

COMP2013J DATABASES AND INFO SYS (S/E)-2022/23

BEIJING-DUBLIN INTERNATIONAL COLLEGE

Report

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1 System Description

1.1 Introduction

The system constitutes an advanced shopping information platform, carefully designed to simplify and enhance the digital shopping experience for both consumers and administrators. For consumers, the system provides a number of key functions including product viewing, filtering selection, adding to cart, making payments, viewing and modifying personal information. This helps to easily discover items and filter them based on a number of attributes and add them to the virtual shopping cart, where the inventory of the item is simultaneously reduced after payment is made in the cart. At the same time, it provides a robust and user-friendly platform for administrators to skillfully manage product data, inventory and updates, experiment with products on and off the shelves, and can manage users. This all-inclusive system not only meets the diverse needs of e-commerce, but also ensures smooth interaction between consumers and administrators, ultimately providing a satisfying and fast shopping experience for all parties.

1.2 System Components

1.2.1 Database System

At the heart of the system lies its powerful and complex database system, which is designed to store and manage a wide range of product-related and user information. This includes product details, categories, inventory, user profiles and transaction histories. The structure of the database system will effectively support the various functions and features of the system such as inserting, searching, deleting and updating product information.

1.2.2 User Interface

The system's user interface is designed to deliver a seamless and intuitive experience for both users and administrators. Accessible exclusively via web browsers, the interface employs an easy-to-navigate layout, characterized by clear and concise menus and buttons, enabling users to swiftly locate and interact with their desired functions.

1.2.3 User Management

The system will support user authentication and authorization, thus providing a secure and personalized experience. After logging in, users will be able to access their shopping cart, view transaction history, and manage their account settings, with the ability to change passwords, etc. Administrators will have access to other features such as managing product information and inventory, enabling products to be shelved, managing user information, etc.

1.3 Assumptions

1. Users and administrators have access to a stable internet connection and a device with a web browser.
2. The system will be used by individuals with basic computer skills.
3. Administrators have a basic understanding of product management and pricing.
4. The number of users and administrators accessing the system will not exceed the system's capacity.

1.4 Features

1. User authentication: Users can create accounts, log in, and manage their profile information.
2. Product browsing: Users can browse products by category, brand, price, and other relevant filters.
3. Search functionality: Users can search for products using keywords, product names, or descriptions.
4. Wishlist and cart management: Users can add items to a wishlist for future reference or add them to a shopping cart for immediate purchase.

5. Product management: Administrators can add, edit, and remove products, along with managing product details such as price, description, and images.

1.5 Implementation

The system will be implemented using a Java-based solution, and it does not rely on any complex ORM technology or MVC frameworks. The system will be developed using Java, along with HTML, CSS, and JavaScript for the front-end. A Java-based solution such as Java Servlets and JavaServer Pages (JSP) will be used for server-side programming. The database will be implemented using MySQL or a similar relational database management system. The front-end will be designed to be responsive and user-friendly, with a focus on clarity and ease of use.

2 System Architecture Diagram

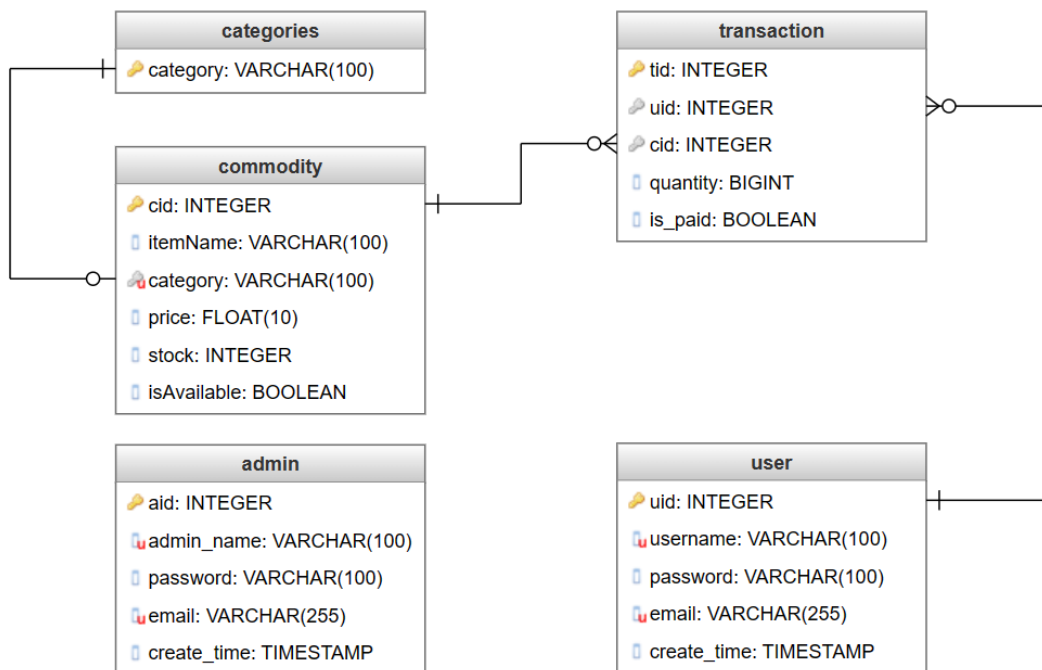


Figure 1: System architecture diagram

3 Tasks

3.1 Feasibility study

The feasibility study aimed to assess the feasibility and practicality of this advanced shopping information platform. This study assesses the potential benefits and drawbacks of implementing the system, considering technical, legal, economic and time related factors. It is the basis for making informed decisions about the feasibility of the project, and outlines the fundamentals behind the development of the database system.

3.1.1 Technical Feasibility

Technical feasibility assesses whether the proposed database system can be successfully developed and integrated into the existing infrastructure. It considers the availability of technology, resources and expertise required to implement and maintain the system.

