Software Requirement and Design Report

MODULE: Team Project (CS2TP)

TEAM 65

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Abstract (Alex-Gabriel Micu, 240102469)

This report introduces NOVA, a luxury perfume e-commerce platform developed by Team 65 for the CS2TP module. The platform combines elegant branding with modern web technologies to deliver a secure, user-friendly shopping experience. The development process followed an Agile methodology, utilising Trello for task management and GitHub for version control This report details the team roles, objectives, target audience, functional and non-functional system requirements, and UML-based and textual use cases illustrating customer and administrator interactions. The prototype simulates key retail functions such as product browsing, account management, and checkout. The report presents NOVA's design and technical foundation for further development in Teaching Period 2.

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Section 1: Team Information

1.1 Team Identification (Alex-Gabriel Micu, 240102469)

Team 65 consists of eight members collaborating on the NOVA project, a luxury perfume brand and e-commerce platform developed for the CS2TP Team Project module. The team combines expertise in front-end design, back-end development, and project management to ensure balanced contributions across all technical and creative aspects.

1.2 Individual Roles and Responsibilities

1.2.1 Alex-Gabriel Micu (Team Leader / Branding Lead & Report Coordinator)

Alex leads the team by managing communication, task allocation, and progress across all sub-groups. He assigns roles based on each member's strengths to ensure balanced collaboration. Alex oversees the NOVA brand identity, including the logo, colour palette, and font style, while contributing to front-end development and report coordination. His role was assigned based on his leadership, design, and organisational skills.

1.2.2 Amirah Begum (UI/UX Engineer / Front-End Quality Assurance Engineer)

Amirah develops responsive, user-friendly interfaces and ensures consistent layout and accessibility through testing and debugging. She collaborates with Shreya (UI/UX Designer) to maintain high design and usability standards while assisting in front-end quality assurance. Her role was assigned based on her attention to detail and commitment to user experience.

1.2.3 Shreya Manojbhai Kathiria (UI/UX Designer / Front-End Developer)

Shreya designs webpage layouts and navigation using wireframes and prototypes, translating them into functional HTML, CSS, and PHP code. She works with front-end developers to ensure accurate, consistent designs aligned with NOVA's identity. Her role was assigned based on her creativity and design expertise.

1.2.4 Ashish Mepani (Front-End Integration Engineer / Report Contributor)

Ashish integrates front-end components with back-end systems to enable smooth data flow and user interaction. He ensures efficient PHP database communication and contributes to the report by documenting integration processes. His role was assigned based on his technical proficiency and communication skills.

1.2.5 Malaika Ahmed (Database Engineer / Branding and Report Contributor)

Malaika designs and manages the MySQL database via phpMyAdmin, defining structures and maintaining data integrity. She collaborates with back-end developers to optimise data handling and supports branding and report documentation. Her role was assigned based on her SQL expertise and structured data approach.

1.2.6 Fuad Shaka (System Integration Engineer / Back-End Developer)

Fuad develops and integrates PHP functionalities linking the front-end with the database to ensure secure, efficient data transactions. He implements validation techniques and works with Robel (Security Engineer) to test and optimise performance. His role was assigned based on his analytical and problem-solving skills.

1.2.7 Robel Gashu (GitHub Repository Manager / Security Engineer)

Robel manages the GitHub repository, overseeing version control, branching, and code reviews. He enforces secure PHP coding standards to protect user data and works with Fuad (Integration Engineer) on testing and optimisation. His role was assigned based on his technical leadership and security expertise.

1.2.8 Oliver Thorpe (Database Validation Engineer / Quality Assurance Tester)

Oliver collaborates with Malaika (Database Engineer) to validate SQL queries and ensure accurate data handling. He tests PHP–MySQL interactions and performs quality checks before deployment to ensure system reliability. His role was assigned based on his precision and attention to detail.

1.3 Statement of Contribution

All members of Team 65 contributed to NOVA's design, development, and documentation. Tasks were assigned by expertise and tracked on Trello, with version control managed through GitHub. Regular meetings and continuous communication ensured effective collaboration and steady progress throughout Teaching Period 1.

Section 2: Project title and brief description

2.1 Project Overview (Alex-Gabriel Micu, 240102469)

The NOVA project, developed by Team 65 for the CS2TP Team Project module, is a luxury perfume brand with an e-commerce platform combining elegance, individuality, and technology. The site allows users to explore fragrances, view details, and make secure purchases through an intuitive interface. It offers a seamless experience reflecting NOVA's identity through refined design and efficient data management (Marcus, Rosenzweig and Soares, 2023), simulating a real-world retail environment with browsing and purchasing features.

