Proposal for Retail Innovations Ltd

Digital Retail Management Platform

T Level Technical Qualification in Digital Software Development

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1. Project Overview

Retail Innovations Ltd is a growing retail business that currently manages its product catalogue, customer records, order processing, and loyalty programme using a combination of spreadsheets and disconnected manual processes. As the business expands, these approaches are becoming slow, error-prone, and difficult to scale. Information is stored in multiple places, staff must re-enter data by hand, and there is no reliable way to monitor sales performance or reward customer loyalty in real time.

The proposed solution is a modern, browser-based digital retail management platform that brings all of these functions together in a single, secure application. The platform will allow administrators to manage products, customers, and orders from one interface, while providing customers with their own personalised view of their order history and loyalty tier progress. All data will be stored in a structured database with appropriate security controls to ensure that each user only sees information relevant to their role.

The system will include the following core features:

- A secure login and registration system with role-based access for administrators and customers.
- A product catalogue with real-time search, category filtering, and full create, read, update, and delete (CRUD) functionality for administrators.
- A customer management module with automatic loyalty tier calculation based on accumulated points.
- An order management system that tracks order status through its full lifecycle from pending to delivered.
- A four-tier loyalty programme (Bronze, Silver, Gold, and Platinum) with configurable rewards.
- An administrator dashboard providing live analytics including total revenue, sales by category, and customer tier distribution.

These features are designed to replace the existing manual workflows, reduce the risk of data errors, and give Retail Innovations Ltd the operational visibility it needs to grow the business effectively.

2. Problems Identified

Problem 1 — Fragmented and Manual Data Management

Retail Innovations Ltd currently stores product information, customer details, and order records across multiple spreadsheets managed by different members of staff. Because there is no single system connecting these records, staff must re-enter data by hand when an order is placed or when a customer's details change. This process is time-consuming and introduces a significant risk of human error — for example, a customer's loyalty points may not be updated after a purchase, or a product's stock level may be incorrectly recorded. The lack of a central database also makes it impossible to run accurate reports or see the business's current status at a glance, which limits management's ability to make informed decisions quickly.

Problem 2 — No Role-Based Access Control

The current spreadsheet-based approach provides no mechanism for controlling which members of staff or which customers can view or edit specific information. Customer personal data, including contact details and purchase history, is accessible to anyone who has access to the relevant file. This represents a significant data protection risk and is not compliant with the requirements of the UK General Data Protection Regulation (UK GDPR). Furthermore, there is no distinction between what an administrator can do and what a customer can see — meaning customers have no dedicated interface through which to view their own order history or loyalty status, and administrators cannot easily restrict access to commercially sensitive information such as total revenue figures or the full customer database.

Problem 3 — No Loyalty Programme Infrastructure

Retail Innovations Ltd wishes to reward repeat customers through a points-based loyalty scheme, but currently has no system to support this. Any loyalty tracking that occurs is done manually, meaning points are rarely calculated consistently and rewards are difficult to manage at scale. Customers have no visibility of their own points balance or tier status, which reduces the motivational effect of the programme entirely. Without an automated and transparent loyalty system, the business is missing a significant opportunity to increase customer retention and encourage repeat purchases.

3. Proposed Solutions

Solution to Problem 1 — Centralised Database Platform

The proposed platform will store all product, customer, order, and loyalty data in a single, structured relational database managed by Supabase — a cloud-hosted PostgreSQL service. Every piece of information will be entered once and will be immediately available to all parts of the application. For example, when an order is placed, it will be linked directly to the relevant customer record and the ordered products, with no need for manual re-entry. Administrators will manage everything through a clean web interface rather than spreadsheets, and the system will automatically maintain referential integrity between records — for example, preventing a product from being deleted if it is referenced by an existing order. This eliminates the data inconsistency and duplication that the current approach suffers from.

