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# EXCLUSIVE BOOKS ONLINE BOOKSTORE

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OSD522 – Online Systems Development



FEBRUARY 10, 2025

NADINE NAUDE  
20230395

# Table of Contents

Table of Contents .....	1
1. Project Plan & Requirements .....	3
1.1 Client Brief Analysis.....	3
1.2 Requirements Specification .....	3
Functional Requirements .....	3
Non-Functional Requirements .....	3
Constraints .....	4
1.3 Project Plan & Schedule .....	4
1.4 Risk Assessment & Mitigation.....	5
2. Database Design Documentation .....	6
2.1 ERD (Entity-Relationship Diagram).....	6
Relationships:.....	6
Diagram (ERD):.....	6
2.2 Normalisation.....	6
1NF (First Normal Form) .....	6
2NF (Second Normal Form).....	7
3NF (Third Normal Form).....	7
2.3 SQL Scripts.....	7
Sample inserts.....	8
2.4 Explanation.....	8
3. Application & Website Design.....	9
3.1 Wireframes.....	9
Login/Signup page.....	9
Home page with book categories .....	10
Book detail page.....	10
Shopping cart .....	11
Admin dashboard.....	11
3.2 UI Design Specifications .....	12
Colours .....	12
Fonts & typography.....	13
Layout principles .....	14

3.3 Prototypes.....	15
3.4 Integrated Website Evidence .....	19
4. Application Code & Functional Components.....	24
4.1 PHP Code Documentation.....	24
4.2 SQL Queries.....	26
4.3 MySQL Database .....	27
Evidence: .....	27
Relation view - foreign keys. ....	29
5. Testing & Quality Assurance.....	30
5.1 Test Plan .....	30
5.2 Test Outcomes.....	31
5.3 Bug Report .....	33
5.4 Quality Assurance Report .....	34
6. System Documentation & Manuals .....	35
6.1 Technical Documentation.....	35
Architecture Overview .....	35
6.2 User Manual – Customer .....	36
Steps for Customers .....	36
6.3 User Manual – Admin .....	39
Steps for Admins .....	39
6.4 Training Materials .....	41
Quick Start Guide .....	41
7. Deployment.....	42
7.1 Deployment Documentation .....	42
Installing on XAMPP .....	42
7.2 Hosting/Live Deployment .....	44
8. Final Documentation & Presentation.....	45
8.1 Compiled PDF Portfolio .....	45
8.2 Presentation Slides.....	46
8.3 Lecturer feedback .....	51
9. References.....	52

## 1. Project Plan & Requirements

### 1.1 Client Brief Analysis

Exclusive Books is a well-known South African bookstore with a history that goes back to 1951. They are respected for carefully choosing what books they sell and for encouraging people to read more. Their main goal is to give people easy access to a wide range of books and to create a love for reading.

Right now, Exclusive Books is very strong with their physical shops, but they want to grow into the digital world by offering an online bookstore. This will allow them to reach people who prefer to shop online, especially younger, tech-savvy readers living in cities.

The online bookstore needs to provide customers with the same trust, variety, and quality they get in-store, but in a convenient, user-friendly online platform.

### 1.2 Requirements Specification

#### **Functional Requirements**

User Accounts: Customers can register, log in, update their profiles, and manage their personal information.

Book Catalogue: A database of books that can be searched and filtered by category, author, or keywords. Each book must have a description, price, and image.

Shopping Cart: Customers can add and remove books, view their cart, and see the total before checkout.

Secure Checkout & Orders: Customers can place orders safely, and their order details must be stored.

Admin Dashboard: Admin users can log in to manage the catalogue (add, edit, delete books), manage users, and view or update orders.

Responsive Design: The system must work on both computers and mobile devices.

#### **Non-Functional Requirements**

Security: Protect customer data by using secure login, hashed passwords, and preventing SQL injection.

Performance: Pages should load quickly and handle multiple users at once.

Scalability: The system should allow for more books, more users, and future growth without major redesign.

Reliability: The system must work consistently without errors or downtime.

Usability: The design should be clean and easy to use so customers can shop without confusion.

## **Constraints**

Time: The project must be completed within 4 weeks.

Tools: PHP, MySQL, XAMPP, Notepad++/VS Code, and Adobe Creative Suite.

Resources: Limited to one developer team (student).

Budget: No external costs since free tools and localhost deployment will be used.

## 1.3 Project Plan & Schedule

### **Week 1 (Phase 1 – Analysis & Planning)**

Analyse Exclusive Books' needs.

Research e-commerce and bookstore platforms.

Write requirements specification.

Create a risk assessment and draft a project timeline.

### **Week 2 (Phase 2 – Design)**

Design the database (ERD + schema).

Create wireframes for all pages (Home, Catalogue, Cart, Admin, etc.).

Finalise UI specifications (colours, fonts, branding).

### **Week 3 (Phase 3 – Development)**

Build PHP/MySQL system.

Implement user accounts, catalogue, and shopping cart.

Build admin dashboard.

Apply responsive design and Exclusive Books branding.

**Week 4 (Phase 4 – Testing & Phase 5 – Finalisation)**

Test functionality with test cases (login, checkout, admin management).

Debug and fix errors.

Prepare user manuals and technical documentation.

Deploy project on XAMPP and create final PDF report.

Prepare and present final presentation.

## 1.4 Risk Assessment & Mitigation

Risk	Impact	Likelihood	Mitigation Strategy
Database errors (incorrect design or queries fail)	High – can break entire system	Medium	Test database early, normalise tables to 3NF, run queries step-by-step
Time delays	High – may affect final submission	High	Stick to schedule, set small milestones weekly, avoid scope creep
Security breaches (SQL injection, weak passwords)	High – risk of data loss	Medium	Use prepared statements, password hashing (bcrypt/MD5), input validation
Bugs in code (login failures, cart not updating)	Medium	High	Regular testing after each new feature, maintain bug log
Poor user experience (hard navigation, unclear design)	Medium	Medium	Follow UX best practices, use clear layouts and Exclusive Books branding
Deployment issues	Medium	Low	Document all deployment steps, test deployment on XAMPP before final submission

## 2. Database Design Documentation

### 2.1 ERD (Entity-Relationship Diagram)

#### Relationships:

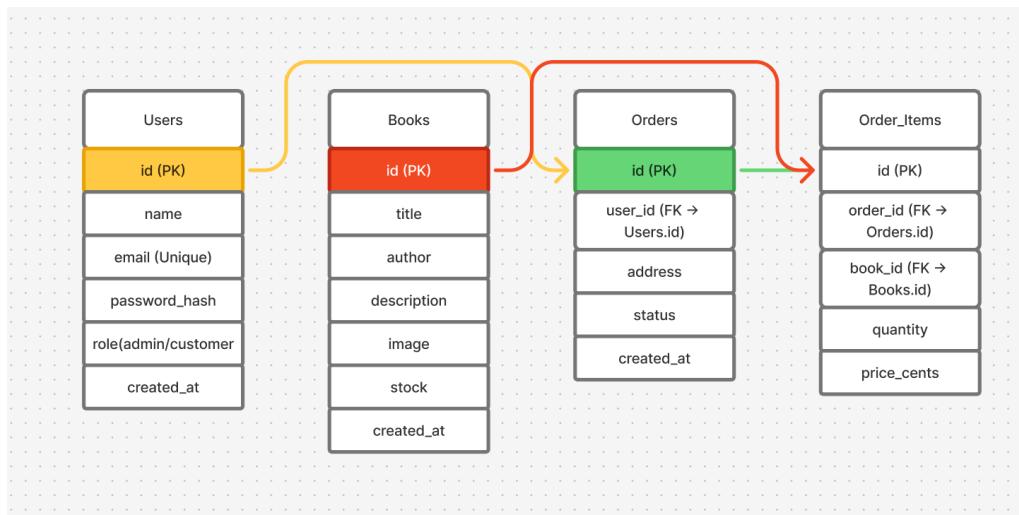
One User can place many Orders.

One Order can have many Order\_Items.

Each Order\_Item is linked to exactly one Book.

Admins are stored in the same Users table, but marked with role = "admin".

#### Diagram (ERD):



### 2.2 Normalisation

#### 1NF (First Normal Form)

All tables have unique rows and atomic values.

Example: Instead of storing multiple books in one order row like book1, book2, we created a separate Order\_Items table where each row = one book per order.

This prevents repeating groups and makes data more structured.

## 2NF (Second Normal Form)

Remove partial dependencies (where non-key columns depend only on part of a composite key).

Example: In Order\_Items, the quantity and price\_cents depend on both order\_id + book\_id, not on just one. This is valid 2NF.

Ensures that order details are properly tied to both the order and the book.

## 3NF (Third Normal Form)

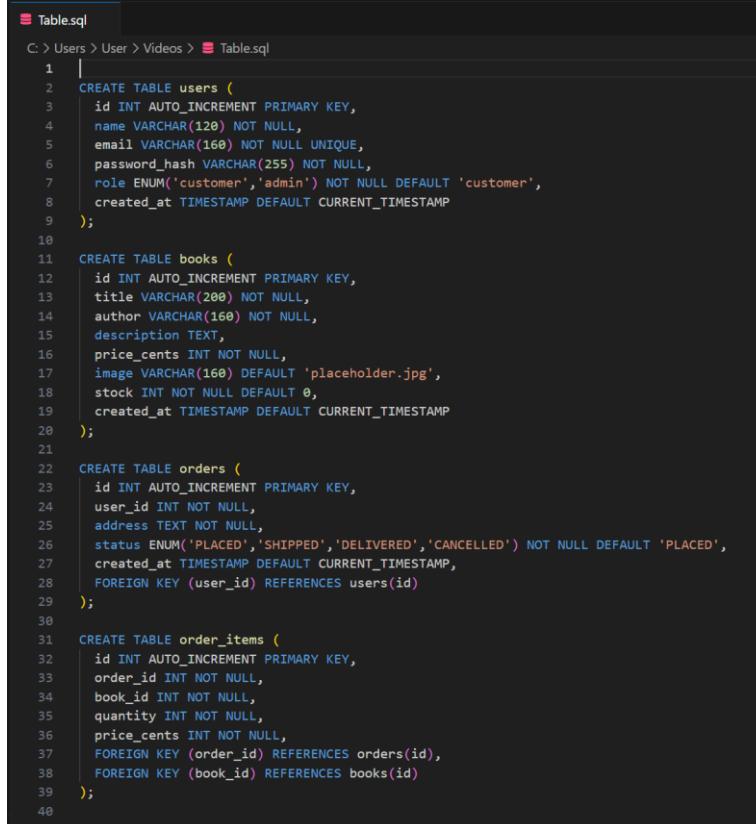
Remove transitive dependencies (non-key attributes depending on other non-key attributes).