2.2 Project Objectives and Scope

The primary objective of the NOVA project is to design and develop a functional e-commerce prototype that reflects a luxury perfume brand's identity. The platform blends visual elegance with reliable functionality to deliver a high-quality user experience. Its scope includes developing the front-end, designing the database, and integrating key interactions such as browsing, searching, and simulated purchasing, excluding large-scale hosting and external payment processing.

Objective	Description
Front-End Design	To design and implement an engaging and brand-consistent front-end interface.
Back-End Infrastructure	To establish a secure back-end infrastructure for managing products, user accounts, and transactions.
Accessibility & Responsiveness	To ensure the system maintains accessibility, responsiveness, and usability across all devices.

Table 1. The primary objectives of the NOVA project define the key goals guiding the e-commerce platform's development, focusing on front-end design, back-end functionality, accessibility and responsiveness.

2.3 Target Audience

The NOVA platform is designed to appeal to consumers who value individuality, elegance, and luxury in their fragrance selection. The primary audience includes adults aged 18 to 40 interested in premium lifestyle products and the convenience of online shopping. The platform also appeals to users seeking visually engaging and informative digital experiences when discovering new scents. NOVA's design and accessible interface ensure intuitive and efficient navigation, browsing, and purchasing for both new and returning users.

2.4 Development Technologies

The NOVA platform utilises both front-end and back-end technologies selected for their suitability, maintainability, and ease of deployment. The front-end employs HTML for a stable, universally supported structure and CSS for consistent branding and responsive design across devices (W3C, 2023). JavaScript enhances interactivity and user experience through dynamic updates such as form validation and real-time feedback.

The back-end is implemented using PHP, chosen for its compatibility with the hosting environment and efficient integration with relational databases. It supports secure data handling and easy maintenance through modular scripts (Pressman and Maxim, 2020). The MySQL database provides scalability and reliability for structured data, managed via phpMyAdmin for tasks such as table creation, query testing, and data validation.

For collaboration, GitHub manages version control through commits and branching, while Trello supports Agile task management by tracking sprints, responsibilities, and deliverables visually (Ambler and Lines, 2012). Collectively, these technologies ensure performance, accessibility, and alignment with the team's skills and project goals.

Section 3: Functional Requirements

3.1 System Functionality Overview (Malaika Ahmed, 240134699)

Requirement	Description
User Registration and Authentication	The system must allow customers to register, log in, and log out securely. Credentials will be validated and stored using encrypted passwords for data protection.
Product Catalogue and Search	The system must display a perfume catalogue, enabling users to browse, search, and filter by criteria such as price or scent type. Search results must be accurate and retrieved from the database.
Shopping Cart and Checkout	The system must allow users to manage items in their cart and complete a simulated checkout. Order details will be stored securely, and users will receive a confirmation message.
Product Discovery and Personalisation	The system must generate dynamic product recommendations based on user browsing or search history to enhance engagement and personalisation.
Product and Content Management (Administrator)	Administrators must be able to add, edit, or delete products and update homepage promotions via an admin panel.
Order Tracking and Customer Activity Management (Administrator)	The system must record all orders and allow administrators to view, update, and manage order statuses through the admin interface.

Table 2. Functional requirements of the NOVA e-commerce platform, outlining the essential customer and administrator features that define the system's core operations and support its overall objectives.

3.2 Functional Requirements Summary

These functional requirements define the key actions available to customers and administrators within the NOVA system (Rebrova, 2024). They ensure secure authentication, efficient order processing, and advanced features such as personalisation and content management (Marcus, Rosenzweig and Soares, 2023).

Section 4: Non-Functional Requirements

4.1 System Quality Characteristics (Malaika Ahmed, 240134699)

Requirement	Description
Usability	The platform must maintain a visually appealing and intuitive interface, ensuring that all users are able to navigate and interact with system features without requiring prior technical knowledge.
Performance and Responsiveness	The system must load all pages, including the product catalogue and checkout, within three seconds under standard network conditions to deliver a smooth browsing experience.
Security and Data Protection	All user credentials and data must be encrypted and protected through PHP validation and secure session management. Only administrators can access the dashboard and modify stored data.
Accessibility and Compatibility	The platform must function consistently across major browsers (Chrome, Edge, Firefox, Safari) and remain accessible on both desktop and tablet devices. Text size and colour contrast must meet accessibility guidelines.
Maintainability and Scalability	The website codebase must follow modular, well-documented structures in both PHP and CSS, allowing future developers to expand product ranges and implement new features.
Branding and Consistency	All visual elements, including typography, colour palette, and logo placement, must align with NOVA's brand identity, ensuring a consistent and professional appearance across all pages.

