# Functional Requirement

🧩 **Functional Requirements Document (FRD)**

**Prepared by:** Dean Phạm

**Role:** Business Analyst

---

## 1. Introduction

This document defines the **functional requirements** for the Production Management Optimization System (PMOS) — a lightweight digital platform designed to automate daily production tracking, integrate HR attendance, and provide real-time visibility into performance metrics for small and medium-sized manufacturing enterprises (SMEs) in Vietnam.

The goal is to improve data accuracy, reduce manual effort, and support faster, data-driven decisions in production management.

---

## 2. Functional Requirements — What the System Shall Do

### Core Functionalities

1. **Production Data Tracking**
    - The system shall record production output, defect counts, and downtime per shift.
    - The system shall display real-time progress for each production line.
2. **HR Attendance Integration**
    - The system shall automatically import attendance data from HR spreadsheets or devices.

- The system shall map attendance data to operator assignments per production shift.

3. **Downtime Logging**
    - The system shall allow supervisors to log machine downtime and specify reasons (e.g., maintenance, material delay).
    - The system shall automatically calculate downtime percentage and alert when downtime exceeds thresholds.
4. **KPI Dashboard**
    - The system shall calculate and display performance KPIs such as:
        - **OEE (Overall Equipment Effectiveness)**
        - **Productivity Rate (Output/Hour)**
        - **Defect Rate (%)**
    - The dashboard shall allow filtering by date, shift, operator, or machine.
5. **Automated Report Generation**
    - The system shall generate daily, weekly, and monthly production summary reports automatically.
    - Reports shall include key metrics such as total output, downtime, quality ratio, and shift performance.
6. **Alert & Notification System**
    - The system shall send real-time alerts to the Factory Manager when daily output drops below target.
    - The system shall notify supervisors when machines remain idle for more than a defined period.
7. **User Access & Collaboration**
    - The system shall allow Production, HR, and QC departments to access synchronized, up-to-date data.
    - Each user shall have role-based permissions to view, edit, or approve data.
8. **Mobile & Tablet Accessibility**

- The system shall support mobile and tablet data entry for operators and supervisors.
- The interface shall be simple, visual, and multilingual (Vietnamese/English).

---

# 3. Relevance of Features to Stakeholders

## Stakeholder: Production Supervisor

**Business Need:** Improve production visibility and reduce manual reporting effort.

- **Requirement:**

  The system shall record and visualize real-time output, defect, and downtime data per shift.

  > Enables the supervisor to monitor production status instantly and act quickly when output drops or downtime increases.

- **Requirement:**

  The system shall automatically generate end-of-shift reports.

  > Reduces manual data entry and eliminates reporting delays.

---

## Stakeholder: HR Officer

**Business Need:** Synchronize attendance with production shifts and reduce mismatched data.

- **Requirement:**

  The system shall import attendance data directly from HR devices or Excel files.

  > Ensures accurate workforce allocation and avoids missing attendance records.

- **Requirement:**

  The system shall automatically link attendance to production shift data.

> Supports accurate payroll calculations and productivity analysis.

---

## Stakeholder: Quality Control (QC) Team

**Business Need:** Improve defect traceability and reporting accuracy.

- **Requirement:**

  The system shall allow digital logging of defect types and inspection results.

  > Enables quick defect root-cause analysis and better production-quality linkage.

- **Requirement:**

  The system shall generate quality performance charts by line, product, or operator.

  > Supports management in identifying recurring quality issues.

---

## Stakeholder: Factory Manager

**Business Need:** Gain full visibility and control over operations.

- **Requirement:**

  The system shall display a consolidated KPI dashboard showing OEE, productivity, and defect trends.

  > Enables data-driven decisions for planning, maintenance, and performance review.

- **Requirement:**

  The system shall trigger alerts when key KPIs (e.g., OEE < 70%) fall below thresholds.

  > Allows faster response to issues that impact efficiency and output.

---

## Stakeholder: IT Support / Vendor

**Business Need:** Ensure smooth technical deployment and easy maintenance.

- **Requirement:**

  The system shall support integration via simple APIs or Google AppScript.

  > Allows connection between HR, production, and dashboard data.

- **Requirement:**

  The system shall allow quick backup and restore functionality.

  > Ensures data reliability with minimal technical downtime.

---

### Stakeholder: CEO / SME Owner

**Business Need:** Evaluate performance and ROI with real-time metrics.

- **Requirement:**

  The system shall generate management-level reports summarizing efficiency and downtime.

  > Helps monitor performance improvement and return on investment.

- **Requirement:**

  The dashboard shall allow comparison of KPI trends across production lines.

  > Provides clear visibility of factory performance for strategic decision-making.

---

## 4. Dependencies and Assumptions

| Dependency | Description |
|---|---|
| HR system integration | Attendance data must be accessible via shared Excel or API. |
| Stable internet connection | Required for real-time synchronization and dashboard updates. |
| Management approval | Required for pilot testing and data-sharing permissions. |
| Staff training | Users must be trained on mobile or desktop input methods. |

---