Full Stack Development 2025B

A. BACKGROUND

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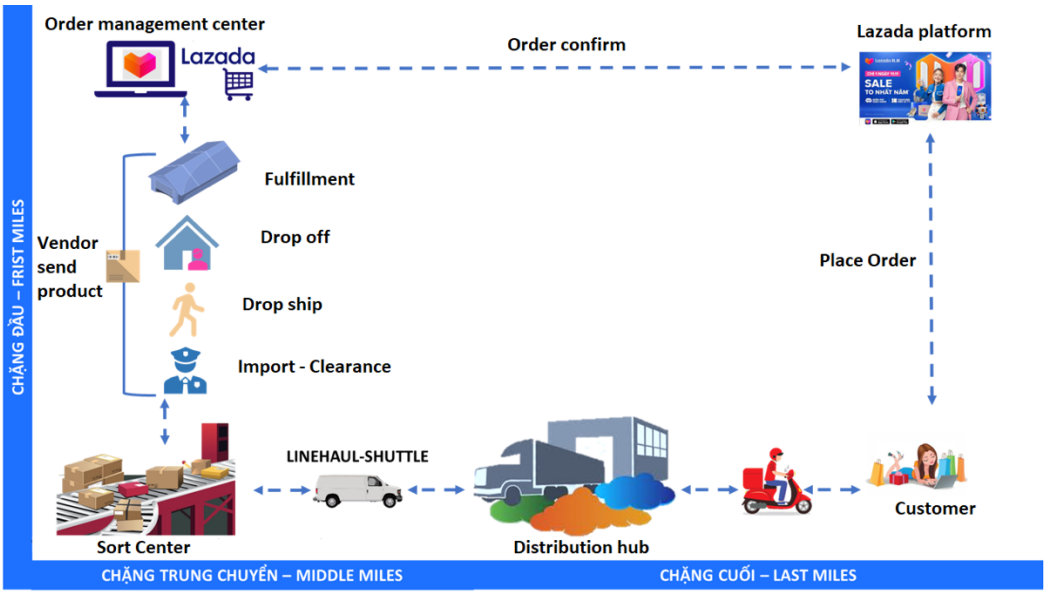
Founded in 2012, **Lazada Group** is Southeast Asia's leading e-commerce platform. Operating across six countries — Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam — Lazada connects this diverse region through its integrated technology, logistics, and payment systems. The platform hosts the largest selection of brands and sellers in the region. Since becoming the regional flagship of the **Alibaba Group** in 2016, Lazada has benefited from Alibaba's world-class technology infrastructure. By 2030, Lazada aims to serve **300 million customers**.

2. E-Commerce System

The diagram below outlines the main components of Lazada's e-commerce system.



For this project, and with Lazada's permission, you will build a **simplified and slightly modified** version of the system illustrated above.

Note: You are **NOT expected to build a Lazada clone**. Lazada is referenced to help you better understand the structure and functionality of a typical e-commerce platform. You are encouraged to use your **creativity** when designing your site. While you may choose to take inspiration from Lazada's look and feel, you are free to develop a completely different visual style and user experience for your own e-commerce website.

B. USER ROLES

There are three main user roles in this project:

- **Customer:** Buys products from vendors.
- **Vendor:** Sells products to customers.

- **Shipper:** Delivers products from distribution hubs to customers.

Each user account corresponds to a **single role**. If one person needs to play multiple roles, they must register separate accounts for each. Additionally, once an order is placed by a customer, the vendor's product is immediately transferred to a distribution hub for shipping.

Before using the platform, all users must register and log in. The following fields are required for each type of user:

- **Vendor:** Username, Password, Profile Picture, Business Name, and Business Address. The username field is unique across the whole system, while the business name and business address are unique among the vendor accounts only. That means two vendors cannot have the same business address, but a vendor's business address can be the same as a customer's address (described below). The profile picture is a file upload field. Assume the user only selects image files, so you do not need to validate its content.
- **Customer:** Username, Password, Profile Picture, Name, and Address. The username field is unique across the whole system. The profile picture is a file upload field. Assume the user only selects image files, so you do not need to validate its content.
- **Shipper:** Username, Password, Profile Picture, and an assigned Distribution Hub (described below). The username field is unique across the whole system. Furthermore, let's assume shippers can select a distribution hub when registering their accounts. The profile picture is a file upload field. Assume the user only selects image files, so you do not need to validate its content.

Distribution Hubs: Products are routed through distribution hubs before being delivered by shippers. Each hub has a unique name and address. For testing purposes, you must pre-create at least three distribution hubs, such as: “Ho Chi Minh”, “Da Nang”, “Hanoi”. These hubs must be shown in a dropdown select menu on the Shipper Registration Page.

The following constraints must be enforced on all registration forms:

- Username: Contains only letters (lower and upper case) and digits, has a length from 08 to 15 characters, unique.
- Password: Contains at least one upper case letter, at least one lower case letter, at least one digit, at least one special letter in the set !@#$%^&*, NO other kind of characters, has a length from 08 to 20 characters.
- Other fields are required and have a minimum length of 05 characters (except the profile picture, which is a file upload, and the shipper's distribution hub, which is a drop-down select).

