

SOFTWARE REQUIREMENTS SPECIFICATION (SRS)

TRENDIFY E-COMMERCE PLATFORM

Project Information

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Team Information

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1. INTRODUCTION

1.1 Purpose

This document serves as the Software Requirements Specification (SRS) for the Trendify E-commerce Platform. It outlines the functional and non-functional requirements, system architecture, and technical specifications needed to develop a comprehensive online marketplace for fashion and lifestyle products.

1.2 Document Scope

This SRS covers the complete system requirements for both customer-facing and administrative functionalities of the Trendify platform, including user management, product catalog, order processing, payment integration, and analytics.

1.3 Intended Audience

- Development Team
- Project Stakeholders
- Quality Assurance Team
- System Administrators
- End Users (Customers and Sellers)

2. PROJECT OBJECTIVES

The Trendify E-commerce Platform aims to achieve the following key objectives:

2.1 Primary Goals

- **Digitization of Retail Operations:** Eliminate manual product handling and paperwork through comprehensive automation
- **Enhanced Operational Efficiency:** Reduce transaction processing time for both customers and sellers
- **Improved Accuracy:** Implement precise order processing and real-time inventory tracking
- **Process Optimization:** Streamline the entire buying and selling workflow

- **Data Security:** Ensure robust security measures for user data and financial transactions

2.2 User Experience Goals

- **Intuitive Interface:** Design user-friendly interfaces requiring minimal training
- **Accessibility:** Support both technical and non-technical users effectively
- **Error Reduction:** Minimize human error through automated processes
- **Personalization:** Provide tailored shopping experiences and recommendations

2.3 Target User Groups

Customers

- Browse extensive product catalogs
- Manage shopping cart and wishlist
- Process secure payments
- Track order status and delivery
- Receive personalized product recommendations
- Access customer support and reviews

Sellers/Administrators

- Manage product listings and inventory
- Monitor stock levels and reorder alerts
- Process and fulfill customer orders
- Create and manage promotional campaigns
- Generate comprehensive sales and performance reports
- Handle customer inquiries and returns

3. SYSTEM ANALYSIS

3.1 Current System Limitations

- **Manual Processes:** Heavy reliance on manual product management and order processing
- **Time-Intensive Operations:** Lengthy search and discovery process for trending fashion products
- **Inventory Management:** Manual tracking of original vs. counterfeit products
- **Communication Gaps:** Manual notification system for customer updates
- **Payment Issues:** Limited payment options and cash-only transactions
- **Geographic Constraints:** Need for physical store visits

3.2 Proposed System Improvements

- **Automated Workflow:** Complete automation of product listing, order management, and customer communications
- **Advanced Search:** AI-powered search and filtering for quick product discovery
- **Smart Inventory:** Real-time inventory tracking with automated alerts
- **Multi-Channel Communication:** Automated email notifications and SMS alerts
- **Multiple Payment Options:** Integration with various payment gateways
- **24/7 Accessibility:** Round-the-clock online shopping experience

4. FUNCTIONAL REQUIREMENTS

4.1 User Management System

- **User Registration:** Email verification and profile creation
- **Authentication:** Secure login with Google OAuth integration
- **Profile Management:** Personal information, addresses, and preferences
- **Role-Based Access:** Customer, seller, and administrator roles

4.2 Product Management

- **Catalog Management:** Add, edit, and delete product listings
- **Category Organization:** Hierarchical product categorization
- **Inventory Tracking:** Real-time stock level monitoring
- **Image Management:** Multiple product images with compression
- **Search and Filtering:** Advanced search with multiple filter options

4.3 Shopping Experience

- **Shopping Cart:** Add, remove, and modify cart items
- **Wishlist:** Save products for future purchase
- **Checkout Process:** Streamlined multi-step checkout
- **Payment Processing:** Multiple payment gateway integration
- **Order Tracking:** Real-time order status updates