Example: In Users, the role describes the user type. Nothing else in the table depends on role, so no transitive dependency.

In Books, price\_cents and stock depend only on the book id, not on anything else.

This means every non-key field depends only on the primary key, ensuring clean design.

## 2.3 SQL Scripts



```
Table.sql
C: > Users > User > Videos > Table.sql
1 |
2 CREATE TABLE users (
3     id INT AUTO_INCREMENT PRIMARY KEY,
4     name VARCHAR(120) NOT NULL,
5     email VARCHAR(160) NOT NULL UNIQUE,
6     password_hash VARCHAR(255) NOT NULL,
7     role ENUM('customer', 'admin') NOT NULL DEFAULT 'customer',
8     created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
9 );
10
11 CREATE TABLE books (
12     id INT AUTO_INCREMENT PRIMARY KEY,
13     title VARCHAR(200) NOT NULL,
14     author VARCHAR(160) NOT NULL,
15     description TEXT,
16     price_cents INT NOT NULL,
17     image VARCHAR(160) DEFAULT 'placeholder.jpg',
18     stock INT NOT NULL DEFAULT 0,
19     created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
20 );
21
22 CREATE TABLE orders (
23     id INT AUTO_INCREMENT PRIMARY KEY,
24     user_id INT NOT NULL,
25     address TEXT NOT NULL,
26     status ENUM('PLACED', 'SHIPPED', 'DELIVERED', 'CANCELLED') NOT NULL DEFAULT 'PLACED',
27     created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
28     FOREIGN KEY (user_id) REFERENCES users(id)
29 );
30
31 CREATE TABLE order_items (
32     id INT AUTO_INCREMENT PRIMARY KEY,
33     order_id INT NOT NULL,
34     book_id INT NOT NULL,
35     quantity INT NOT NULL,
36     price_cents INT NOT NULL,
37     FOREIGN KEY (order_id) REFERENCES orders(id),
38     FOREIGN KEY (book_id) REFERENCES books(id)
39 );
40
```

## Sample inserts

```
INSERT INTO users (name, email, password_hash, role)
VALUES ('Site Admin', 'admin@exclusive.test', '$2y$10$WeFIq2n2gS3Ib8KzmQ6kSuj7Z7BvZODAyPZpjIbOtnbDa6Z4dyc3m', 'admin');

INSERT INTO users (name, email, password_hash, role)
VALUES ('Nadine', 'customer@exclusive.test', '$2y$10$E5dr3061k0Vzkl3Kf8AqU0QAZl0Z6eLxEwI6eQq1sA6kHls4Jp7ne', 'customer');

INSERT INTO books (title, author, description, price_cents, image, stock) VALUES
('The Alchemist', 'Paulo Coelho', 'A philosophical story about following your dreams.', 15999, 'alchemist.jpg', 15),
('Born a Crime', 'Trevor Noah', 'Stories from a South African childhood.', 18999, 'bornacrime.jpg', 12),
('Long Walk to Freedom', 'Nelson Mandela', 'Autobiography of Nelson Mandela.', 24999, 'longwalk.jpg', 6),
('Atomic Habits', 'James Clear', 'Tiny changes, remarkable results.', 21999, 'atomic.jpg', 20),
('The Subtle Art of Not Giving a F*ck', 'Mark Manson', 'A counterintuitive approach to living a good life.', 19999, 'subtle.jpg'),
('Dune', 'Frank Herbert', 'Epic science fiction saga.', 17999, 'dune.jpg', 10);
```

## 2.4 Explanation

### User Security:

Passwords are stored as hashes (password\_hash() in PHP).

Roles (admin vs customer) are stored in users.role so permissions can be enforced.

### Order Tracking:

Each order links to a user and stores its own status (PLACED, SHIPPED, etc.).

order\_items ensures every book and quantity is tracked per order.

### Efficient Queries:

Indexes (primary keys + foreign keys) allow fast lookups.

Searching books by title/author is quick because the data is atomic and normalized.

### Scalability:

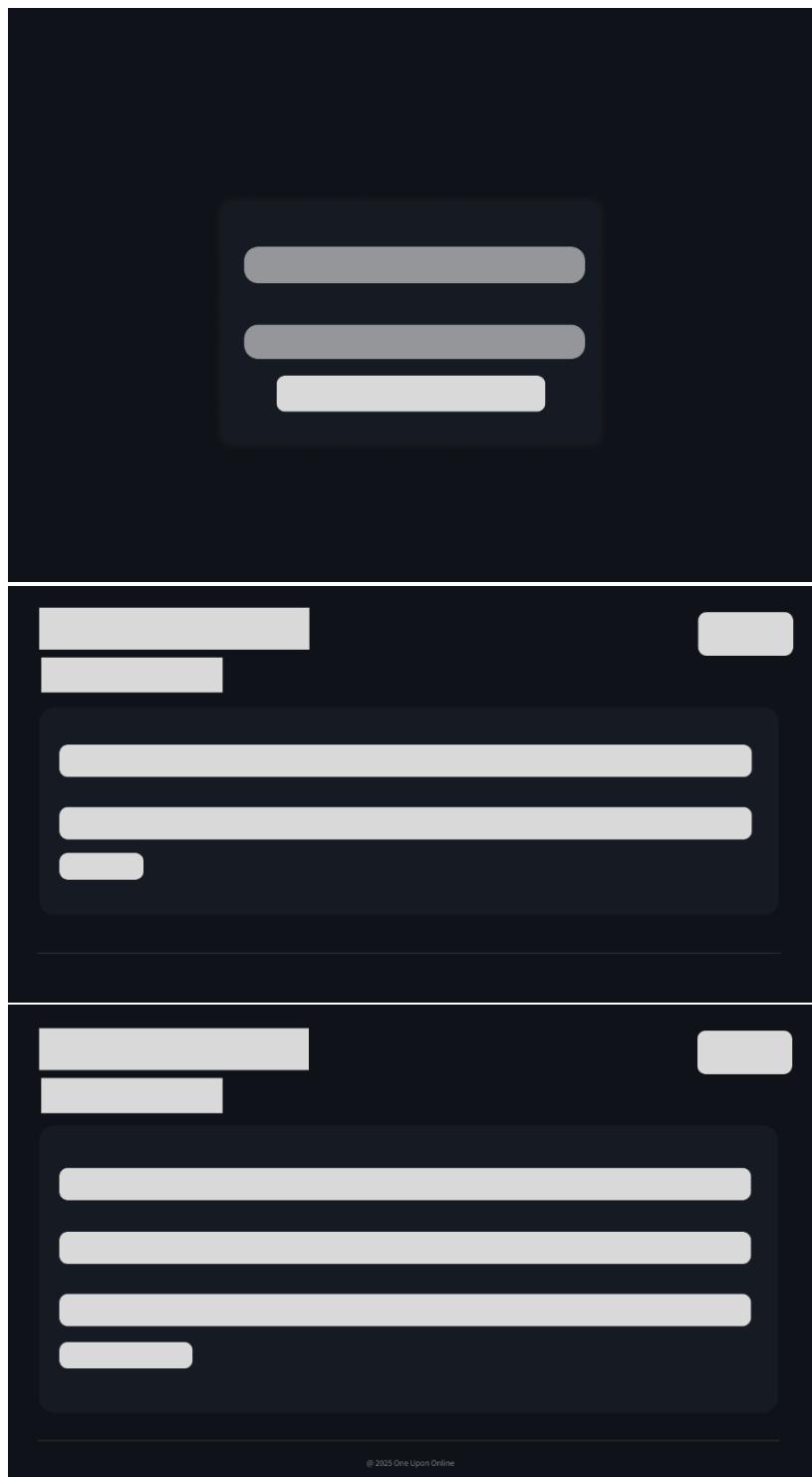
The schema can handle many users, books, and orders without redesign.

Adding more roles (like staff) or order statuses is easy.