Solution to Problem 2 — Role-Based Access Control with Database Security

The platform will implement a two-role access control system — administrator and customer — enforced at both the interface level and the database level. Administrators will see all data and have full CRUD permissions across all modules. Customer-role users will see only their own orders and loyalty information, with no access to other customers' data, financial totals, or management functions. Database-level Row Level Security (RLS) policies will be configured in Supabase to enforce these access rules regardless of what the front-end application does — ensuring that even if the interface were compromised, the underlying data would remain protected. This approach directly addresses the UK GDPR requirement that personal data must only be accessed by those with a legitimate need to do so.

Solution to Problem 3 — Automated Loyalty Programme

The platform will implement a four-tier loyalty programme (Bronze, Silver, Gold, and Platinum) with clear point thresholds that are automatically calculated and applied whenever a customer's points balance is updated. Customers will be able to see their current tier, their available rewards, and their progress towards the next tier directly within their account view. Administrators will be able to define and manage rewards — including percentage discounts, fixed-amount vouchers, and free shipping — and can update reward values or activate and deactivate individual offers without developer involvement. This automates the entire loyalty workflow and gives customers the visibility they need to engage meaningfully with the programme.

4. Decomposition of Solutions

Product Catalogue Management

Design a products database table that stores the product name, description, price, stock quantity, category, SKU (stock keeping unit code), image URL, and an active or inactive status flag. Ensure the price and stock quantity fields include database-level CHECK constraints to prevent negative values being saved.

Build a product table interface for the administrator that displays all products with a thumbnail image, the product name and SKU, the price, the current stock level, and the active status. Implement real-time search that filters results on every keystroke and a category dropdown that further narrows the results so administrators can find specific products quickly.

Create an add and edit modal form that administrators can use to create new products or update existing ones. The form should validate all required fields before saving and provide clear error messages if any field is left blank or contains an invalid value. Implement an image error fallback so that if a product image URL is broken or unavailable, a clean placeholder is shown in its place rather than a broken browser icon.

Add an active or inactive toggle so that administrators can hide products from the customer view without permanently deleting them. Ensure that delete actions require confirmation before proceeding, to prevent accidental data loss.

Customer Management and Loyalty Tiers

Design a customers table that stores the customer name, email address, optional phone number, accumulated loyalty points, and the calculated loyalty tier. Create a calculateLoyaltyTier function that automatically derives the correct tier based on the customer's current points — Bronze for 0 to 499 points, Silver for 500 to 999, Gold for 1000 to 1999, and Platinum for 2000 points and above — so that tier status is always consistent with the points balance and cannot be manually miscalculated.

Build an administrator-only customer panel that shows a visual summary of the four tier levels at the top of the page, giving staff immediate context before they view individual records. The customer table should display each customer's tier as a colour-coded badge and allow searching by name or email and filtering by tier.

Implement duplicate email checking before any new customer record is saved to prevent multiple accounts being created for the same person. Validate that loyalty points cannot be set to a negative value.

Order Management

Design an orders table linked to both the customers and products tables via foreign keys. Each order should record the customer, the total amount, the payment method, the order status, and the date it was created. Use a five-stage status lifecycle — pending, processing, shipped, delivered, and cancelled — to track each order through its full journey from placement to completion.

Ensure that administrator users can see all orders across all customers, while customer-role users can only see their own orders. This role separation must be enforced at the database level using Row Level Security as well as at the interface level, so that a customer cannot access another customer's data even by navigating directly to a URL or calling API endpoints directly.

Dashboard Analytics

Build an administrator dashboard that calculates and displays four key statistics — total number of products, total registered customers, total order count, and total revenue — each as a clearly labelled card that updates in real time when new data is added.

Implement a bar chart that breaks down the product catalogue by category, showing the relative distribution of products visually so administrators can identify which categories are best stocked at a glance. Implement a donut chart that shows the distribution of customers across the four loyalty tiers, helping management understand the loyalty programme's reach. Both charts should be built without external chart libraries, using calculated CSS properties to keep the application lean and fast.

5. Client and User Needs

Retail Innovations Ltd's primary objectives are to replace its fragmented spreadsheet-based processes with a single, reliable digital platform; to introduce a properly enforced loyalty scheme that rewards customer retention; and to give management real-time visibility of sales and customer data so that business decisions can be made based on accurate information rather than estimates.

