I. Project Description

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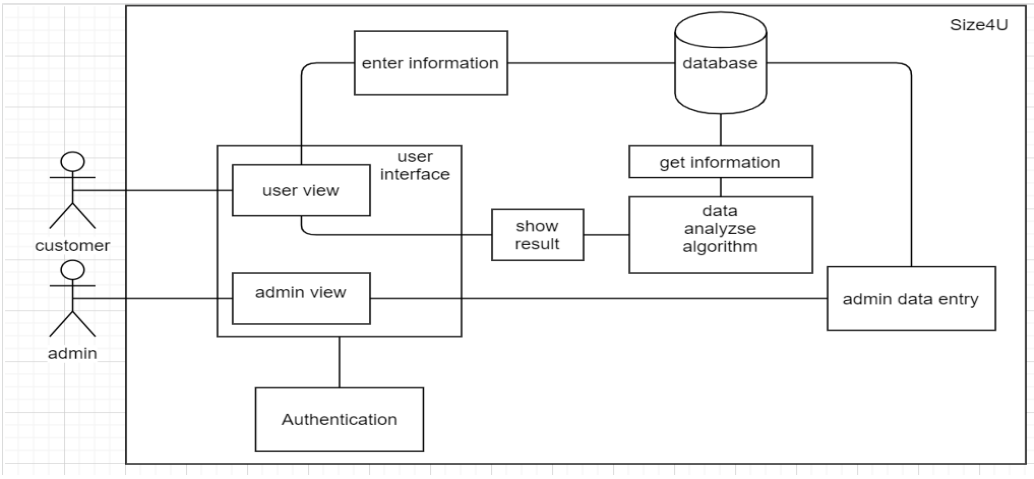
Chapter 1. Mission Statement

We are building a user-oriented software, a software that uses accurate body information entered by users to determine the exact clothing size for users, and recommend styles and colors that customers with a similar proportion of your body like. Its target users are all consumers, especially users who prefer shopping online. It allows users to quickly know the size of different brands corresponding to their body information, as well as the colors and styles of clothes that are suitable for them.

Chapter 2. Mission Objectives

- The application is designed to help the customer find the dressing style and clothes size that fit best for them.
- Enable users to input their personal information such as height, weight and body shape to get style and size recommendations.
- Producing recommendations by using an algorithm combined the official recommendations provided by various brands and the feedback from other users.
- Enable users to make comment and evaluate the results of size recommendations at different levels (Very Accurate, Accurate, Inaccurate.).
- Enable administrator to manage the database of the size information from different brands, such as add or delete brands into the database, update official size recommendations and check the report of user usage.

Chapter 3. System Boundary Diagram



Chapter 4. User Views (UCDs) and Their Requirements

1. User Views

1). User

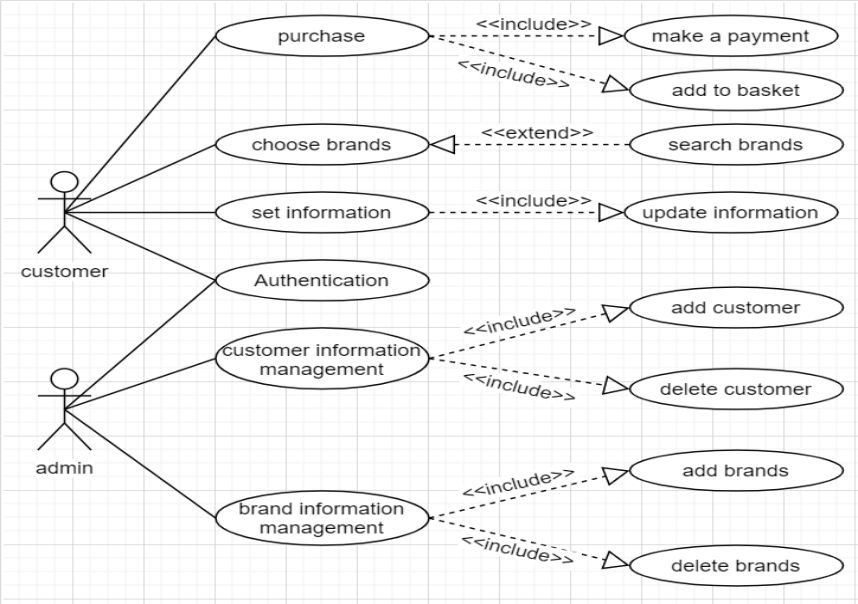
Once authenticated, can:
1> Input their body information
2> Choose brand
3> View the size, color and style recommendation
4> Evaluate the results of recommendations

2).System Administrator

Once authenticated can:

1> Upgrade information stored in database
2> Add new information stored in database
3> Delete information stored in databese
4> View all information stored in database
5> Check user evaluation

Our project aims to provide effective size advice, clothing style advice and color advice for all consumers, especially those who like to shop online. It helps consumers quickly identify clothes that fit their body, reducing the possibility of buying clothes of the wrong size, style, or color. The basic function of the project is to integrate the size standards of different clothing brands and the color and style preference information of users of different sizes. The ideal feature of the project is to use this website to determine the size of the clothes and recommend styles and colors that customers with a similar proportion of your body like. The site has two different types of users: consumers and admins.