### 3. Application & Website Design

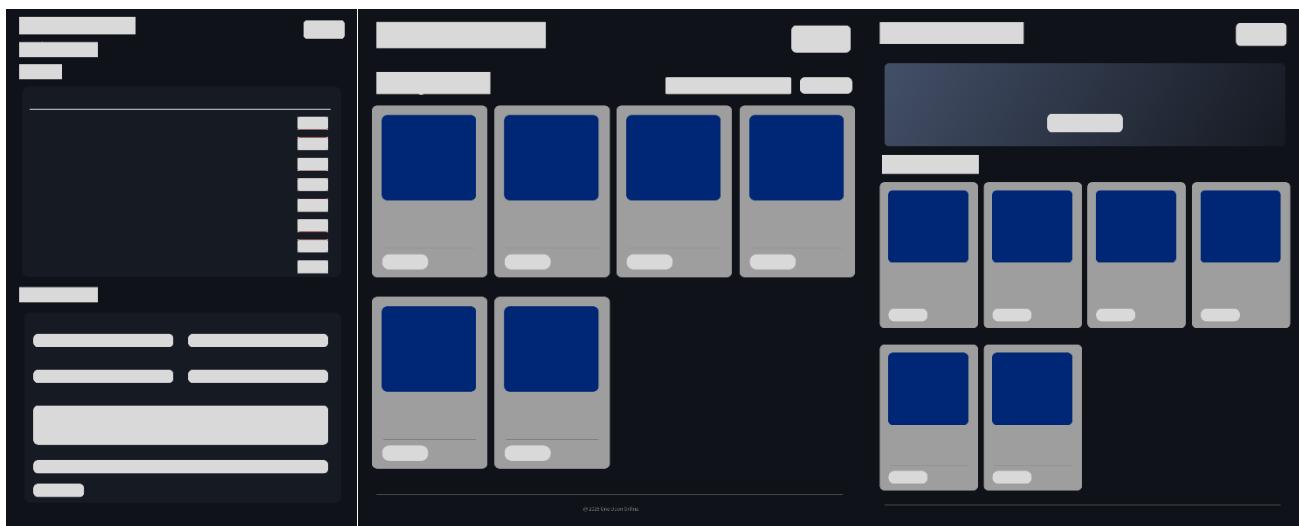
#### 3.1 Wireframes

##### Login/Signup page

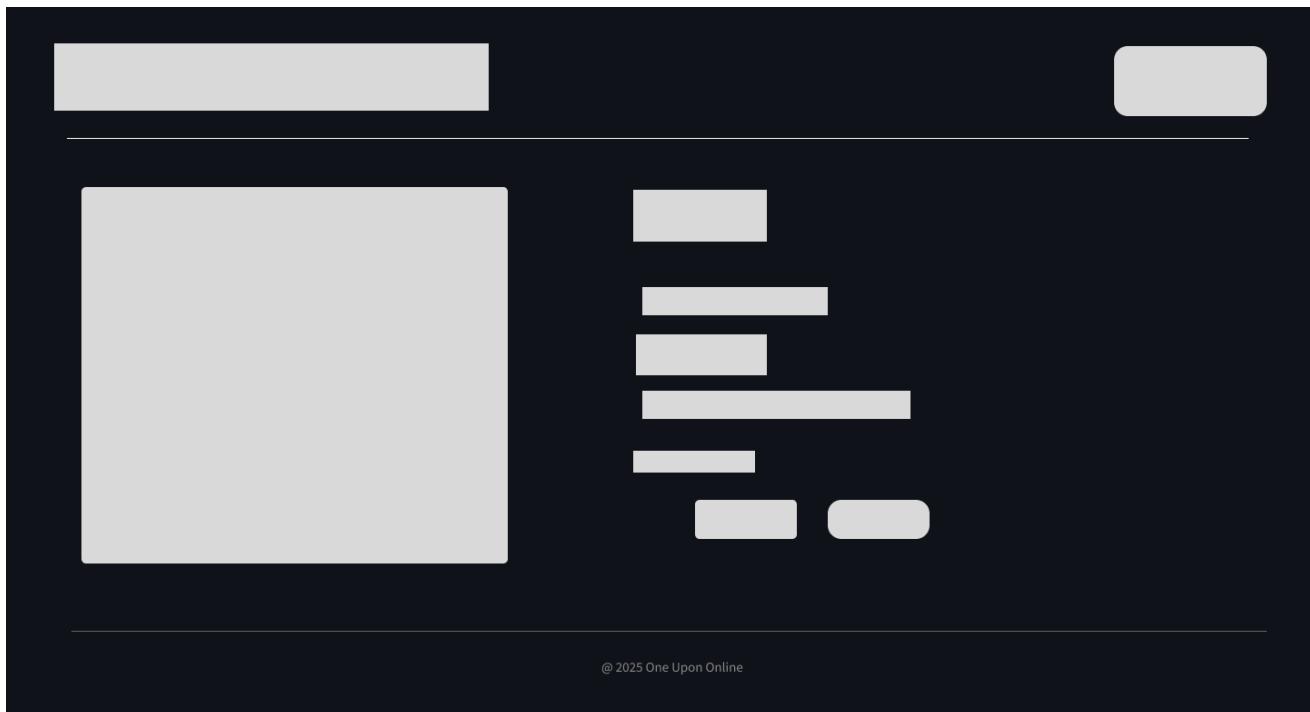


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## Home page with book categories



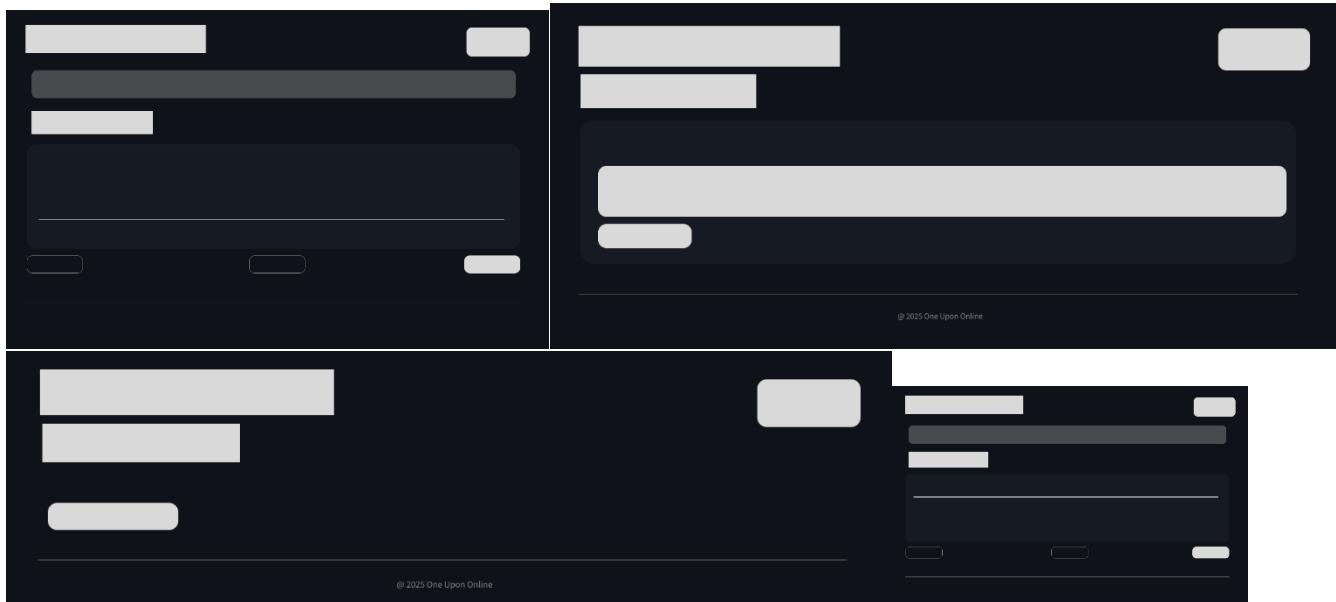
## Book detail page



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## Shopping cart



## Admin dashboard



## 3.2 UI Design Specifications

### Colours



Primary Colour (Accent): Gold #F0B429 - used for buttons, highlights, and brand text.

Secondary Colour: Light Gold #F4E3B2 - used for subtle accents and hover states.

Background (Dark Mode Base): Deep Charcoal #0F1115 - creates a modern, immersive look.

Card Background: Dark Grey #161A22 - used for book listings, forms, and admin panels.

Text Colour: Off-White #E6E8EE - ensures contrast and readability.

Muted Text: Grey #A3AAB7 - used for secondary information like authors and timestamps.

Alert / Error Colour: Soft Red #FF5C7C.

Link / Info Colour: Bright Blue #3FA9F5.

## Fonts & typography

### Base Font

#### Segoe UI

The quick brown fox jumped over the lazy dog  
The quick brown fox jumped over the lazy dog  
The quick brown fox jumped over the lazy dog  
**The quick brown fox jumped over the lazy dog**  
**The quick brown fox jumped over the lazy dog**  
**The quick brown fox jumped over the lazy dog**

#### Roboto

The quick brown fox jumped over the lazy dog  
The quick brown fox jumped over the lazy dog  
The quick brown fox jumped over the lazy dog  
**The quick brown fox jumped over the lazy dog**  
**The quick brown fox jumped over the lazy dog**  
**The quick brown fox jumped over the lazy dog**

#### Arial

The quick brown fox jumped over the lazy dog  
**The quick brown fox jumped over the lazy dog**  
The quick brown fox jumped over the lazy dog  
**The quick brown fox jumped over the lazy dog**  
**The quick brown fox jumped over the lazy dog**  
*The quick brown fox jumped over the lazy dog*  
*The quick brown fox jumped over the lazy dog*

Chosen for legibility and wide browser support

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Headings: Bold weight, slightly larger sizes for hierarchy.

h1 (Hero & Page titles): 1.8rem - 2.6rem, bold.

h2 (Section titles): 1.4rem - 1.8rem, bold.

h3 (Card titles / subtitles): 1.1rem - 1.4rem, medium weight.

Body Text: 1rem - 1.1rem, normal weight, high contrast against dark background.

Muted Text: Smaller size (0.85rem), lighter grey tone for secondary info.

## **Layout principles**

### **Grid Structure:**

Desktop: Multi-column layout.

Tablet: 2-column layouts for product grids and admin tables.

Mobile: Single-column stacked layout for readability.

### **Consistency:**

All pages use the same header/footer.

Buttons are rounded (border-radius: 16px), with clear hover effects.

Cards (book listings) follow the same pattern: image - title - author - price - action button.

### **Responsive Principles:**

Breakpoints around 820px (tablet) and 480px (mobile).

Navigation collapses into stacked buttons on smaller screens.

Images scale fluidly (object-fit: cover).

