

IMS

Non-functional requirements doc

Version 1.0.0

Prepared by me
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1 Introduction

1.1 Purpose

This document outlines the non-functional requirements for the Inventory Management System (IMS). Non-functional requirements define how the system performs and focuses on aspects such as usability, performance, security, and scalability.

1.2 Scope

The non-functional requirements apply to the overall operation of the Inventory Management System and ensure that the system meets business expectations for performance, reliability, and security while scaling as needed.

2 Non-Functional Requirements

ID	Requirement Description	Priority	Comments
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2.1 Performance Requirements

NFR-01	The system must handle at least 50 concurrent users without performance degradation.	High	
NFR-02	The system must process and complete transactions (e.g., inventory updates, order processing) within 2 seconds under normal load conditions.	high	
NFR-03	The system must be able to generate and display reports (e.g., sales, inventory lists) within 5 seconds for datasets under 100,000 records.	high	
NFR-04	The system must ensure that background processes such as data synchronization or backups do not impact the performance of user-facing operations.	high	

2.2 Scalability Requirements

NFR-05	The system must be able to scale to handle at least 500,000 inventory items and 10,000 sales transactions per day.	High	
NFR-06	The system must be scalable to accommodate additional warehouses and users as the business grows.	High	
NFR-07	The system must support horizontal and vertical scaling as required, including the ability to add more servers or resources when needed.		

2.3 Availability and Reliability Requirements

NFR-08	The system must provide 99.9% uptime availability during business hours (Monday to Friday, 8 AM to 6 PM).		
NFR-09	The system must support automatic failover to a backup server in case of a primary system failure, ensuring continued access to critical functionality.		

NFR-010	The system must automatically retry any failed transactions or data syncs to ensure no data is lost		
NFR-011	The system must notify administrators immediately via email or SMS in the event of a critical system failure or outage.		

2.4 Security Requirements

NFR-012	The system must enforce user authentication using strong password policies, including a minimum of 8 characters with at least one uppercase letter, one number, and one special character.		
NFR-013	The system must implement role-based access control (RBAC) to restrict users' access to specific features based on their roles (e.g., admin, warehouse staff, sales team).		
NFR-014	The system must ensure all sensitive data, including user credentials and financial transactions, are encrypted using industry-standard encryption methods (e.g., AES-256).		
NFR-015	The system must provide audit logs to track user activities, such as login attempts, inventory updates, and order processing.		
NFR-016	The system must use HTTPS for all communications between client and server to ensure data integrity and confidentiality.		

2.5 Usability Requirements

NFR-017	The system interface must be user-friendly and require minimal training for new users (no more than 1 day).		
NFR-018	The system must support multi-language functionality to accommodate users in different regions.	low	
NFR-019	The system must provide clear error messages with instructions on how to resolve common user errors.	medium	
NFR-020	The system must provide a mobile-friendly interface, optimized for smartphones and tablets, allowing warehouse staff to manage inventory on-the-go.		

2.6 Maintainability Requirements

NFR-021	The system must be modular and allow easy updates or changes to individual components without affecting overall system functionality.		
NFR-022	The system must include detailed documentation for system administrators, including instructions on configuration, maintenance, and troubleshooting.		
NFR-023	The system must allow administrators to apply software updates and patches with minimal downtime (no more than 15 minutes of downtime for updates).		

2.7 Backup and Recovery Requirements

NFR-024	The system must automatically back up inventory, sales, and order data daily to a secure, off-site location.		
NFR-025	The system must allow administrators to restore the most recent backup in case of data loss, with no more than 15 minutes of downtime.		
NFR-026	The system must store backups for a minimum of 90 days, ensuring data can be recovered for any period within this timeframe.		

2.8 Compliance Requirements

NFR-027	The system must comply with local and international data protection laws (e.g., GDPR for EU-based users).		
NFR-028	The system must provide a mechanism for users to export and delete their personal data to comply with privacy regulations.		

