E-Commerce Platform Software Requirements Specification

This document specifies the functional and non-functional requirements for the E-Commerce Platform system. The system shall provide comprehensive online shopping capabilities for customers and administrative tools for merchants.

2. User Authentication and Authorization

REQ_001: The system shall allow users to register new accounts with email verification. The system must validate email addresses and send confirmation emails within 5 minutes of registration.

REQ_002: The system shall authenticate users using secure login credentials. Users must provide valid username/email and password combinations. Failed login attempts shall be logged and limited to 5 attempts per hour.

REQ_003: The system shall support password reset functionality via email. Password reset links must expire within 24 hours and be single-use only.

REQ_004: The system shall implement role-based access control for administrators, merchants, and customers. Each user role shall have specific permissions and access restrictions to system features.

REQ_005: The system shall maintain user session security with automatic timeout. User sessions must expire after 30 minutes of inactivity for security purposes.

3. Product Management

REQ_006: The system shall allow merchants to add new products with detailed information. Product information must include name, description, price, category, images, inventory count, and specifications.

REQ_007: The system shall support product categorization with hierarchical structures. Categories must support multiple levels and allow products to belong to multiple categories.

REQ_008: The system shall provide advanced product search functionality. Search must support keyword matching, category filtering, price ranges, and sorting options.

REQ_009: The system shall display product availability in real-time. Inventory levels must be updated immediately when orders are placed or stock is modified.

REQ_010: The system shall support product reviews and ratings from customers. Customers must be able to rate products from 1-5 stars and write detailed reviews.

4. Shopping Cart and Checkout

REQ_011: The system shall provide persistent shopping cart functionality. Cart contents must be preserved across user sessions and browser closures.

REQ_012: The system shall calculate accurate totals including taxes and shipping. All financial calculations must be precise to two decimal places and include applicable fees.

REQ_013: The system shall support multiple shipping options with cost calculation. Shipping costs must be calculated based on weight, dimensions, destination, and delivery speed.

REQ_014: The system shall validate product availability during checkout. The system must verify stock levels and reserve items during the checkout process.

REQ_015: The system shall support guest checkout without account creation. Guest users must be able to complete purchases with minimal required information.

5. Payment Processing

REQ_016: The system shall integrate with secure payment gateways. Payment processing must comply with PCI DSS standards and support major credit cards.

REQ_017: The system shall support multiple payment methods including credit cards, PayPal, and digital wallets. Payment options must be clearly displayed and securely processed.

REQ_018: The system shall handle payment failures with appropriate error messages. Failed payments must provide clear explanations and alternative payment options.

REQ_019: The system shall generate payment confirmations and receipts. Payment receipts must be emailed immediately and stored in user accounts.

REQ_020: The system shall support partial refunds and payment reversals. Administrators must be able to process refunds with proper authorization and audit trails.

6. Order Management

REQ_021: The system shall generate unique order numbers for all transactions. Order numbers must be sequential, unique, and include date-based prefixes.

REQ_022: The system shall track order status throughout fulfillment. Order statuses must include: pending, confirmed, processing, shipped, delivered, and cancelled.

REQ_023: The system shall send automated order confirmation emails. Confirmation emails must include order details, shipping information, and tracking numbers.

REQ_024: The system shall provide order history for customers. Customers must be able to view all past orders with detailed information and reorder functionality.

REQ_025: The system shall support order cancellation within specified timeframes. Orders must be cancellable before shipping with automatic refund processing.

7. Inventory Management

REQ_026: The system shall maintain accurate inventory levels across all products. Stock levels must be updated in real-time and prevent overselling scenarios.

REQ_027: The system shall generate low stock alerts for merchants. Automatic notifications must be sent when inventory falls below configurable thresholds.

REQ_028: The system shall support inventory reservations during checkout. Products must be temporarily reserved to prevent overselling during payment processing.

REQ_029: The system shall track inventory movements and provide audit trails. All stock changes must be logged with timestamps, reasons, and user information.

REQ_030: The system shall support multiple warehouse locations. Inventory must be trackable across different storage locations with location-based fulfillment.

8. Customer Service

REQ_031: The system shall provide customer support ticket functionality. Customers must be able to create, track, and communicate through support tickets.

REQ_032: The system shall support live chat functionality for real-time assistance. Live chat must be available during business hours with automated responses for common questions.

REQ_033: The system shall maintain comprehensive FAQ sections. FAQs must be searchable, categorized, and regularly updated with common customer questions.