Table 3. Non-functional requirements of the NOVA e-commerce platform, outlining the quality attributes that ensure usability, performance, security, accessibility, and visual consistency across the system.

4.2 Non-Functional Requirements Summary

The outlined non-functional requirements define the quality standards by which the NOVA system performs, appears, and scales over time (Rebrova, 2024). They are designed to ensure that the platform maintains high levels of usability, security, and consistency while remaining aligned with the brand’s identity and technical objectives (Nielsen, 2012; Krug, 2014).

Section 5: Textual Use Cases

5.1 Customer Use Cases (Ashish Mepani, 240364872)

5.1.1 Customer Interactions Use Case

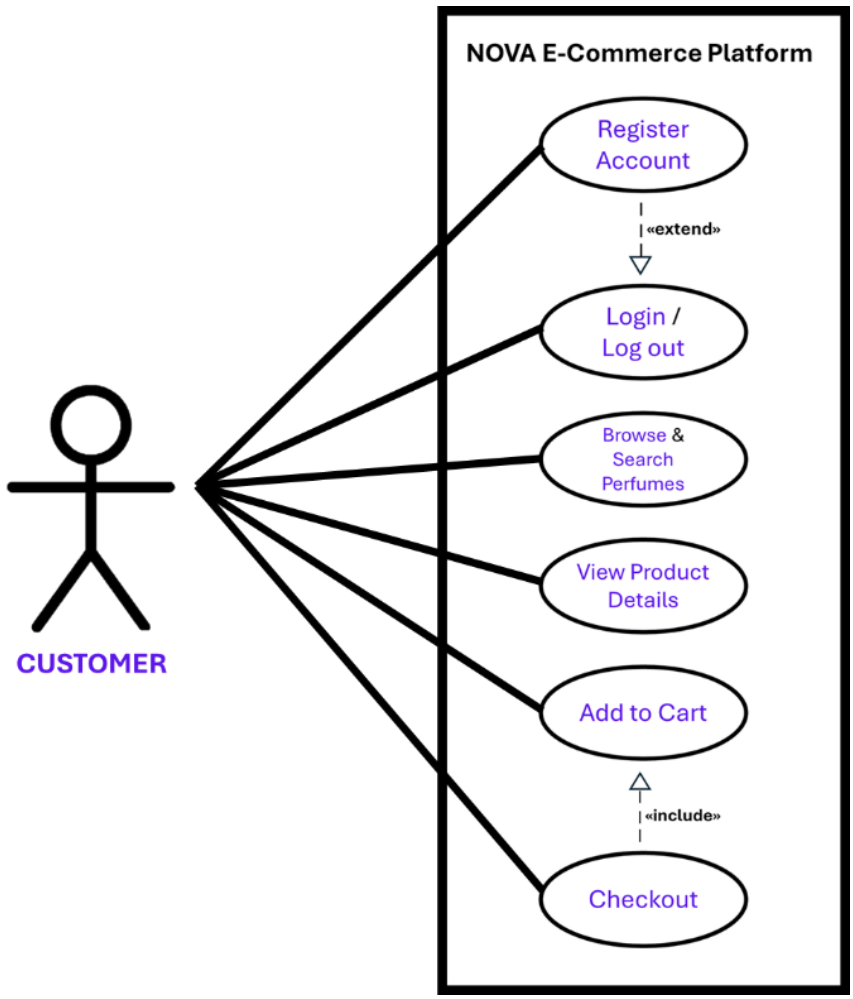

Figure 1. The interaction of a customer with the NOVA e-commerce platform, showing actions that include, account registration, browsing, viewing product details, and completing purchases through checkout.

5.1.2 Use Case C1: Account Management

Brief Description	This use case describes how a customer creates, logs into, or logs out of a NOVA account to access personalised features and manage their shopping activity.
Actor(s)	Customer (new or registered)
Main success scenarios	
Basic Flow	
1. User opens the registration or login page. 2. Enters full name, email, and password. 3. System validates inputs, creates an account, or authenticates credentials. 4. Upon login, the homepage is displayed with user options. 5. User selects “Log Out” to end the session.	
Alternate Flows	
Title	**Description**
Invalid Credentials	On registration, if email exists, system shows error and suggests login or password reset. On login, if email/password invalid, system shows error and invites retry or reset.
Pre-Conditions	
Title	**Description**
Active Website and Services	The NOVA website and authentication services are online and connected to the database.
Post-Conditions	
Title	**Description**
Account or Session Updated	A new account is created and stored, or an existing session is securely initiated or closed.