The platform must serve two distinct user types, each with different needs and expectations. Administrator users — typically retail managers or senior members of staff — need the ability to manage the full product catalogue, view and update all customer accounts, process and track orders through their lifecycle, configure the loyalty rewards scheme, and monitor business performance through the dashboard. They need the interface to be efficient to use on a daily basis, with actions such as editing a product or updating an order status requiring as few clicks as possible. They also need confidence that sensitive commercial data, such as total revenue and the full customer list, is not visible to customers or unauthorised parties.

Customer users need a clean, straightforward interface that allows them to view their own order history, understand their current loyalty tier and the points required to reach the next level, and browse the available rewards. Customers are likely to access the platform on a range of devices including mobile phones and tablets, so the interface must be fully responsive and function consistently across different screen sizes. Error messages must be in plain, jargon-free language so that customers who are not technically experienced can understand what has gone wrong and how to correct it without needing to contact support.

To meet these needs, the system will implement a responsive web application that uses a tab-based navigation structure placing all core functions within a single click of the main interface. The role-based access control system will ensure that each user type sees only the information and controls relevant to their role. Input validation will prevent invalid data from being saved and will provide immediate, specific feedback when a form field contains an error. The dual-mode architecture — which allows the application to fall back to local storage if a cloud database connection is unavailable — ensures that the platform can be demonstrated and tested in any environment and that a network outage does not render the application entirely unusable.

6. Mitigating Potential Risks

To ensure the Retail Innovations Ltd platform is secure, reliable, and performs as expected in a real business environment, it is important to identify the risks that could affect the system and to plan how each one will be reduced before the platform is deployed. The following four risks have been identified as the most significant, along with their potential impacts and the strategies that will be used to address them.

Risk 1 — Unauthorised Access to Sensitive Business Data. If customer records, revenue figures, or management functions could be accessed by any logged-in user regardless of their role, sensitive commercial information and personal customer data would be exposed to people who have no legitimate need to see it. This would breach UK GDPR, which requires personal data to be accessible only to those with a specific and lawful purpose, and could expose Retail Innovations Ltd to significant financial penalties.

Impact: Disclosure of customers' personal data, potential regulatory fines under UK GDPR, loss of customer trust, and reputational damage.

Solution: Implement a two-role access control system (administrator and customer) enforced at both the front-end interface and the database level. Supabase Row Level Security (RLS) policies will be configured on every table so that even if the JavaScript interface were manipulated, the database itself would reject any query that violates the access rules. Administrator functions — including the customer management panel, revenue statistics, and dashboard charts — will be hidden from customer-role users via CSS class rules and protected by JavaScript function guards that check the user's role before executing any sensitive operation.

Justification: Defence in depth — enforcing access control at multiple layers (UI, application logic, and database) ensures that a failure at any single layer does not expose the data. RLS policies are evaluated server-side, meaning they cannot be bypassed by modifying client-side code.

Risk 2 — Cross-Site Scripting (XSS) Attack via User Input. If user-supplied text — for example, a product name or description entered by an administrator — is inserted directly into the page's HTML without sanitisation, a malicious actor could inject JavaScript code that would execute in other users' browsers. This could be used to steal session tokens, redirect users to fraudulent pages, or perform actions on behalf of the victim without their knowledge.

Impact: Theft of session credentials, unauthorised actions performed on behalf of legitimate users, potential data breach.

Solution: Implement an escaping function (esc()) that replaces the five HTML characters most commonly used in XSS payloads — ampersand, less-than, greater-than, double quote, and single quote — with their safe HTML entity equivalents before any user-supplied string is inserted into the DOM. This function will be applied consistently to every dynamic text value rendered by the application. The platform will not use innerHTML with unescaped strings at any point.

Justification: HTML entity escaping is the primary defence against reflected and stored XSS attacks as recommended by OWASP. Applying it consistently to all user-supplied content rather than selectively ensures that no injection vector is inadvertently left unprotected.