Key factors to consider for technical feasibility:

- * **Safety and Security:** The system's ability to implement robust security measures is evaluated to identify potential vulnerabilities and implement appropriate security measures to protect user data and prevent unauthorized access. For example, preventing SQL injection issues is crucial during the implementation of the database system.
- * **Hardware and Software Availability:** The availability of suitable hardware and software requirements, including servers, network connections, and database management systems, is assessed. Additionally, the availability of compatible and reliable software components is considered.
- * **Integration:** The compatibility of the database system with existing systems is evaluated, ensuring smooth data exchange between different components. We employ a Java-based implementation approach, utilizing JSP and CSS for frontend interface development and JDBC for connecting to the database.
- * **Scalability and Performance:** The ability of the hardware and software infrastructure to handle the expected workload and data volume is evaluated. Factors such as system response time, data storage capacity, and the system's ability to scale as the user base or data grows are considered.
- * **Technical Expertise:** The technical expertise of the team members involved in developing the database system is assessed to determine appropriate roles and collaboration. This includes individuals responsible for database implementation, frontend design and development, backend implementation, as well as testing and maintenance.

By assessing technical feasibility, it can be determined if the necessary expertise is available to effectively implement the proposed database system. This analysis helps ensure that the system can be successfully developed, deployed, and maintained within the technical capabilities of the team members.

3.1.2 Legal Feasibility

Legal feasibility assessment of whether the proposed database system can be developed and operated within the scope of relevant laws and regulations. The system will comply with all applicable laws and regulations, including data protection and privacy laws. User data will be stored securely, and the system will take steps to prevent unauthorized access and data leakage. In addition, any copyrighted material (e.g., images, data, etc.) used within the system will be used with the appropriate permission or license from the copyright owner. By conducting a legal feasibility analysis, it is possible to ensure that the database system operates within the law.

3.1.3 Economic Feasibility

Economic feasibility focuses on assessing the financial aspects of a project. It includes an analysis of the costs involved in developing and maintaining the database system, as well as the potential benefits and return on investment, ensuring that sufficient funds are available to carry out the development and that significant return revenue can be generated.

Key factors to consider for economic feasibility:

- * **Development Costs:** Evaluate the costs associated with database design, software development, hardware infrastructure, cloud servers and cloud databases, and any necessary licensing or third-party services.
- * **Operational Costs:** Evaluate ongoing costs such as server maintenance, system upgrades, data backups, and user support.
- * **Cost Benefit:** Analyze the potential benefits of the system, such as cost savings due to improved operational efficiencies, cost savings, increased revenue, or streamlined inventory management. Compare projected benefits to estimated costs to determine if the solution provides a positive return on investment.

By performing an economic feasibility analysis, developers can assess the financial viability of the database system and make adjustments based on projected costs and benefits at the time of implementation.

3.1.4 Time Feasibility

Time feasibility evaluates whether the development and testing of the proposed database system can be completed within the designated timeframe. It takes into account the project schedule, potential dependencies, and any time constraints that may impact the development and deployment processes. Through regular team meetings, self-assessment, and feedback mechanisms, schedule feasibility is assessed to ensure proper planning and execution of the project within the specified timeframe, thereby ensuring timely delivery of the database system.

3.2 Collection and analysis of requirements

The main objective of this phase is to gather and analyze the requirements for the development of the database system. Comprehensive requirements gathering ensures a thorough understanding of the system functionality and helps in the subsequent development and implementation. The following is our summary of the requirements for the system.

- **User Registration**

- User name input field
- Password field
- Confirm password field
- Email field
- Submit button
- Save User in Database

- **User/Administrator Login**

- User name input field
- Password field
- Choose user type
- Submit button
- Read User/Administrator from Database

- **Administrator Add/Remove/Edit Category/Commodity**

- Add category field
- Add category button
- Remove category button
- Search for the category field
- Add commodity button
- On/off shelf button
- Remove commodity button
- Save category/commodity in Database

- **Administrator Edit User/Administrator Account**

- Search for the user/administrator name field
- Edit user/administrator information button
- Save User/Administrator in Database

- **User Check/Choose Commodity**

- Search for the category field
- Add commodity to the shopping cart

- Commodity number field
- Add button
- Save transaction in Database

- **User Pay in Shopping Cart**

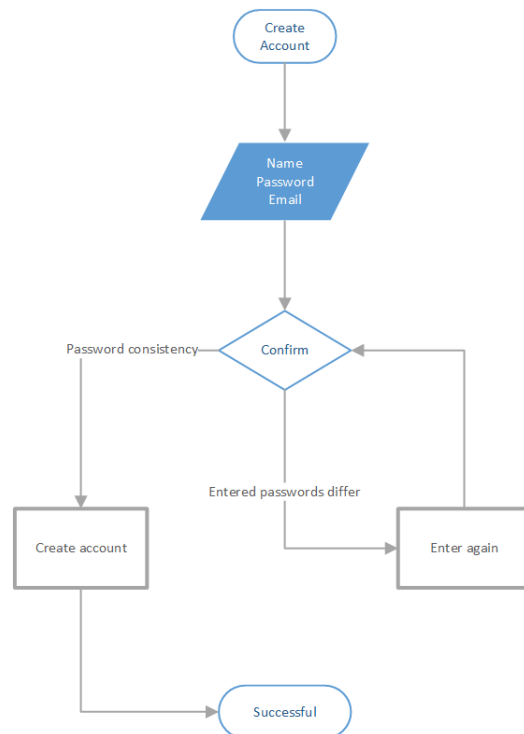
- Edit number of commodity
- Modify button
- Remove commodity button
- Pay button
- Save transaction and commodity in Database

3.3 Design

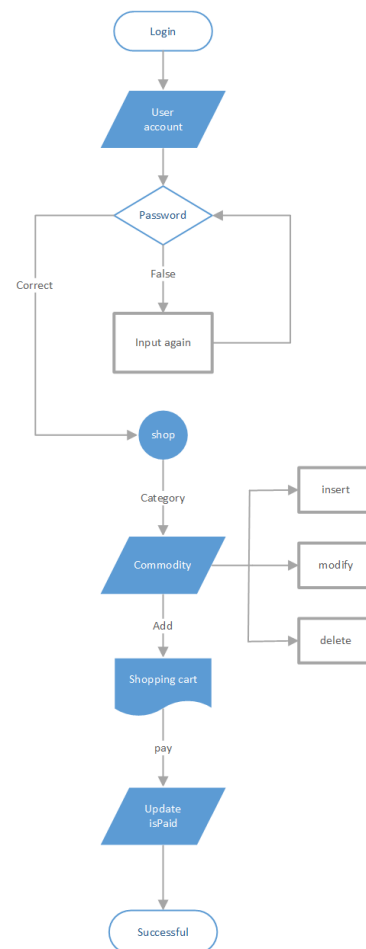
3.3.1 Operational design

1. Interface design

- **User registration:** Users who have not registered are required to fill in the user name, password, email address, and other information during registration.
- **User login:** The login function is used for registered users. The username and password are required during login.



