# Technical Documentation: Production Manager Reporting & Dashboard KPIs

This document outlines the key performance indicators (KPIs) and strategic reports essential for the Production Manager role in a make-to-order manufacturing ERP system. Each KPI includes its definition, visual representation method, calculation logic, and sample data where applicable. This helps the product and engineering teams implement accurate, role-specific dashboards and reporting tools.

## Machine Utilization %

Definition: Proportion of available machine hours that are used for actual productive work.

Visual Representation: Vertical Bar Chart with heatmap coloring (per machine).

Calculation Logic / Example:

Utilization (%) = (Actual Run Time / Available Time) × 100  
Example: M1 = (7.5 / 8) × 100 = 93.75%

## Job Delay Report

Definition: Displays jobs that exceeded their scheduled completion time.

Visual Representation: Grouped Bar Chart: Planned vs Actual completion times.

Calculation Logic / Example:

Delay = Actual End Time – Planned End Time  
Example: WO102 delayed by 2 days.

## WIP Load per Machine

Definition: Shows queued workload per machine in hours.

Visual Representation: Horizontal Stacked Bar Chart (per machine, job-wise).

Calculation Logic / Example:

Load = Sum of remaining estimated hours for scheduled jobs  
Example: M2 = Job A(8h) + Job B(6h) + Job C(3h) = 17h

## Schedule Adherence

Definition: Measures how many jobs are completed on time versus their schedule.

Visual Representation: Line Chart (Weekly trend).

Calculation Logic / Example:

Adherence (%) = (Jobs on Time / Total Jobs) × 100  
Example: 92% in Week 1.

## Downtime by Machine

Definition: Categorizes downtime into breakdown, preventive, and idle time.

Visual Representation: Donut Chart with % segments by reason.

Calculation Logic / Example:

Total Downtime = Sum of hours by reason  
Example: Breakdown 40%, Preventive 35%, Idle 25%.

## Defect Rate

Definition: Shows percentage of rejected output per operation.

Visual Representation: Pareto Chart (Bar for count, Line for cumulative %).

Calculation Logic / Example:

Defect Rate = (Rejected Qty / Produced Qty) × 100  
Example: Op2 = (7 / 200) × 100 = 3.5%

## Rework Rate

Definition: Percentage of units requiring rework compared to total output.

Visual Representation: Stacked Column with Trend Line (Qty + %).

Calculation Logic / Example:

Rework Rate = (Reworked Qty / Total Produced Qty) × 100  
Example: 4% rework rate on Tuesday.

## Bottleneck Identification

Definition: Identifies overloaded machines contributing to delays.

Visual Representation: Bar Chart with red highlight for high load.

Calculation Logic / Example:

If Load % > 90 → Bottleneck Flag  
Example: M2 = 95% → Red bar.

## Planned vs Actual Operation Time

Definition: Compares estimated operation duration to actual execution time.

Visual Representation: Bar + Line Combo Chart (Actual bar, Planned line).

Calculation Logic / Example:

Efficiency = (Planned / Actual) × 100  
Example: Op1 = (2.0 / 2.2) × 100 = 91%

## Operator-wise Performance

Definition: Tracks output quantity by operator.

Visual Representation: Lollipop Chart (Operator vs Qty).

Calculation Logic / Example:

Simply visualize output per operator  
Example: OpC = 130 units/day.

## Work Order Aging

Definition: Shows the number of open WOs in time-based buckets.

Visual Representation: Donut Chart (0–3, 4–7, 8–15, 15+ days).

Calculation Logic / Example:

WO Aging = Current Date – WO Created Date  
Example: 5 WOs pending >15 days.