REQ_034: The system shall support return merchandise authorization (RMA) process. Customers must be able to initiate returns with automated approval workflows.

9. Performance Requirements

REQ_035: The system shall respond to user requests within 2 seconds under normal load. Response times must be measured from request initiation to complete page rendering.

REQ_036: The system shall support concurrent users up to 10,000 without performance degradation. Performance must remain consistent during peak traffic periods.

REQ_037: The system shall maintain 99.9% uptime availability. Downtime must not exceed 8.76 hours per year excluding scheduled maintenance.

REQ_038: The system shall handle database queries efficiently with proper indexing. Database response times must not exceed 100 milliseconds for standard queries.

10. Security Requirements

REQ_039: The system shall encrypt all sensitive data in transit and at rest. Encryption must use industry-standard algorithms with minimum 256-bit key strength.

REQ_040: The system shall implement protection against common web vulnerabilities. Security measures must include SQL injection, XSS, CSRF, and other OWASP top 10 protections.

REQ_041: The system shall maintain audit logs for all administrative actions. Logs must include timestamps, user identification, and detailed action descriptions.

REQ_042: The system shall implement secure password policies. Passwords must meet complexity requirements and be stored using secure hashing algorithms.

11. Additional Features

REQ_043: The system shall support wishlist functionality for customers. Customers must be able to save products for future purchase and share wishlists.

REQ_044: The system shall provide advanced filtering and sorting options. Product browsing must support filtering by multiple attributes with saved filter preferences.

REQ_045: The system shall support social media integration for sharing and login. Products must be shareable on social platforms with integrated authentication options.

REQ_046: The system shall implement loyalty program with points and rewards. Customer activities must earn points redeemable for discounts and special offers.

REQ_047: The system shall support subscription-based recurring orders. Customers must be able to set up automatic recurring purchases with flexible scheduling.

REQ_048: The system shall provide price comparison and history tracking. Price changes must be tracked and displayed to customers with trend information.

REQ_049: The system shall support gift card creation and redemption. Gift cards must be purchasable, customizable, and redeemable with balance tracking.

REQ_050: The system shall implement advanced search with auto-suggestions. Search functionality must include predictive text, spell correction, and popular searches.

12. Mobile Compatibility

REQ_051: The system shall provide mobile-optimized functionality for requirement 51. Mobile users must have access to all essential features with touch-friendly interfaces.

REQ_052: The system shall provide mobile-optimized functionality for requirement 52. Mobile users must have access to all essential features with touch-friendly interfaces.

REQ_053: The system shall provide mobile-optimized functionality for requirement 53. Mobile users must have access to all essential features with touch-friendly interfaces.

REQ_054: The system shall provide mobile-optimized functionality for requirement 54. Mobile users must have access to all essential features with touch-friendly interfaces.

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REQ_056: The system shall provide mobile-optimized functionality for requirement 56. Mobile users must have access to all essential features with touch-friendly interfaces.

REQ_057: The system shall provide mobile-optimized functionality for requirement 57. Mobile users must have access to all essential features with touch-friendly interfaces.

REQ_058: The system shall provide mobile-optimized functionality for requirement 58. Mobile users must have access to all essential features with touch-friendly interfaces.

REQ_059: The system shall provide mobile-optimized functionality for requirement 59. Mobile users must have access to all essential features with touch-friendly interfaces.

REQ_060: The system shall provide mobile-optimized functionality for requirement 60. Mobile users must have access to all essential features with touch-friendly interfaces.

13. Reporting and Analytics

REQ_061: The system shall generate comprehensive analytics reports for requirement 61. Data visualization must be interactive and exportable in multiple formats.

REQ_062: The system shall generate comprehensive analytics reports for requirement 62. Data visualization must be interactive and exportable in multiple formats.

REQ_063: The system shall generate comprehensive analytics reports for requirement 63. Data visualization must be interactive and exportable in multiple formats.

REQ_064: The system shall generate comprehensive analytics reports for requirement 64. Data visualization must be interactive and exportable in multiple formats.

REQ_065: The system shall generate comprehensive analytics reports for requirement 65. Data visualization must be interactive and exportable in multiple formats.

REQ_066: The system shall generate comprehensive analytics reports for requirement 66. Data visualization must be interactive and exportable in multiple formats.

REQ_067: The system shall generate comprehensive analytics reports for requirement 67. Data visualization must be interactive and exportable in multiple formats.

