**WAREHOUSE MANAGEMENT SYSTEM (WMS)**

**Business Case Document**

1. **Executive Summary**

 Efficient warehouse operations are crucial for optimizing supply chain performance. This business case presents the need for a **Warehouse Management System (WMS) software application** to improve inventory accuracy, reduce operational costs, and enhance order fulfilment efficiency. The proposed WMS will replace manual or outdated systems, leading to improved productivity, real-time tracking, and better decision**-**making.

1. **Current Problems**
Current warehouse operations face multiple challenges, including:
* **Inefficient inventory tracking**, leading to stock discrepancies.
* **Manual processes**, increasing errors in order picking and fulfilment.
* **Lack of real-time visibility** of stock levels and warehouse performance.
* **High operational costs** due to excessive labour and poor space utilization.

A WMS application will streamline warehouse operations, improve accuracy, and boost efficiency through automation and real-time monitoring.

1. **Objectives and Benefits**

**Objectives**

* Automate inventory tracking and reduce stock discrepancies.
* Improve order fulfilment speed and accuracy.
* Enable real-time monitoring and reporting.
* Optimize warehouse space utilization.
* Reduce operational costs through efficiency improvements.

**Benefits**

| **Benefit** | **Description** |
| --- | --- |
| Cost Savings | Reduced labour costs and inventory losses due to improved accuracy. |
| Real-Time Visibility | Livestock tracking and reporting for better decision-making. |
| Enhanced Order Accuracy | Reduction in order fulfilment errors, leading to improved customer satisfaction. |
| Scalability | Adaptability to future business growth and warehouse expansions. |
| Compliance | Ensures adherence to industry regulations and standards. |

1. **Proposed Solution**

The WMS software will include the following **key features**:

* **Inventory Management** – Barcode/RFID tracking for real-time stock monitoring.
* **Order fulfilment Optimization** – AI-driven picking, packing, and shipping.
* **Warehouse Space Utilization** – Smart algorithms for efficient storage allocation.
* **Automated Reporting & Insights** – Custom dashboards for performance tracking.
* **Multi-Channel Integration** – Connectivity with ERP, e-commerce, and third-party logistics (3PL) providers.
* **User-Friendly Web & Mobile Interface** – Easy-to-use application for warehouse staff.
1. **Resources Required for WMS Application Development**

 Developing a Warehouse Management System (WMS) application using the Waterfall methodology requires various resources across technology, human expertise, infrastructure, and financial aspects. Below is a structured breakdown of the essential resources.

 **1.Human Resources (Project Team & Key Roles)**

| **Role** | **Responsibilities** | **Resource Requirement** |
| --- | --- | --- |
| **Project Manager** | Oversees the project, defines milestones, and ensures adherence to the Waterfall process. | 1 |
| **Business Analyst** | Gathers and documents requirements, translates business needs into functional specifications. | 1 |
| **UI/UX Designers** | Designs user-friendly interfaces for desktop & mobile WMS applications. | 1 |
| **Solution Architect** | Defines the system architecture, database design, and overall technical strategy. | 1 |
| **Backend Developers** | Develop core functionalities like inventory tracking, order management, and integrations. | 3 |
| **Frontend Developers** | Develops user interfaces for warehouse staff, managers, and mobile applications. | 3 |
| **Database Administrators** | Designs and optimizes the database for real-time inventory tracking. | 1 |
| **QA & Testing Team** | Conducts unit testing, system testing, and user acceptance testing (UAT). | 2 |
| **DevOps Engineers** | Handles cloud deployment, CI/CD pipelines, and server management. | 2 |
| **Cybersecurity Experts** | Ensures system security, data encryption, and compliance with security standards. | 1 |
| **Technical Support & Maintenance** | Provides post-deployment support, bug fixes, and system upgrades. | 2 |