2.9 Integration Requirements

NFR-029	The system must provide APIs for integration with third-party systems, including accounting software, point-of-sale (POS) systems, and e-commerce platforms.	low	
NFR-030	The system must support real-time synchronization with third-party sales and financial systems to maintain up-to-date inventory and transaction records.	low	

2.10 Data Consistency and Integrity

NFR-031	The system must ensure data consistency across all modules, ensuring that any changes to inventory, orders, or sales are reflected in real-time throughout the system.		
NFR-032	The system must enforce database constraints (e.g., foreign keys, unique keys) to maintain data integrity and prevent duplication or corruption.		
NFR-033	The system must ensure that inventory stock levels and financial data are always in sync and reflect current transactions.		

2.11 Data Retention and Archiving

NFR-034	The system must support the archiving of historical sales, order, and inventory data older than 5 years. Archived data should be retrievable on-demand.		
NFR-035	The system must retain all financial transaction records for a minimum of 7 years to comply with accounting and tax regulations.		

2.12 Localization and Internalization

NFR-036	The system must support multi-currency operations, allowing prices and financial records to be displayed and processed in local currencies.		
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NFR-037	The system must allow localization of date formats, number formats, and other region-specific settings to accommodate global users.		
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2.13 Transaction Integrity and Atomicity

NFR-038	The system must ensure that critical transactions, such as inventory updates and sales processing, are atomic, meaning they either fully succeed or fail without partial completion.		
NFR-039	The system must roll back any changes in case of transaction failure, ensuring no partial or incomplete data is stored.		

2.14 System Monitoring and Logging

NFR-040	The system must support real-time monitoring of system performance, tracking metrics such as CPU usage, memory usage, and database query performance.		
NFR-041	The system must maintain detailed logs of all user activities and system operations, such as login attempts, inventory updates, and transaction processing.		
NFR-042	The system must allow administrators to configure alerts for critical events, such as system performance degradation, security breaches, or failed transactions.		

2.15 Disaster Recovery and Business Continuity

NFR-043	The system must have a disaster recovery plan in place to ensure business continuity in case of major system failures, cyberattacks, or natural disasters.		
NFR-044	The system must ensure that recovery time for business-critical functions is no longer than 1 hour in the event of a major failure.		

2.16 User Experience (UX) Requirements

NFR-045	The system must provide consistent navigation and layout across all modules to enhance usability and reduce training time for new users.		
NFR-046	The system must ensure that key functions, such as inventory search and sales processing, can be performed with minimal clicks or steps.		
NFR-047	The system must ensure that load times for user interface elements are under 2 seconds to promote a responsive experience.		

2.17 API Availability and Rate Limiting

NFR-048	The system must provide an API with availability of 99.9% to ensure smooth integration with third-party applications (e.g., accounting, POS).		
NFR-049	The system must implement rate limiting on API requests to prevent overloading and abuse of system resources.		

2.18 Energy Efficiency

NFR-050	The system must optimize energy consumption by minimizing server resource usage during idle periods.		
NFR-051	The system must utilize cloud infrastructure features such as auto-scaling and resource optimization to reduce costs and environmental impact.		

3 Assumptions and Constraints

3.1 Assumptions:

- The system will be hosted on a cloud platform with scalable resources.
- Users will have reliable internet access for using the system.
- mobile devices will be available to warehouse staff.

3.2 Constraints:

- Budget constraints may limit the use of some advanced features like AI-based forecasting or high-end data encryption.
- Compliance with local regulations may limit some functionality (e.g., data retention policies).

4 Acceptance Criteria

- The system must meet performance standards under typical load conditions.
- The system must enforce security protocols and user access controls to ensure data safety.
- The system must provide a mobile-friendly interface for warehouse staff.
- The system must handle scalability for increasing inventory and user numbers over time.
- Data backups must occur daily, and data recovery processes must be smooth with minimal downtime.