

Ecouture

Team 1

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# **Software Requirements Specification Document**

**Version: (2)**

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## Changelog

Version	Date	Changes Made
1.0	Oct. 2, 2024	Wrote and finalized all sections for submission.
2.0	Dec. 9, 2024	Updated the Scope (2), Key Users (3.1), Assumptions and Dependencies (5), Specific Requirements (6 - 6.3.1) sections.

## 1 Purpose

The fashion industry is one of the largest polluters, responsible for generating about 10% of the world's carbon emissions. Fast fashion contributes to environmental issues due to its overproduction and rapid disposal model, which leads to excessive textile and toxic waste, pollution, water overuse, and the spread of microplastics. These harmful environmental practices are caused by the industry's focus on keeping up with short-lived fashion trends. While there are many slow fashion brands that prioritize sustainability, they struggle to gain the same popularity as fast fashion retailers, mainly due to their higher prices and less trend-focused products.

Consumers also lack awareness of what's in their wardrobe and the environmental impact of their shopping habits. Many don't pay attention to the materials their clothes are made from or consider whether the brands they purchase from follow sustainable practices. As fast fashion brands continue to expand, it's now up to consumers to really consider the sustainability of their clothes in order to help contribute healthier changes to the environment.

Although there are many fashion related applications and software, ranging from closet outfit planners to online thrifting platforms, there's still a lack of software that utilizes a consumer's existing wardrobe to actively promote sustainability. A new system is needed to address the lack of consumer awareness about the environmental impact of their fashion choices, such as the materials in their clothes and the sustainability of the brands they support. Current platforms focus on resale and organization, but they do not aid consumers in reflecting on the sustainability of their wardrobe or motivating them to develop eco-friendly fashion habits.

With detailed statistics and insights into the sustainability of a consumer's wardrobe and offering guidance for eco-friendly clothing choices, a new system could encourage responsible shopping behavior. In creating such a software, it can help support slow fashion brands, and it can also help reduce carbon emissions and harmful production one eco-conscious consumer at a time.

## 2 Scope

Our software, Ecouture, is a sustainable fashion platform that addresses the issues surrounding the lack of awareness about eco-friendly fashion, helping users reduce the environmental impact of their clothing choices. The primary features and objectives include:

Ecouture users will be able to create a digital catalog of their wardrobe by adding, deleting, and editing clothing items. Each item entry will include key details such as the type of material, brand, and how the item was acquired (e.g., online, in-store, thrifted, or second-hand). This feature will let users maintain an organized and detailed record of their clothing. These clothing statistics will also help the software to calculate and display the user's sustainability rating via Ecouture's dashboard.

With Ecouture's sustainability dashboard, it will display detailed analytics about the user's wardrobe. The dashboard will calculate percentages and create pie charts reflecting how sustainable a user's closet is based on factors such as material composition and brand sustainability ratings. This visual summary will help users understand and evaluate their environmental impact of their closet and monitor their progress over time.

In the Community Forum feature of Ecouture, users would be able to create posts to engage with other community members and share their sustainability journey or to ask questions about sustainable fashion, such as how to care for certain eco-friendly fabrics or find sustainable brands. Community members would be able to comment or reply to these posts, offering advice, support, or feedback. The goal is to foster collaboration, knowledge sharing, and collective motivation toward sustainable fashion habits.

Ecouture addresses key deficiencies in the fashion industry by empowering consumers to be more conscious of their environmental impact. It will bring significant business value by supporting slow fashion brands, promoting sustainable shopping habits, and helping users reduce their environmental impact. The system will benefit consumers by simplifying the process of building a sustainable wardrobe and rewarding them for their eco-conscious efforts, ultimately contributing to healthier environmental practices across the fashion industry.

## 3 User characteristics

The potential users of Ecouture would be teenagers or young adults who are looking to become more conscious of sustainable fashion practices. Nonetheless, Ecouture would be designed to accommodate a

wide range of users, from those new to sustainability to those who are already familiar with eco-friendly fashion. Another potential user includes sustainable slow fashion companies that are invested in promoting their products and supporting the system.