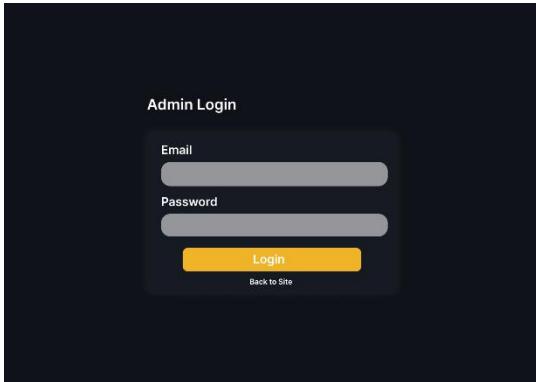
### **Accessibility:**

Sufficient colour contrast (light text on dark background).

Clear focus states for input fields.

Large enough tap targets on mobile.

### 3.3 Prototypes



The Admin Login page features a dark background with white text and input fields. It includes a 'Back to Site' link at the bottom.

Admin Login

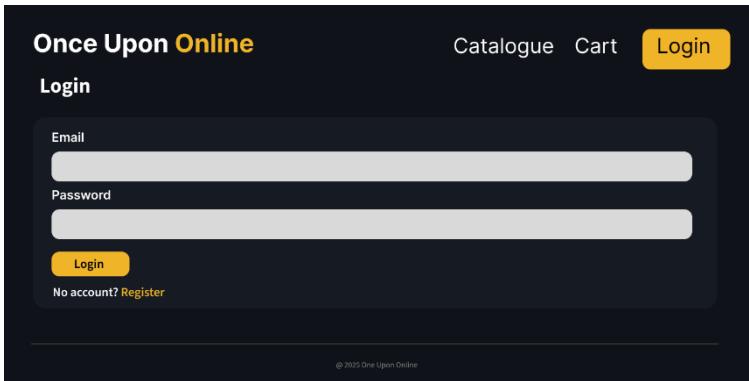
Email

Password

Login

Back to Site

Admin Login Page



The User Login page is part of the Once Upon Online interface. It shows the navigation bar 'Once Upon Online', 'Catalogue', 'Cart', and 'Login'. Below the navigation is a 'Login' section with fields for 'Email' and 'Password', a 'Login' button, and a 'No account? Register' link.

Once Upon Online

Catalogue Cart Login

Login

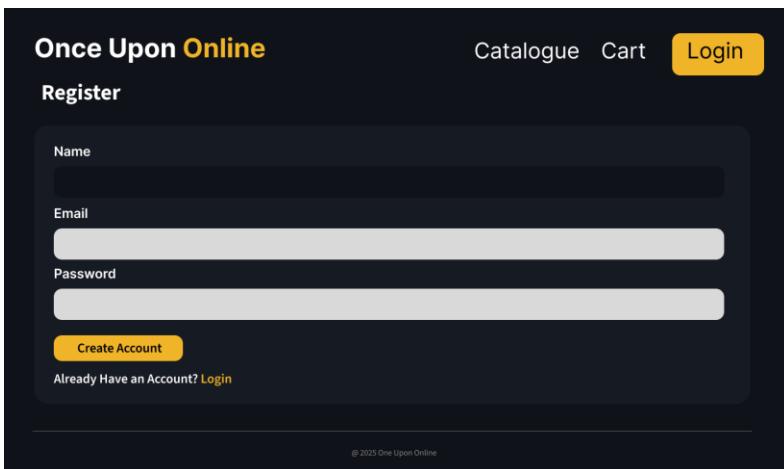
Email

Password

Login

No account? Register

User Login Page



The User Register page is also part of the Once Upon Online interface. It follows a similar layout to the login page, with the 'Once Upon Online' logo, navigation bar, and a 'Register' section for entering 'Name', 'Email', and 'Password'. It includes a 'Create Account' button and a 'Login' link for existing users.

Once Upon Online

Catalogue Cart Login

Register

Name

Email

Password

Create Account

Already Have an Account? Login

User Register Page

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Once Upon Online Books Orders Logout

Admin

Books

ID	Title	Author	Price	Stock	Action
8	The Hunger Games	Suzanne Collins	R25.75	60	Delete
7	Dune	Frank Herbert	R375.00	10	Delete
6	The Subtle Art of Not Giving a F*ck	Kirk Hammett	R499.95	18	Delete
5	Atomic Habits	James Clear	R219.95	20	Delete
4	A Long Walk to Freedom	Nelson Mandela	R249.95	6	Delete
3	Born to Run	Terence McKenna	R189.95	12	Delete
2	The Alchemist	Paulo Coelho	R129.95	15	Delete
1	The Hunger Games	Suzanne Collins	R25.75	50	Delete

Add New Book

Title:

Author:

Price (cents):

Stock:

Description:

Image Filename (in public/assets/img):

Admin Book Page

Once Upon Online Books Orders Logout

Admin Dashboard

Manage Books View Orders

Add, Edit, Delete See Recent Orders

Admin Dashboard

Once Upon Online Books Orders Logout

Admin

Orders

ID	Date	Customer	Status	Address
1	2025-09-18 10:07:47	Dienkie	PLACED	33 Altona Crescent

Admin Orders Page

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The screenshot shows a dark-themed web page for 'Once Upon Online'. At the top, there's a navigation bar with 'Once Upon Online' logo, 'Catalogue', 'Cart', and 'Login' buttons. A green notification bar at the top says 'Book added to cart.' Below it, a section titled 'Your Cart' displays a table of items. The table has columns: Book, Author, Price, Qty, and Total. One item is listed: 'The Subtle Art of Not Giving a F\*ck' by Mark Manson, priced at R199.99, quantity 1, total R199.99. Below the table are 'Update', 'Clear Cart', and 'Checkout' buttons. At the bottom, a copyright notice reads '© 2023 Once Upon Online'.

User Cart Page

The screenshot shows a dark-themed web page for 'Once Upon Online'. At the top, there's a navigation bar with 'Once Upon Online' logo, 'Catalogue', 'Cart', and 'Login' buttons. A search bar with a 'Search' button is also present. The main area is titled 'Catalogue' and shows a grid of book cards. Each card includes the book title, author, price, and an 'Add to Cart' button. The books listed are: 'Atomic Habits' by James Clear (R219.99), 'Born a Crime' by Trevor Noah (R189.99), 'Dune' by Frank Herbert (R179.99), 'Long Walk to Freedom' by Nelson Mandela (R249.99), 'The Alchemist' by Paulo Coelho (R159.99), and 'The Hunger Games' by Suzanne Collins (R219.99). At the bottom, a copyright notice reads '© 2023 Once Upon Online'.

User Catalogue Page

The screenshot shows a dark-themed web page for 'Once Upon Online'. At the top, there's a navigation bar with 'Once Upon Online' logo, 'Catalogue', 'Cart', and 'Login' buttons. A section titled 'Checkout' is displayed. Below it, a 'Delivery Address' input field is shown. At the bottom, a 'Place Order' button is visible. A copyright notice at the very bottom reads '© 2023 Once Upon Online'.

User Checkout Page

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The screenshot shows a dark-themed web page for the book 'Dune'. At the top, there's a navigation bar with 'Once Upon Online' (in yellow), 'Catalogue', 'Cart', and a 'Login' button. Below the navigation, the title 'Dune' is displayed next to a large, empty gray placeholder image. To the right of the title is a small, horizontal gray progress bar with a yellow 'Add to Cart' button to its right. At the bottom of the page, a copyright notice reads '© 2025 Once Upon Online'.

User Book Information Page

The screenshot shows a dark-themed web page confirming an order placement. The top navigation bar includes 'Once Upon Online' (yellow), 'Catalogue', 'Cart', and 'Login'. A prominent message 'Order Placed' is displayed, followed by a success message: 'Thanks! Your order (#3) has been placed successfully.' Below this is a 'Continue Shopping' button. The footer contains the copyright notice '© 2025 Once Upon Online'.

User Order Placed page

The screenshot shows a dark-themed web page featuring a central call-to-action button labeled 'Find your next favorite book' with the subtext 'Curated titles. Local delivery. Easy checkout.' and a 'Browse Catalogue' button. Below this section is a 'New Arrivals' grid. The first row contains four book cards: 'Atomic Habits' by James Clear (R219.99), 'Born a Crime' by Trevor Noah (R189.99), 'Dune' by Frank Herbert (R179.99), and 'Long Walk to Freedom' by Nelson Mandela (R249.99). Each card includes an 'Add to Cart' button. The second row contains two more book cards: 'The Alchemist' by Paulo Coelho (R159.99) and 'The Hunger Games' by Suzanne Collins (R219.99), each with an 'Add to Cart' button. The footer contains the copyright notice '© 2025 Once Upon Online'.

User View Books page

## 3.4 Integrated Website Evidence

### Home Page

Once Upon Online

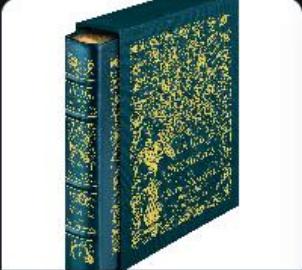
Catalogue Cart Login

## Find your next favourite book

Curated titles. Local delivery. Easy checkout.