4.4 Administrative Features

- **Dashboard Analytics:** Sales trends and performance metrics
- **Order Management:** Process, fulfill, and track orders
- **Customer Management:** User account and inquiry handling
- **Report Generation:** Comprehensive business intelligence reports
- **Promotional Tools:** Discount codes and marketing campaigns

5. NON-FUNCTIONAL REQUIREMENTS

5.1 Performance

- **Response Time:** Page load times under 3 seconds
- **Scalability:** Support for 10,000+ concurrent users
- **Availability:** 99.9% uptime guarantee
- **Database Performance:** Optimized queries for large datasets

5.2 Security

- **Data Encryption:** SSL/TLS for all data transmission

- **Authentication:** JWT-based secure authentication
- **Payment Security:** PCI DSS compliant payment processing
- **Data Privacy:** GDPR compliance for user data protection

5.3 Usability

- **Responsive Design:** Cross-device compatibility
- **Accessibility:** WCAG 2.1 compliance
- **Browser Support:** Modern browser compatibility
- **Mobile Optimization:** Native mobile app-like experience

6. TECHNICAL ARCHITECTURE

6.1 System Architecture

The Trendify platform follows a modern MERN (MongoDB, Express.js, React.js, Node.js) stack architecture with the following components:

6.2 Frontend Technologies

Core Framework

- **React.js 18+:** Component-based architecture for building dynamic user interfaces
- **Vite:** Modern build tool for fast development and optimized production builds
- **React Router:** Client-side routing for single-page application navigation

Styling and UI Components

- **Tailwind CSS:** Utility-first CSS framework for rapid and consistent styling
- **Material-UI (MUI):** Pre-built React components following Material Design principles
- **Emotion:** CSS-in-JS library for dynamic styling solutions
- **React Icons & Lucide React:** Comprehensive icon libraries for UI enhancement

Interactive Features

- **GSAP (GreenSock):** High-performance animation library for smooth transitions
- **Swiper:** Touch-enabled slider library for product carousels
- **React Hot Toast:** User-friendly notification system
- **React Toastify:** Advanced toast notification management

6.3 Backend Technologies

Server Framework

- **Node.js:** JavaScript runtime for server-side development
- **Express.js:** Web application framework for RESTful API development

Database

- **MongoDB:** NoSQL document database for flexible data storage
- **Mongoose:** MongoDB object modeling for Node.js

Authentication & Security

- **JSON Web Tokens (JWT):** Secure user session management
- **bcrypt.js:** Password hashing and encryption
- **Google OAuth 2.0:** Third-party authentication integration

6.4 Payment Integration

- **Stripe:** Primary payment gateway for credit/debit card processing
- **PayPal:** Alternative payment method integration
- **Razorpay:** (Recommended for Indian market) Local payment gateway support

6.5 Development Tools

- **ESLint:** Code quality and consistency enforcement
- **Prettier:** Automated code formatting
- **PostCSS & Autoprefixer:** CSS processing and browser compatibility

- **Axios:** HTTP client for API communication
- **Chart.js:** Data visualization for analytics dashboards

6.6 Additional Features

- **Browser Image Compression:** Client-side image optimization
- **Real-time Analytics:** Performance monitoring and user behavior tracking
- **Email Service:** Automated email notifications and marketing campaigns

7. PROJECT SCOPE AND DELIVERABLES

7.1 In-Scope Features

- Complete e-commerce platform with customer and seller portals
- Mobile-responsive web application
- Secure payment processing system
- Inventory management system
- Order tracking and management
- Analytics and reporting dashboard
- Email notification system
- Search and recommendation engine

7.2 Target User Demographics

- **Students:** Budget-conscious shoppers seeking trendy fashion
- **Working Professionals:** Time-constrained users requiring quick shopping solutions
- **Senior Citizens:** Users needing simplified, accessible interfaces
- **Small Business Sellers:** Entrepreneurs seeking online marketplace presence
- **Fashion Enthusiasts:** Users interested in latest trends and exclusive products