(a) Registration



(b) User Login

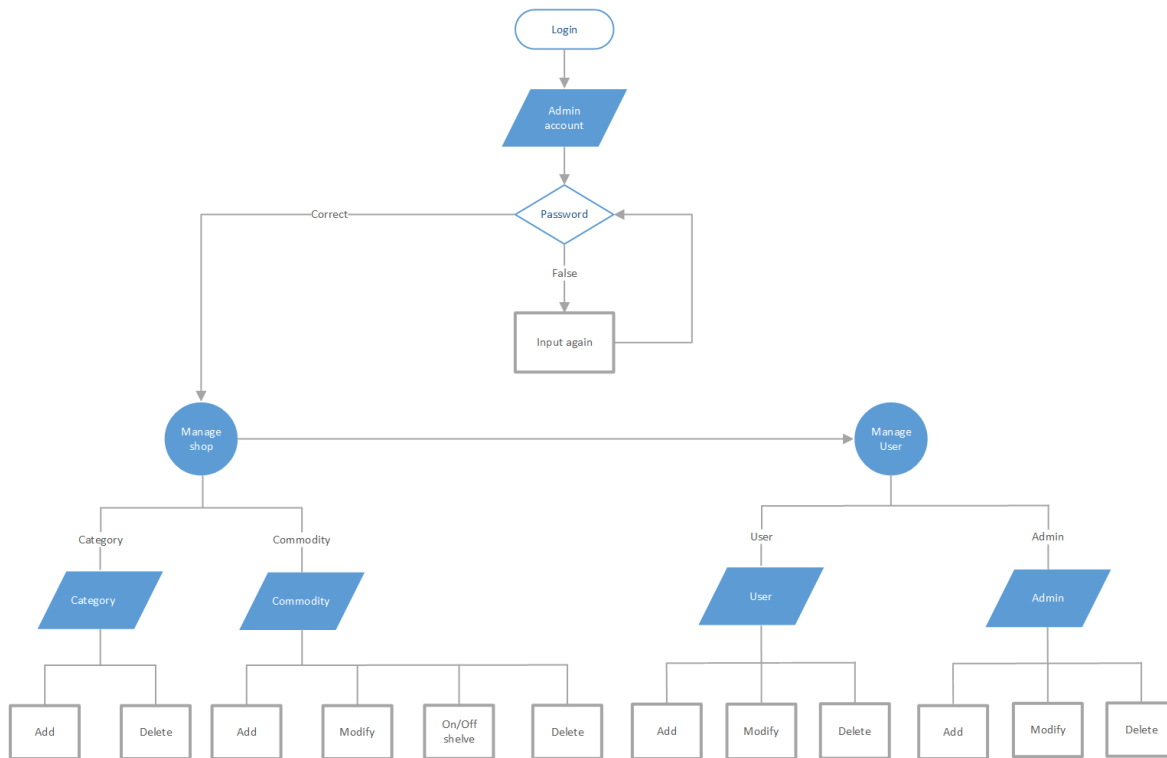


Figure 2: Administrator Login

- **User information:** Provides a page for viewing and modifying user information, showing the information of login personnel except the password. You can modify the name, password, delete the account, and log out.
- **Commodity:** Provides a category page that shows the secondary categories of all commodities, as well as a list of commodities under each category, required to support search. You need to display information such as the commodity's name, price, stock, and buttons such as add to cart.
- **Shopping Cart:** Provides a shopping cart page that displays a list of commodities that the user has added to the cart, along with information such as quantity, price, subtotal of each commodity, and buttons such as payment and delete.
- **Administrator login:** Provides an administrator login page. You need to enter the administrator account and password for authentication.
- **Administrator Home page:** Displays administrator operation menus, including category management, commodity management, and user management.
- **Category Management:** Provides a category management page that displays a list of all categories, information such as the name of each category, and buttons for adding and deleting categories.
- **Commodity Management:** Provides a commodity management page that displays a list of all commodities, with each commodity's name, price, stock, and other information, as well as buttons to add, delete, and edit commodities.
- **User/Administrator Management:** Provides a user/administrator management page, displays the list of all users/administrators, the user name, email, and other information of each logon, and the button to edit user/administrator information.
- **User/Administrator information view and modify:** provides a user/administrator information view and modify page, displays login information except the password, supports to modify the name, password, and delete account.

2. Software implement design

Team members use different software and tools for development.

Java development environment:

- Eclipse: Some team members use Eclipse as the preferred integrated development environment (IDE) for Java development.
- IntelliJ IDEA: Other team members use IntelliJ IDEA as the IDE for Java development.

Database Development:

- Navicat Premium 12: Some members utilize Navicat Premium 12 (a database management tool) to accomplish database development tasks. It provides features to manage and manipulate databases, execute queries and visualize database structures.
- MySQL Command Line: Some team members also use the MySQL command line tool to interact with the database through a command line interface.
- Cloud Database: The team utilizes a cloud-based database solution for development, ensuring real-time database sharing.

Version control and collaboration:

- GitHub: Our team uses GitHub as a version control platform to support collaborative code development, version tracking, and team coordination.
- Overleaf: For report preparation, teams use Overleaf, an online collaborative LaTeX editor that allows multiple team members to work on reports simultaneously.

By leveraging these software and tools, team members can effectively collaborate on code development, database management, and report preparation, thereby increasing productivity and facilitating seamless teamwork.

