■ Product Requirements Document (PRD)

Product: E-commerce Platform with Personalized Product Recommendation

Version: 1.0 | Owner: [Your Name] | Date: [Date]

Overview:

Build an e-commerce platform with personalized product recommendations to improve engagement, conversion, and retention.

Objectives:

- Enable seamless product discovery and purchases.
- Provide AI-driven personalized recommendations.
- Increase AOV (Average Order Value) and CLV (Customer Lifetime Value).
- Support web and mobile platforms.

Key Features:

- User Management – registration, login, profiles, roles.
- Product Catalog – categories, product details, search & filters.
- Personalized Recommendations – collaborative, content-based, hybrid models.
- Shopping Cart & Checkout – multi-payment, order summary.
- Order Management – tracking, notifications, returns.
- Seller Dashboard – product upload, inventory, analytics.
- Admin Dashboard – manage users, products, orders, analytics.

Non-Functional Requirements:

- Scalability
- Performance
- Security
- Availability
- Privacy

KPIs:

- CTR on recommendations
- Conversion Rate uplift
- AOV
- Customer Retention
- System uptime

■ Methods to Scale User Growth

Acquisition:

- SEO & content marketing
- Referral programs
- Influencer & affiliate marketing
- Paid ads (Google, Facebook, Instagram)
- Partnerships & collaborations

Activation:

- Personalized onboarding
- First purchase discounts
- Gamified experiences

Retention:

- AI-driven personalized recommendations
- Loyalty programs
- Push notifications & emails
- Subscription models

Revenue Optimization:

- Upselling & cross-selling
- Dynamic pricing
- Bundles & combos

Virality & Community:

- User-generated content (reviews, photos)
- Wishlist & gift sharing
- Live shopping events

Data-Driven Growth:

- A/B testing
- Cohort analysis
- User feedback loops

■ Website Optimization Methods

Front-End Optimization:

- Lazy loading for images
- Image optimization (WebP/AVIF)
- Minify JS/CSS/HTML
- Use CDN for static assets
- Browser caching & PWA service workers

Back-End Optimization:

- Database indexing & optimized queries
- Read replicas & sharding
- Redis/Memcached caching
- Asynchronous background processing

Search & Recommendations:

- Elasticsearch/Meilisearch for search
- Pre-compute recommendations daily
- Real-time personalization overlay

Scalable Architecture:

- Microservices architecture
- Load balancing (Nginx, HAProxy, ELB)
- Auto-scaling (AWS/GCP/Azure)
- API gateway & rate limiting

Security & Stability:

- HTTPS everywhere
- Web Application Firewall (WAF)
- Error monitoring with Sentry/Datadog

Testing & Monitoring:

- Load testing (JMeter, Locust)
- Real User Monitoring (Core Web Vitals)
- A/B testing recommendation placement