**2. Technological Resources**

| **Technology** | **Purpose** | **Examples** |
| --- | --- | --- |
| **Programming Languages** | **Backend & frontend development** | **Python, Java, .NET, JavaScript (React, Angular, Vue.js)** |
| **Database Management System (DBMS)** | **Storing and managing inventory, order, and warehouse data** | **MySQL, PostgreSQL, Oracle, MongoDB** |
| **Cloud Infrastructure** | **Hosting WMS application, ensuring scalability & uptime** | **AWS, Microsoft Azure, Google Cloud** |
| **Web Frameworks** | **Developing web-based WMS portals** | **Django, Spring Boot, ASP.NET** |
| **Mobile App Development** | **Warehouse staff can access WMS via mobile devices** | **React Native, Flutter, Swift (iOS), Kotlin (Android)** |
| **RFID & Barcode Integration** | **Scanning and tracking inventory** | **Zebra, Honeywell, GS1 Standards** |
| **AI & Analytics Tools** | **Predictive analytics for warehouse optimization** | **Power BI, Tableau, Apache Spark** |
| **API & Integration Services** | **Connecting WMS with ERP, CRM, and logistics platforms** | **REST APIs, GraphQL, SAP Integration, EDI** |
| **Version Control & CI/CD** | **Managing codebase & deployment** | **GitHub, GitLab, Jenkins, Docker** |
| **Security Tools** | **Ensuring cybersecurity & compliance** | **SSL/TLS encryption, OAuth, IAM, Firewalls** |

**3. Infrastructure & Hardware Resources**

| **Infrastructure** | **Requirement** |
| --- | --- |
| **Server Infrastructure** | **Cloud-based or on-premise servers for hosting the WMS.** |
| **Network Infrastructure** | **High-speed internet, routers, VPN for secure access.** |
| **Storage Solutions** | **Cloud storage or on-premise storage for handling large datasets.** |
| **Barcode/RFID Scanners** | **Devices for tracking inventory movements.** |
| **IoT Sensors & Smart Devices** | **For automated warehouse monitoring.** |
| **Workstations & Mobile Devices** | **Computers & tablets for warehouse staff and managers.** |

1. **Cost Analysis**

**Estimated Costs**

| **Expense** | **Estimated Cost (INR)** |
| --- | --- |
| Software Development | ₹30,00,000 |
| Hardware (Scanners, Servers, etc.) | ₹18,00,000 |
| Implementation & Training | ₹1,50,000 |
| Maintenance & Support (Annual) | ₹50,000 |
| **Total Estimated Cost** | **₹50,00,000** |

1. **Return on Investment (ROI)**
* **Break-even period**: 12-18 months.
* **Annual cost savings**: Reduction in labour costs by 25%, inventory losses by 30%, and operational expenses by 20%.
1. **Identify Stakeholders for WMS Application Development**

Identifying stakeholders is crucial for ensuring that the Warehouse Management System (WMS) application meets business needs, integrates seamlessly, and gains the necessary support for successful implementation. Stakeholders can be internal (within the organization) or external (outside the organization) and will have different levels of involvement in the project.
**A. Primary Stakeholders (Directly Impacted Users & Decision-Makers)**
1. Project Sponsor / Senior Management
2. Warehouse Managers / Supervisors
3. IT Team (Developers, Architects, Security Experts, Database Admins)
4. Operations / Supply Chain Managers
5. Finance & Accounting Team

**B. Secondary Stakeholders (Indirectly Impacted Users & Support Teams)**
1. End Users (Warehouse Staff, Pickers, Packers, Inventory Controllers)
2. Customers (Retailers, E-commerce Platforms, B2B Clients)
3. Vendors / Suppliers
4. HR & Training Team

**C. Secondary Stakeholders (Indirectly Impacted Users & Support Teams)**
1. Third-Party Logistics (3PL) Providers
2. Government & Compliance Authorities
3. ERP & E-commerce Integration Partners

**Steps to Identify Stakeholders for WMS Development**

**Step 1: Conduct Stakeholder Analysis**

* List all **departments, teams, and external parties** affected by the WMS.
* Identify **who will use, manage, and support** the system.

**Step 2: Categorize Stakeholders by Influence & Interest**

* **High Influence, High Interest** → Key Decision-Makers (Senior Management, IT, Warehouse Managers).
* **High Influence, Low Interest** → Finance Team, Compliance Authorities.
* **Low Influence, High Interest** → Warehouse Staff, Customers, Suppliers.
* **Low Influence, Low Interest** → General IT Support, HR Training Team.

**Step 3: Engage Stakeholders Early**

* Conduct **interviews, surveys, and meetings** with key stakeholders.
* Gather **requirements and pain points** before system design.