3.3.2 Database design

1. Conceptual Design

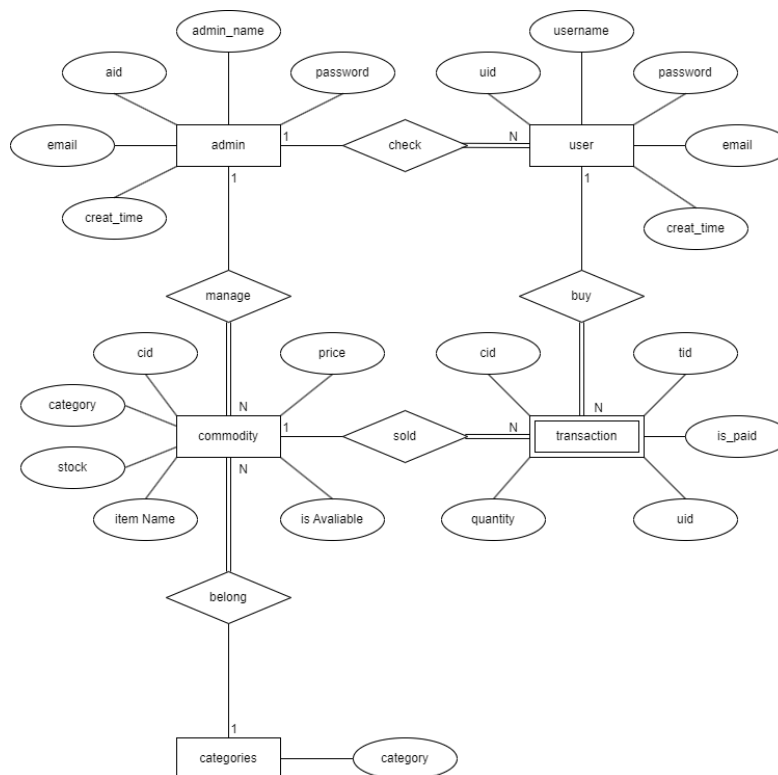


Figure 3: Entity-Relationship Model

2. Logical Design Convert an ER diagram into a logical model.

(a) Mapping Regular Entity Types

categories	<u>category</u>					
commodity	<u>cid</u>	itemName	category	price	isAvaliable	stock
user	<u>uid</u>	password	username	email	create_time	
admin	<u>aid</u>	admin_name	password	email	create_time	

Figure 4: Mapping Regular Entity Types

Notes:

- For CATEGORIES, select the unique key category as the primary key.
- For COMMODITY, either cid (commodity id) or itemName would be OK to choose as a primary key. We choose only one (primary keys are underlined).
- For USER and ADMIN, choose uid (user id) and aid (administrator id) as the primary key.
- No relationships/foreign keys are included yet.

(b) Mapping Weak Entity Types

categories	<u>category</u>					
commodity	<u>cid</u>	itemName	category	price	isAvaliable	stock
user	<u>uid</u>	password	username	email	create_time	
admin	<u>aid</u>	admin_name	password	email	create_time	
transaction	<u>tid</u>	uid	cid	quantity	is_paid	

Figure 5: Mapping Weak Entity Types

Notes:

- uid is a foreign key attribute in USER.
- cid is a foreign key attribute in COMMODITY. We choose only one (primary keys are underlined).
- For TRANSACTION, choose tid (transaction id) as the primary key.

(c) Mapping 1:N Relationships

categories	<u>category</u>						
commodity	<u>cid</u>	itemName	category	price	isAvaliable	stock	cgrs_category
user	<u>uid</u>	password	username	email	create_time		
admin	<u>aid</u>	admin_name	password	email	create_time		
transaction	<u>tid</u>	<u>uid</u>	<u>cid</u>	quantity	is paid	usr uid	cmd cid

Figure 6: Mapping 1:N Relationships

Notes:

- In the COMMODITY relation, we include "cgr_category" that refers to "category" in CATEGORIES to show the category name they belong to (*cgrs_category* should be NOT NULL to show that each commodity must belong to a category).
- In the TRANSACTION relation, we include the "user_uid" attribute to be a foreign key that refers to the "uid" attribute of each user's id.
- In the TRANSACTION relation, we include the "cmd_cid" attribute to be a foreign key that refers to the "cid" attribute of each commodity's id.

3.3.3 Physical design

The physical design phase involves translating the logical database design into a physical implementation. This includes defining the tables, columns, keys, indexes, and other physical structures needed to store and retrieve data efficiently.

(a) Convert Entities to Tables

- i. CATEGORIES table:
 - category (Primary Key)
- ii. COMMODITY table:
 - cid (Primary Key)
 - itemName
 - category (Foreign Key referencing category in CATEGORIES)
 - price
 - stock
 - isAvailable
- iii. USER table:
 - uid (Primary Key)
 - username
 - password
 - email
 - create_time
- iv. ADMIN table:
 - aid (Primary Key)
 - admin_name
 - password
 - email
 - create_time
- v. TRANSACTION table:
 - tid (Primary Key)
 - uid (Foreign Key referencing uid in USER)
 - cid (Foreign Key referencing cid in COMMODITY)
 - quantity
 - is_paid

(b) Define Column Definitions

- Specify the data types and constraints for each column in the tables.
- Use the column definitions you provided in the table creation statements.

(c) Define Keys

- Primary Keys (PK): Identify unique records in each table.
- Foreign Keys (FK): Establish relationships between tables.

(d) Normalisation

When initially creating the database, we created "total" in the "commodity" table. "total" is a derived value that can be calculated using the data we have stored, namely the price and stock of the commodity. Derived values in the database add redundancy, so we take "total" out of the database and simply refer to price and stock as objects when needed

3.4 Implementation

3.4.1 User Interface

The image shows a web browser window with a light gray background decorated with several blue butterfly icons. In the center, there is a white rectangular box with a light blue border. At the top of this box, the text "COMP2013J Databases and Info Sys" is displayed in a bold, black font. Below this, the text "Group3 Assignment" is shown in a smaller, regular black font. The main content area of the box contains a login form. It starts with a "Username:" label followed by a white input field with a small gray eye icon on the right. Below that is a "Password:" label followed by a similar white input field with a gray eye icon. Under the password field, there are two radio buttons: "Customer" (which is selected) and "Admin". Below the radio buttons is a solid blue "Login" button. At the bottom of the form, there is a link that says "Click to create an account" in a small, purple font.