Use case diagram

2. Transaction Requirements

1). Transactions related to the user view

1> User Authentication
2> add user information to database
3> Display the recommendation
4> Provide evaluation page

2). Transactions related to the System Administrator view

1> Administrator authentication
2> Store update information to database
3> Store add information to database
4> Reconfirm the delete operation
5> display user evaluation

3. Functional Requirements And Nonfunctional Requirements

1). Functional Requirements

1> Generic Functional Requirements

- The software must support two different types of accounts: user and administrator.
- The language of the software is English.

- The software must protect

2> Functional Requirements related to User view
- The software provides a registration and login window for user to register and log in. Providing remember password function and forget password function.
- The software provides multiple dimensions of body data for user input or selection. Besides height and weight, user can choose their body shape or provide more specific data like size of the chest, waist and hips. Users can optionally fill in part of the information or provide all of it.
- The software offers a variety of different brands for users to choose from.
- User can get size and style recommendations after choosing a brand.
- User can make comments about the result of recommendation with three different degree: Very Accurate, Accurate, Inaccurate.
- User can view the history of recommendations.
- User can update their body information.

3> Functional Requirements related to administrator view
- The user information that managers can see must be anonymized.
- The software provides a few administrator accounts.
- Administrators have access to manage background data.
- Administrators can view the graphical user usage data, such as Statistical graph of user body data and popular brands report.

4> Functional Requirements related to algorithm
- The algorithm needs to combine official data with user feedback to get accurate results.

2). Non-Functional Requirements

- The software must support Windows, MacOS, Android, IOS.
- The software must let users and administrators use account and password to login.
- The software must support more than 1k users.
- The database must capable to support the size information from more than 100 brands.
- The software must provide the recommendations in 5 seconds.
- This software is aimed at all consumers, so the UI should be simple and easy to use.
- The software must be able to use offline.
- Software must protect users' privacy from being compromised.

3). System requirements

1> Initial Database Size
- The database must have the capability to hold records for a minimum of 1000 users.

2> Rate of Growth
- The database must have the capability to expand as tasks are added to the system.

3> Expected type and frequency of searches
- The system cannot withstand a search frequency greater than 10 times per minute

4> Network and Access requirements
- The database requires a stable network connection
- Access the database must require administrator privileges and be authenticated

5> Performance
- The system is expected to complete the search in up to 6s

6> Security
- Both users and administrators must be authenticated to log in
- The first-time user must register an account and password, and the password must consist of eight digits containing letters and numbers
- The administrator has the highest authority, can perform any operation after being authorized, and can stop any abnormal operation

7> Backup and Recovery
- All passwords are backed up and can be sent to the email account used by customers when they forget it

8> Legal Issues
- The data stored in the database and the system must comply with the UK Data Protection Act 1998.

Chapter 5. Conduct of the Project and Plan

1. Background Research

Clearly, modern fashion has a fit problem. The debate over sizing is an emotional one, especially right now, when so many shoppers are rejecting labels of all kinds, from sexual orientation to gender to, yes, size. Underlying it all is the same maddening question: At a time when consumers are more vocal than ever about what they want and need, why is it still so hard to find clothes that fit? if you try on four pairs of a size-8 jean in the same brand, you will find that they all fit differently. The predicament is so absurd, it sounds like a joke. At the same time, buying clothes of the wrong size also brought a serious spin-off problem. Customers return an estimated 40% of what they buy online, mostly because of sizing issues. That's a hassle for shoppers and a costly nightmare for retailers, who now spend billions covering 'free' returns[1].

2. Data Required

The required data will be obtained through user and administrator input. For example, the user can add personal body information to the system, and the administrator can enter the size, color, and style information of each brand, and these information can be updated, modified, and deleted by administrator. In the process, a large amount of external data is required to support algorithm analysis and the system run.

3. Design Methods and Documentation

For this project, we will develop the software using object-oriented programming techniques. The code will be commented and structured clearly to make it easy for others to understand. The code itself will be written in a modular way to allow multiple people to work on it easily. We plan to use use case diagrams to represent user and administrator interactions with the system, and to show the features supported by the system to make development easier. We will use pseudo code to initially represent the algorithm, which will help us to use algorithm more accurate. We will also create class diagrams, which can help us determine which classes, methods and variables will be used.

4. Implementation stage

1). Hardware required

Basically the components of a computer:

1> Processor
2> hard disk storage
3> RAM
4> A server that can meet basic needs and can connect to a database

2). Software required

1> Java Development Kit - JDK is the core of the entire Java, including the Java Runtime Environment, some Java tools, and the Java core class library (Java API)
2> Database and DBMS(such as mysql, sql server, oracle, db2, mongoDB)
3> Operating system environment - Windows, MacOS, Linux
4> Development tools - Netbeans, IntelliJ IDEA, Eclipse
5> Web server software - Apache

5. Risk Assessment

1). Project Challenges

- The team members were divided over whether to create a website or a software. Each person's tasks have different time limits, and the delay of one team member may affect the tasks of other.
- There are challenges in algorithm design. A poor algorithm construction choice, for example, a high time complexity algorithm, will make the software run for a long time. At the meanwhile, the algorithm may have limitations, and have difficulties in optimization.
- Data collection will face challenges. The brands may not disclosing the core data, which makes collecting data longer and harder.