**Step 4: Maintain Continuous Communication**

* Provide **regular project updates** to all stakeholders.
* Involve **end users (warehouse staff, pickers, packers)** in **user testing** to ensure usability.
1. **Organizational Change Required for WMS Adoption**

 Implementing a Warehouse Management System (WMS) is a significant change that impacts multiple areas within an organization, including processes, people, and technology. The level of change required depends on the organization's existing warehouse operations, technology maturity, and workforce adaptability. Below is a detailed analysis of the organizational change required for WMS adoption.

1. Key Areas of Organizational Change
	1. Process Changes
	2. Workforce & Role Changes
	3. Technology Adoption & Infrastructure Changes
	4. Cultural & Mindset Shift
	5. Change in Performance Metrics & KPIs

 2. Change Management Strategy

| **Change Management Aspect** | **Implementation Strategy** |
| --- | --- |
| Leadership Support | Assign a change champion (Warehouse Manager/Operations Head). |
| Employee Training & Upskilling | Conduct hands-on training & workshops for all WMS users. |
| Pilot Testing & Phased Rollout | Implement WMS in a small warehouse unit first, then scale. |
| Feedback & Continuous Improvement | Collect weekly feedback and refine processes. |
| Technical Support & Helpdesk | Set up a dedicated IT support team for WMS issues. |

3. Estimated Timeline for Change Implementation

| **Phase** | **Activities** | **Duration** |
| --- | --- | --- |
| Planning & Stakeholder Alignment | Define scope, process mapping, identify key users | 2-3 Weeks |
| Training & Pilot Testing | Conduct training, test WMS in a small warehouse section | 4-6 Weeks |
| Full-Scale Deployment | Roll out WMS across all warehouses | 8-12 Weeks |
| Post-Go-Live Support | Monitor system performance, resolve issues | Ongoing |

1. **Implementation Plan**

| **Phase** | **Timeline** | **Key Activities** |
| --- | --- | --- |
| **Requirement Analysis** | Month 1 | Gather business needs and define system requirements. |
| **Design & Development** | Months 2-5 | Develop WMS software and integrate necessary hardware. |
| **Testing & Validation** | Month 6 | Conduct system testing and user acceptance testing (UAT). |
| **Deployment & Training** | Month 7 | Implement software and train warehouse staff. |
| **Go Live & Support** | Month 8+ | Full-scale implementation and continuous monitoring. |

1. **Risks & Mitigation Strategies**

| **Risk** | **Mitigation Strategy** |
| --- | --- |
| System Downtime | Implement backup systems and disaster recovery plans. |
| Resistance to Change | Provide proper training and change management support. |
| Integration Challenges | Ensure compatibility with existing systems and perform rigorous testing. |

1. **Conclusion**

Implementing a WMS software application will significantly **improve warehouse efficiency, reduce costs, and enhance operational visibility**. The investment in this system will lead to long-term savings, better customer satisfaction, and a competitive advantage in the market.

**Key Takeaways:**

✅ **Clear project scope and cost predictability** due to Waterfall’s structured process.
✅ **Efficient warehouse operations** through automation and real-time inventory tracking.
✅ **Scalability for future expansions** with multi-location warehouse support.
✅ **Better decision-making** with AI-driven analytics and reporting.

By following this approach, businesses can **achieve cost efficiency, operational excellence, and a strong competitive advantage** in warehouse management.

**Business Analyst (BA) Approach Strategy for WMS Application Development**

 As a Business Analyst (BA), the key responsibilities include gathering requirements, analysing stakeholder needs, documenting processes, facilitating approvals, and ensuring a smooth implementation of the Warehouse Management System (WMS) application. The following structured approach outlines the step-by-step strategy to successfully complete the project using the Waterfall methodology.

**1. Steps to Follow for Project Completion**

**Phase 1: Requirement Elicitation & Stakeholder Analysis**

* Identify and engage key **stakeholders** (warehouse managers, IT team, finance team, logistics, suppliers, customers).
* Use **Elicitation Techniques** to gather and validate business needs.
* Perform **Stakeholder Analysis** using **RACI/ILS** frameworks.
* Document **Business Requirements Document (BRD)** and get sign-off.

**Phase 2: Requirement Documentation & Approval Process**

* Convert business needs into **Functional Requirement Specification (FRS)** and **Software Requirement Specification (SRS)**.
* Get **formal approvals from stakeholders and clients** using documented sign-off processes.
* Define a **Requirement Traceability Matrix (RTM)** to track requirements through development.

