KR Steel PMS - Complete Project Blueprint & Implementation Plan

Project Name: SHARP (Shipyard Heavy Asset Reliability Planner)

Client: KR Steel (Ship Recycling Facility)

Version: 2.0 (Updated with correct specifications)

Date: February 2026

📋 Table of Contents

🎯 Project Overview

Purpose

A Planned Maintenance System (PMS) for KR Steel's ship recycling facility to track, manage, and schedule maintenance jobs across various equipment categories with automated calculations and comprehensive reporting.

Key Features

- Simple username/password login
- Sidebar navigation with equipment categories and items
- Job management with automated due date and overdue tracking
- Remaining hours calculation

- Criticality-based filtering
- Three types of downloadable PDF reports

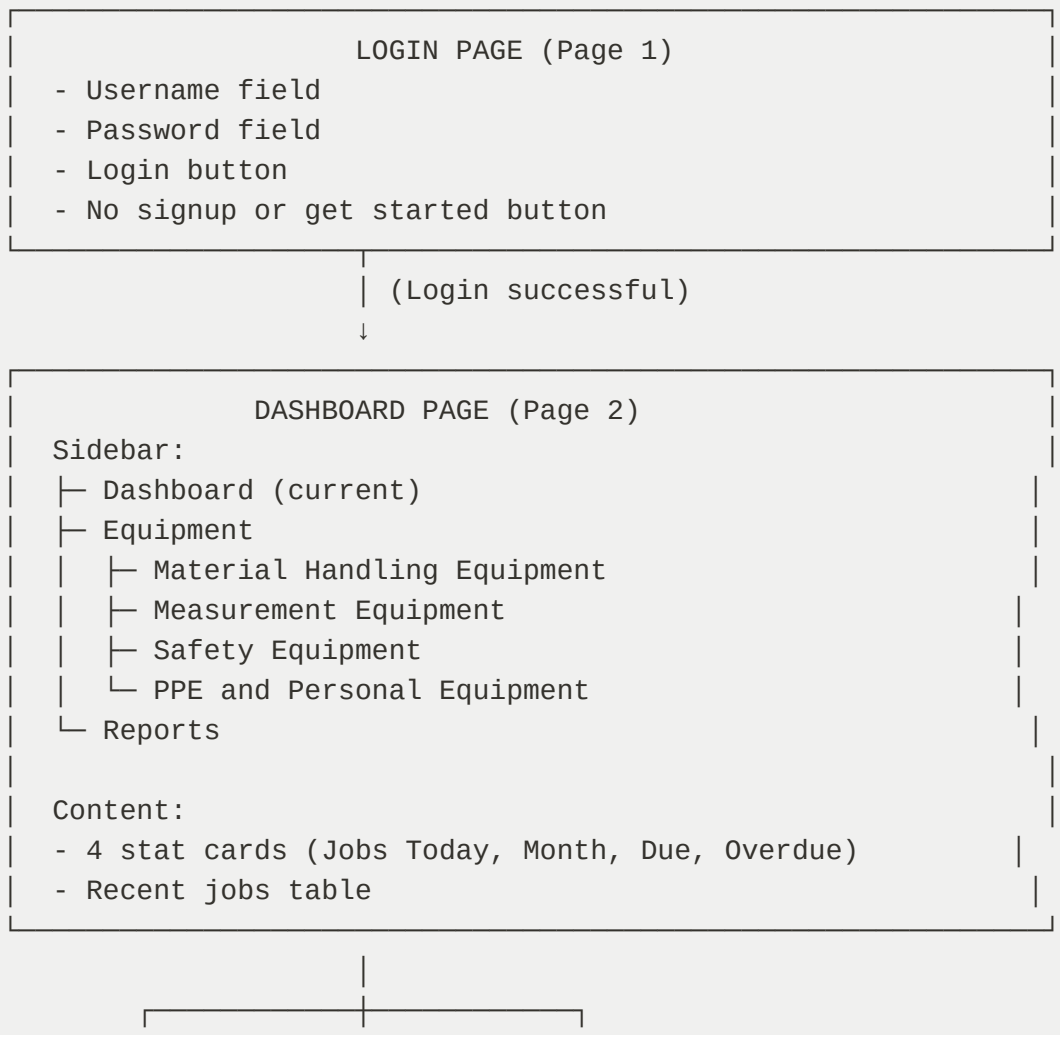
Technology Stack

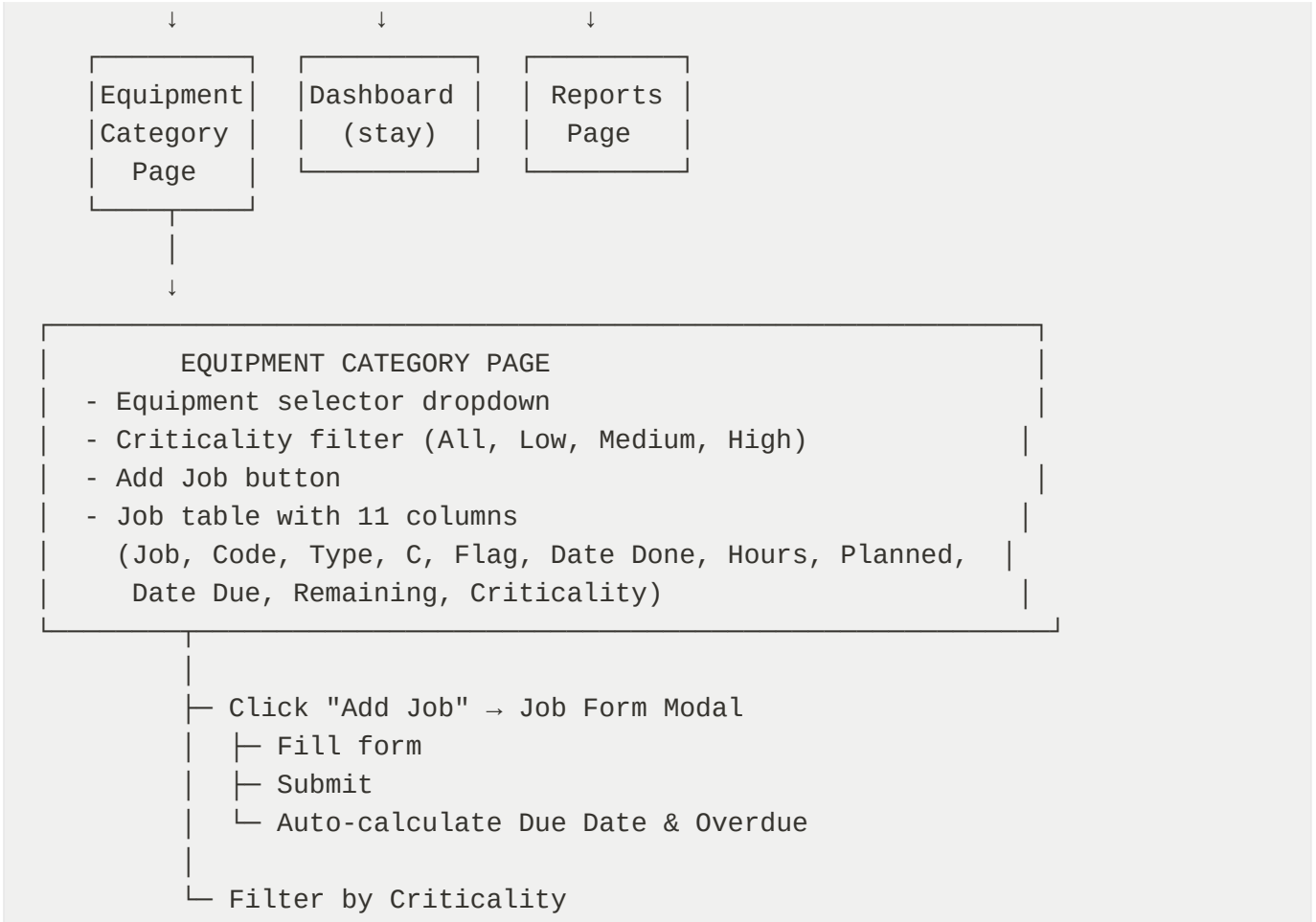
- **Frontend:** Next.js 14+, React 18+, TypeScript, Tailwind CSS
- **Backend:** Next.js API Routes, Prisma ORM
- **Database:** PostgreSQL or MySQL
- **PDF Generation:** jsPDF, html2canvas
- **Authentication:** JWT-based