Figure 7: User and Administrator Login

This is the login interface for users and administrators, which includes "Username" input box and "Password" input box. When logging in, you need to select your own identity and click the "Login" button after completing the information. Click the button below to reach the user registration interface in Fig. 8.

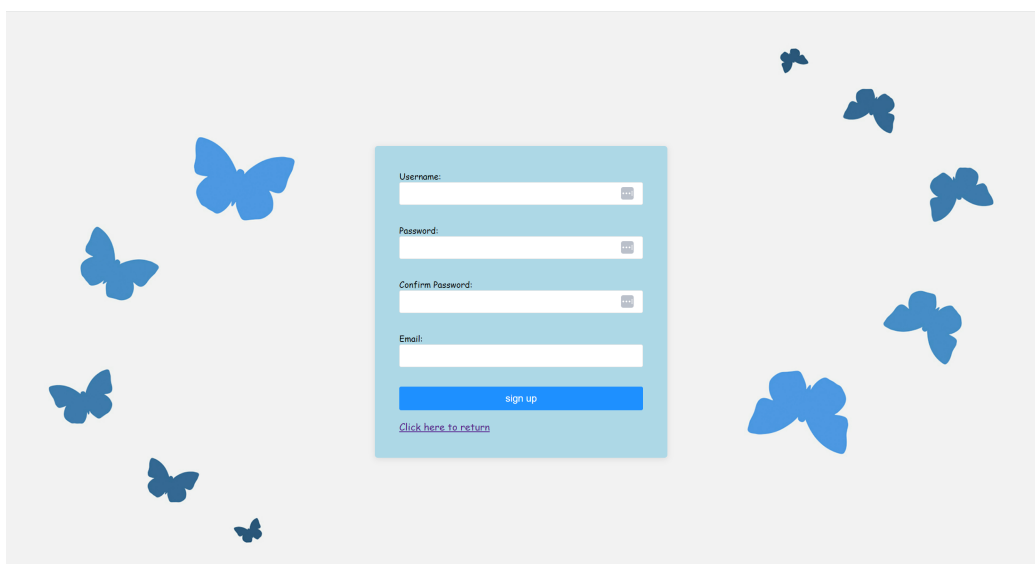
The image shows a web browser window with the same light gray background and blue butterfly icons as Figure 7. In the center, there is a white rectangular box with a light blue border. At the top of this box, the text "COMP2013J Databases and Info Sys" is displayed in a bold, black font. Below this, the text "Group3 Assignment" is shown in a smaller, regular black font. The main content area of the box contains a registration form. It starts with a "Username:" label followed by a white input field with a small gray eye icon on the right. Below that is a "Password:" label followed by a similar white input field with a gray eye icon. Under the password field, there is a "Confirm Password:" label followed by a white input field with a gray eye icon. Below the confirm password field is an "Email:" label followed by a white input field. At the bottom of the form is a solid blue "sign up" button. Below the button, there is a link that says "Click here to return" in a small, purple font.

Figure 8: User Registration

This is the user registration interface, including "Username" input box, "Password" input box, "Confirm password" input box and "Email" input box. After completing the information, click "sign up" button to log in. Click the button below to return to the user login interface in Fig. 7.

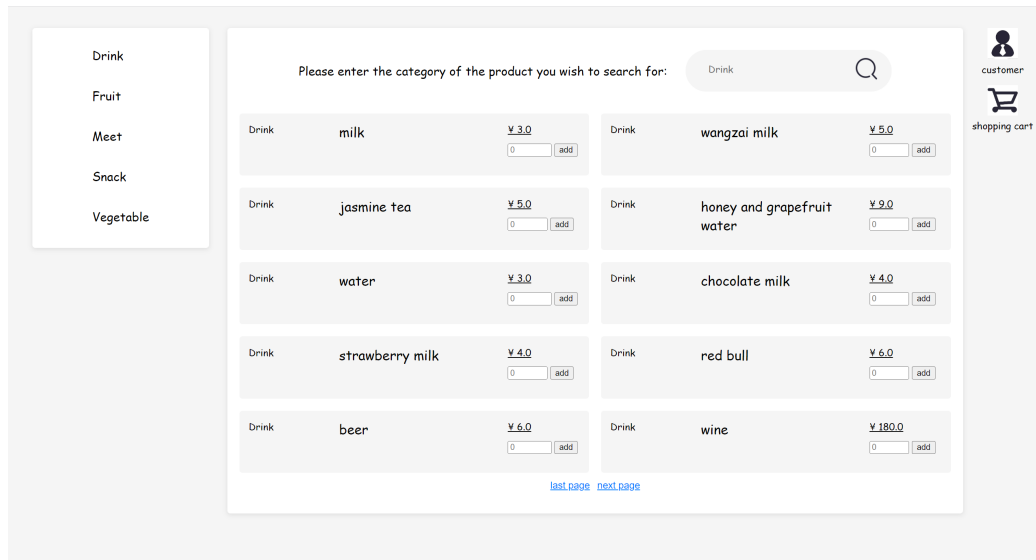


Figure 9: Commodity

This is the commodity page. On the left side, the user can select a category for the commodity, and on the top right, you can search for category. In the middle are commodities you can add to your cart, and at the bottom you can turn the page. The commodity displays category, name and price, and the user can enter the quantity as required to add to the cart (cannot exceed inventory). Click the second button "shopping cart" on the right to access the shopping cart page in Fig. 10.