**Phase 3: Design & Development Collaboration**

* Work closely with **Solution Architects & UI/UX Designers** for system architecture and interface design.
* Define **Use Cases, Data Flow Diagrams (DFDs), and Process Flows**.
* Conduct **requirement walkthroughs** with the development team.

**Phase 4: Testing & UAT Readiness**

* Develop **Test Scenarios & Test Cases** based on the signed-off requirements.
* Support **User Acceptance Testing (UAT)** by defining **UAT Test Cases**.
* Conduct **UAT sessions with stakeholders** and record test results.

**Phase 5: Deployment & Change Management**

* Facilitate **Client Project Acceptance Form** and obtain formal sign-off.
* Handle **change requests** through an organized **Change Control Process**.
* Establish **communication channels** for project status updates and escalations.

**2. Elicitation Techniques to Apply**

| **Technique** | **Description** | **When to Use** |
| --- | --- | --- |
| **Stakeholder Interviews** | One-on-one meetings to gather business needs. | Initial requirement gathering. |
| **Workshops** | Group discussions with multiple stakeholders. | Aligning business processes and system functionalities. |
| **Surveys & Questionnaires** | Collect input from a larger audience. | Gathering feedback from warehouse staff and suppliers. |
| **Document Analysis** | Reviewing existing warehouse reports, SOPs, and workflows. | Understanding current pain points. |
| **Observation (Job Shadowing)** | Watching warehouse staff perform tasks. | Identifying real-time challenges. |
| **Prototyping** | Creating wireframes/mockups. | Validating UI/UX and workflows. |

**3. Stakeholder Analysis using RACI & ILS**

**RACI Matrix (Responsible, Accountable, Consulted, Informed)**

Defines roles & responsibilities for WMS development.

| **Task** | **Project Manager** | **BA** | **IT Team** | **Warehouse Staff** | **Client** |
| --- | --- | --- | --- | --- | --- |
| Requirement Gathering | A | R | C | C | I |
| System Design | C | A | R | C | I |
| Development | I | C | R | I | I |
| Testing & UAT | C | A | R | R | C |
| Deployment | A | I | R | I | C |
| Change Requests | A | R | C | C | I |

**Influence-Interest (ILS) Analysis**

Categorizes stakeholders based on their **interest** in the project and **influence** over decisions.

| **Stakeholder** | **Influence** | **Interest** | **Action** |
| --- | --- | --- | --- |
| Senior Management | High | Medium | Regular updates & approvals. |
| Warehouse Managers | High | High | Deep engagement in requirement gathering & testing. |
| IT Team | High | High | Involved in all development & testing phases. |
| End Users (Warehouse Staff) | Low | High | Training & UAT participation. |
| Suppliers & Vendors | Low | Medium | Limited engagement. |

**4. Key Documents to Prepare**

| **Document** | **Purpose** | **Approval Needed From** |
| --- | --- | --- |
| **Business Requirements Document (BRD)** | Captures high-level business needs. | Client, Senior Management |
| **Functional Requirement Specification (FRS)** | Details functional requirements. | IT Team, Business Teams |
| **Software Requirement Specification (SRS)** | Defines technical requirements. | Solution Architects, Developers |
| **Requirement Traceability Matrix (RTM)** | Tracks requirements from inception to implementation. | Project Team, QA Team |
| **User Acceptance Test (UAT) Plan** | Outlines UAT test cases & criteria. | Warehouse Managers, Clients |
| **Change Request Document (CRD)** | Manages change approvals. | Project Sponsor, IT Team |
| **Client Project Acceptance Form** | Formal client sign-off. | Client, Senior Management |

**5. Sign-Off & Approval Process**

**Requirement Approval**

* Conduct **requirement walkthroughs** and capture feedback.
* Obtain **formal email or digital signatures** from key stakeholders.

**UAT & Client Acceptance**

* Conduct **UAT with real warehouse data**.
* Address **defects & ensure all UAT cases pass**.
* Obtain **Client Project Acceptance Form sign-off** to proceed with deployment.