### 3.1. Key Users

The key users of Ecouture can manage their wardrobe by adding, deleting, and editing clothing items. They will track the sustainability of their closet through the dashboard.

Ecouture users should have a basic understanding of fashion sustainability concepts. However, the software will enable users to make informed sustainable choices as they continue to use the software. So, users can be categorized as either novices or journeymen, depending on their prior knowledge and learning progress.

In terms of technological proficiency, key users are expected to have an intermediate level of expertise, placing them at the journeyman level. The system should still prioritize user-friendly design and intuitive navigation to accommodate users of varying technical abilities.

In general, the primary demographic is likely to be between 18-30 years old, particularly millennials and Gen Z users who are more attuned to sustainability issues. The system will mostly appeal to women or feminine-presenting individuals as a large majority of this demographic tends to use fashion apps. However, Ecouture will still appeal to a broader gender spectrum. Primary users are also expected to be generally positive toward technology, viewing Ecouture as a tool for achieving personal and environmental goals.

### 3.2. Secondary Users

Secondary users of Ecouture include sustainable slow fashion brands that are invested in promoting their products and supporting the system. Although their opinions do not affect the long-term success of the platform, these stakeholders are vital to support the software's mission.

These users can promote their sustainable products via the community forum feature, helping consumers make more informed decisions about eco-friendly brands and materials.

As brands specializing in sustainable fashion, these secondary users are considered masters of the subject matter. Their deep understanding of the environmental impact of clothing production allows them to offer valuable insights and promote ethical business practices.

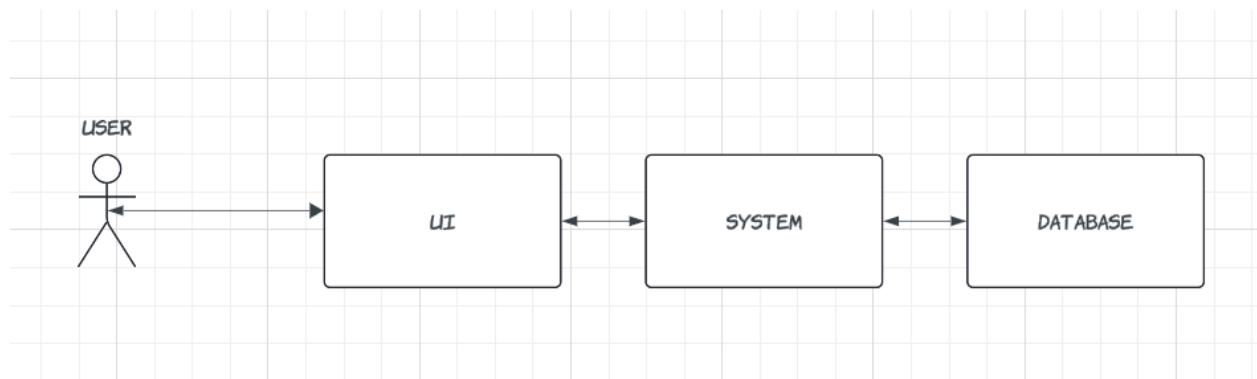
Slow fashion brands would most likely have little interaction with the platform and would be more limited compared to key users; they would be focused primarily on brand promotion and knowledge

spreading. Hence, these secondary users are likely to be a novice or journeymen in technological expertise.

Because the secondary users are likely to be small to medium-sized businesses, the main characteristics and demographic of them are very broad. Generally, these secondary users' attitude toward technology must be generally positive, viewing Ecouture as a tool for reaching consumers and promoting sustainable practices. Representatives of slow fashion brands are expected to be well-educated in both business and sustainability principles.

## 4 Product Perspective

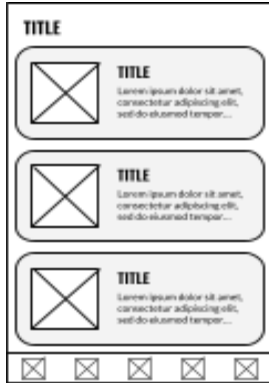
### 4.1 System Context



- The system interacts with the user via the user interface which serves as a communication layer to help the user initiate requests which are to be processed by the system.
- The system acts as a bridge between the user interface and the database, executing queries, managing data retrieval or storage, and ensuring data consistency and security.