Figure 2. Use case template for Account Management, outlining the steps and alternate flow for customer registration and authentication.

5.1.3 Use Case C2: Browse and View Products

Brief Description	Customer browses perfumes in the NOVA catalogue, applies filters, and views details for selected products.
Actor(s)	Customer (new or registered)
Main success scenarios	
Basic Flow	
1. User opens the products page. 2. Applies filters or enters search terms. 3. System displays matching perfumes with names, images, and prices. 4. User selects a product to view full details, including description, stock, and variants. 5. User selects a preferred variant or size.	
Alternate Flows	
Title	**Description**
No Products Found	If no items match the search, the system displays a message "No perfumes found" and allows a new search.
Pre-Conditions	
Title	**Description**
Catalogue Available	Product data exists in the database and is accessible through the front-end interface.
Post-Conditions	
Title	**Description**
Product Information Displayed	The system successfully retrieves and presents relevant perfume details.

Figure 3. Use case template for Browse and View Products, describing customer actions for searching and viewing perfume details.

5.1.4 Use Case C3: Add to Cart and Checkout

Brief Description **Actor(s)**	Registered customer adds perfumes to the shopping cart and completes a simulated checkout with order confirmation. Registered customer
Main success scenarios	
Basic Flow	
1. User adds items to the cart. 2. Reviews the order on the checkout page. 3. Enters delivery details and completes payment. 4. System validates, saves the order, and clears the cart. 5. Confirmation message is displayed.	
Alternate Flows	
Title	**Description**
Payment Failed	If payment validation fails, the system displays an error and offers retry or cancellation options.
Pre-Conditions	
Title	**Description**
Authenticated User	Customer is logged in and has at least one product added to the cart.
Post-Conditions	
Title	**Description**
Order Recorded	Order details are saved in the database, and the user receives a confirmation message.

Figure 4. Use case template for Add to Cart and Checkout, detailing the customer process for completing simulated purchases.