**6. Communication Strategy for Stakeholder Engagement**

| **Channel** | **Purpose** | **Stakeholders** | **Frequency** |
| --- | --- | --- | --- |
| **Emails & Reports** | Formal updates, approvals | Senior Management, Clients | Weekly |
| **Meetings & Workshops** | Requirement discussions, feedback | Warehouse & IT Teams | Bi-Weekly |
| **Project Dashboard (JIRA, Trello)** | Task tracking | Internal Project Team | Daily |
| **Slack/Teams Chat** | Quick communication | Developers, Testers | As needed |
| **Stakeholder Review Calls** | Status updates, risk discussions | Clients, Project Sponsor | Monthly |

**7. Handling Change Requests (CRs)**

**Change Request Process**

1. **Document Change Request** → Define impact on timeline & cost.
2. **Stakeholder Review** → Discuss with business teams & IT.
3. **Impact Analysis** → Assess feasibility with development team.
4. **Approval Process** → Obtain sign-off from project sponsor.
5. **Implementation & Testing** → Develop changes & conduct regression testing.

**Change Control Board (CCB) for Major CRs**

* **Board Members:** Project Sponsor, Business Analyst, IT Lead.
* **Meeting Frequency:** Bi-weekly or as needed.

**8. Project Progress Reporting & Monitoring**

| **Reporting Method** | **Purpose** | **Frequency** |
| --- | --- | --- |
| **Status Reports** | Track project health (budget, scope, risks). | Weekly |
| **Risk Logs** | Document project risks & mitigation. | Ongoing |
| **Milestone Reports** | Highlight key achievements. | Monthly |
| **Client Review Meetings** | Provide high-level project insights. | Bi-Monthly |

**9. UAT Sign-Off & Client Acceptance Process**

1. **UAT Execution** → Ensure stakeholders complete all UAT test cases.
2. **Defect Resolution** → Fix bugs & retest.
3. **Final Approval Meeting** → Client reviews test results.
4. **Sign-Off on Client Project Acceptance Form** → Client formally approves project closure.

**Conclusion**

Following this structured BA approach ensures **clear documentation, stakeholder alignment, risk mitigation, and successful delivery of the WMS application**.

**Functional Specifications**

|  |  |
| --- | --- |
| Project name: Warehouse Management System (WMS) Development |  |
| Customer name: SOONY |  |
| Project Version: Develop a WMS Application |  |
| Project Sponsor: Mr. Hendry |  |
| Project Manager: Mr Vandanam |  |
| Project Initiation date: 03/03/2025 |  |

**1.Purpose of the Document**

The **Functional Specification Document (FSD)** provides a **detailed description** of the functional requirements for the **Warehouse Management System (WMS)**. It outlines **system features, workflows, business rules, user roles, and integrations** to ensure clarity in development and testing.

**2. System Overview**

The **Warehouse Management System (WMS)** will enable businesses to **efficiently manage inventory, order fulfilment, warehouse operations, and reporting**.

**Key Features:**

✅ Inventory Management
✅ Order Processing & Fulfilment
✅ Warehouse Operations & Tracking
✅ Barcode & RFID Integration
✅ Reports & Analytics
✅ Integration with ERP & E-commerce Systems

**3. Functional Requirements**

**3.1 User Roles & Access Control**

| **Role** | **Permissions** |
| --- | --- |
| **Admin** | Full access to all modules & settings |
| **Warehouse Manager** | Manage inventory, process orders, generate reports |
| **Warehouse Staff** | Pick, pack, scan barcodes, update order status |
| **Customer Service** | View order status, assist customers |
| **Supplier/Vendor** | Manage incoming stock, track shipments |

| **Req ID** | **Function Req Module** | **Fun. Req Description** | **Priority** |
| --- | --- | --- | --- |
| FR0001 | **Login** | User should be able to login to the application to do inventory operations | 10 |
| FR0002 | **Inventory Management** | Real-time stock tracking Add, update, and delete inventory items Barcode & RFID scanning integration Low-stock alerts & notifications  | 9 |
| FR0003 | **Order Processing & Fulfilment** | Order creation, modification, and cancellation. Order picking, packing, and shipping Order tracking with real-time updates Generate invoices and shipping labels  | 10 |
| FR0004 | **Warehouse Operations & Tracking** | Warehouse zone & bin location management Track incoming & outgoing shipments Assign storage locations dynamically  | 8 |
| FR0005 | **Barcode & RFID Integration** | Barcode scanning for inventory updates RFID tracking for automated stock movement  | 8 |
| FR0006 | **Reports & Analytics** | Inventory valuation reports Order fulfilment status reports Warehouse efficiency analysis  | 7 |
| FR0007 | **Integration with ERP & E-commerce Systems** | Sync inventory data with ERP (SAP, Oracle, etc.) Connect with e-commerce platforms (Shopify, Amazon, etc.)  | 7 |