Risk 3 — Data Loss Due to Accidental Deletion. In a system where administrators can delete products, customers, and orders, there is a risk that a staff member accidentally deletes a record that is still needed — for example, deleting a customer account that has

active orders, or removing a product that has been ordered in the past. Without safeguards, this data could not be recovered and could cause operational and financial issues.

Impact: Permanent loss of order history, incorrect financial reporting, inability to fulfil existing orders, potential customer complaints.

Solution: All delete actions in the interface will require explicit confirmation through a browser confirmation dialogue before the deletion proceeds, giving the user an opportunity to cancel if they clicked delete by mistake. At the database level, foreign key constraints will be configured to use SET NULL rather than CASCADE where appropriate — for example, deleting a customer will set the customer_id field to null on their existing orders rather than deleting the orders themselves, preserving financial records. A soft-delete approach using an is_active flag will be offered for products, allowing them to be hidden from the customer view without being permanently removed from the database.

Justification: Combining UI-level confirmation dialogs with database-level constraint choices provides both human and technical safeguards against accidental loss. Preserving order records even when a customer account is deleted is essential for financial record-keeping and auditing purposes.

Risk 4 — Platform Unavailability Due to Cloud Database Outage. The platform relies on the Supabase cloud database service for its primary data storage. If the Supabase service experiences an outage or if the user's network connection is lost, the platform would be unable to read or write any data, rendering it entirely non-functional at precisely the time it might be needed — for example, during a busy trading period.

Impact: Staff unable to access product, customer, or order information; inability to process orders or update stock levels; loss of business during the outage period.

Solution: Implement a dual-mode architecture that detects at startup whether a Supabase connection can be established. If a connection is available, all data operations will use the cloud database. If the connection is unavailable, the application will automatically fall back to using the browser's local storage for all data operations, using identical data structures so that the interface continues to function without any code changes. This fallback mode allows the platform to be used for demonstrations and day-to-day operations even without internet access.

Justification: The dual-mode approach ensures continuous availability regardless of cloud service status, which is essential for a retail business where staff need to access product and order data throughout the working day. Supabase's own service level agreement provides 99.9% uptime for production-tier services, and the fallback mode addresses the remaining risk.

7. Addressing Relevant Regulations and Legal Requirements

To ensure the Retail Innovations Ltd platform is safe, legally compliant, and trustworthy, it must conform to the following regulations and legal requirements. These have been selected for their direct relevance to a system that collects and processes customer personal data, handles financial transactions, and is intended to be accessible to a broad range of users.

Regulation 1 — UK General Data Protection Regulation (UK GDPR)

Why it Applies: The platform will collect and store personal data about customers, including full names, email addresses, telephone numbers, and purchase history. UK GDPR, which is the post-Brexit retained version of the EU regulation, governs how this personal data must be collected, stored, processed, and protected by organisations operating in the United Kingdom.

Justification: Compliance with UK GDPR requires that personal data is collected only for a specified and legitimate purpose, stored securely using appropriate technical measures such as encryption and access control, not retained longer than necessary, and protected from unauthorised access. The platform's Row Level Security policies, role-based access control, and the Supabase platform's built-in encryption in transit and at rest all contribute directly to meeting these requirements. Non-compliance with UK GDPR can result in fines of up to £17.5 million or 4% of global annual turnover, whichever is higher, making compliance a critical business requirement rather than an optional consideration.

Regulation 2 — Equality Act 2010

Why it Applies: The platform will be used by customers of all ages and abilities, including people who rely on assistive technologies such as screen readers, users with visual impairments who require sufficient colour contrast, and users who navigate using a keyboard rather than a mouse. The Equality Act 2010 places a legal duty on organisations providing services to make reasonable adjustments to ensure those services are accessible to people with disabilities.