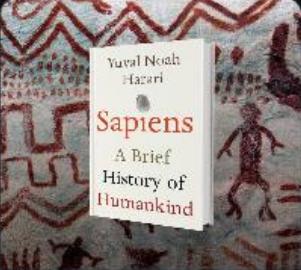
Browse Catalogue

### New Arrivals



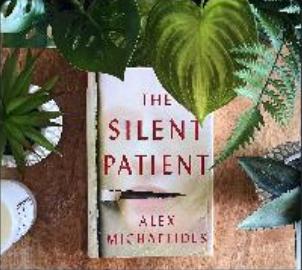
**Pride and Prejudice**  
Jane Austen  
**R149.99**

Add to Cart



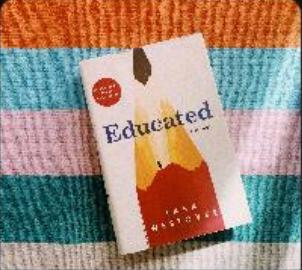
**Sapiens: A Brief History of Humankind**  
Yuval Noah Harari  
**R259.99**

Add to Cart



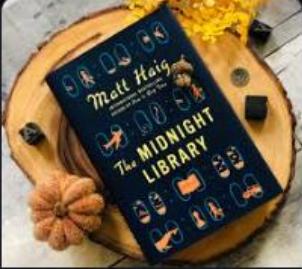
**The Silent Patient**  
Alex Michaelides  
**R199.99**

Add to Cart



**Educated**  
Tara Westover  
**R189.99**

Add to Cart



**The Midnight Library**  
Matt Haig  
**R219.99**

Add to Cart



**Dune**  
Frank Herbert  
**R179.99**

Add to Cart

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## Catalogue Page

Once Upon Online

Catalogue Cart Login

Catalogue

Search by title or author

The book cover for "Atomic Habits" by James Clear. It features a white background with the title in large, bold, yellow letters. Below the title, it says "Tiny Changes, Remarkable Results". The author's name, "James Clear", is at the bottom.

The book cover for "Dune" by Frank Herbert. It has a warm, orange-toned background with the title "DUNE" in large, stylized letters. At the bottom, there are two small figures standing on a rocky surface.

The book cover for "Educated" by Tara Westover. It features a colorful, striped background with a small white tag attached to the top left corner. The tag has the title "Educated" and the author's name "Tara Westover" on it.

The book cover for "Pride and Prejudice" by Jane Austen. It shows a dark blue book with gold-colored decorative patterns on the front cover.

**Atomic Habits**  
James Clear  
**R219.99**

[Add to Cart](#)

**Dune**  
Frank Herbert  
**R179.99**

[Add to Cart](#)

**Educated**  
Tara Westover  
**R189.99**

[Add to Cart](#)

**Pride and Prejudice**  
Jane Austen  
**R149.99**

[Add to Cart](#)

The book cover for "Sapiens: A Brief History of Humankind" by Yuval Noah Harari. It features a textured, reddish-brown background with abstract shapes and figures.

The book cover for "The Midnight Library" by Matt Haig. It has a dark blue cover with the title in white and yellow letters. There are small illustrations of people and objects on the cover.

The book cover for "The Silent Patient" by Alex Michaelides. It features a white cover with a portrait of a woman's face in the center. The title and author's name are printed below the portrait.

The book cover for "The Subtle Art of Not Giving a F\*ck" by Mark Manson. It has a bright red cover with the title in large, white, bold letters. The author's name is at the bottom.

**Sapiens: A Brief History of Humankind**  
Yuval Noah Harari  
**R259.99**

[Add to Cart](#)

**The Midnight Library**  
Matt Haig  
**R219.99**

[Add to Cart](#)

**The Silent Patient**  
Alex Michaelides  
**R199.99**

[Add to Cart](#)

**The Subtle Art of Not Giving a F\*ck**  
Mark Manson  
**R199.99**

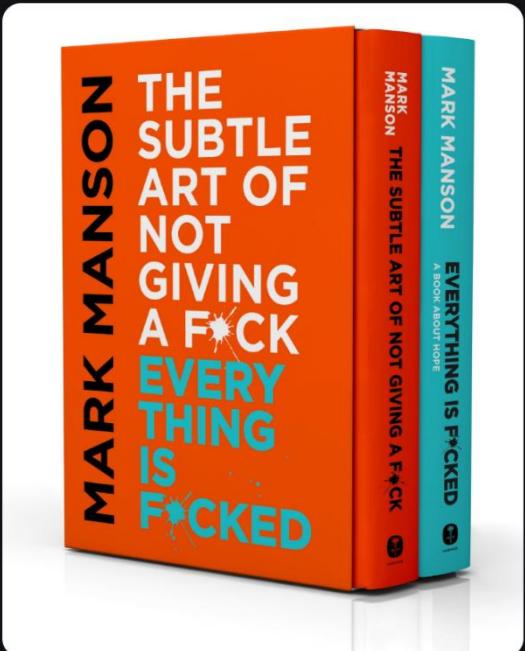
[Add to Cart](#)

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## Book Detail Page

Once Upon Online Catalogue Cart Login



**The Subtle Art of Not Giving a F\*ck**  
by Mark Manson  
**R199.99**  
A counterintuitive approach to living a good life.  
In stock: 18  
Qty: 1 Add to Cart

© 2025 Once Upon Online

## Shopping Cart

Once Upon Online Catalogue Cart Login

Book added to cart.

### Your Cart

Book	Author	Price	Qty	Total
The Subtle Art of Not Giving a F*ck	Mark Manson	R199.99	1	R199.99
The Silent Patient	Alex Michaelides	R199.99	1	R199.99

**Subtotal R399.98**

Update Clear Cart Checkout

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## Checkout Page

The screenshot shows the Once Upon Online checkout page. At the top, there's a header with the brand name "Once Upon Online" and navigation links for "Catalogue", "Cart", and "Logout". Below the header, the word "Checkout" is prominently displayed. A large input field labeled "Delivery Address" contains the placeholder "Street, City.....|". Below this field is a yellow "Place Order" button. At the bottom of the page, a copyright notice reads "© 2025 Once Upon Online".

## Login / Register Pages

The screenshot displays two side-by-side pages from Once Upon Online. On the left is the "Register" page, which includes fields for "Name" (Nadine), "Email" (admin@online.test), and "Password" (\*\*\*\*\*). A "Create Account" button is at the bottom. On the right is the "Login" page, showing a success message "Registration successful. Please log in." It has fields for "Email" (admin@online.test) and "Password" (\*\*\*\*\*), a "Login" button, and links for "No account? Register". Both pages include a copyright notice at the bottom: "© 2025 Once Upon Online".

The screenshot shows the "Admin Login" page. It features fields for "Email" (admin@exclusive.test) and "Password" (\*\*\*\*\*). A yellow "Login" button is positioned below the password field. At the bottom of the form, there's a link "Back to site".

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20230395

## Admin Dashboard

**Once Upon Online**

Books Orders Logout

### Admin Dashboard

**Manage Books**  
Add, edit, delete

**View Orders**  
See recent orders

Admin

Dashboard Books Logout

### Orders

ID	Date	Customer	Status	Address
4	2025-09-18 12:38:38	Site Admin	PLACED	sds
3	2025-09-18 12:18:39	Site Admin	PLACED	Street Namme
2	2025-09-18 11:37:09	Site Admin	PLACED	34 Altona Crescent
1	2025-09-18 10:07:47	Dienkie	PLACED	33 Altona Crecent

Admin

Dashboard Orders Logout

### Books

ID	Title	Author	Price	Stock	Action
18	Pride and Prejudice	Jane Austen	R149.99	20	<button>Delete</button>
17	Sapiens: A Brief History of Humankind	Yuval Noah Harari	R259.99	15	<button>Delete</button>
16	The Silent Patient	Alex Michaelides	R199.99	10	<button>Delete</button>
15	Educated	Tara Westover	R189.99	8	<button>Delete</button>
14	The Midnight Library	Matt Haig	R219.99	12	<button>Delete</button>
6	Dune	Frank Herbert	R179.99	10	<button>Delete</button>
5	The Subtle Art of Not Giving a F*ck	Mark Manson	R199.99	18	<button>Delete</button>
4	Atomic Habits	James Clear	R219.99	20	<button>Delete</button>

Add New Book

Title

Author

Price (cents)  Stock

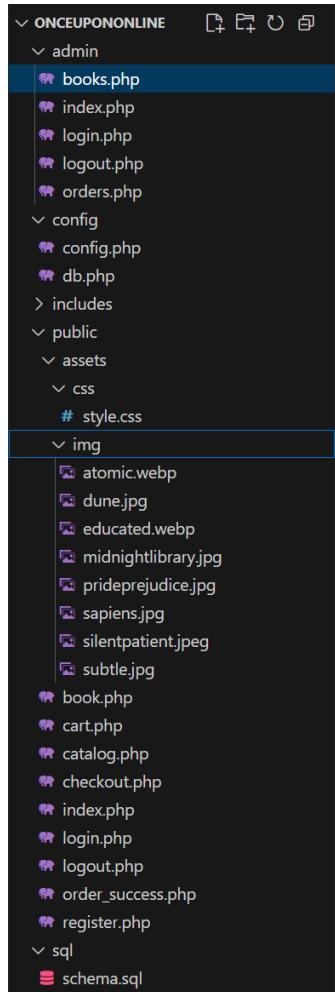
Description

Image filename (in public/assets/img)

## 4. Application Code & Functional Components

### 4.1 PHP Code Documentation

#### Folder Structure



#### login.php (public)

Allows customers to log in by checking email + password. Uses password\_verify() against the stored hash. If successful, session stores user info.

#### register.php (public)

Creates new customer accounts. Input is validated, password hashed with password\_hash(), and inserted into users table.

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20230395

## checkout.php

Handles placing an order. Creates a new orders row, then adds each book in the cart into order\_items. Uses SQL transactions for consistency.

## cart.php

Stores books in a session array. Supports adding, updating, and removing items. Calculates subtotal before checkout.

## books.php (admin)

Admins can add new books or delete existing ones. Displays a table with book stock and prices.

## orders.php (admin)

Shows all placed orders, linked to customer names and addresses.

## config.php / db.php

Stores DB credentials and connects to MySQL using mysqli. Ensures UTF-8 encoding.

## header.php / footer.php

Reusable templates for navigation, branding, and footer to keep the site consistent.

## auth.php

Provides helper functions: require\_login() and require\_admin() for access control.

