# Real-Life Assessment (RLA) E-Commerce & Dashboard Web Application

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Table of Contents

[Real-Life Assessment (RLA) E-Commerce & Dashboard Web Application 1](#_Toc221399641)

[1. Introduction 3](#_Toc221399642)

[2. Real-Life Context and Problem Statement 3](#_Toc221399643)

[3. Project Objectives 3](#_Toc221399644)

[4. Integrative Learning Approach 3](#_Toc221399645)

[5. Team Organization and Collaboration 3](#_Toc221399646)

[6. Client Interview and Requirement Analysis 4](#_Toc221399647)

[7. Data Source and Database Design 4](#_Toc221399648)

[8. System Architecture 5](#_Toc221399649)

[9. Backend Development (Flask) 5](#_Toc221399650)

[10. Frontend Development 5](#_Toc221399651)

[11. Frontend–Backend Connection 5](#_Toc221399652)

[12. Map Feature Integration 5](#_Toc221399653)

[13. Shop and Add to Cart 5](#_Toc221399654)

[14. Email Subscription Feature 7](#_Toc221399655)

[15.Login and Registration 7](#_Toc221399656)

[16. Obstacles and Challenges Faced 8](#_Toc221399657)

[17. Conclusion 8](#_Toc221399658)

## 1. Introduction

This Real-Life Assessment (RLA) project focuses on solving a real-world problem faced by a merchant selling artisanal cosmetic products. The merchant is overwhelmed by large volumes of data related to sales, inventory, and customer interactions. The goal of this project is to design and develop a professional web-based solution that provides online visibility while also supporting informed decision-making through data exploitation.

## 2. Real-Life Context and Problem Statement

The client is the owner of an Indian cosmetic brand who wishes to expand their market reach. Currently, product data, inventory, and customer information are scattered and difficult to analyze. The lack of an online platform limits growth opportunities and makes decision-making inefficient.

## 3. Project Objectives

The objectives of this project are:  
- To build a functional e-commerce website for online presence.  
- To develop a Python-based backend using Flask.  
- To store and manage data using a MySQL database.  
- To display available cosmetic products dynamically.  
- To create a dashboard-like structure for activity tracking.  
- To interact with the client to gather and refine requirements.  
- To implement additional features such as maps and email subscriptions.

## 4. Integrative Learning Approach

This RLA integrates knowledge from multiple courses including programming, databases, web development, and communication skills. Students apply theoretical concepts to a professional scenario, simulating real engineering tasks such as requirement analysis, system design, and implementation.

## 5. Team Organization and Collaboration

The project was completed by a team of three members. Tasks were distributed among backend development, frontend design, and database management. Regular internal meetings and discussions helped in reaching the goal.

Each of us was assigned a specific role

Abdullah Salman: Worked on backend and make sure that frontend is connected to backend and everything is working real time instead of static. Used the EmailJS library for subscription thing.

Muhammad Saim: Worked on dashboard and other features on website like map, website design.

Divine: Divine was responsible for layout and frontend. She designed the frontend and basic layout.

We worked together on many other things like use of flask , dash.

## 6. Client Interview and Requirement Analysis

A simulated client interview was conducted using the Gemini Live feature. The client expressed the need for a clean, professional website that highlights products, tracks store activity, and remains easy to use. The interview helped define priorities such as simplicity, usability, and scalability.

Details of client interview are shared in ClientInterview Documentation.

## 7. Data Source and Database Design

The dataset used for this project is the 'E-commerce Cosmetic Products' dataset from Kaggle. This data was cleaned and stored in a MySQL database. Tables were designed to store product details, pricing, inventory status, and subscription data.

First of all we transferred all the data to dummy table. After that we create different tables like categories, products, users, subcategories. This really helped us in working with database.

We fetched data on our website by using SQL queries and join the tables.

A screenshot of a computer

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## 8. System Architecture

The application follows a client-server architecture. The frontend communicates with the Flask backend through HTTP requests. Flask handles business logic and database operations, while MySQL ensures persistent data storage.

## 9. Backend Development (Flask)

The backend was developed using Flask due to its lightweight and modular nature. Flask routes handle product retrieval, database queries, and data processing. The backend acts as a bridge between the frontend interface and the MySQL database.

## 10. Frontend Development

The frontend was built using HTML, CSS, and JavaScript. It provides a user-friendly interface to browse products and interact with features such as maps and email subscriptions. Flask templates are used to dynamically render content.

## 11. Frontend–Backend Connection

The connection between frontend and backend is achieved using Flask routing and templating. Data fetched from MySQL is passed from Flask to HTML templates. JavaScript is used to enhance interactivity and handle asynchronous operations where needed.

## 12. Map Feature Integration

A map feature was added to enhance real-world usability. It allows customers to view store locations or service areas. This improves customer trust and provides geographical context to the business.

A map of a city

AI-generated content may be incorrect.

## 13. Shop and Add to Cart

In shop page we displayed all the items along with their names and price. We couldn’t display the pictures because items list was too long. If the items were less we would have attached the pics as well. Other than that when you click on BUY button under the object it will take you to the website whose link is shared with each object in database. If you click on Add to cart it will be added to the cart only if you are login. If you aren’t login it will ask you to first login and then add to cart.

On shop page we also added some of the filters like categories and price range.

A screenshot of a computer

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A screenshot of a computer screen

AI-generated content may be incorrect.

## 14. Email Subscription Feature

An email subscription feature was implemented using EmailJS. Customers can subscribe to receive updates, promotions, or announcements. This feature helps the merchant maintain engagement without managing a dedicated mail server.

A collage of a person with brown hair

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## 15.Login and Registration

We also implemented login/registration in our website. It helped us to store user’s data and its ADD\_TO\_CART things. When user logins with his account again all his ADD\_TO\_CART items come back. We did this by making separate tables for users and ADD\_TO\_CART items.

When user registers we also store the password but we keep it confidential. User’s password is hashed using bcrypt so that we don’t see the password.

A screenshot of a child

AI-generated content may be incorrect.

## 16. Obstacles and Challenges Faced

Several challenges were encountered during the project:  
  
- Understanding and cleaning the Kaggle dataset.  
- Designing an efficient MySQL schema.  
- Connecting Flask with MySQL and debugging connection issues.  
- Ensuring smooth data flow between frontend and backend.  
- Integrating third-party services such as maps and EmailJS.

It was the first time that we connected the backend with the frontend. In the beginning it felt really difficult because of the flask thing. After going through several youtube tutorials and documentations we finally got through it. Now we know how the website actually work. How the requests between frontend and backend are carried out.  
  
Overcoming these challenges strengthened technical and problem-solving skills.

## 17. Conclusion

This RLA project successfully delivers a complete web-based solution for a real client scenario. The application not only provides an online presence for the merchant but also supports data-driven decision-making. The project reflects readiness for professional software development.

This project really helped us in understanding cores of web development. By this project we also got the opportunity to showcase our creativity. Now heading towards next semester with the hope of seeing something great like this.