience and user-friendly applications.
- Data is protected and secured in both clothing brand and user ends.

Chapter 05

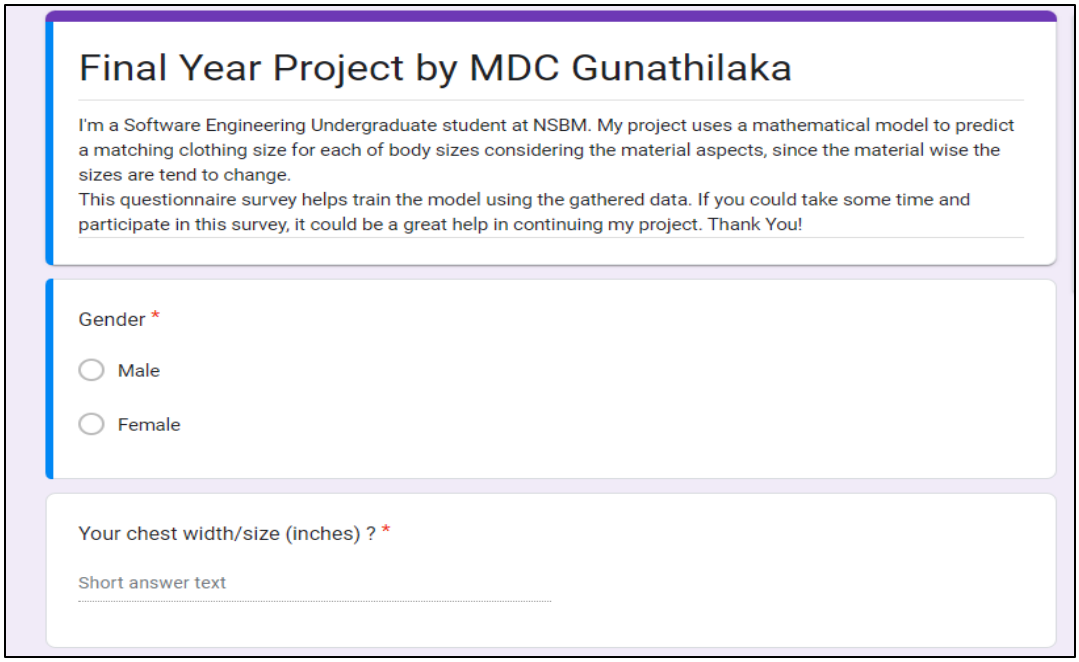
Finance

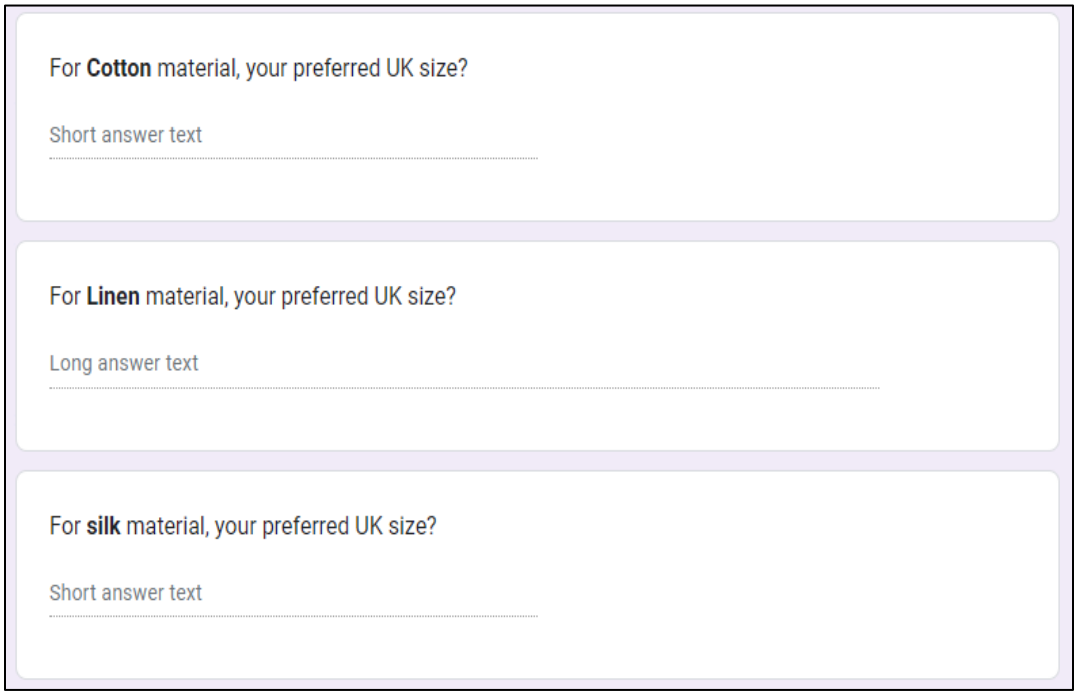
This project does not require any hardware equipment. In addition to that, requirement of paid software tools/License, APIs or high-end GPUs are also not required for this project as for now.

Chapter 06

External organizations

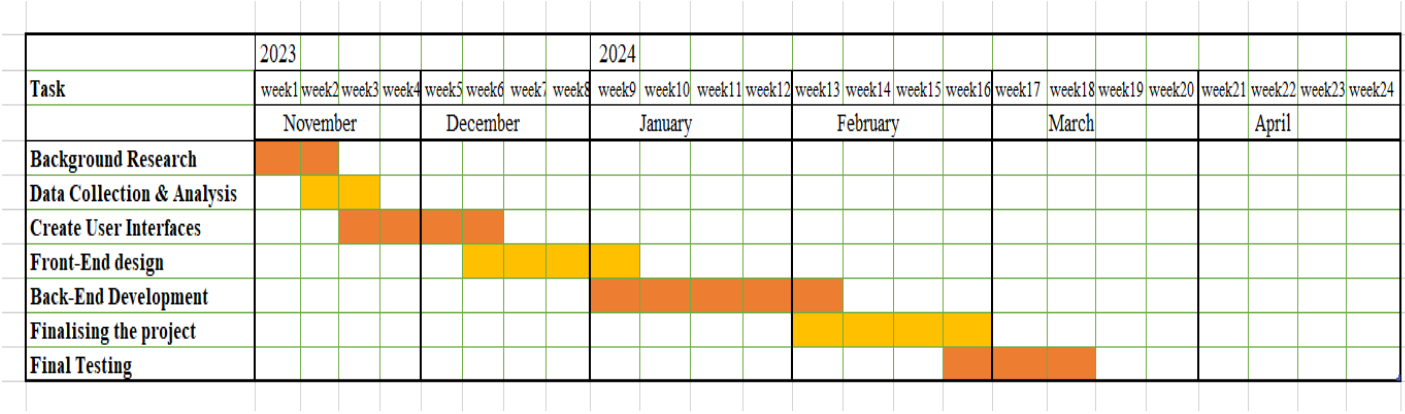
- This project does not involve an external party, or any real client. However, a survey is used for gathering the data based on material-related sizes according to the user body measurement.





Chapter 06

Time Frame / Timeline



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