Justification: To meet this obligation, the platform will be designed in accordance with the Web Content Accessibility Guidelines (WCAG) 2.1 at Level AA, which is the standard referenced by most accessibility legislation in the UK. Specific measures include ensuring that all status indicators use text labels alongside colour (so information is not conveyed by colour alone, which would exclude colour-blind users), maintaining a minimum colour contrast ratio of 4.5:1 between text and background, ensuring all form inputs have associated labels, and binding key actions to the Enter key as well as mouse clicks so that the interface is operable without a pointing device.

Regulation 3 — Cyber Essentials (National Cyber Security Centre)

Why it Applies: Cyber Essentials is a UK Government-backed cybersecurity framework designed to help organisations protect themselves against the most common cyber threats. Any system that stores customer personal data or processes payment-related information should be assessed against the five Cyber Essentials controls: firewalls, secure configuration, user access control, malware protection, and patch management.

Justification: The platform addresses the user access control control through its role-based system and Row Level Security policies. Secure configuration is addressed through the use of environment variables for Supabase credentials rather than hardcoded values in the source code, and through the consistent use of HTTPS for all communication between the

client and the Supabase service. XSS protection through HTML entity escaping contributes to secure configuration by ensuring that the application does not execute unintended code. Adherence to Cyber Essentials principles demonstrates a baseline of cybersecurity diligence that builds customer and stakeholder trust.

Regulation 4 — Intellectual Property and Licensing

Why it Applies: The platform makes use of third-party software and assets, including the Supabase JavaScript client library, product photography sourced from Unsplash, and code patterns drawn from official technical documentation. Each of these resources is governed by its own licence, and using them without understanding and complying with those licences could expose Retail Innovations Ltd to copyright infringement claims.

Justification: All third-party assets used in the platform have been selected specifically because they are available under licences that permit free use in commercial applications without requirement for royalty payment or source code disclosure. The Supabase JavaScript client library is licensed under the Apache 2.0 licence, which permits free use in both open-source and proprietary commercial projects. Product images are sourced from Unsplash under the Unsplash Licence, which permits free use in commercial and non-commercial projects without attribution. Compliance with these licensing terms protects Retail Innovations Ltd from legal disputes and ensures the platform can be deployed and maintained without unanticipated costs.

8. Functional and Non-Functional Requirements

Functional Requirements — What the system must do

Functional requirements describe the specific actions and behaviours the system must be capable of performing in order to meet the needs of Retail Innovations Ltd and its users. Each requirement is stated in measurable terms and is accompanied by a justification explaining why it is necessary.

ID	Requirement	Description	Justification
FR1	User Registration and Authentication	The system shall allow new users to register with an email address, password, and full name. Registered users shall be able to sign in securely. The system shall assign each user either an administrator or customer role on registration or via admin promotion.	Secure authentication is the gateway to all other system functions. Role assignment at registration is required to implement role-based access control throughout the platform.
FR2	Product Catalogue with CRUD and Filtering	Administrators shall be able to create, view, edit, and delete products. Each product shall have a name, description, price, stock quantity, category, SKU, image URL, and active status. All users shall be able to search products by name and filter by category in real time.	The product catalogue is the foundation of the retail operation. Real-time filtering allows administrators and customers to find specific items quickly without waiting for a page reload, improving efficiency and user experience.
FR3	Order Management with Status Lifecycle	Administrators shall be able to create, edit, and delete orders. Each order shall record the customer, total amount, payment method, and current status. Order status shall progress through five stages: pending, processing, shipped, delivered, and cancelled. Customers shall see only their own orders.	Full order lifecycle tracking gives Retail Innovations Ltd visibility of every transaction from placement to fulfilment. Role separation ensures customers cannot access other customers' order data.
FR4	Customer Management with Tier Calculation	Administrators shall be able to create, view, edit, and delete customer records. Each record shall store the customer's name, email, optional phone number, loyalty points, and calculated tier. The system shall automatically calculate the loyalty tier from the points balance whenever it changes.	Centralising customer data in a searchable, filterable table replaces the existing manual spreadsheets and removes the risk of inconsistent tier calculations. Automatic tier derivation ensures the system is always