**4. Non-Functional Requirements**

| **Requirement** | **Description** |
| --- | --- |
| **Performance** | System should support **100+ concurrent users**. |
| **Security** | Implement **role-based access control (RBAC)**. |
| **Scalability** | Support multi-warehouse operations **without performance lag**. |
| **Availability** | System uptime should be **99.9%**. |
| **Compliance** | Adhere to **GDPR & ISO 27001** standards. |

**5. User Interface Mockups (Optional)**

* **Login Page**
* **Dashboard for Admin & Warehouse Manager**
* **Order Processing Screen**
* **Inventory Management Screen**

**6. API & Integration Requirements**

📌 **External Systems:**

* ERP System (SAP, Oracle)
* E-commerce (Amazon, Shopify)
* Payment Gateway (Stripe, PayPal)

📌 **API Functionalities:**

* GET Inventory Details /api/inventory/{sku}
* POST New Order /api/order/create
* PUT Update Order Status /api/order/update/{id}

**7. Workflow Diagrams**

* **Order Processing Flow**
* **Inventory Movement Flow**
* **Warehouse Staff Workflow**

**8. Assumptions & Constraints**

✅ System will be **cloud-based** (AWS/Azure).
✅ Barcode scanners & RFID readers **must be compatible**.
✅ Internet connectivity is **required** for real-time updates.

**9. Sign-Off**

| **Role** | **Name** |  **Signature** | **Date** |
| --- | --- | --- | --- |
| **Business Analyst:**  |  Kumaran  | Dharmalingam |  |
| **Project Manager:** | Mr. Vandanam |  |  |
| **Client Representative** | : Mr. |  |  |

**Conclusion**

This **FSD ensures all functional aspects of WMS development** are **well-defined, structured, and approved**.

**Requirement Traceability Matrix (RTM) for Warehouse Management System (WMS)**

**1. Document Overview**

* **Project Name:** Warehouse Management System (WMS)
* **Prepared By: Kumaran Dharmalingam (BA)**
* **Reviewed By:** Mr. Vandanam (PM)
* **Version:** 1.0
* **Date:** 03/03/3035

**Purpose of the Document**

The **Requirement Traceability Matrix (RTM)** ensures that all functional and non-functional requirements are tracked throughout the **Software Development Life Cycle (SDLC)**. It maps each requirement to its corresponding **design, development, testing, and validation** phases to ensure complete implementation.

**Functional Requirements**

| **Requirement ID** | **Requirement Description** | **Business Objective** | **Design Specification** | **Development Status** | **Test Case ID** | **Testing Status** | **UAT Status** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| FR001 | User Login with Role-Based Access | Secure access control | UI Login Page, Database Authentication | ✅ Completed | TC001 | ✅ Passed | ✅ Approved |
| FR002 | Inventory Management (Add, Update, Delete) | Real-time stock tracking | Inventory Module, DB Schema | ✅ Completed | TC002, TC003 | ✅ Passed | ✅ Approved |
| FR003 | Barcode & RFID Scanning for Stock Update | Automate inventory tracking | API Integration, Hardware Compatibility | ✅ Completed | TC004 | 🔄 In Progress | ❌ Pending |
| FR004 | Order Processing (Picking, Packing, Shipping) | Streamline order fulfilment | Order Workflow Design | ✅ Completed | TC005 | ✅ Passed | ✅ Approved |
| FR005 | Generate Inventory Reports | Data-driven decision-making | Reports Module, Dashboard UI | 🔄 In Progress | TC006 | ❌ Not Started | ❌ Pending |
| FR006 | Integration with ERP System | Sync inventory & orders with ERP | API Development | 🔄 In Progress | TC007 | ❌ Not Started | ❌ Pending |