5.2 Administrator Use Cases

5.2.1 Administrator Interactions Use Case

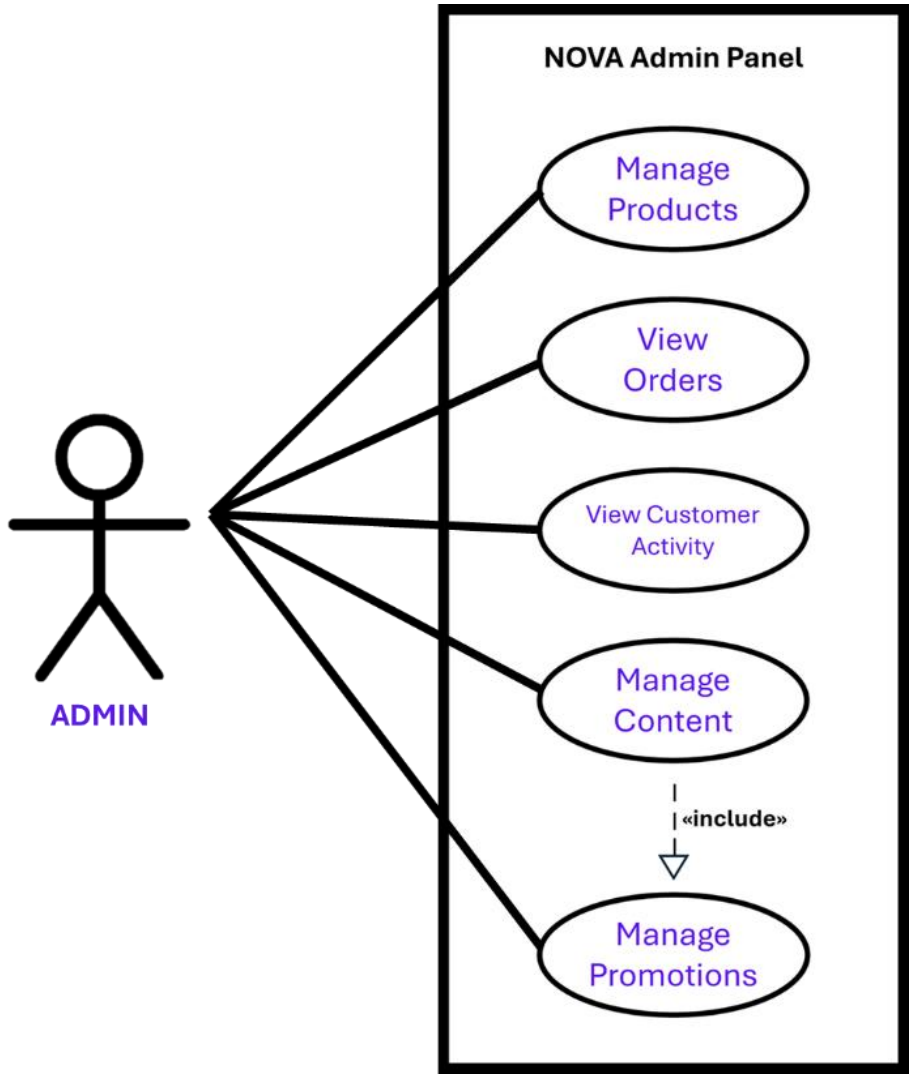

Figure 5. The interaction of an administrator with the NOVA Admin Panel showing actions that include, managing products, reviewing orders, and updating promotional content.

5.2.2 Use Case A1: Manage Products (Add / Edit / Delete)

Brief Description **Actor(s)**	Administrator adds, edits, or deletes perfume listings to maintain an up-to-date catalogue. Administrator
Main success scenarios	
Basic Flow	
1. Admin accesses the product dashboard. 2. Creates or edits product details such as name, price, or image. 3. System validates input and saves updates. 4. Updated products appear in the catalogue.	
Alternate Flows	
Title	**Description**
Invalid Input	If product details are missing or incorrect, the system displays an error message until corrected.
Pre-Conditions	
Title	**Description**
Admin Access Granted	Administrator is logged in with permission to modify product data.
Post-Conditions	
Title	**Description**
Product Database Updated	Product records are successfully added, edited, or deleted.

Figure 6. Use case template for Manage Products, describing administrator functions for adding, editing, and deleting product listings.

5.2.3 Use Case A2: Manage Orders and Content

Brief Description	Administrator reviews customer orders and updates homepage content such as banners or featured products.
Actor(s)	Administrator
Main success scenarios	
Basic Flow	
1. Admin navigates to the "Orders and Content" section. 2. Reviews customer orders and updates order statuses. 3. Edits homepage banners or promotional content. 4. System validates and saves all changes.	
Alternate Flows	
Title	**Description**
No Orders Available	If there are no existing orders, the system displays a message and allows the admin to update content only.
Pre-Conditions	
Title	**Description**
Admin Logged In	The administrator is authenticated and has access to manage orders and content.
Post-Conditions	
Title	**Description**
Data Updated	Orders and promotional content are saved and reflected on the website.

Figure 7. Use case template for Manage Orders and Content, showing administrative interactions for updating orders and homepage promotions.

5.3 Summary

The use cases above outline the core functional behaviour of the NOVA system from both customer and administrator perspectives. Figures 1 and 2 present UML diagrams illustrating each actor’s interactions with the platform. Together, these define NOVA’s functional requirements, forming a strong foundation for implementation in Teaching Period 2.

Section 6: Project Management

6.1 Software Engineering Process (Alex-Gabriel Micu, 240102469)

The NOVA project uses an Agile, sprint-based methodology promoting collaboration and iterative development (Ambler and Lines, 2012). Each sprint involves planning, implementation, and review to align design and functionality. This approach was chosen for its flexibility, communication focus, and incremental delivery (Pressman and Maxim, 2020). Front-end, back-end, and database tasks run simultaneously, with progress tracked on Trello and weekly meetings maintaining accountability.

6.2 Version Control (GitHub)

Version control for the NOVA project is managed through GitHub. Code is committed to individual feature branches before being merged into the protected main branch. Each pull request undergoes peer review to maintain code quality and security (Loeliger and McCullough, 2012). GitHub Issues are linked to Trello cards, ensuring traceability between development tasks and user stories.

GitHub Repository: https://github.com/CS2TP-Team-65-NOVA/NOVA_E-Commerce_Platform

6.3 Task and Project Tracking (Trello)

Project planning and coordination for NOVA are managed through Trello, where each card lists assigned members, tasks, and deadlines to ensure progress tracking (Loeliger and McCullough, 2012). Trello also stores key design materials, including wireframes, sitemap, use case diagrams, and database schema, collectively documenting the project's planning and design process.

Trello Board: https://trello.com/b/7CddvAjM

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