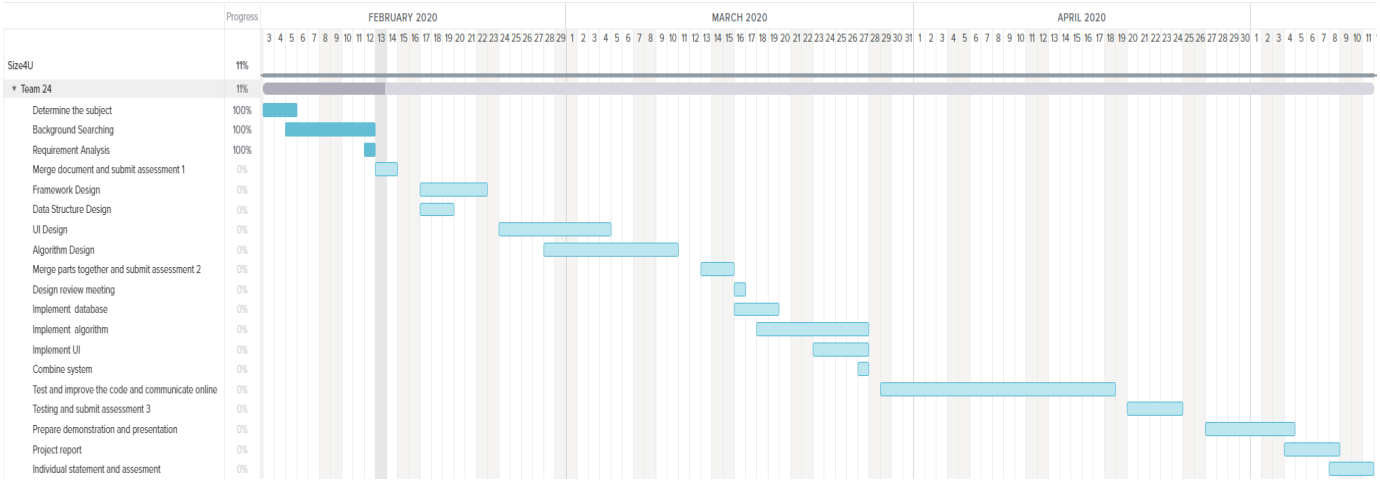
- Acquiring and protecting data also carries risks. If the user does not grant the system the right to store their data, the system will not be able to produce highly accurate recommendation results by analyzing a large amount of data. Furthermore, the administrator will also not be able to evaluate the system operation and algorithm capabilities by reading data feedback. However, Updating the system has become extremely difficult.
- Faced with security challenges, the lack of adequate protection from attack may lead customer data leaks, which triggers customer distrust.

2). New Skills Required for Project Completion

- Further study high-level languages such as JAVA, python for software development and programming.
- Analyzing the costs and comparing the pros and cons of each development platform, then, make a choice of development platform.
- The algorithm is the core of the program, so how to create a good algorithm needs to learn.
- Learn how to connect applications with databases.
- Learn code modularity in order to improve the reusability of the code.

7. Project Plan and Gantt Chart

	A	B	C	D
1	Task	Begin	Duration	Member
2	Determine the subject	2020/2/3	3	All
3	Background Searching	2020/2/5	8	Yiwei Chang, Tongfei Sun, Yanwenjing Qu, Ruitong Su
4	Requirement Analysis	2020/2/12	1	Yiwei Chang, Tongfei Sun, Yanwenjing Qu, Ruitong Su
5	Merge document and submit assessment 1	2020/2/13	2	All
6	Framework Design	2020/2/17	6	Yiwei Chang, Tongfei Sun
7	Data Structure Design	2020/2/17	3	Yanwenjing Qu, Ruitong Su
8	UI Design	2020/2/24	10	Nathan Woods
9	Algorithm Design	2020/2/28	12	Yiwei Chang, Ruitong Su
10	Merge parts together and submit assessment 2	2020/3/13	3	All
11	Design review meeting	2020/3/16	1	All
12	Implement database	2020/3/16	4	Tongfei Sun, Yanwenjing Qu
13	Implement algorithm	2020/3/18	10	Yiwei Chang, Ruitong Su
14	Implement UI	2020/3/23	5	Nathan Woods, James Maskrey
15	Combine system	2020/3/27	1	All
16	Test and improve the code and communicate online	2020/3/29	21	All
17	Testing and submit assessment 3	2020/4/20	5	All
18	Prepare demonstration and presentation	2020/4/27	7	All
19	Project report	2020/5/4	5	All
20	Individual statement and assesment	2020/5/8	4	All



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