### 4.2 User interfaces

- It is required that the system provides short detailed error messages.
- It is required that the system allows users to save data after each upload.
- It is required that the system provides a consistent navigation bar at the bottom of every screen past the login screen.
- It is required that the system interfaces are multimedia and the following screen layout:



### 4.3 Software interfaces

- The system must use MySQL Community Server 8.0.39 as its database component.
- Communication with the DB is through JDBC (Java Database Connectivity)

### 4.4 Deployment requirements

- New data tables created for this system must be installed on the company's existing DB server and populated prior to system activation.

## 5 Assumptions and Dependencies

- It's assumed that users are not color blind.
- It's assumed that users have little to no prior knowledge of sustainable clothing.
- The system is dependent on SQL Community Server 8.0.39 as the database to store clothing information and user information.

## 6 Specific requirements

### R.1 Closet Management

R.1.1 The system shall display and provide the following required information for each clothing item within individual, separate panels:

- Name of the item
- Clothing type
- Percentages
- Material Type

- Brand
- Acquisition

R.1.2 The system may support the upload of up to 500 clothing items per user account without performance degradation.

## R.2 Closet Dashboard

R.2.1 The system shall calculate the data for the dashboard of each clothing item based on pre-defined factors such as and display that information in a visual format (e.g., pie chart, star rating) which includes:

- Overall Sustainable Rating out of 5 stars
- Overall Brands in Closet Rating out of 5 stars
- Overall Materials Rating out of 5 stars
- Carbon Footprint measured in kilograms of CO<sub>2</sub> equivalent per item
- Water Used measured in liters per kg
- Energy Used measured in MJ per kg
- Breakdown of Closet's Materials displayed via pie chart
- Breakdown of Acquisition Method displayed via pie chart

## R.3 Brand Reviews

R.3.1 The system shall display a rating for different major clothing brands from a scale of 1 to 5 depending on how sustainable their practices are.

R.3.2 The system shall follow these guidelines for where each website will fall on the rating chart:

- Ethical manufacturing
- sustainable material
- Reduce waste
- Use renewable energy
- transparency
- packaging

R.3.3 The system may maintain a 90% accuracy for the rating of each website.

## R.4 Community Forum

R.4.1 The system shall allow users to upload a forum post by providing user inputs in the form of:

- Forum Post Title (string)
- Forum Post Content (string)

R.4.2 The system may provide a textbox within each user post for other users to make comments.



## 6.1 System Functional Requirements

As a new user, when I click the add clothing items button, I would like to see a form-like page appear so that I can understand what information is required of me in order to successfully add a clothing item to my closet.

As a user, I would like to be able to use a navigation bar so that I can easily navigate and access through each core functionalities of the application.

As a user, I would like to be able to scroll through a page that contains a lot of information so that all the information is not cramped and hard to read.

As a user who wants to access their own personal closet, I would like to register my own account using a user management system (login/signup) so that I can access my own information and so others can't access my account as well.

As a user who enjoys the design of applications, I would like to see an application with a set color, font, and layout theme and design so that it enhances my user experience.

As a user, I would like a closet feature where I can add, delete, and edit my clothing information so that I can manipulate and see how sustainable my closet is via the dashboard.

As a user who wants to interact with the sustainability community, I would like a forum system where I can add, delete, and edit my forum posts so that I can participate in community building.

As a user who is conscious about sustainability, I would like to see the numbers and percentages of my carbon footprint so that I am aware of my environmental impact.

As a person who loves to shop at name brands, I would like to get an insight on a brand's sustainability practice with a brand review page so that I am aware of what brands to shop at and what brands to avoid.

As a user, I would like to know about the sustainability ratings of clothing brands and types of materials through the dashboard so I can consider my clothing habits.