## 4.2 SQL Queries

### Login

```
SELECT id, name, email, password_hash, role
FROM users
WHERE email = ?;
```

### Retrieve Books

```
SELECT id, title, author, price_cents, image
FROM books
ORDER BY title ASC;
```

### Add to Cart (session-based, but verifies DB)

```
SELECT id, price_cents
FROM books
WHERE id = ?;
```

### Place Order

#### Create order:

```
INSERT INTO orders (user_id, address, status)
VALUES (?, ?, 'PLACED');
```

#### Insert items:

```
INSERT INTO order_items (order_id, book_id, quantity, price_cents)
VALUES (?, ?, ?, ?);
```

### Admin – Manage Books

```
INSERT INTO books (title, author, description, price_cents, image, stock)
VALUES (?, ?, ?, ?, ?, ?, ?);
```

## 4.3 MySQL Database

The database onceupononline\_db is fully normalised to 3NF.

Tables: users, books, orders, order\_items.

### Relationships confirmed:

One user - many orders.

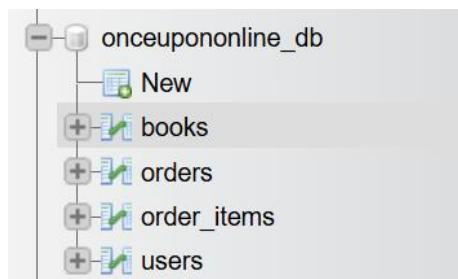
One order - many order\_items.

One book - many order\_items.

Admin accounts are part of the users table with role = admin.

## Evidence:

### The list of tables



### Books

	<a href="#">Edit</a>	<a href="#">Copy</a>	<a href="#">Delete</a>	<a href="#">id</a>	<a href="#">title</a>	<a href="#">author</a>	<a href="#">description</a>	<a href="#">price_cents</a>	<a href="#">image</a>	<a href="#">stock</a>	<a href="#">created_at</a>
<input type="checkbox"/>	<a href="#">Edit</a>	<a href="#">Copy</a>	<a href="#">Delete</a>	4	Atomic Habits	James Clear	Tiny changes, remarkable results.	21999	atomic.webp	20	2025-09-18 09:59:35
<input type="checkbox"/>	<a href="#">Edit</a>	<a href="#">Copy</a>	<a href="#">Delete</a>	5	The Subtle Art of Not Giving a F*ck	Mark Manson	A counterintuitive approach to living a good life.	19999	subtle.jpg	18	2025-09-18 09:59:35
<input type="checkbox"/>	<a href="#">Edit</a>	<a href="#">Copy</a>	<a href="#">Delete</a>	6	Dune	Frank Herbert	Epic science fiction saga.	17999	dune.jpg	10	2025-09-18 09:59:35
<input type="checkbox"/>	<a href="#">Edit</a>	<a href="#">Copy</a>	<a href="#">Delete</a>	14	The Midnight Library	Matt Haig	A novel about choices, regrets, and second chances...	21999	midnightlibrary.jpg	12	2025-09-22 14:33:39
<input type="checkbox"/>	<a href="#">Edit</a>	<a href="#">Copy</a>	<a href="#">Delete</a>	15	Educated	Tara Westover	A memoir of a woman who escapes her strict upbring...	18999	educated.webp	8	2025-09-22 14:33:39
<input type="checkbox"/>	<a href="#">Edit</a>	<a href="#">Copy</a>	<a href="#">Delete</a>	16	The Silent Patient	Alex Michaelides	A psychological thriller about a woman who stops s...	19999	silentpatient.jpeg	10	2025-09-22 14:33:39
<input type="checkbox"/>	<a href="#">Edit</a>	<a href="#">Copy</a>	<a href="#">Delete</a>	17	Sapiens: A Brief History of Humankind	Yuval Noah Harari	An exploration of human history from evolution to ...	25999	sapiens.jpg	15	2025-09-22 14:33:39
<input type="checkbox"/>	<a href="#">Edit</a>	<a href="#">Copy</a>	<a href="#">Delete</a>	18	Pride and Prejudice	Jane Austen	A timeless romance and social commentary classic.	14999	prideprejudice.jpg	20	2025-09-22 14:33:39

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20230395

## Orders

Server: 127.0.0.1 » Database: onceupononline\_db » Table: orders

Browse Structure SQL Search Insert Export Import Privileges Operations

Showing rows 0 - 3 (4 total, Query took 0.0002 seconds.)

SELECT \* FROM `orders`

Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

	id	user_id	address	status	created_at
<input type="checkbox"/>	1	3	33 Altona Crescent	PLACED	2025-09-18 10:07:47
<input type="checkbox"/>	2	4	34 Altona Crescent	PLACED	2025-09-18 11:37:09
<input type="checkbox"/>	3	4	Street Namme	PLACED	2025-09-18 12:18:39
<input type="checkbox"/>	4	4	sds	PLACED	2025-09-18 12:38:38

Check all With selected: Edit Copy Delete Export

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

## Order Item

Server: 127.0.0.1 » Database: onceupononline\_db » Table: order\_items

Browse Structure SQL Search Insert Export Import Privileges Operations

Showing rows 0 - 4 (5 total, Query took 0.0002 seconds.)

SELECT \* FROM `order\_items`

Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

	id	order_id	book_id	quantity	price_cents
<input type="checkbox"/>	1	1	5	1	19999
<input type="checkbox"/>	2	2	4	1	21999
<input type="checkbox"/>	3	3	5	1	19999
<input type="checkbox"/>	4	3	6	1	17999
<input type="checkbox"/>	5	4	6	1	17999

Check all With selected: Edit Copy Delete Export

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

## Users

Server: 127.0.0.1 » Database: onceupononline\_db » Table: users

Browse Structure SQL Search Insert Export Import Privileges Operations Tracking Triggers

Showing rows 0 - 3 (4 total, Query took 0.0002 seconds.)

SELECT \* FROM `users`

Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

	id	name	email	password_hash	role	created_at
<input type="checkbox"/>	2	Nadine	customer@exclusive.test	\$2y\$10\$E5dr3O61k0VZkL3Kf8AqUOQAZl0Z6eLxEwI6eQtIsA6...	customer	2025-09-18 09:59:35
<input type="checkbox"/>	3	Dienkie	osd522.Fa1@gmail.com	\$2y\$10\$NkStuGCU3qlVjGCo3o1xBc5WlwwyQTStbrkdafj5lN...	customer	2025-09-18 10:07:25
<input type="checkbox"/>	4	Site Admin	admin@exclusive.test	\$2y\$10\$jn7X9xy/7lqlrlvQd8TuxH8qSBdAM5lQo9mYpZK7...	admin	2025-09-18 10:12:11
<input type="checkbox"/>	7	Nadine	admin@online.test	\$2y\$10\$Kn5zL6.8SPzuhRVlleiKud3LjhQ7pigdC4rsrovC3...	customer	2025-09-22 14:44:08

Check all With selected: Edit Copy Delete Export

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None



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## Relation view - foreign keys.

### Books

The screenshot shows the 'Relation view' for the 'books' table. It displays foreign key constraints. One constraint, 'orders\_ibfk\_1', is visible, linking the 'user\_id' column in 'books' to the 'id' column in the 'users' table. The 'Constraint properties' section shows 'ON DELETE RESTRICT' and 'ON UPDATE RESTRICT'. A '+' Add constraint button is present at the bottom.

### Orders

The screenshot shows the 'Relation view' for the 'orders' table. It displays foreign key constraints. Two constraints are listed: 'orders\_ibfk\_1' (linking 'user\_id' to 'users.id') and 'orders\_ibfk\_2' (linking 'book\_id' to 'books.id'). Both constraints have 'RESTRICT' actions for both delete and update. A '+' Add constraint button is present at the bottom.

### Order Item

The screenshot shows the 'Relation view' for the 'order\_items' table. It displays foreign key constraints. Two constraints are listed: 'order\_items\_ibfk\_1' (linking 'order\_id' to 'orders.id') and 'order\_items\_ibfk\_2' (linking 'book\_id' to 'books.id'). Both constraints have 'RESTRICT' actions for both delete and update. A '+' Add constraint button is present at the bottom.

### Users

The screenshot shows the 'Relation view' for the 'users' table. It displays foreign key constraints. One constraint, 'onceupononline\_ibfk\_1', is visible, linking the 'user\_id' column in 'users' to the 'id' column in the 'books' table. The 'Constraint properties' section shows 'ON DELETE RESTRICT' and 'ON UPDATE RESTRICT'. A '+' Add constraint button is present at the bottom.

## 5. Testing & Quality Assurance

### 5.1 Test Plan

Test Case ID	Description	Steps	Expected Result	Actual Results
TC01	User Registration	Open Register page Enter name, email, password Click "Create Account"	Account created, success message shown, redirected to login.	Pass
TC02	Login (Valid)	Open Login page Enter valid email + password Submit	User logged in, redirected to Home page with "Welcome" msg.	Pass
TC03	Login (Invalid)	Open Login page Enter wrong password Submit	Error "Invalid credentials" shown.	Pass
TC04	Add to Cart	Browse catalogue Click "Add to Cart" on a book	Cart updated, item visible in Cart page.	Pass
TC05	Checkout	Add books to cart Click Checkout Enter address Submit	Order created, cart cleared, confirmation page shown.	Pass
TC06	Admin Login	Open Admin Login Enter admin credentials Submit	Admin redirected to Dashboard.	Pass
TC07	Add Book (Admin)	Login as admin Go to Manage Books Add new book with details	Book saved, appears in catalogue.	Pass
TC08	View Orders (Admin)	Login as admin Go to Orders page	Orders displayed with user + address info.	Pass

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20230395

## 5.2 Test Outcomes

The screenshot shows the Once Upon Online homepage. At the top, the logo "Once Upon Online" is displayed. In the top right corner, there are links for "Catalogue", "Cart Hi, Nadine", and a "Logout" button. A green notification bar at the top contains the text "Welcome back, Nadine!". Below the header, there is a dark navigation bar with several menu items.

Successful login with customer account.