REQ_068: The system shall generate comprehensive analytics reports for requirement 68. Data visualization must be interactive and exportable in multiple formats.

REQ_069: The system shall generate comprehensive analytics reports for requirement 69. Data visualization must be interactive and exportable in multiple formats.

REQ_070: The system shall generate comprehensive analytics reports for requirement 70. Data visualization must be interactive and exportable in multiple formats.

14. Integration Requirements

REQ_071: The system shall support third-party integrations for requirement 71. API endpoints must be secure and well-documented for external system connectivity.

REQ_072: The system shall support third-party integrations for requirement 72. API endpoints must be secure and well-documented for external system connectivity.

REQ_073: The system shall support third-party integrations for requirement 73. API endpoints must be secure and well-documented for external system connectivity.

REQ_074: The system shall support third-party integrations for requirement 74. API endpoints must be secure and well-documented for external system connectivity.

REQ_075: The system shall support third-party integrations for requirement 75. API endpoints must be secure and well-documented for external system connectivity.

REQ_076: The system shall support third-party integrations for requirement 76. API endpoints must be secure and well-documented for external system connectivity.

REQ_077: The system shall support third-party integrations for requirement 77. API endpoints must be secure and well-documented for external system connectivity.

REQ_078: The system shall support third-party integrations for requirement 78. API endpoints must be secure and well-documented for external system connectivity.

REQ_079: The system shall support third-party integrations for requirement 79. API endpoints must be secure and well-documented for external system connectivity.

REQ_080: The system shall support third-party integrations for requirement 80. API endpoints must be secure and well-documented for external system connectivity.

15. Content Management

REQ_081: The system shall provide content management capabilities for requirement 81. Content must be easily editable and support multimedia elements.

REQ_082: The system shall provide content management capabilities for requirement 82. Content must be easily editable and support multimedia elements.

REQ_083: The system shall provide content management capabilities for requirement 83. Content must be easily editable and support multimedia elements.

REQ_084: The system shall provide content management capabilities for requirement 84. Content must be easily editable and support multimedia elements.

REQ_085: The system shall provide content management capabilities for requirement 85. Content must be easily editable and support multimedia elements.

REQ_086: The system shall provide content management capabilities for requirement 86. Content must be easily editable and support multimedia elements.

REQ_087: The system shall provide content management capabilities for requirement 87. Content must be easily editable and support multimedia elements.

REQ_088: The system shall provide content management capabilities for requirement 88. Content must be easily editable and support multimedia elements.

REQ_089: The system shall provide content management capabilities for requirement 89. Content must be easily editable and support multimedia elements.

REQ_090: The system shall provide content management capabilities for requirement 90. Content must be easily editable and support multimedia elements.

16. Scalability Features

REQ_091: The system shall implement scalable architecture for requirement 91. Performance must be maintained under increasing load conditions.

REQ_092: The system shall implement scalable architecture for requirement 92. Performance must be maintained under increasing load conditions.

REQ_093: The system shall implement scalable architecture for requirement 93. Performance must be maintained under increasing load conditions.

REQ_094: The system shall implement scalable architecture for requirement 94. Performance must be maintained under increasing load conditions.

REQ_095: The system shall implement scalable architecture for requirement 95. Performance must be maintained under increasing load conditions.

REQ_096: The system shall implement scalable architecture for requirement 96. Performance must be maintained under increasing load conditions.

REQ_097: The system shall implement scalable architecture for requirement 97. Performance must be maintained under increasing load conditions.

REQ_098: The system shall implement scalable architecture for requirement 98. Performance must be maintained under increasing load conditions.

REQ_099: The system shall implement scalable architecture for requirement 99. Performance must be maintained under increasing load conditions.

REQ_100: The system shall implement scalable architecture for requirement 100. Performance must be maintained under increasing load conditions.

17. User Experience

REQ_101: The system shall enhance user experience for requirement 101. Interface design must be intuitive and accessible to users of all skill levels.

REQ_102: The system shall enhance user experience for requirement 102. Interface design must be intuitive and accessible to users of all skill levels.

REQ_103: The system shall enhance user experience for requirement 103. Interface design must be intuitive and accessible to users of all skill levels.

REQ_104: The system shall enhance user experience for requirement 104. Interface design must be intuitive and accessible to users of all skill levels.

REQ_105: The system shall enhance user experience for requirement 105. Interface design must be intuitive and accessible to users of all skill levels.