- Except the uniqueness constraint, all other constraints must be validated at both the client side and the server side.

C. UI REQUIREMENTS

- The website must support the following device types:
  - Desktop: 1024 pixels or higher width.
  - Tablet: 768 to 1023 pixels width.
  - Smartphone: 767 pixels or lower width.
- The following sections are common on every page of the website:
  - Header: Contains a logo, the website name, and “My Account” or “Login” link depending on whether the current user has logged in or not.
  - Footer: Contains About, Copyright, Privacy, and Help Links.
  - Main: This section is positioned between Header and Footer. Its actual content changes from page to page.
- For static pages (e.g., About, Privacy, etc.): You can enter any meaningful information. You can copy from the Internet too, but you need to cite the source.
- The “View Products” page (see the D.4 section for more information) must be responsive as:
  - Desktop: Three-Column Layout.
  - Tablet: Two-Column Layout.
  - Smartphone: One-Column Layout.
- The responsiveness requirement applies to the section where you list the products only.

D. FUNCTIONAL REQUIREMENTS

1. Register Account

- Create three registration pages for the three roles mentioned above.
- Apply necessary validations as described.
- If registration is successful, the user information is stored on a MongoDB Atlas Database (Cloud Database). The passwords of users must be hashed before storing to ensure their confidentiality.
- To manage profile pictures or other images, you can store on the MongoDB Atlas DB using either BinData (binary data) or you can save image locally in the public folder and store the filenames of images in the database instead.

2. Login/Logout and My Account

- To log in, a correct combination of username and password is required.

- The My Account Page displays all information of the logged-in user, except the password. Note that a user must log in successfully before he/she can access this page. If a user has not logged in but entered the My Account Page URL directly into the browser address bar, that user will be redirected automatically to the Login Page.
- To validate hashed passwords, there are many npm packages to add that functionality! Please justify npm package selection in the report!
- On the My Account Page, the user can change her profile image to a new picture.
- On the My Account Page, there is a link to let the user log out of the system.

Note: My Account Page can be accessed by vendors, customers or shippers. The information or fields of My Account Page could be different for each user role as each of them have different information fields in their schema.

3. Vendor Pages

- For vendors, after logging in, there are two special pages: “View My Products” and “Add New Products”.
- View My Products: The vendor can see all products she has added so far.
- Add New Products: Allow vendors to add one new product at a time. A product includes name (text, has a length from 10 to 20), price (positive number), image (image file - no validation needed), and description (text, at most 500 characters).

4. Customer Pages

- For customers, after logging in, they can see all products offered by vendors. The customer can enter a minimum and maximum price to filter the unwanted products. Furthermore, the customer can also search for products based on their names. The filtering and searching can be done on the server side and only the matching products are displayed.
- Customers can click on a specific product to view its details. On this product detail page, customers can click “Add to shopping cart” to add the current product to the shopping cart. Customers can remove products from their shopping cart.
- When customers are happy with their choices, they can click on an “Order” link to order all products in the shopping cart. The shopping cart is now empty and an active order is created at one of the distribution hubs (you can choose any distribution hub randomly to send the order to).

5. Shipper Pages

- For shippers, after logging in, they can see all active orders sent to the distribution hub they are assigned to at registration time. When clicking on a particular order, the shipper can see all details of the order, including the products in that order, the total price, the address of the receiver (i.e., the customer who ordered), etc. The shipper

can update the status of the order from “active” to either “delivered” or “canceled”. If an order is not “active”, it is not shown on the shipper page anymore.

Note: To keep the website simple, assume there is no status “delivering” as it takes zero time to deliver a order, so if a shipper decide to deliver that active order then the status will be changed to delivered right away.

E. COMMENT

- You should put some useful comment in your code.
- Besides, every source code file must have the following header at the top of the file:

```
# RMIT University Vietnam
# Course: COSC2769 - Full Stack Development
# Semester: 2025B
# Assessment: Assignment 02
# Author: Your Names (e.g. Nguyen Van Minh)
# ID: Your Student ID (e.g. 1234567)
```

F. LIBRARIES, MODULES, AND FRAMEWORKS

- Front-End: CSS Frameworks, External Fonts and Icons.
- Front-End Packages: @reduxjs/toolkit, react-dom, react-router-dom, react-redux, react.
- Back-End: NodeJS and Express, Middleware Modules from Express Middleware Resources (https://expressjs.com/en/resources/middleware.html), Session Stores based on MongoDB or MySQL from Express Session Stores (https://expressjs.com/id/resources/middleware/session.html).
- Database & ORM:
  - mysql, sequelize.
  - pg, sequelize.
  - mongodb, mongoose.
- Security & Environment Configuration:
  - bcrypt (for password hashing).
  - dotenv (for managing environment variables).

Note 2: You can use tools or libraries not listed here for evaluation purposes (e.g., testing, usability testing, etc.).