7.3 Key Benefits

- **Simplified Product Management:** Streamlined catalog and inventory operations
- **Seamless Shopping Experience:** From product discovery to delivery
- **Personalized Recommendations:** AI-driven product suggestions
- **Comprehensive Analytics:** Data-driven business insights
- **Automated Backup Systems:** Secure user data management
- **Real-time Communication:** Instant system alerts and notifications

8. SYSTEM SIGNIFICANCE

8.1 Business Impact

- **Operational Automation:** Reduces manual workload by 80% through automated product listing, order management, and payment processing
- **Market Reach:** Eliminates geographical constraints, enabling 24/7 global accessibility
- **Customer Engagement:** Automated email marketing system for order updates, promotions, and personalized recommendations
- **Vendor Empowerment:** Self-service portal for inventory management and performance analytics
- **Data-Driven Decisions:** Advanced analytics for business intelligence and strategic planning

8.2 Technical Advantages

- **Scalable Architecture:** Modular design supporting seamless feature additions and upgrades
- **High Performance:** Optimized for handling thousands of concurrent users
- **Security First:** Enterprise-grade security measures for data protection
- **Cross-Platform Compatibility:** Responsive design ensuring consistent experience across devices

9. DEVELOPMENT ENVIRONMENT

9.1 Integrated Development Environment

- **Visual Studio Code:** Primary code editor with extensions for React, Node.js, and MongoDB
- **MongoDB Compass:** GUI for database management and query optimization
- **Postman:** API testing and documentation tool

9.2 Version Control and Deployment

- **Git & GitHub:** Source code version control and collaboration
- **Docker:** Containerization for consistent development and deployment environments
- **Cloud Hosting:** AWS/Heroku deployment for production environment

10. TESTING STRATEGY

10.1 Testing Approach

- **Unit Testing:** Component-level testing using Jest and React Testing Library
- **Integration Testing:** API endpoint testing with automated test suites
- **User Acceptance Testing:** Real-world scenario testing with target user groups
- **Performance Testing:** Load testing for scalability validation
- **Security Testing:** Vulnerability assessment and penetration testing

11. PROJECT TIMELINE AND MILESTONES

Phase 1: Foundation (Weeks 1-4)

- System architecture setup
- Database design and implementation
- Basic user authentication system

Phase 2: Core Development (Weeks 5-12)

- Product catalog and inventory management
- Shopping cart and checkout system
- Payment gateway integration

Phase 3: Advanced Features (Weeks 13-16)

- Analytics dashboard
- Recommendation engine
- Admin panel development

Phase 4: Testing and Deployment (Weeks 17-20)

- Comprehensive testing
- Performance optimization
- Production deployment

12. REFERENCES AND RESOURCES

Industry Benchmarks

- **Amazon.com** - Global e-commerce platform reference
- **Flipkart.com** - Indian e-commerce market leader
- **Shopify** - E-commerce platform architecture study

Technical Documentation

- **React.js Official Documentation** - <https://reactjs.org/docs>
- **MongoDB Documentation** - <https://docs.mongodb.com>
- **Node.js Best Practices** - <https://nodejs.org/en/docs>
- **Stripe API Documentation** - <https://stripe.com/docs/api>

Development Resources

- **Stack Overflow** - Technical problem-solving community
- **GitHub** - Open-source code repositories and collaboration

- **MDN Web Docs** - Web development standards and best practices

13. CONCLUSION

The Trendify E-commerce Platform represents a comprehensive solution for modern online retail operations. By leveraging cutting-edge technologies and following industry best practices, this platform will deliver a superior shopping experience while providing robust business management tools for sellers and administrators.

The modular architecture ensures scalability and maintainability, while the focus on user experience and security creates a trustworthy platform for all stakeholders. This project positions Trendify as a competitive player in the rapidly growing e-commerce market.

This document serves as the foundation for the Trendify E-commerce Platform development and will be updated as requirements evolve throughout the project lifecycle.