REQ_106: The system shall enhance user experience for requirement 106. Interface design must be intuitive and accessible to users of all skill levels.

REQ_107: The system shall enhance user experience for requirement 107. Interface design must be intuitive and accessible to users of all skill levels.

REQ_108: The system shall enhance user experience for requirement 108. Interface design must be intuitive and accessible to users of all skill levels.

REQ_109: The system shall enhance user experience for requirement 109. Interface design must be intuitive and accessible to users of all skill levels.

REQ_110: The system shall enhance user experience for requirement 110. Interface design must be intuitive and accessible to users of all skill levels.

18. Data Management

REQ_111: The system shall implement robust data management for requirement 111. Data integrity and consistency must be maintained across all operations.

REQ_112: The system shall implement robust data management for requirement 112. Data integrity and consistency must be maintained across all operations.

REQ_113: The system shall implement robust data management for requirement 113. Data integrity and consistency must be maintained across all operations.

REQ_114: The system shall implement robust data management for requirement 114. Data integrity and consistency must be maintained across all operations.

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REQ_118: The system shall implement robust data management for requirement 118. Data integrity and consistency must be maintained across all operations.

REQ_119: The system shall implement robust data management for requirement 119. Data integrity and consistency must be maintained across all operations.

REQ_120: The system shall implement robust data management for requirement 120. Data integrity and consistency must be maintained across all operations.

19. Quality Assurance

REQ_121: The system shall include quality assurance measures for requirement 121. Testing procedures must verify functionality and performance standards.

REQ_122: The system shall include quality assurance measures for requirement 122. Testing procedures must verify functionality and performance standards.

REQ_123: The system shall include quality assurance measures for requirement 123. Testing procedures must verify functionality and performance standards.

REQ_124: The system shall include quality assurance measures for requirement 124. Testing procedures must verify functionality and performance standards.

REQ_125: The system shall include quality assurance measures for requirement 125. Testing procedures must verify functionality and performance standards.

REQ_126: The system shall include quality assurance measures for requirement 126. Testing procedures must verify functionality and performance standards.

REQ_127: The system shall include quality assurance measures for requirement 127. Testing procedures must verify functionality and performance standards.

REQ_128: The system shall include quality assurance measures for requirement 128. Testing procedures must verify functionality and performance standards.

REQ_129: The system shall include quality assurance measures for requirement 129. Testing procedures must verify functionality and performance standards.

REQ_130: The system shall include quality assurance measures for requirement 130. Testing procedures must verify functionality and performance standards.

20. Compliance Features

REQ_131: The system shall ensure regulatory compliance for requirement 131. All applicable industry standards and legal requirements must be met.

REQ_132: The system shall ensure regulatory compliance for requirement 132. All applicable industry standards and legal requirements must be met.

REQ_133: The system shall ensure regulatory compliance for requirement 133. All applicable industry standards and legal requirements must be met.

REQ_134: The system shall ensure regulatory compliance for requirement 134. All applicable industry standards and legal requirements must be met.

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REQ_136: The system shall ensure regulatory compliance for requirement 136. All applicable industry standards and legal requirements must be met.

REQ_137: The system shall ensure regulatory compliance for requirement 137. All applicable industry standards and legal requirements must be met.

REQ_138: The system shall ensure regulatory compliance for requirement 138. All applicable industry standards and legal requirements must be met.

REQ_139: The system shall ensure regulatory compliance for requirement 139. All applicable industry standards and legal requirements must be met.

REQ_140: The system shall ensure regulatory compliance for requirement 140. All applicable industry standards and legal requirements must be met.

21. Business Intelligence

REQ_141: The system shall provide business intelligence capabilities for requirement 141. Decision support tools must be available for strategic planning.

REQ_142: The system shall provide business intelligence capabilities for requirement 142. Decision support tools must be available for strategic planning.

REQ_143: The system shall provide business intelligence capabilities for requirement 143. Decision support tools must be available for strategic planning.

REQ_144: The system shall provide business intelligence capabilities for requirement 144. Decision support tools must be available for strategic planning.

REQ_145: The system shall provide business intelligence capabilities for requirement 145. Decision support tools must be available for strategic planning.

REQ_146: The system shall provide business intelligence capabilities for requirement 146. Decision support tools must be available for strategic planning.

REQ_147: The system shall provide business intelligence capabilities for requirement 147. Decision support tools must be available for strategic planning.