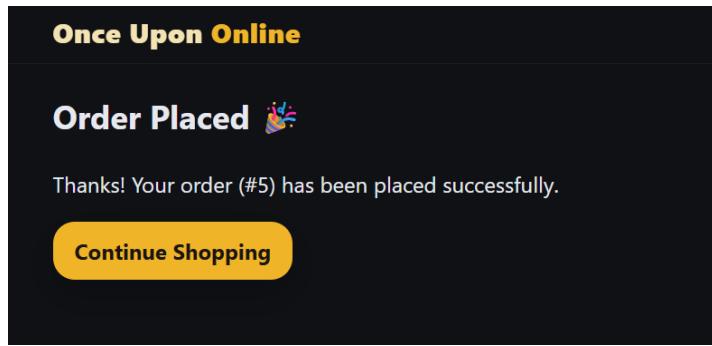
The screenshot shows the Once Upon Online login page. The top navigation bar includes the logo, "Catalogue", "Cart", and a yellow "Login" button. A green error message box displays "Invalid credentials.". Below the message, there is a form for entering email and password, and a "Login" button. At the bottom of the page, there is a link for "No account? Register".

Login attempt with wrong password.

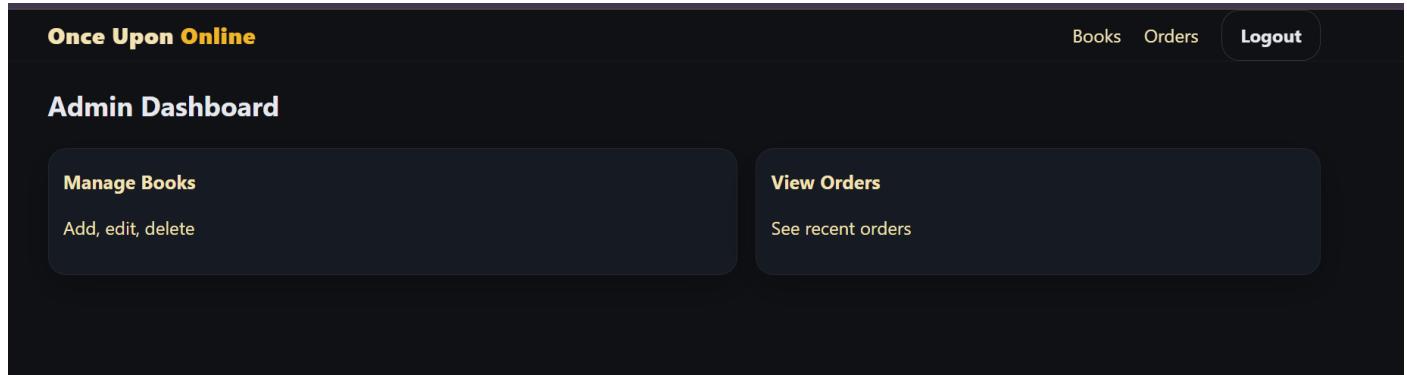
The screenshot shows the Once Upon Online cart page. The top navigation bar includes the logo, "Catalogue", "Cart Hi, Nadine", and a "Logout" button. A green success message box displays "Book added to cart.". The main content area is titled "Your Cart" and shows a table of items. The table has columns for Book, Author, Price, Qty, and Total. One item listed is "The Subtle Art of Not Giving a F\*ck" by Mark Manson, priced at R199.99, with a quantity of 1 and a total of R199.99. At the bottom of the table, there is a "Subtotal R199.99" and a "Checkout" button. There are also "Update" and "Clear Cart" buttons.

Cart page showing books added.

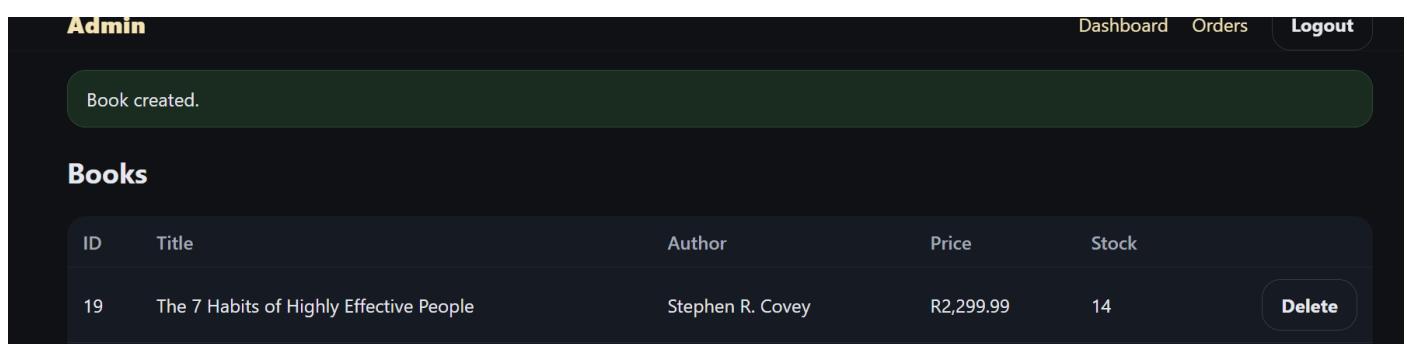
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Order success page after checkout.



Admin dashboard after login.



Admin screen showing new book successfully added.

### 5.3 Bug Report

Bug ID	Description	Severity	Fix Applied
B01	SITE_NAME undefined error when loading index/catalog	High	Added require_once config.php before using constant.
B02	Admin login failed even with correct credentials	High	Inserted correct admin hash into database + helper script to recreate admin.
B03	Book cover images not showing	Medium	Matched database image values with actual filenames in /assets/img/.
B04	Cart not clearing after checkout	Low	Added session reset after successful order insert.

## 5.4 Quality Assurance Report

### **Functional Coverage:**

User registration, login/logout, catalogue browsing, cart, checkout, and admin dashboard were all tested and passed.

Both valid and invalid input scenarios tested successfully.

### **Performance Check:**

Pages load quickly on localhost (XAMPP).

Tested on desktop and mobile browser widths - responsive design confirmed.

Database queries (SELECT, INSERT, UPDATE) executed within acceptable time.

### **Security Measures Tested:**

Passwords stored as hashes, login uses password\_verify().

SQL queries use prepared statements to prevent injection.

Sessions properly destroyed on logout.

## 6. System Documentation & Manuals

### 6.1 Technical Documentation

#### Architecture Overview

##### Flow of interaction:

A user accesses the website in a browser.

Apache (via XAMPP) serves the PHP files.

PHP scripts communicate with MySQL using mysqli.

Database queries fetch/save data (users, books, orders).

Results are displayed back in the browser.

This ensures a full LAMP-style stack (Local Apache MySQL PHP) setup.

#### File Structure Explanation

config/ → Connection settings (config.php, db.php).

includes/ → Shared files (header, footer, helper functions, authentication).

public/ → Customer-facing site (index, catalog, book detail, cart, checkout, login/register).

admin/ → Admin dashboard (login, dashboard, books management, orders management).

sql/ → Database schema and sample inserts.

assets/ → CSS + images for design.

#### Security Measures

Password Hashing: All passwords stored using password\_hash() with bcrypt.

SQL Injection Prevention: All DB queries use prepared statements (\$stmt->bind\_param) instead of raw SQL.

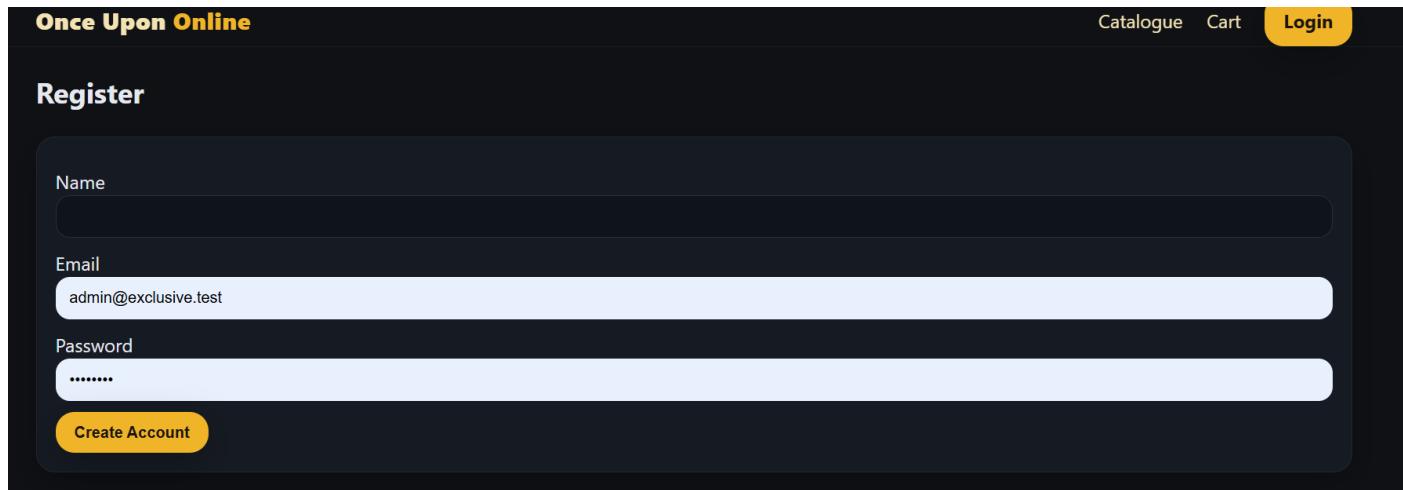
Session Handling: Login state stored in PHP sessions; sessions destroyed on logout.

Role Management: Admin vs customer is enforced with require\_admin() and require\_login().

## 6.2 User Manual – Customer

### Steps for Customers

Register - Click Register, fill in name, email, and password, then submit.



The screenshot shows the registration page for 'Once Upon Online'. At the top right are links for 'Catalogue', 'Cart', and a yellow 'Login' button. Below that is a heading 'Register'. The form fields are: 'Name' (empty), 'Email' (admin@exclusive.test), and 'Password' (\*\*\*\*\*). At the bottom is a yellow 'Create Account' button.