## 6.2 Logical Database Requirements

### Entity-Relationship Diagram

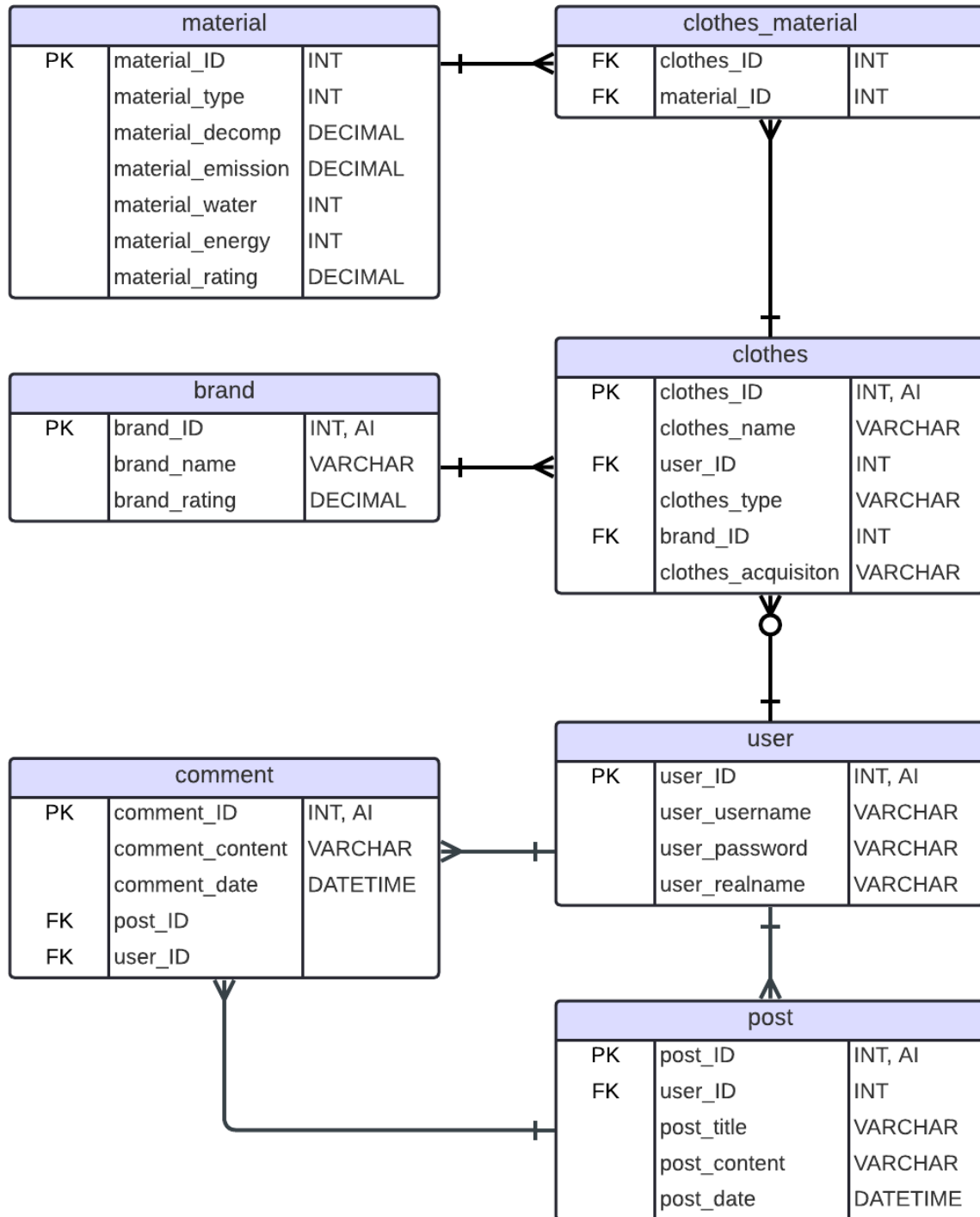


Table: Clothes

- **clothes\_ID** (Primary Key, int, AUTO\_INCREMENT) - A unique identifier for each clothing item.
- **clothes\_name** (varchar) - A title to briefly describe a clothing item.
- **user\_ID** (Foreign Key, int) - The user that the clothes belong to.
- **clothes\_type** (varchar) - Type of article of clothing.
- **brand\_ID** (Foreign Key, int) - Corresponding brand ID of the clothing item.
- **clothes\_acquisition** (varchar) - How the clothing item was acquired.