REQ_148: The system shall provide business intelligence capabilities for requirement 148. Decision support tools must be available for strategic planning.

REQ_149: The system shall provide business intelligence capabilities for requirement 149. Decision support tools must be available for strategic planning.

REQ_150: The system shall provide business intelligence capabilities for requirement 150. Decision support tools must be available for strategic planning.

22. Automation Features

REQ_151: The system shall implement automation for requirement 151. Manual processes must be reduced through intelligent automation capabilities.

REQ_152: The system shall implement automation for requirement 152. Manual processes must be reduced through intelligent automation capabilities.

REQ_153: The system shall implement automation for requirement 153. Manual processes must be reduced through intelligent automation capabilities.

REQ_154: The system shall implement automation for requirement 154. Manual processes must be reduced through intelligent automation capabilities.

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REQ_158: The system shall implement automation for requirement 158. Manual processes must be reduced through intelligent automation capabilities.

REQ_159: The system shall implement automation for requirement 159. Manual processes must be reduced through intelligent automation capabilities.

REQ_160: The system shall implement automation for requirement 160. Manual processes must be reduced through intelligent automation capabilities.

23. Communication Tools

REQ_161: The system shall provide communication tools for requirement 161. Multi-channel communication must be supported for customer engagement.

REQ_162: The system shall provide communication tools for requirement 162. Multi-channel communication must be supported for customer engagement.

REQ_163: The system shall provide communication tools for requirement 163. Multi-channel communication must be supported for customer engagement.

REQ_164: The system shall provide communication tools for requirement 164. Multi-channel communication must be supported for customer engagement.

REQ_165: The system shall provide communication tools for requirement 165. Multi-channel communication must be supported for customer engagement.

REQ_166: The system shall provide communication tools for requirement 166. Multi-channel communication must be supported for customer engagement.

REQ_167: The system shall provide communication tools for requirement 167. Multi-channel communication must be supported for customer engagement.

REQ_168: The system shall provide communication tools for requirement 168. Multi-channel communication must be supported for customer engagement.

REQ_169: The system shall provide communication tools for requirement 169. Multi-channel communication must be supported for customer engagement.

REQ_170: The system shall provide communication tools for requirement 170. Multi-channel communication must be supported for customer engagement.

24. Personalization

REQ_171: The system shall offer personalization features for requirement 171. User experience must be customized based on individual preferences and behavior.

REQ_172: The system shall offer personalization features for requirement 172. User experience must be customized based on individual preferences and behavior.

REQ_173: The system shall offer personalization features for requirement 173. User experience must be customized based on individual preferences and behavior.

REQ_174: The system shall offer personalization features for requirement 174. User experience must be customized based on individual preferences and behavior.

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REQ_179: The system shall offer personalization features for requirement 179. User experience must be customized based on individual preferences and behavior.

REQ_180: The system shall offer personalization features for requirement 180. User experience must be customized based on individual preferences and behavior.

25. Advanced Analytics

REQ_181: The system shall implement advanced analytics for requirement 181. Machine learning capabilities must provide predictive insights and recommendations.

REQ_182: The system shall implement advanced analytics for requirement 182. Machine learning capabilities must provide predictive insights and recommendations.

REQ_183: The system shall implement advanced analytics for requirement 183. Machine learning capabilities must provide predictive insights and recommendations.

REQ_184: The system shall implement advanced analytics for requirement 184. Machine learning capabilities must provide predictive insights and recommendations.

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REQ_188: The system shall implement advanced analytics for requirement 188. Machine learning capabilities must provide predictive insights and recommendations.

REQ_189: The system shall implement advanced analytics for requirement 189. Machine learning capabilities must provide predictive insights and recommendations.

REQ_190: The system shall implement advanced analytics for requirement 190. Machine learning capabilities must provide predictive insights and recommendations.

26. Future Enhancements

REQ_191: The system shall support future enhancements for requirement 191. Architecture must be flexible to accommodate evolving business needs and technologies.

REQ_192: The system shall support future enhancements for requirement 192. Architecture must be flexible to accommodate evolving business needs and technologies.

REQ_193: The system shall support future enhancements for requirement 193. Architecture must be flexible to accommodate evolving business needs and technologies.

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REQ_199: The system shall support future enhancements for requirement 199. Architecture must be flexible to accommodate evolving business needs and technologies.

REQ_200: The system shall support future enhancements for requirement 200. Architecture must be flexible to accommodate evolving business needs and technologies.