

Industrial IoT, OEE & Predictive Monitoring Solution

Smart Factory Monitoring, Analytics & Real-Time Alerts

Proposed by: ByteMatrix Technology

Solution: Industrial IoT (IIoT) & OEE Monitoring Platform



1. Executive Summary

ByteMatrix Technology proposes an Industrial IoT and Smart Manufacturing Monitoring Solution that connects machines, PLCs and sensors to a centralized platform for real-time production monitoring, OEE analytics, energy monitoring, alarm management and predictive maintenance.

The solution enables management and production teams to identify downtime, improve machine utilization, monitor production performance and receive instant alerts before critical issues impact operations.

2. Key Capabilities

Real-Time Machine Monitoring

- Machine Running / Idle / Down status
- Production count and cycle time
- Machine speed and load
- Temperature and vibration monitoring
- Live machine health indicators

OEE & Production Analytics

- Overall Equipment Effectiveness (OEE)
- Availability
- Performance
- Quality
- Production target vs. actual
- Shift-wise and machine-wise performance
- Downtime and loss analysis

Energy Monitoring

- Machine-wise power consumption
- Plant/line energy consumption
- Energy trends and peak usage
- Energy cost monitoring
- Energy consumption per production unit

Predictive Maintenance

- Vibration monitoring
- Temperature monitoring
- Load analysis
- Machine health score
- Abnormal behavior detection
- Maintenance alerts and recommendations

Smart Alarm & Notification System

- Critical / Warning / Information alarms
- Real-time dashboard notifications
- Email/SMS/WhatsApp integration
- Configurable machine thresholds
- Alarm acknowledgement and history
- Edge-based emergency triggers

3. Technology Architecture

The solution supports integration with existing industrial infrastructure.

Machines / PLC / Sensors → Edge Gateway → MQTT → IoT Platform → Analytics → Web Dashboard

Communication

MQTT is used for lightweight, reliable and real-time machine data transmission.

Computing

Deployment can be implemented using:

- AWS IoT
- Microsoft Azure IoT
- Private Cloud
- On-premise Edge Server
- Hybrid Architecture

Dashboard

A modern web-based dashboard provides access to:

- Management
- Plant Managers

- Production Teams
 - Maintenance Teams
 - Quality Teams
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4. Integration

The platform can integrate with existing:

- PLCs
- SCADA systems
- Industrial sensors
- Energy meters
- Machines
- ERP
- MES
- Existing databases
- REST APIs

The solution can be deployed without replacing existing production systems.

5. Security & Scalability

The architecture is designed for enterprise deployment with:

- TLS-secured MQTT communication
- Authentication and authorization
- Role-based access control
- Multi-plant support
- Multi-tenant architecture
- Secure REST APIs
- Audit logs
- Edge processing for reduced cloud dependency
- Scalable cloud/on-premise deployment

6. Business Benefits

The solution helps industries:

Reduce Downtime

Identify machine stoppages and their root causes.

Improve OEE

Track Availability, Performance and Quality continuously.

Increase Productivity

Compare actual production against targets in real time.

Reduce Maintenance Cost

Identify abnormal machine behavior before major failures.

Optimize Energy Consumption

Monitor machine-level consumption and identify energy losses.

Improve Decision Making

Replace manual reports with real-time operational data.

7. Implementation Approach

Phase 1 – Assessment

Machine/site survey, data-source identification and KPI definition.

Phase 2 – Pilot

Integration with selected machines/production lines and deployment of the dashboard.

Phase 3 – Validation

OEE, production, alarm and energy data validation.

Phase 4 – Rollout

Expansion across additional machines, lines or plants.

Phase 5 – Optimization

Advanced analytics, predictive maintenance and ERP/MES integration.

8. Commercial Model

Pricing can be customized based on:

- Number of machines
- Number of sensors
- Number of production lines
- Edge gateway requirements
- Cloud/on-premise deployment
- Integration requirements
- Number of users
- Data retention requirements

Indicative Pilot Package

₹2.5 Lakh – ₹5 Lakh

Includes:

- Pilot deployment
- Up to 5–10 machines
- MQTT/Edge integration
- Web-based monitoring dashboard
- OEE monitoring
- Basic alarm management
- Production monitoring
- Basic reports
- User management
- Deployment & configuration

Enterprise deployment: Customized quotation based on machine count, plant size and integration requirements.

9. Deliverables

- Industrial IoT web dashboard
 - Machine monitoring interface
 - OEE dashboard
 - Production analytics
 - Downtime analysis
 - Alarm & notification module
 - Energy monitoring
 - Predictive maintenance dashboard
 - MQTT/Edge integration
 - REST API integration
 - User & role management
 - Reports and analytics
 - Deployment and technical support
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10. Proposed Timeline

Phase	Estimated Duration
Site Assessment & Requirement Study	3–5 Days
Solution Design	3–5 Days
Pilot Development & Integration	2–4 Weeks
Testing & Validation	1 Week
Pilot Deployment	2–3 Days
Production Rollout	As per plant scope
Typical Pilot: 4–6 weeks.	

11. Why ByteMatrix Technology

ByteMatrix Technology provides customized software and IoT solutions focused on automation, real-time monitoring, analytics and operational efficiency.

Our approach combines:

- Industrial IoT
- Real-time data processing
- Web dashboards
- Machine monitoring
- Automation
- Analytics
- API/ERP/MES integration

We can design the solution around your existing machines and infrastructure rather than forcing a complete technology replacement.

12. Next Step

We propose a technical discovery session/site assessment to understand your machines, PLCs, sensors, production processes and current monitoring infrastructure.

Following the assessment, ByteMatrix Technology will provide a detailed technical architecture, pilot scope, implementation plan and final commercial proposal.

ByteMatrix Technology
Industrial IoT | Automation | AI | Software Solutions

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