🔄 Application Flow

Flow Diagram

Plain Text





📊 Sidebar Navigation Structure

Navigation Hierarchy

Plain Text

```
SIDEBAR (Always Visible)
├── 🏠 Dashboard
│   └── Main overview page with statistics
│
├── 🔧 Equipment (Expandable)
│   ├── Material Handling Equipment
│   │   ├── Overhead Crane (EQ-001)
│   │   ├── Forklift (EQ-002)
│   │   ├── Lifting Devices (EQ-003)
│   │   └── Welding Equipment (EQ-004)
│   │
│   ├── Measurement Equipment
│   │   ├── Micrometer (EQ-005)
│   │   ├── Caliper (EQ-006)
```

```
│   │   └─ Gauge (EQ-007)
│   │
│   ├─ Safety Equipment
│   │   ├─ Fire Extinguisher (EQ-008)
│   │   ├─ Safety Harness (EQ-009)
│   │   └─ First Aid Kit (EQ-010)
│   │
│   └─ PPE and Personal Equipment
│       ├─ Safety Helmet (EQ-011)
│       ├─ Safety Gloves (EQ-012)
│       └─ Safety Boots (EQ-013)
│
└── 📊 Reports
    ├─ Overall Job Details (Equipment Wise)
    ├─ Equipment Wise Report
    └─ Overdue Jobs List
```

Sidebar Behavior

- **Always visible** on desktop (left side)
- **Collapsible** on mobile/tablet
- **Dark blue background** (#1A3A52)
- **White text** with icons
- **Equipment categories** expandable/collapsible
- **Items listed** under each category
- **Active state** highlighted in light blue
- **Logout button** at bottom

📄 Page Specifications

1. LOGIN PAGE

URL: `/login`

Components:

- KR Steel logo/branding
- Username input field
- Password input field
- Login button

- Error message display (if login fails)

Functionality:

- Accept username and password
- Validate credentials against database
- Generate JWT token on success
- Store token in localStorage
- Redirect to `/dashboard` on success
- Display error message on failure

Design:

- Centered form layout
- Blue gradient background
- Professional, minimalist design
- No signup or get started button

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2. DASHBOARD PAGE

URL: `/dashboard`

Components:

- Sidebar navigation
- Page title: "Dashboard"
- 4 stat cards:
  - Jobs Today (light blue background)
  - Jobs This Month (light green background)
  - Due Jobs (light yellow background)
  - Overdue Jobs (light red background)
- Recent jobs table with columns:
  - Job ID
  - Job Type
  - Equipment
  - Status
  - Due Date

- Assigned To

Functionality:

- Display real-time statistics
- Show recent jobs (last 10)
- Color-coded status indicators
- Click on job to view details (optional)

Data Sources:

- Database queries for job counts
- Filter by date ranges for statistics

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3. EQUIPMENT CATEGORY PAGE

URL: `/dashboard/equipment/[categoryId]`

Components:

- Sidebar navigation (Equipment category highlighted)
- Page title: Category name (e.g., "Material Handling Equipment")
- Equipment selector dropdown
- Criticality filter dropdown (All, Low, Medium, High)
- "Add Job" button (blue)
- Job table with 11 columns:
  1. Job (text)
  2. Job Code (text)
  3. Job Type (dropdown/select)
  4. C (Category - dropdown/select)
  5. Flag (text)
  6. Date Done (date picker)
  7. Hours (number)
  8. Planned (number)
  9. Date Due (date - auto-calculated, read-only)
  10. Remaining (number - auto-calculated, read-only)
  11. Criticality (dropdown: Low, Medium, High)

Functionality:

- Load equipment items for selected category
- Display jobs for selected equipment
- Filter jobs by criticality
- Show empty table rows for data entry
- Add new job via modal form
- Auto-calculate due date based on frequency
- Auto-calculate remaining hours
- Auto-calculate overdue days

Data Entry:

- User manually enters values in table cells
- Frequency field determines due date calculation
- Planned hours - Hours worked = Remaining hours

---

4. JOB FORM MODAL

URL: Modal overlay on Equipment Category Page

Components:

- Modal title: "Create New Job"
- Form fields (2-column layout):
  - **Left Column:**
    - Job Code (text input)
    - Job Type (dropdown)
    - Category (dropdown)
    - Flag (text input)
  - **Right Column:**
    - Date Done (date picker)
    - Planned Hours (number input)
    - Frequency (dropdown: weekly, monthly, 3-monthly, yearly, 5-yearly)
    - Criticality (dropdown: low, medium, high)
  - **Full Width:**

        - Job Name (textarea)
- Cancel button
- Create Job button (blue)

Functionality:

- Accept all job details
- Auto-calculate due date based on frequency
- Auto-calculate overdue days
- Auto-calculate remaining hours (Planned - 0)
- Submit to database
- Close modal on success
- Refresh job table
- Display success/error message

---

5. REPORTS PAGE

URL: `/dashboard/reports`

Components:

- Sidebar navigation (Reports highlighted)
- Page title: "Reports"
- Page subtitle: "Generate and download maintenance reports"
- 3 report cards in grid layout:

  Card 1: Overall Job Details (Equipment Wise)

  Card 2: Equipment Wise Report

  Card 3: Overdue Jobs List

    - Icon: Clipboard with gear
    - Title: "Overall Job Details (Equipment Wise)"
    - Description: "Grouped by equipment type and name"
    - Download button
    - Icon: Clipboard with checkmark
    - Title: "Equipment Wise Report"
    - Description: "Complete equipment registry"

- Download button
- Icon: Clipboard with alert
- Title: "Overdue Jobs List"
- Description: "Overall and equipment based"
- Download button

Functionality:

- Generate PDF report on button click
- Download file with timestamp
- Report 1: Group jobs by equipment type and name
- Report 2: List all equipment with details
- Report 3: List all overdue jobs with details

🗄️ Database Schema

Tables

1. Users

```
SQL

CREATE TABLE users (
  id INT PRIMARY KEY AUTO_INCREMENT,
  username VARCHAR(255) UNIQUE NOT NULL,
  password VARCHAR(255) NOT NULL,
  email VARCHAR(255) UNIQUE,
  role ENUM('admin', 'user') DEFAULT 'user',
  createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  updatedAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP
);
```

2. EquipmentCategories

```
SQL

CREATE TABLE equipment_categories (
  id INT PRIMARY KEY AUTO_INCREMENT,
  name VARCHAR(255) UNIQUE NOT NULL,
  description TEXT,
```

```
  createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);
```

3. Equipment

SQL

```
CREATE TABLE equipment (
  id INT PRIMARY KEY AUTO_INCREMENT,
  code VARCHAR(255) UNIQUE NOT NULL,
  name VARCHAR(255) NOT NULL,
  categoryId INT NOT NULL,
  location VARCHAR(255),
  description TEXT,
  status ENUM('active', 'inactive', 'maintenance', 'retired') DEFAULT 'active',
  createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  updatedAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
  FOREIGN KEY (categoryId) REFERENCES equipment_categories(id) ON DELETE CASCAD
);
```

4. Jobs

SQL

```
CREATE TABLE jobs (
  id INT PRIMARY KEY AUTO_INCREMENT,
  jobCode VARCHAR(255) UNIQUE NOT NULL,
  jobName VARCHAR(255) NOT NULL,
  jobType VARCHAR(255),
  equipmentId INT NOT NULL,
  category VARCHAR(255),
  flag VARCHAR(255),
  dateDone DATETIME NOT NULL,
  hoursWorked FLOAT DEFAULT 0,
  plannedHours FLOAT NOT NULL,
  frequency ENUM('weekly', 'monthly', '3-monthly', 'yearly', '5-yearly') NOT NU
  dateDue DATETIME NOT NULL,
  remainingHours FLOAT DEFAULT 0,
  criticality ENUM('low', 'medium', 'high') NOT NULL,
  overduedays INT DEFAULT 0,
  createdBy INT NOT NULL,
  createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  updatedAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
  FOREIGN KEY (equipmentId) REFERENCES equipment(id) ON DELETE CASCADE,
```

```
  FOREIGN KEY (createdBy) REFERENCES users(id)
);
```