ID	Requirement	Description	Justification
			accurate.
FR5	Loyalty Programme with Configurable Rewards	The system shall define four loyalty tiers — Bronze (0–499 points), Silver (500–999), Gold (1000–1999), and Platinum (2000+). Administrators shall be able to create, edit, and delete loyalty rewards, specifying the reward name, type, value, and points required to claim it. All users shall be able to view available rewards.	A transparent and configurable loyalty programme gives customers a clear incentive to make repeat purchases. Administrator control of reward values allows the scheme to be adjusted without developer involvement.
FR6	Administrator Dashboard Analytics	Administrators shall see a dashboard displaying four summary statistics (product count, customer count, order count, and total revenue), a bar chart of products by category, and a donut chart of customer distribution by loyalty tier. All dashboard data shall reflect the current state of the database.	Real-time business analytics replace the manual reporting process and allow management to monitor the business at a glance. Charts provide at-a-glance insight that raw numbers alone do not provide.
FR7	Client-Side Input Validation with User Feedback	The system shall validate all form inputs before saving. Required fields shall not be left blank. Numeric fields such as price and stock quantity shall not accept negative values. Validation errors shall be communicated to the user immediately through clear, plain-language toast notifications that specify which field is invalid and why.	Client-side validation prevents invalid data from reaching the database and gives users immediate feedback. Clear error messages reduce frustration and allow users to correct their input without needing to submit the form multiple times.
FR8	Role-Based Access Control	The system shall restrict access to features and data based on the logged-in user's role. Administrator-only functions (customer management panel, revenue figures, dashboard charts, product editing, order management) shall be hidden from customer-role users at the interface level and blocked at the database level via Row Level Security policies.	Role-based access control is required to protect commercially sensitive data and customer personal information. Enforcement at both interface and database levels ensures that access restrictions cannot be bypassed by modifying client-side code.

Non-Functional Requirements — How the system must perform

Non-functional requirements describe the quality attributes and constraints that govern how the system must behave, independently of its specific features. They set measurable standards for performance, security, usability, and reliability.

ID	Category	Requirement	Justification
NFR 1	Performance	All pages and sections within the application shall load and become interactive within three seconds on a standard broadband connection. Dashboard analytics shall recalculate and re-render within one second of new data being added.	Slow loading reduces productivity for staff who need to work efficiently throughout the day and increases frustration for customers. The three-second target aligns with industry research showing that users begin abandoning applications that take longer than this to respond.
NFR 2	Usability	All core tasks — including adding a product, creating an order, and searching the catalogue — shall be completable by a first-time user without training or documentation. The interface shall follow established web conventions (tabbed navigation, modal forms, inline search) so that users can apply prior knowledge from other applications.	A usable interface reduces training time, decreases the risk of user error, and ensures that the platform provides practical value from day one of deployment rather than requiring an extended onboarding period.
NFR 3	Accessibility	The platform shall comply with WCAG 2.1 Level AA. Colour contrast between text and background shall meet a minimum ratio of 4.5:1. All status indicators shall include text labels and shall not rely on colour alone. All form inputs shall have associated visible labels. Key actions shall be triggerable by keyboard as well as mouse.	WCAG 2.1 AA compliance is the standard referenced by the Equality Act 2010 accessibility guidance. Meeting this standard ensures the platform is usable by staff and customers with visual, motor, or cognitive impairments and protects Retail Innovations Ltd from discrimination claims.
NFR 4	Security	All data transmitted between the client application and the Supabase service shall be encrypted in transit using HTTPS/TLS. All user-supplied strings rendered into the HTML document shall be escaped using HTML entity encoding before insertion. Database access shall be governed by Row Level Security policies. No credentials or API keys shall be hardcoded in the client-side source	Encryption in transit, XSS protection, and RLS enforcement collectively address the most significant attack vectors for a web-based application handling personal data. Environment variable management for

