📘 SOFTWARE REQUIREMENTS SPECIFICATION (SRS)

Nelna Company Integrated Maintenance Management System (NCIMMS)

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1 Introduction

1.1 Purpose

The purpose of this document is to describe the requirements for the **Nelna Company Integrated Maintenance Management System (NCIMMS)**.
This system will manage vehicles, machines, services, stores, and inventory operations within the company.

The system will be developed using:

- Frontend: Flutter (Mobile & Web)
- Backend: Node.js + Express
- Database: MySQL

1.2 Scope

The system will provide:

- Vehicle Management
- Machine Maintenance Management
- Service Request Management
- Stores & Inventory Management
- Reporting & Analytics
- Role-Based Access Control
- Notifications & Alerts

The system will support multi-branch operations and centralized monitoring.

1.3 Definitions

- AMC – Annual Maintenance Contract
- RBAC – Role-Based Access Control
- GRN – Goods Received Note
- SLA – Service Level Agreement

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2 Overall Description

2.1 Product Perspective

The system will function as a centralized enterprise maintenance platform.

Architecture:

Flutter App
⬇
REST API (Node.js + Express)
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MySQL Database

Optional:

- Firebase Cloud Messaging (Notifications)
- Cloud Storage for image uploads

2.2 User Classes and Characteristics

1. Super Admin

- Full access
- System configuration
- User & branch management

2. Company Admin

- Manage all modules

- Approve requests
- Generate reports

3. Maintenance Manager

- Schedule maintenance
- Assign technicians
- Monitor service progress

4. Technician

- View assigned tasks
- Update repair status
- Upload service reports

5. Store Manager

- Manage stock
- Approve stock issuance
- Monitor low stock alerts

6. Driver

- Report vehicle issues
- Update fuel logs

7. Finance Officer

- Track maintenance costs
- View expense analytics

2.3 Operating Environment

- Android & iOS devices
- Web Admin Panel
- MySQL 8+
- Linux-based cloud server

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3 Functional Requirements

3.1 Authentication & Authorization

FR-1: The system shall allow user login using email and password.
FR-2: The system shall implement JWT authentication.
FR-3: The system shall enforce role-based access control.
FR-4: The system shall allow password reset.

3.2 Vehicle Management Module

FR-5: The system shall allow vehicle registration.
FR-6: The system shall store vehicle documents (insurance, license).
FR-7: The system shall track fuel usage.
FR-8: The system shall track vehicle service history.
FR-9: The system shall generate service reminders based on mileage or date.
FR-10: The system shall assign drivers to vehicles.

3.3 Machine Maintenance Module

FR-11: The system shall allow machine registration.
FR-12: The system shall track preventive maintenance schedules.
FR-13: The system shall record machine breakdowns.
FR-14: The system shall calculate downtime duration.
FR-15: The system shall maintain complete service history.

3.4 Service Management Module

FR-16: The system shall allow creation of service requests.
FR-17: The system shall allow managers to approve/reject requests.
FR-18: The system shall assign technicians to service tasks.
FR-19: The system shall allow technicians to update job progress.
FR-20: The system shall allow uploading service reports.
FR-21: The system shall record spare parts used.
FR-22: The system shall calculate total service cost.

3.5 Inventory Management Module

FR-23: The system shall allow product registration.
FR-24: The system shall manage product categories.
FR-25: The system shall record stock-in and stock-out transactions.
FR-26: The system shall generate low stock alerts.
FR-27: The system shall manage suppliers.
FR-28: The system shall generate purchase orders.
FR-29: The system shall record GRN details.

3.6 Stores Maintenance Module

FR-30: The system shall track store equipment assets.
FR-31: The system shall record internal transfers.
FR-32: The system shall maintain asset repair logs.

3.7 Reporting & Analytics

FR-33: The system shall generate vehicle maintenance reports.
FR-34: The system shall generate machine downtime reports.
FR-35: The system shall generate inventory movement reports.
FR-36: The system shall generate expense reports.
FR-37: The system shall provide dashboard analytics.

3.8 Notifications

FR-38: The system shall send service reminders.
FR-39: The system shall send low stock alerts.
FR-40: The system shall send breakdown notifications.

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4 Non-Functional Requirements

4.1 Performance

- The system shall support 500+ concurrent users.
- API response time shall be less than 3 seconds.

4.2 Security

- All passwords shall be encrypted.
- JWT-based authentication.
- Role-based permission enforcement.
- Data backup daily.

4.3 Reliability

- 99% uptime.
- Automatic database backup.

4.4 Usability

- User-friendly mobile interface.
- Dashboard-based navigation.
- Multi-language support (Optional).

4.5 Scalability

- System shall support multi-branch expansion.
- Modular design for future feature additions.

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5 Database Requirements (High-Level Entities)

Main tables:

- users
- roles
- vehicles
- machines
- service_requests
- service_tasks
- products
- stock_movements
- suppliers
- purchase_orders
- expenses
- branches

Foreign key relationships shall be enforced.

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6 System Constraints

- Must use MySQL database.
- Must use Flutter for frontend.
- Must comply with company IT policies.
- Internet connection required (except offline mode if implemented).

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7 Risk Management

Risk	Impact	Mitigation
Data loss	High	Daily backup
Unauthorized access	High	RBAC + JWT
Server downtime	Medium	Cloud hosting
Budget overrun	Medium	Phase-wise development

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8 Testing Strategy

Unit Testing

- Backend API testing

Integration Testing

- Flutter + API testing

System Testing

- Full module testing

User Acceptance Testing

- Conduct with company staff

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9 Future Enhancements

- Predictive Maintenance using AI
- GPS Tracking Integration
- QR Code scanning for assets
- Barcode inventory system
- SLA monitoring
- HR & Payroll integration

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10 Conclusion

The Nelna Company Integrated Maintenance Management System will provide a centralized platform to manage vehicles, machines, services, stores, and inventory operations efficiently. The system aims to improve operational efficiency, reduce downtime, and provide real-time analytics for better decision-making