5. MaintenanceHistory

SQL

```
CREATE TABLE maintenance_history (
  id INT PRIMARY KEY AUTO_INCREMENT,
  equipmentId INT NOT NULL,
  jobId INT,
  description TEXT,
  performedAt DATETIME DEFAULT CURRENT_TIMESTAMP,
  createdAt TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  FOREIGN KEY (equipmentId) REFERENCES equipment(id) ON DELETE CASCADE,
  FOREIGN KEY (jobId) REFERENCES jobs(id) ON DELETE SET NULL
);
```

🧮 Automated Calculations

1. Due Date Calculation

Formula:

Plain Text

```
Due Date = Date Done + Frequency (in days)
```

Frequency Mapping:

Frequency	Days
weekly	7
monthly	30
3-monthly	90
yearly	365
5-yearly	1825

Example:

- Date Done: 2026-02-15
- Frequency: weekly (7 days)
- Due Date: 2026-02-22

2. Overdue Days Calculation

Formula:

```
Plain Text

Overdue Days = Current Date - Due Date (if Current Date > Due Date)
```

Example:

- Due Date: 2026-02-22
- Current Date: 2026-02-28
- Overdue Days: 6 days

3. Remaining Hours Calculation

Formula:

```
Plain Text

Remaining Hours = Planned Hours - Hours Worked
```

Example:

- Planned Hours: 40
- Hours Worked: 15
- Remaining Hours: 25

Note: Remaining hours cannot be negative; minimum is 0.

📊 Reports System

Report 1: Overall Job Details (Equipment Wise)

Format:

```
Plain Text
```

```
Equipment Type 1 | Equipment Name 1
├─ Job Code: J-001, Type: Inspection, Criticality: High
├─ Job Code: J-002, Type: Maintenance, Criticality: Medium
└─ Job Code: J-003, Type: Repair, Criticality: Low

Equipment Type 1 | Equipment Name 2
├─ Job Code: J-004, Type: Maintenance, Criticality: High
└─ Job Code: J-005, Type: Inspection, Criticality: Low

Equipment Type 2 | Equipment Name 3
└─ Job Code: J-006, Type: Overhaul, Criticality: High
```

Data Included:

- Equipment Type (from category)
- Equipment Name
- Job Code
- Job Name
- Job Type
- Date Done
- Planned Hours
- Date Due
- Criticality
- Overdue Status

Report 2: Equipment Wise Report

Format:

Plain Text

```
Equipment Code | Equipment Name | Category | Location | Status
EQ-001 | Overhead Crane | Material Handling Equipment | Bay A | Active
EQ-002 | Forklift | Material Handling Equipment | Bay B | Active
EQ-003 | Micrometer | Measurement Equipment | Lab 1 | Active
...
```

Data Included:

- Equipment Code
- Equipment Name

- Category
- Location
- Status
- Total Jobs Count
- Overdue Jobs Count

Report 3: Overdue Jobs List

Format:

```
Plain Text

OVERALL OVERDUE JOBS:
├─ Job Code: J-001, Equipment: Overhead Crane, Overdue By: 5 days, Criticality:
├─ Job Code: J-002, Equipment: Forklift, Overdue By: 2 days, Criticality: Mediu
└─ Job Code: J-003, Equipment: Micrometer, Overdue By: 10 days, Criticality: Hi

EQUIPMENT-BASED OVERDUE JOBS:

Material Handling Equipment | Overhead Crane:
└─ Job Code: J-001, Overdue By: 5 days, Criticality: High

Material Handling Equipment | Forklift:
└─ Job Code: J-002, Overdue By: 2 days, Criticality: Medium

Measurement Equipment | Micrometer:
└─ Job Code: J-003, Overdue By: 10 days, Criticality: High
```

Data Included:

- Job Code
- Equipment Name
- Equipment Type
- Days Overdue
- Due Date
- Criticality
- Job Type

🎨 Design System

Color Palette

Color	Hex	Usage
Primary Blue	#0052CC	Buttons, links, highlights
Light Blue	#E6F0FF	Backgrounds, hover states
Pastel Mint	#D4F1E8	Card backgrounds, accents
Pastel Peach	#FFE6D5	Alert backgrounds
Pastel Yellow	#FFF4D6	Warning backgrounds
Dark Gray	#1A1A1A	Text, sidebar
Light Gray	#F8F9FA	Page backgrounds
Success Green	#10B981	Completed status
Warning Orange	#F59E0B	In-progress status
Danger Red	#EF4444	Overdue/error status