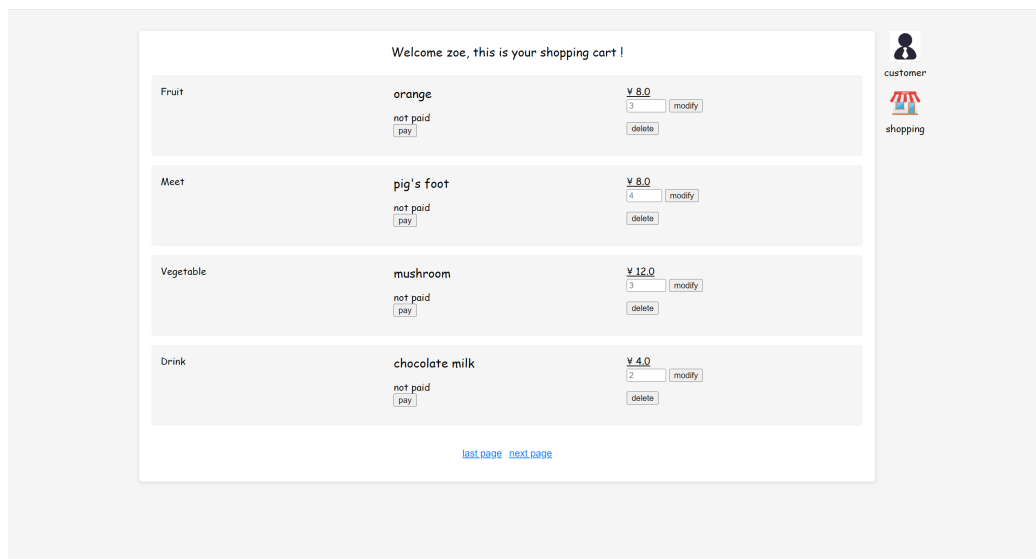


Figure 10: Shopping Cart

This is the shopping cart page. Users can change the number of commodities they want to buy, delete commodities, and pay for the commodities. After the user pays, the status of the goods in the shopping cart will become "is paid", and the stock of the goods in the database will decrease. Click the second button "shopping"

on the right to return to the commodity page in Fig. 9. Click the first button "customer" on the right to access the user information page in Fig. 11.



Figure 11: User Information

This is the user information page. Here users can see their personal information, including name, identity, registered email address, and cid. Click modify password to enter the change password page in Fig. 12. Click the "Log Out" button to return to the login screen in Fig. 7. Click "Delete Account" to delete the account.



Figure 12: Change Password

This is the change password page. Here the user can change their password, including input "Password" box and "Confirm" box. Click the "Modity" button to change the password in the database.

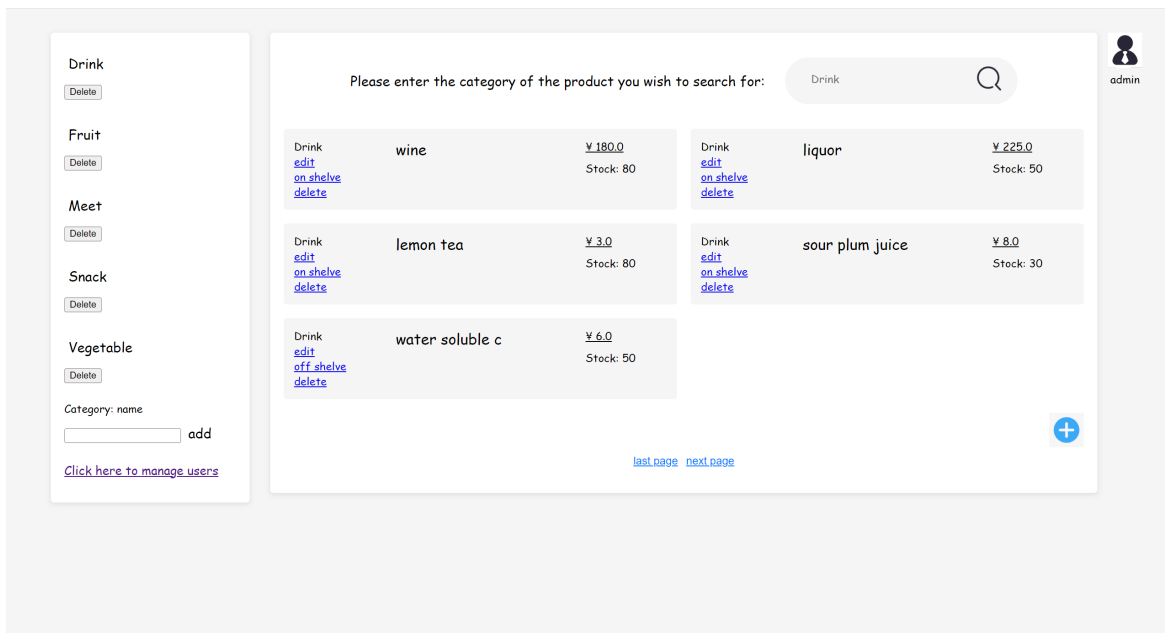


Figure 13: Category and Commodity Management

This is administrators to manage the commodities and categories page. On the left side is category, which the administrator can delete, enter the name of a new category, and add. Administrator can search for categories in the upper right corner. In the middle are the commodities under this category, which can be edited in Fig. 14, put on or removed, and deleted. The plus key in the lower right corner can realize the addition of goods. Click the lower left corner to jump to the administrative user interface in Fig. 15.



Figure 14: Commodity Management

This is the product editing page. Including commodity "Category" input box, "Name" input box, "Price" input box, "Stock" input box, after the administrator modifies the number click "modify" button can realize the modification of data in the database. Click the button below to return to the administrator's page in Fig. 13.