Screenshot: Registration form.

Log in - Enter your email and password on the login page.



The screenshot shows the login page for 'Once Upon Online'. At the top right are links for 'Catalogue', 'Cart', and a yellow 'Login' button. Below that is a heading 'Login'. The form fields are: 'Email' (admin@exclusive.test) and 'Password' (\*\*\*\*\*). At the bottom left is a yellow 'Login' button, and at the bottom right is a link 'No account? Register'.

Screenshot: Login screen.

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20230395

Browse/Search Books - Go to Catalogue, browse categories or use the search bar.

Once Upon Online

Catalogue

Logout Admin

Search by title or author Search

**Atomic Habits**  
James Clear  
**R219.99**  
[Add to Cart](#)

**Dune**  
Frank Herbert  
**R179.99**  
[Add to Cart](#)

**Educated**  
Tara Westover  
**R189.99**  
[Add to Cart](#)

**Pride and Prejudice**  
Jane Austen  
**R149.99**  
[Add to Cart](#)

Screenshot: Catalogue page with search.

Add to Cart - On book cards or details page, click Add to Cart.

Once Upon Online

Catalogue Cart Hi, Site Admin Logout Admin

**Dune**  
by Frank Herbert  
**R179.99**  
Epic science fiction saga.  
In stock: 10  
Qty:  [Add to Cart](#)

Screenshot: Book details with Add to Cart.

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20230395

View Cart - Open Cart page, update or remove items.

The screenshot shows the 'Once Upon Online' website's cart page. At the top, there are links for 'Catalogue', 'Cart Hi, Nadine', and 'Logout'. Below that, a green banner displays the message 'Book added to cart.' In the main area, a table lists the item in the cart:

Book	Author	Price	Qty	Total
The Subtle Art of Not Giving a F*ck	Mark Manson	R199.99	1	R199.99

Below the table are three buttons: 'Update', 'Clear Cart', and a yellow 'Checkout' button.

Screenshot: Cart page.

Checkout - Enter delivery address, confirm order.

The screenshot shows the 'Once Upon Online' website's checkout page. At the top, there are links for 'Catalogue', 'Cart Hi, Site Admin', 'Logout', and 'Admin'. Below that, a section titled 'Checkout' contains a 'Delivery Address' input field with the placeholder 'Street Name and stuff2'. At the bottom is a yellow 'Place Order' button.

Screenshot: Checkout page.

Order Confirmation - System shows success page with order number.

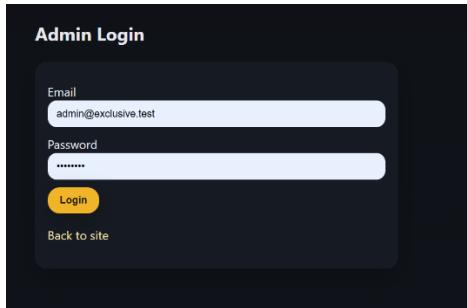
The screenshot shows the 'Once Upon Online' website's order confirmation page. At the top, there is a link for 'Catalogue'. The main message is 'Order Placed' with a small gift icon. Below it, a message says 'Thanks! Your order (#5) has been placed successfully.' A yellow 'Continue Shopping' button is at the bottom.

Screenshot: Order success page.

## 6.3 User Manual – Admin

### **Steps for Admins**

Log in as Admin - Open /admin/login.php, enter admin email and password.



Screenshot: Admin login.

Dashboard Overview - Links to Books and Orders are shown.

The screenshot shows the "Once Upon Online" Admin Dashboard. At the top right are links for "Books", "Orders", and "Logout". Below is a section titled "Admin Dashboard" with two main buttons: "Manage Books" (with "Add, edit, delete" subtext) and "View Orders" (with "See recent orders" subtext).

Screenshot: Admin dashboard.

Manage Books - Add new books (title, author, price, stock, image filename) or delete old ones.

The screenshot shows the "Admin Books" page. At the top are buttons for "Edit Record", "Order", and "Logout". Below is a table of books with columns: ID, Title, Author, Price, Stock, and Delete. The table contains 15 entries. At the bottom is a form titled "Add New Book" with fields for "Title", "Author", "Price", and "Stock". There is also a file input for "Image Name (or public/cover.jpg)" and a "Submit" button.

Screenshot: Manage books page.

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20230395

View Orders - See all customer orders with user details, addresses, and status.

Admin				
		Dashboard	Books	Logout
Orders				
ID	Date	Customer	Status	Address
5	2025-09-23 13:39:32	Nadine	PLACED	Street name and stuff
4	2025-09-18 12:38:38	Site Admin	PLACED	sds
3	2025-09-18 12:18:39	Site Admin	PLACED	Street Namme
2	2025-09-18 11:37:09	Site Admin	PLACED	34 Altona Crescent
1	2025-09-18 10:07:47	Dienkie	PLACED	33 Altona Crecent

Screenshot: Orders list.

## 6.4 Training Materials

### **Quick Start Guide**

#### **For Customers:**

Register - Log in - Browse Catalogue - Add to Cart - Checkout - Order Placed

#### **For Admins:**

Login with admin credentials - Add new books - View orders - Manage catalogue

Technical Setup (XAMPP):

Copy folder to htdocs.

Import sql/schema.sql into phpMyAdmin.

Update DB credentials in config/config.php if needed.

#### **Run:**

Customer site - <http://localhost/onceupononline/public/>

Admin site - <http://localhost/onceupononline/admin/login.php>

## 7. Deployment

### 7.1 Deployment Documentation

#### Installing on XAMPP

Install XAMPP

Download XAMPP from <https://www.apachefriends.org>

Install and run it.

Start Apache and MySQL from the XAMPP Control Panel.

Copy Project Folder

Place the project folder onceupononline into:

Windows: C:\xampp\htdocs\onceupononline

macOS: /Applications/XAMPP/htdocs/onceupononline

Import the Database

Open <http://localhost/phpmyadmin>

Create a new database called onceupononline\_db.

Go to the Import tab.

Select the SQL file: /onceupononline/sql/schema.sql.

Click Go.

Tables (users, books, orders, order\_items) will be created with sample data.

Configure config.php

Open /onceupononline/config/config.php.

Confirm database settings:

```
define('DB_HOST', 'localhost');  
define('DB_USER', 'root');  
define('DB_PASS', ""); // leave blank unless you set a MySQL password  
define('DB_NAME', 'onceupononline_db');
```

NadineNaude

20230395

Also check BASE\_URL matches your folder name:

```
define('BASE_URL', 'http://localhost/onceupononline/public/');
```

Access the Website

Customer site: http://localhost/onceupononline/public/

Admin site: http://localhost/onceupononline/admin/login.php

## 7.2 Hosting/Live Deployment

Hosting Provider (example)

InfinityFree (Free hosting with PHP & MySQL support)

Alternative: Local paid hosting provider like Afrihost or Hetzner (South Africa).

Deployment Steps (if hosted live)

Buy hosting package (with cPanel).

Upload onceupononline folder via File Manager or FTP to /public\_html/.

Create MySQL database in cPanel.

Import the SQL file (schema.sql) using phpMyAdmin on hosting.

Update config.php with live DB details (DB name, user, password, host).

Access the site via your domain.

### **Demo Accounts**

Admin Login:

Email: admin@onceupononline.test

Password: admin123

Customer Login:

Email: customer@onceupononline.test

Password: test123



## 8. Final Documentation & Presentation

### 8.1 Compiled PDF Portfolio

Project Plan & Requirements

Database Design Documentation (ERD, Normalisation, SQL Scripts)

Application & Website Design (Wireframes, UI Specs, Prototypes, Integrated Evidence)

Application Code & Functional Components (Folder structure, key code, queries, DB proof)

Testing & Quality Assurance (Test plan, outcomes, bug report, QA summary)

System Documentation & Manuals (Technical docs, User/Admin guides, Quick start)

Deployment (XAMPP install, SQL import, config setup, optional live hosting)

Final Documentation & Presentation

## 8.2 Presentation Slides

# **ONCE UPON ONLINE**

Nadine Naude - 20230395

OSD522 – Online Systems Development

## **PROJECT OVERVIEW**

- Client wanted an online bookstore to expand beyond physical stores.
- Goals: easy access, user-friendly platform, responsive design.
- Tech stack: PHP, MySQL, XAMPP.

## REQUIREMENTS

- Functional Requirements:
- User accounts (register, login).
- Browse/search books.
- Cart + checkout.
- Admin dashboard.
- Non-Functional Requirements:
- Security (hashed passwords).
- Scalability.
- Reliability.Usability.

## DATABASE DESIGN

- Entities: Users, Books, Orders, Order\_Items. One-to-many relationships.
- Normalised to 3NF.

## APPLICATION DESIGN

- **Wireframes:** page layouts (Home, Catalogue, Cart).
- **Prototypes:** styled mockups with colours & branding.
- **UI Choices:** dark theme, gold accents, responsive grid.

## INTEGRATED WEBSITE

- Fully implemented in browser.
- Customer features: Register, Login, Browse, Cart, Checkout.
- Admin features: Manage books, View orders.



## TESTING & QA

- Test Plan: Registration, login, add to cart, checkout, admin actions.
- Bug Fixes: image paths, admin login, SITE\_NAME error.
- Outcome: All major functions passed.

## DEPLOYMENT

- Local setup with XAMPP:
- Copy folder to htdocs
- Import schema.sql in phpMyAdmin
- Configure config.php
- Demo accounts included.



## CONCLUSION

- Project successfully delivered.
- Secure, scalable, user-friendly bookstore system.
- Future improvements: book categories, payment gateway, user profiles.

## 8.3 Lecturer feedback



Feedback 25/09/2025

Feedback given: Lines are uneven in the Catalogue page for 2 books.

Fix: Fixed the lines that were uneven.

## 9. References

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