ID	Category	Requirement	Justification
		code.	credentials prevents accidental exposure of database access keys.
NFR 5	Reliability	The platform shall be available for normal use at least 99.5% of the time during business hours. In the event of a cloud database outage, the application shall automatically fall back to local storage mode and continue operating without displaying an error to the user, with a clear status indicator reflecting the offline state.	Retail businesses depend on continuous access to their product, customer, and order data throughout the trading day. The dual-mode architecture provides an additional layer of resilience beyond the Supabase service level agreement, ensuring business continuity.
NFR 6	Compatibility	The platform shall function correctly in the latest stable versions of Chrome, Firefox, Safari, and Edge, on both desktop and mobile devices. The interface shall be fully responsive and shall provide a usable experience at screen widths from 375 pixels (small mobile) upwards.	Retail staff may use a range of devices and browsers, and customers are likely to access the platform on mobile phones. A responsive, cross-browser interface ensures that the platform is accessible regardless of the user's hardware or software configuration.
NFR 7	Scalability	The database schema shall be designed to support growth without requiring structural changes. The platform architecture shall be capable of supporting at least 100 concurrent users without degradation in response time. The application shall be deployable on standard cloud infrastructure without custom server configuration.	As Retail Innovations Ltd grows, the platform must be able to accommodate an increasing number of products, customers, and orders. Using a cloud-hosted database service and a stateless web application architecture provides the scalability the business will need without requiring a dedicated server infrastructure team.

9. Key Performance Indicators (KPIs)

Key Performance Indicators are measurable values that will be used to assess how effectively the Retail Innovations Ltd digital platform is meeting its core objectives following deployment. Each KPI includes a definition, a method of measurement, and a specific target against which performance can be judged. These KPIs were derived directly from the functional and non-functional requirements and from the client's stated business goals.

KPI Name	Definition	Measurement	Target
Application Page Load Time	The time taken from a user navigating to the application to the interface becoming fully interactive.	Measured using browser developer tools performance panel and manual timing across at least three devices.	All sections shall become interactive within 3 seconds on a standard broadband connection.
System Uptime	The proportion of scheduled business hours during which the platform is available and functional for both administrator and customer users.	Monitored using Supabase's built-in uptime monitoring dashboard and supplemented by periodic manual checks.	99.5% availability during business hours each month.
Task Completion Rate	The proportion of intended user tasks — such as adding a product, placing an order, or editing a customer record — that are completed successfully without the user needing to abandon the task.	Monitored during user acceptance testing by recording successful and abandoned task attempts across a sample of at least five users per role.	95% of tasks completed successfully without assistance in user acceptance testing.
Customer Loyalty Programme Adoption	The proportion of registered customers who have interacted with the loyalty programme by viewing available rewards or having their tier updated.	Tracked by querying the proportion of customer records with a tier above Bronze (i.e. with more than zero accumulated points) after three months of operation.	At least 30% of registered customers reaching Silver tier or above within three months of launch.
Monthly Active User Count	The number of unique users who log in and perform at least one action on the platform within a given calendar month.	Tracked via the Supabase auth.users table and supplemented by reviewing the created_at timestamps on recently modified records.	A minimum of 10 active users in the first month following launch, growing by at least 20% month-on-month in the first quarter.

KPI Name	Definition	Measurement	Target
WCAG 2.1 AA Compliance	The extent to which the platform meets the Web Content Accessibility Guidelines 2.1 at Level AA as required by the Equality Act 2010.	Assessed using automated accessibility checking tools (such as axe or Lighthouse) supplemented by manual keyboard navigation testing and colour contrast measurement.	Zero critical WCAG 2.1 AA violations reported by automated tooling and confirmed by manual review.
User Satisfaction Score	The average satisfaction rating given by users after completing a structured set of tasks with the platform during a review session.	Collected via a short post-session questionnaire using a five-point scale administered to both administrator and customer test users.	An average score of at least 4 out of 5 across all user groups within six months of launch.

10. User Acceptance Criteria

User Acceptance Criteria (UAC) describe the specific, testable conditions that must be satisfied for Retail Innovations Ltd to accept the digital platform as complete and fit for purpose. These criteria are written from the user's perspective, focused on observable outcomes rather than technical implementation details, and are directly traceable to the functional requirements defined in Section 8. The client will use these criteria as the basis for formal acceptance testing before the platform is signed off for deployment.