**3.2 Non-Functional Requirements**

| **Requirement ID** | **Requirement Description** | **Business Objective** | **Design Specification** | **Development Status** | **Test Case ID** | **Testing Status** | **UAT Status** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| NFR001 | System should support 100+ concurrent users | High system performance | Cloud-based Architecture | ✅ Completed | TC008 | ✅ Passed | ✅ Approved |
| NFR002 | Data Encryption for Security | Secure sensitive data | AES-256 Encryption | ✅ Completed | TC009 | ✅ Passed | ✅ Approved |
| NFR003 | Role-Based Access Control (RBAC) | Restrict unauthorized access | User Management Module | ✅ Completed | TC010 | ✅ Passed | ✅ Approved |
| NFR004 | System Availability 99.9% | Ensure uptime | AWS/Azure Deployment | 🔄 In Progress | TC011 | ❌ Not Started | ❌ Pending |
| NFR005 | API Response Time < 2 sec | Improve performance | REST API Optimization | 🔄 In Progress | TC012 | ❌ Not Started | ❌ Pending |

**4. Traceability Matrix Summary**

✅ **Completed & Approved:** 7 Requirements
🔄 **In Progress:** 5 Requirements
❌ **Not Started:** 3 Requirements

# **Business Requirements Document (BRD) for Warehouse Management System (WMS)**

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**1. Document Revisions**

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| --- | --- | --- |
| **Date**  | **Version Number**  | **Document Changes**  |
| **05/02/20xx**  | **0.1**  | **Initial Draft**  |

**2. Approvals**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Role**  | **Name**  | **Title**  | **Signature**  | **Date**  |
| **Project Sponsor: Mr. Hendry** |
| **Business Owner: Mr. Hendry** |
| **Project Manager: Mr. Vandanam** |
| **System Architect: ARUN** |
| **Development Lead: Mr. Suresh** |
| **User Experience** **Lead :Mr.Gopi** |
| **Quality Lead :Mr.Mohan** |
| **Content Lead: Ms. Tamilselvi** |

**2. Executive Summary**

**2.1 Purpose of the Document**

This document outlines the **business requirements** for developing a **Warehouse Management System (WMS)**. The WMS will **automate, optimize, and improve warehouse operations**, enabling efficient **inventory tracking, order processing, stock management, and reporting**.

**2.2 Business Objectives**

✅ Improve **warehouse efficiency** by **30%** through automation.
✅ Reduce **order processing time** and minimize **errors** in stock management.
✅ Ensure **real-time inventory tracking** via **barcode/RFID scanning**.
✅ Enable seamless **integration with ERP systems** for data synchronization.
✅ Provide **role-based access control** for security and compliance.

**3. Business Scope**

**3.1 Project Scope**

The WMS will cover the following:
✔ **User Authentication & Role Management** (Admin, Warehouse Manager, Staff, Customer Service, Supplier).
✔ **Inventory Management** – Add, update, delete, track stock levels.
✔ **Order Processing & fulfilment** – Picking, packing, shipping.
✔ **Barcode/RFID Integration** – Real-time stock updates.
✔ **Reports & Dashboards** – Generate inventory, order, and performance reports.
✔ **ERP Integration** – Sync orders and inventory data with enterprise systems.

**3.2 Out of Scope**

🚫 Warehouse robotics automation.
🚫 Direct customer-facing e-commerce order processing.
🚫 AI-based predictive analytics (Phase 2 development).

**4.RACI Chart**

| **Project Activity** | **Business Owner** | **Project Manager** | **Business Analyst** | **Developers** | **QA Team** | **IT Team** | **Warehouse Manager** | **End Users** | **Finance Team** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. Requirements Gathering** | **A** | **R** | **R** | **C** | **C** | **I** | **C** | **I** | **I** |
| **2. Business Case Approval** | **A** | **R** | **C** | **I** | **I** | **I** | **I** | **I** | **C** |
| **3. UI/UX Design** | **I** | **R** | **C** | **R** | **C** | **I** | **C** | **I** | **I** |
| **4. Development** | **I** | **R** | **C** | **R** | **C** | **C** | **I** | **I** | **I** |
| **5. Integration with ERP** | **I** | **R** | **C** | **R** | **C** | **R** | **I** | **I** | **C** |
| **6. System Testing** | **I** | **R** | **C** | **I** | **R** | **I** | **I** | **I** | **I** |
| **7. UAT (User Acceptance Testing)** | **I** | **R** | **C** | **I** | **R** | **I** | **R** | **R** | **I** |
| **8. Deployment & Go-Live** | **I** | **R** | **C** | **R** | **R** | **R** | **I** | **I** | **I** |
| **9. Training & Change Management** | **I** | **R** | **C** | **C** | **I** | **R** | **R** | **R** | **I** |
| **10. Post-Go-Live Support** | **I** | **R** | **I** | **R** | **R** | **R** | **I** | **I** | **I** |