Typography

Element	Font Size	Font Weight	Usage
Heading 1	32px	Bold (700)	Page titles
Heading 2	24px	Bold (700)	Section titles
Heading 3	20px	Bold (700)	Card titles
Body Text	16px	Regular (400)	Main content
Small Text	12px	Regular (400)	Labels, captions
Button Text	16px	Semibold (600)	Buttons

Spacing Grid

- Base unit: 4px
- Spacing scale: 4px, 8px, 16px, 24px, 32px, 48px

Components

Buttons:

- Primary: Blue background, white text, rounded corners
- Secondary: Gray background, dark text
- Danger: Red background, white text

Cards:

- White background, subtle shadow, rounded corners
- Padding: 24px
- Margin-bottom: 16px

Inputs:

- Border: 1px solid #E5E7EB
- Padding: 12px 16px
- Border-radius: 8px
- Focus: Blue border, shadow

Badges:

- Low: Green background
- Medium: Orange background
- High: Red background

🚀 Implementation Roadmap

Phase 1: Setup & Authentication (Week 1)

- [ ] Set up Next.js project
- [ ] Configure Prisma and database
- [ ] Create login page
- [ ] Implement JWT authentication
- [ ] Create user model and database

Phase 2: Core Navigation (Week 1-2)

- [ ] Build sidebar component

- [ ] Create dashboard page
- [ ] Implement equipment categories
- [ ] Create equipment items listing

Phase 3: Job Management (Week 2-3)

- [ ] Create job table component
- [ ] Build job form modal
- [ ] Implement job creation API
- [ ] Add job retrieval API

Phase 4: Automated Calculations (Week 3)

- [ ] Implement due date calculation
- [ ] Implement overdue days calculation
- [ ] Implement remaining hours calculation
- [ ] Add real-time calculation on form submission

Phase 5: Filtering & Search (Week 3-4)

- [ ] Implement criticality filter
- [ ] Add equipment selector
- [ ] Create job filtering logic

Phase 6: Reports (Week 4)

- [ ] Create reports page
- [ ] Implement report generation APIs
- [ ] Add PDF export functionality
- [ ] Test all three report types

Phase 7: Testing & Refinement (Week 4-5)

- [ ] Unit tests for calculations
- [ ] Integration tests for APIs
- [ ] UI/UX testing

- [ ] Performance optimization

Phase 8: Deployment (Week 5)

- [ ] Prepare for production
- [ ] Deploy to hosting platform
- [ ] Set up monitoring
- [ ] Create user documentation

📱 Responsive Design

Breakpoints

- **Mobile:** < 640px
- **Tablet:** 640px - 1024px
- **Desktop:** > 1024px

Mobile Considerations

- Sidebar collapses to hamburger menu
- Single-column layout for tables
- Touch-friendly button sizes (48px minimum)
- Simplified forms on small screens

🔐 Security Considerations

- Hash passwords using bcryptjs
- Use JWT tokens with expiration
- Validate all inputs on backend
- Implement CORS properly
- Use HTTPS in production
- Sanitize database queries (Prisma handles this)
- Implement rate limiting on login
- Add CSRF protection

📝 Notes

- All dates should be stored in UTC
- Display dates in user's local timezone
- Frequency field is required for due date calculation
- Overdue calculation runs automatically on job retrieval
- Reports should be generated on-demand
- Consider caching for frequently accessed reports
- Equipment categories are fixed (4 types)
- Equipment items are created by admins

✅ Checklist for Implementation

- [ ] Database schema created and migrated
- [ ] Login page functional
- [ ] Sidebar navigation complete
- [ ] Dashboard page with statistics
- [ ] Equipment category pages
- [ ] Job table with all 11 columns
- [ ] Job form modal with validation
- [ ] Automated calculations working
- [ ] Criticality filter functional
- [ ] Reports page with 3 report types
- [ ] PDF generation working
- [ ] All API endpoints tested
- [ ] UI matches design mockups
- [ ] Responsive design verified
- [ ] Security measures implemented
- [ ] Performance optimized
- [ ] User documentation created

- [ ] Ready for deployment

Document Version: 2.0

Last Updated: February 16, 2026

Status: Ready for Implementation