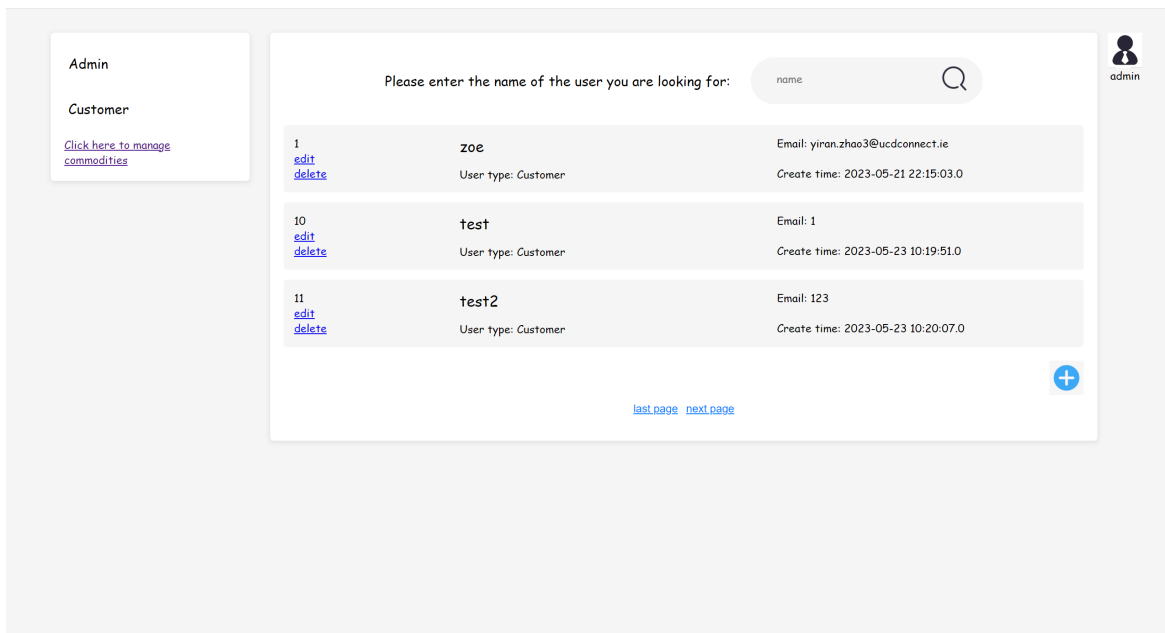


Figure 15: User and Administrator Management

This is the user and administrator information management page. On the left side, you can select admin or customer. You can search for the user name in the upper right corner. In the middle is the user under this category, which can be edited in Fig. 16 and deleted. The plus key in the lower right corner can realize adding users. Click the lower left corner to jump to the category and commodity management page in Fig. 13.

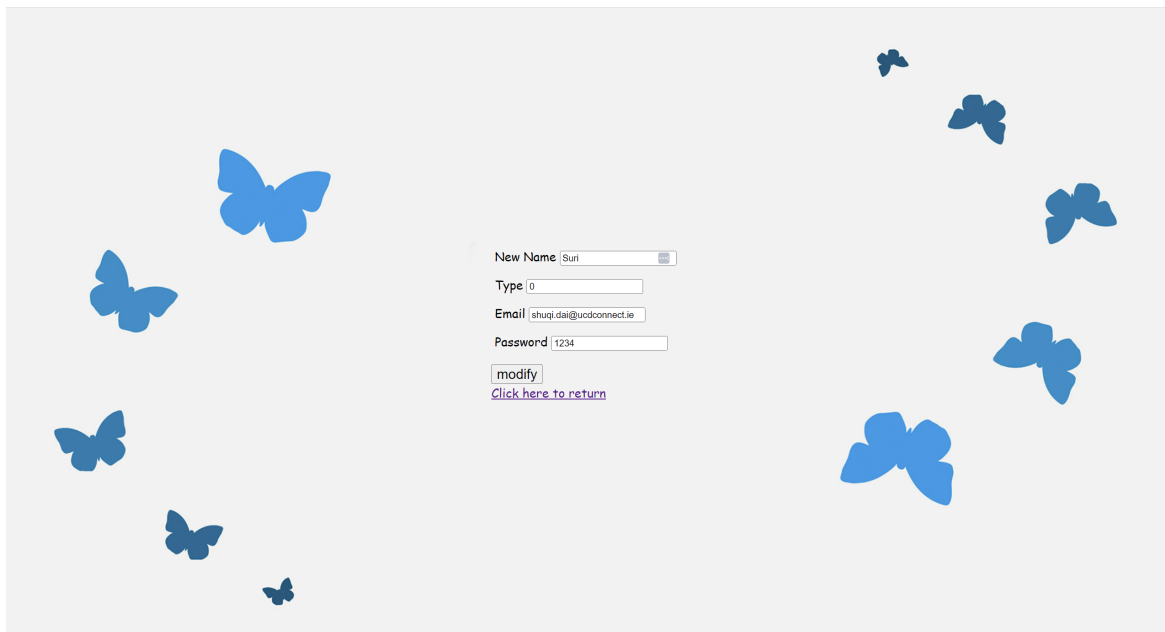


Figure 16: User and Administrator information view and modify

This is the user and administrator information and modify page. It includes the "New Name" input box, "Type" input box (0 represents administrator, 1 represents user), "Email" input box, and "Password" input box. Click "modify" button after the administrator changes the data in the database. Click the button below to the user and administrator information management page in Fig. 15.

3.4.2 JSP

The JSP page has the following logical processing.

1. All pages, except the login page, will include logic to detect the user's login status. If a user attempts to access an internal page without logging in, the system will automatically redirect them to the login page.
2. The JSP pages not only check the user's login status but also validate whether the user's credentials and permissions meet the expected criteria. If an unauthorized or malicious request is detected, the system will redirect the user back to the previous page to ensure secure access control.
3. Stringent validation measures are implemented for the vast majority of data received by the JSP pages. Even in cases where users attempt to send illegal GET or POST requests, the system is designed to handle these situations without displaying internal server errors (HTTP 500). Additionally, parameters required for database operations undergo rigorous validation to prevent any potential attacks targeting the database.
4. The JSP files adhere to a structured workflow, following a specific sequence of actions: receiving and validating session information, receiving and validating user input parameters, processing the received parameters, and finally rendering the resulting page. This approach minimizes the inclusion of unnecessary logic and conditional statements within the JSP pages, leading to improved runtime efficiency and optimized page performance.

3.5 Validation and Testing

Testing and validation are crucial steps in ensuring the reliability, functionality, and performance of the developed system. This phase involves various testing techniques to identify and rectify any defects or issues before the system is deployed.

- **Java Testing:** By calling the methods in the DAO class written in java, we ensure that there are changes in the synchronized database to ensure the consistency of the data.
- **System Testing:** System testing evaluates the entire system as a whole. It verifies that the integrated components and modules function properly and meet the specified requirements. The front-end interface is operated to ensure that the database is synchronized and updated to achieve add, delete, and check operations without abnormalities.
- **Security Testing:** Security testing identifies vulnerabilities and weaknesses in system security measures. It includes testing for potential vulnerability exploitation, unauthorized access, data leakage, and ensuring compliance with relevant security standards. Security testing helps reduce risk and protects user data and system integrity.
- **Validation** is an ongoing process throughout the testing phase. It involves comparing the system's actual behavior against the expected behavior defined in the requirements. Any discrepancies or deviations are identified, documented, and addressed appropriately.

