Non-Functional Requirement Document (NFRD): Online Apparels Shopping Website

1. Introduction

This document specifies the non-functional requirements (NFRs) for the Online Apparels Shopping Website. These requirements define criteria used to judge the system's operation rather than specific behaviors, focusing on aspects like performance, security, scalability, and usability.

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2. Performance Requirements

Performance requirements specify constraints on the speed and efficiency of the system.

ID	Requirement	Metric	Target	Rationale
NFR-P1	**Page Load Speed**	Time to fully load web pages (excluding initial DNS lookup)	Shall not exceed **3 seconds**[1].	Ensures a satisfactory buyer experience and reduces bounce rate (BRD NFR-002: target of 30 seconds is revised to 3 seconds, aligning with modern web standards).
NFR-P2	**API Response Time**	Time for critical API calls (e.g., search, add to cart, login)	Shall not exceed **500 milliseconds**.	Ensures responsiveness during shopping and checkout processes.
NFR-P3	**Search Latency**	Time to return initial product search results	Shall not exceed **1 second**.	Critical for product discovery and core user journey (FR-003).

3. Scalability and Capacity Requirements

Scalability defines the system's ability to handle increasing workload, and capacity defines the limits under current infrastructure.

ID	Requirement	Metric	Target	Rationale
NFR-S1	**Concurrent Users**	Maximum number of simultaneously active user sessions (logged in or browsing)	Must accommodate up to **100 users concurrently**[2].	Directly supports the BRD NFR-001[3].
NFR-S2	**Order Processing Capacity**	Maximum number of orders the system can process reliably per hour	Must support a minimum of **150 orders per hour**.	Provides capacity buffer above the concurrent user target for peak events.
NFR-S3	**Product Catalog Capacity**	Total number of products the database should be able to store and search efficiently	Must support a minimum of **10,000 product SKUs**.	Allows for significant future growth beyond the initial product set.

4. Security Requirements

Security requirements protect the system, data, and communications from unauthorized access and damage.

ID	Requirement	Metric	Target	Rationale
NFR-Q1	**Payment Security**	Encryption standard for handling payments and sensitive data	**SSL security and encryption** [4] (Minimum TLS 1.2).	Mandatory for all online payment transactions (FR-008) and compliance (BRD NFR-004).
NFR-Q2	**Data Protection**	Encryption mechanism for user credentials	Passwords must be stored using a **one-way hashing algorithm** (e.g., bcrypt or Argon2) with salt.	Protects user accounts (FR-001, FR-002, FR-014).
NFR-Q3	**Access Control**	Authorization mechanism for the Admin Panel	Must enforce **Role-Based Access Control (RBAC)** [6666] for all Admin and Sub-user functions (FR-022, FR-023).	Ensures sub-users only access permitted sections, protecting sensitive data.
NFR-Q4	**Input Validation**	Protection against common web vulnerabilities	System must enforce **input validation** against SQL Injection and Cross-Site Scripting (XSS)	Prevents data breaches and corruption.

ID	Requirement	Metric	Target	Rationale
			on all user and admin inputs.	

5. Reliability and Availability Requirements

Reliability defines the system's ability to operate without failure, and availability is the proportion of time the system is operational.

ID	Requirement	Metric	Target	Rationale
NFR-R1	**Availability**	Uptime during core business hours (9 AM - 5 PM EST)	**99.9%** (less than 8.7 hours of downtime per year).	Essential for a continuous e-commerce business model.
NFR-R2	**Error Handling**	Response to missing pages	Web pages should not get broken and must **display an appropriate "Page Not Found" error**[7].	Ensures user experience is maintained even in case of invalid URLs (BRD NFR-003 [8]).
NFR-R3	**Data Backup**	Frequency and retention of full database backups	**Daily** full backup; retention for **30 days**.	Enables rapid recovery from data loss or system failure.

6. Operability and Maintainability Requirements

These define how easily the system can be operated, administered, and updated.

ID	Requirement	Metric	Target	Rationale
NFR-O1	**Audit Logging**	Record keeping for critical Admin actions	Must log **all create/edit/delete operations** performed by Admin and Sub-users (FR-016, FR-017, FR-019).	Necessary for security, compliance, and dispute resolution.
NFR-O2	**Configuration Management**	Ease of updating system parameters	All configurable values (e.g., Tax rates, Shipping carrier details, Email content [9]) must be managed via the **Admin Panel** (FR-017, FR-025).	Reduces reliance on developer intervention for business changes.
NFR-O3	**Code Maintainability**	Coding standards compliance	Codebase must adhere to **[Specific Language] coding standards** (e.g., PEP8 for Python) and pass peer review.	Ensures long-term maintainability and reduces bug introduction.

7. Legal and Regulatory Constraints

These requirements address necessary legal and business limitations.

ID	Requirement	Metric	Target	Rationale
NFR-L1	**Geographic Constraint**	Where the system accepts orders	**US country only**[10].	Adheres to the BRD assumption/constraint. System must validate shipping addresses for US residency.
NFR-L2	**Currency Standard**	Pricing display and payment currency	All product prices will be in **USD**[12].	Adheres to the BRD assumption[13].
NFR-L3	**Policy Management**	Accessibility of legal documents	**CMS pages** for Privacy Policy and Terms and Conditions must be accessible and editable by the Admin (FR-024).	Essential for legal compliance and transparency.