**5. Stakeholders**

| **Stakeholder** | **Role & Responsibilities** |
| --- | --- |
| **Business Owner** | Approves WMS implementation, ensures alignment with business goals. |
| **Warehouse Manager** | Oversees stock management, assigns tasks to warehouse staff. |
| **Warehouse Staff** | Handles stock movement, order picking, and packing. |
| **IT Team** | Ensures software deployment, integration, and maintenance. |
| **Finance Team** | Tracks cost, revenue impact, and ensures financial accuracy. |
| **Customers** | Indirect stakeholder; benefits from improved order accuracy and speed. |

**5. Business Requirements**

| **Requirement ID** | **Requirement Description** | **Priority** |
| --- | --- | --- |
| BR001 | The system shall allow users to log in with role-based access. | High |
| BR002 | The system shall allow warehouse managers to add, update, and delete inventory. | High |
| BR003 | The system shall track stock levels in real time using barcode/RFID scanning. | High |
| BR004 | The system shall allow warehouse staff to process orders (picking, packing, shipping). | High |
| BR005 | The system shall generate real-time inventory and order reports. | Medium |
| BR006 | The system shall integrate with ERP software for order and inventory synchronization. | Medium |

**6. Business Process Workflow**

**6.1 Current Workflow (Manual Process)**

* **Step 1:** Warehouse staff manually **checks stock levels**.
* **Step 2:** Orders are processed **using spreadsheets**.
* **Step 3:** Staff **manually picks and packs** items without barcode validation.
* **Step 4:** Shipment tracking is **logged in paper-based records**.

**6.2 Proposed Workflow (With WMS Implementation)**

✅ **Step 1:** Warehouse staff scans incoming inventory via **barcode/RFID**.
✅ **Step 2:** Stock is **updated in real time** within WMS.
✅ **Step 3:** Orders are automatically assigned for **picking & packing**.
✅ **Step 4:** The system generates **shipping labels** and tracks orders.

**7. Risk Analysis & Mitigation Plan**

| **Risk** | **Impact** | **Mitigation Strategy** |
| --- | --- | --- |
| Employee resistance to new system | High | Conduct **training & change management** programs. |
| System downtime affecting operations | High | Ensure **cloud-based deployment with failover mechanisms**. |
| Integration issues with ERP | Medium | Conduct **API testing & pilot deployment** before full rollout. |
| Data security concerns | High | Implement **role-based access & encryption** for sensitive data. |

**8. Assumptions & Constraints**

**8.1 Assumptions**

* The organization has **stable internet connectivity** for cloud-based WMS.
* Barcode/RFID scanning devices are available and **compatible** with the system.
* Users will receive **training** before system deployment.

**8.2 Constraints**

* The system must be developed within a **6-month timeframe**.
* The budget for development is **fixed** and cannot exceed [amount].
* Any additional feature requests will be **considered in future phases**.

**9. Implementation Timeline & Milestones**

| **Phase** | **Tasks** | **Duration** | **Completion Date** |
| --- | --- | --- | --- |
| **Phase 1: Planning** | Requirements gathering, stakeholder discussions | 2 Weeks | [Date] |
| **Phase 2: Design** | UI/UX wireframes, system architecture | 4 Weeks | [Date] |
| **Phase 3: Development** | Backend & frontend development, integration | 10 Weeks | [Date] |
| **Phase 4: Testing** | Functional, performance, security testing | 6 Weeks | [Date] |
| **Phase 5: Deployment** | Go-live, training, support | 4 Weeks | [Date] |

**10. Sign-Off**

| **Role** | **Name** | **Signature** | **Date** |
| --- | --- | --- | --- |
| **Business Analyst** |  |  |  |
| **Project Manager** |  |  |  |
| **IT Head** |  |  |  |
| **Client Representative** |  |  |  |

**Conclusion**

This **Business Requirements Document (BRD)** serves as the foundation for the **Warehouse Management System (WMS) development**. It ensures that all **stakeholders, business objectives, and system requirements** are aligned for a **successful implementation**. ✅

Would you like me to include a **detailed cost estimation or stakeholder communication plan**? 😊