By conducting comprehensive testing and validation, the system's quality, reliability, and performance can be improved, providing a robust and error-free user experience.

3.6 Operation

Once the system has been tested and validated, it is ready to be put into use. This phase involves deploying the system in the environment and making it available to users and administrators. It includes steps such as infrastructure setup, deployment, monitoring and performance optimization, user support and training, maintenance and upgrades. Continuous monitoring, user support, and proactive maintenance throughout the operational phase are necessary to ensure that the system runs smoothly, meets user expectations, and provides the expected benefits.

4 Team Member Contribution

In the development of the advanced shopping information platform, each team member made significant contributions to different aspects of the system. The following sections outline the individual contributions of each team member to ensure clarity and transparency.

4.1 Division of Team Member

- Front-end development: [REDACTED] is responsible for the overall design of the front-end page, including processing session information, request logic, specific logical functions and implementation of the page. [REDACTED] is also responsible for writing JSP files, including HTML controls, session processing, sending requests, receiving parameters, and implementing information processing by calling Java methods to access the database.
- Backend Development: [REDACTED] is responsible for developing server-side logic using Java and integrating the front-end with the back-end. Specifically, [REDACTED] is responsible for writing the java code that completes the connection between the database and the front-end, which can connect to update the database by calling the methods implemented in java. Meanwhile, [REDACTED] helped [REDACTED] with some of the front-end css code, which made the code more beautiful.
- Database Design and Implementation: [REDACTED] designed the database, created the tables, and implemented the relationships using a relational database management system, and scripts to generate the same.
- Testing and Documentation: [REDACTED] will be responsible for thoroughly testing the system, identifying bugs, and documenting the entire development process and completing all diagrams. In addition, [REDACTED] helped [REDACTED] to populate relational database with test entries.

4.2 Collaborative Efforts

While each team member had specific areas of responsibility, the development of the advanced shopping information platform was a collaborative effort. Regular meetings were held to discuss the overall system architecture, resolve technical challenges, and ensure seamless integration between different components. Team members provided feedback and assistance to one another, enhancing the overall quality and coherence of the system. Additionally, thorough testing and debugging were conducted collectively to identify and address any issues or bugs that arose during the development process.

Through the active contributions of each team member working together to advance the project, we were able to create an advanced shopping information platform that met the needs and expectations of both consumers and administrators. The synergy among the team members resulted in a system that delivers a gratifying and expeditious shopping experience while effectively managing product data and inventory.

5 Self-assessing and self-feedback records

We have conducted a comprehensive self-evaluation and self-feedback on the development process and outcomes of the database project. This introspective analysis has allowed us to critically assess our work, identify both strengths and weaknesses, and explore opportunities for improvement. Throughout the implementation of the project, we encountered several challenges, such as the design of shopping carts, the accurate recording of merchandise transactions, and the distinction between item removal and deletion. Through group discussions and collaborative efforts, we actively tackled these challenges.

We strongly acknowledge the significance of continuous learning and improvement in our future projects, as they are crucial for delivering high-quality solutions that effectively meet user needs and surpass their expectations. By thoroughly reflecting on our experiences and incorporating valuable feedback, we aim to enhance our skills and capabilities, ultimately achieving superior outcomes in our forthcoming endeavors.

In addition, the self-assessment and planning sections of the group's tiny reports from the previous weeks are documented in the Appendix.

6 Appendices

6.1 Tiny Report1

6.1.1 Self-assessing

As of the current stage of the Commodity Information System project, our team has successfully identified and agreed upon the primary theme of the data system we aim to develop. Through a series of brainstorming sessions and meticulous discussions, we have reached a consensus to focus on creating an advanced and efficient Commodity Information System. The distribution of tasks among team members is carefully discussed and determined to ensure that everyone's contribution to the team is equal. We have completed the textual description of the Commodity Information System, providing a comprehensive overview of its objectives, features, and functionalities. In the meantime, we have created a github repository for shared code and a shared database using a cloud database. So far we are making steady progress with our project.

6.1.2 Group Plan

Over the next two weeks we will be implementing the system as we aim to do, gradually completing the basic code and testing and maintaining it at the same time.

6.2 Tiny Report2

6.2.1 Self-assessing

Over the past fortnight, significant strides have been made in the evolution of our avant-garde shopping information platform.

Our primary achievement pertains to the establishment of the foundational database system. This feat involved the construction of pertinent tables and the subsequent populating of these with preliminary data. This substantial development constitutes the core of our system, housing crucial information such as product specifics, user profiles, and transactional history, which are indispensable for a multitude of functionalities within our platform.

An additional critical juncture that we successfully navigated was the completion of the login interface along with the product display interface. The fruition of these interfaces represents a momentous advancement in our development trajectory. Users are now endowed with the capability to log into the system, and the platform has the capacity to efficaciously exhibit an array of products tailored to the user's selection.

Moreover, the implementation of rudimentary shopping functionalities has been initiated. In particular, post login, users can now elect to add desired products to their shopping cart. This feature embodies a vital component of the e-commerce experience, edging us closer to our objective of delivering an effortless and gratifying digital shopping journey for our users.

6.2.2 Group Plan

As we propel forward, we acknowledge that our endeavor is a work in progress. The ensuing phase of our project will primarily concentrate on the manifestation of the remaining functionalities. We aspire to augment the user experience by integrating features such as product filtration, search functionality, and wishlist formation.

Furthermore, we will address the requirements of our administrators by devising tools for management of product information, inventory, and updates. Concurrent to the addition of these new functionalities, we will dedicate efforts to refine the user interface design to ensure an intuitive and seamless experience for our users.

In addition, extensive testing will be undertaken to validate the solidity and reliability of our platform. This will encompass system checks for bugs, user experience evaluations, and stress testing to guarantee the system's capacity to endure the anticipated load.

While we express satisfaction with our progress hitherto, we comprehend the significance of sustaining our momentum. Notwithstanding the prospective challenges ahead, we remain steadfast in our commitment to delivering a comprehensive, user-friendly, and robust shopping information platform that caters to the needs of both users and administrators.