UAC for Product Catalogue Management

- Administrators shall be able to add a new product by completing the product form and clicking Save, with the new product appearing in the product table within the same session without a page reload.
- Administrators shall be able to edit any existing product by clicking its Edit button, updating one or more fields, and saving, with the updated values immediately reflected in the product table.
- Administrators shall be able to delete a product after confirming the deletion in a confirmation dialogue, with the product no longer appearing in the table once deleted.
- All users shall be able to search for products by typing in the search bar, with the results filtering on every keystroke to show only products whose name or description contains the entered text.
- All users shall be able to filter the product table by category using the category dropdown, with the results updating immediately to show only products in the selected category.
- If an administrator leaves a required field blank or enters an invalid value (such as a negative price) and attempts to save, a clear error message shall describe the specific field that is invalid and the form shall not be submitted until the error is resolved.

Justification: These criteria ensure that the product catalogue management module delivers the core CRUD functionality needed to replace the existing spreadsheet process. Real-time filtering and clear validation feedback directly support the usability requirements defined in NFR2 and NFR7.

UAC for Customer Management and Loyalty Programme

- Administrators shall be able to create a new customer record with a full name, email address, and loyalty points balance, with the system automatically displaying the correct loyalty tier badge based on the points entered.
- When an administrator updates a customer's loyalty points to a value that crosses a tier boundary, the displayed tier badge shall update to reflect the new tier without requiring a page reload.
- If an administrator attempts to save a customer record with an email address that already exists in the system, an error message shall be displayed and the duplicate record shall not be created.
- All users with the appropriate role shall be able to view the four loyalty tier cards at the top of the Customers panel, each showing the tier name and the points range required.
- All logged-in users shall be able to view the available loyalty rewards in the Loyalty Rewards panel, with each reward showing its name, type, value, and required points.

- Administrators shall be able to add, edit, and delete loyalty rewards, with changes immediately reflected in the rewards table for all users.

Justification: These criteria verify that the loyalty system operates accurately and transparently, which is essential for maintaining customer trust in the programme. Automatic tier updates and duplicate prevention directly address the data integrity risks identified in the problems analysis in Section 2.

UAC for Order Management

- Administrators shall be able to create a new order by specifying the customer, total amount, payment method, and initial status, with the new order appearing in the orders table within the same session.
- Administrators shall be able to update an order's status from any current status to any subsequent status in the lifecycle (pending, processing, shipped, delivered, cancelled), with the status badge updating immediately in the table.
- When logged in as a customer, the Orders panel shall display only orders associated with that customer's account. No orders belonging to other customers shall be visible or accessible.
- When logged in as an administrator, the Orders panel shall display all orders from all customers, clearly identifying the customer associated with each order.
- If an administrator attempts to save an order with a negative or non-numeric total amount, an error message shall be displayed and the order shall not be saved.

Justification: These criteria confirm that the order management module correctly enforces the role-based data separation required by FR3 and FR8. The status lifecycle criteria verify that orders can be tracked through their full journey from placement to completion, replacing the current manual tracking process.

UAC for Role-Based Access Control and Security

- When logged in as a customer, the Customers tab shall not be visible in the navigation bar and the customer management panel shall not be accessible by any means including direct JavaScript console calls.
- When logged in as a customer, the Dashboard panel shall not display total revenue figures or the customer tier distribution chart, which contain commercially sensitive information.
- If text containing HTML or JavaScript characters (such as a script tag or an image tag with an onerror attribute) is entered into any text field and saved, the text shall be displayed as literal characters and no script shall execute.
- When a user signs out, their session shall be cleared immediately and the application shall return to the login screen. Pressing the browser back button after signing out shall not re-display any account data.

Justification: These criteria verify the security properties that are most critical for a system handling personal customer data and commercially sensitive business information. XSS prevention and session management are both required to demonstrate that the platform meets the security requirements of UK GDPR and Cyber Essentials as described in Section 7.