# AR-Warehouse Management System

## Requirements Specification Document

## Version 1.0

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## 1. Introduction

This document provides the detailed requirements for the AR-Warehouse Management System (AR-WMS) project, aimed at improving inventory management and operational efficiency in a small computer store warehouse through augmented reality technology.

## 2. Phase 1: Requirements Specification

## 2.1 Inventory Data Requirements

* Product details: categories, name, model, manufacturer, SKU, serial number
* Inventory tracking: purchase info, warranty, quantity, reorder levels, condition, location
* Identification: barcodes/QR codes, future RFID readiness
* Usage records: sales, assignments, notes

## 2.2 AR System Readiness

* Warehouse layout standardized for AR navigation and scanning
* Network coverage ensuring real-time data sync
* User workflows with AR guidance and alerts

## 2.3 System Integration

* Backend-frontend API, ERP compatibility
* Security, authentication, and data protection

## 3. Phase 2: System Design

* Overall system architecture including AR components, backend, database, and communication flows
* Selection of object detection models and image processing techniques
* Data flow and database schema design
* API definitions and security protocols

## 4. Phase 3: Prototype Development

* Data collection, annotation, and training of detection models
* Initial AR overlay prototype development and validation
* Basic UI/UX design and user interaction flows with AR devices

## 5. Phase 4: Backend and API Development

* Implementation of database schema and inventory management system
* Development of RESTful API for seamless backend-frontend communication
* Integration with existing inventory or ERP software as needed

## 6. Phase 5: Frontend AR Application Development

* Development of the AR app using OpenCV and appropriate mobile AR SDKs
* Real-time recognition and information overlay on warehouse items
* Performance optimization and hardware compatibility checks

## 7. Phase 6: Testing and Refinement

* System integration testing and quality assurance
* Usability testing with warehouse staff and collecting feedback
* Accuracy improvements for object detection and interface responsiveness

## 8. Phase 7: Deployment and Training

* Deployment of hardware and software components
* Conducting staff training sessions for effective AR system use
* Preparation of user manuals and support documentation
* Establishing maintenance and support procedures

## 9. Success Criteria

* Reduced operational time for locating and picking items by at least 30%
* Improved inventory accuracy with error reduction by 50%
* Positive usability feedback from warehouse staff during pilot phase

## 10. Document Control

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