Table: Material

- **material\_ID** (Primary Key, int, AUTO\_INCREMENT) - A unique identifier for each material type.
- **material\_type** (varchar) - Type of material a clothing is made out of.
- **material\_decomp** (decimal) - How long it takes for a clothing item to decompose in months.
- **material\_emission** (decimal) - How much kg CO2e per item of clothing.
- **material\_water** (int) - How much water in liters was used to make items in the closet.
- **material\_energy** (int) - How much energy in MJ was used to make items in the closet.
- **material\_rating** (decimal) Sustainability rating of a material out of 5 stars.

Table: Clothes\_Material

- **clothes\_ID** (Foreign Key, int) - A unique identifier for each clothing item.
- **material\_ID** (Foreign Key, int) - A unique identifier for each material type.

Table: Brand

- **brand\_ID** (Primary Key, int, AUTO\_INCREMENT) - A unique identifier for each brand.
- **brand\_name** (varchar) - Name of the brand
- **brand\_rating** (decimal) - Sustainability rating of a brand out of 5 stars.

Table: User

- **user\_ID** (Primary Key, int, AUTO\_INCREMENT)
- **user\_username** (varchar) - The user's chosen username.
- **user\_password** (varchar) - The user's password.
- **user\_realname** (varchar) - The preferred name of the user.

Table: Post

- **post\_ID** (Primary Key, int, AUTO\_INCREMENT) - A unique identifier for each post.
- **user\_ID** (Foreign Key, int) - the user who wrote the post.
- **post\_title** (varchar) - The title that the user chooses for their post.
- **post\_content** (varchar) - What the user writes about in the post.
- **post\_date** (datetime) - The date and time the post was created.

Table: Comment

- **comment\_ID** (Primary Key, int, AUTO\_INCREMENT) - A unique identifier for each comment.
- **user\_ID** (Foreign Key, int) - the user who wrote the comment.
- **post\_ID** (Foreign Key, int) - The post that the comment replies under.
- **comment\_content** (varchar) - What the user writes about in the comment.
- **comment\_date** (datetime) - The date and time the comment was created.

## 6.3 Software System Attributes

### 6.3.1 Usability

As a first time user, when I open the app, I want to see a clear and consistent layout so that I am able to navigate and learn the system within 5 minutes of opening it.

As a user, I want to view a summary of my closet's sustainability in a brief and concise format so that I can take action toward building a sustainable wardrobe.

As a user, I want the system to provide real-time feedback (e.g., success notifications, error messages) during my interactions so that I understand the outcomes of my actions.

### 6.3.2 Performance

As a user, I want the system to process 5 forum posts within 3 seconds, so I don't have to wait long for the forum page to load up.

As a user, I want to upload a clothing item in less than 2 seconds, so that I can quickly update my wardrobe without delays.

The system must perform 100% data validation both at the application level and at the MySQL level to prevent invalid or corrupted data from being written to the database.

### 6.3.3 Reliability/Dependability

The system must perform 100% data validation both at the application level and at the MySQL level to prevent invalid or corrupted data from being written to the database.

### 6.3.4 Security

- The system shall utilize an RSA algorithm to secure communication between users as the pair of keys make it secure.
- To authenticate system users, there will be a usernames and password system that will be stored in the database and secured by using prepared statements in SQL and valid inputs. This allows the program to check the username and password before trying to access the database

- To check for data integrity, the system will hash the user's password to protect from malicious access as it will make it very difficult to break the hash. The system will use the sha256sum hashing algorithm as that is the industry standard.
- In order to ensure data privacy, the system will encrypt the data using hashing algorithm for user's password and username, valid inputs for the database, using prepared statements so that it will check for any invalid inputs.

#### 6.3.5 Maintainability

The software must be divided into well-defined, independent modules that focus on a single responsibility. Changes in one module should not require changes in other modules unless they are directly related to shared interfaces.

Variable names, function names, and class names must be self-explanatory, so that code is understandable without heavy reliance on external documentation.

All modules must use a consistent error-handling strategy, ensuring that any runtime errors are logged and handled correctly.

The system shall include comprehensive inline documentation for any complex or non-trivial logic within the codebase. Every class, method, and function must have clear comments explaining its purpose and usage.