

WHITEPAPER

Unlocking Machine Potential: 4 IIoT Use Cases for Machine Owners

www.ei3.com

Introduction

Implementing an Industrial Internet of Things (IIoT) strategy is increasingly crucial for machine builders and OEMs. This is driven by the growing awareness among their customers, the machine owners and users, of the significant benefits and savings offered by IoT-enabled solutions. They understand that automated, analytical applications based on machine data can reduce downtime, increase production, achieve higher quality, and save energy.

At ei³, we recognize the immense potential for machine builders and OEMs to deliver specialized IoT applications to their markets. With our extensive experience providing internet solutions to OEMs across various manufacturing industries, we have identified key use cases driven by more productive operations and equipment. These use cases are essential components of a successful machine IoT strategy and form the focus of this whitepaper.

Unlocking Potential with 4 IIoT Use Cases

1



**Remote Service &
Aftermarket Programs**

2



**Cloud-Based
KPIs**

3



**Quality
Management**

4



**Energy &
Resource Savings**

Use Case 1

IoT-Enabled Remote Service and Aftermarket Programs

Machine owners can unlock a range of benefits by using IIoT technology for remote service and proactive parts delivery.



BENEFITS OF SECURE REMOTE SERVICE

Through secure connections, technicians conduct virtual service visits to machine controls, leveraging real-time operational data stored and analyzed in the cloud. This access to actionable insights enables technicians to address issues swiftly, minimizing machine downtime. Consumables use, part wear, and key process parameters are measured against predictive models to send alerts, driving replacement programs and enabling advanced business models for aftermarket parts.



PREDICTIVE ANALYTICS FOR PROACTIVE MAINTENANCE

Predictive alerts based on historical data and analytics facilitate proactive replacement programs, optimizing machine performance and prolonging its lifespan. Machine builders can utilize these insights to drive aftermarket service business models, reducing unplanned downtime and associated costs.



REDUCED MACHINE MAINTENANCE COSTS

IIoT-enabled remote service and aftermarket programs provide machine owners with peace of mind, knowing that their machines are monitored and serviced proactively. McKinsey reports that such proactive remote-enabled services can reduce machine maintenance costs by up to 40%, highlighting the substantial benefits for machine owners!

IIoT-enabled services and aftermarket programs offer tangible benefits for machine owners, including reduced downtime, increased productivity, and peace of mind. Partnering with machine builders prioritizing advanced IIoT solutions enhances operational efficiency and profitability.

REAL WORLD IMPACT

A global printing machinery OEM reported that over [80% of breakdown situations could be resolved online](#) using a secure remote service solution.²

ei³'s SOLUTION

With ei³'s **SERVICE** application, machine owners gain secure remote troubleshooting and zero-trust access to industrial networks. Using cutting-edge algorithms and the '**Amphion**' edge gateway, SERVICE ensures IT-approved, OT-managed security for data flow and access control.

Increasing Machine Utilization: Leveraging Cloud-Based KPIs

Manufacturers worldwide use Lean Six Sigma principles to enhance production performance by systematically eliminating waste and downtime. Effectively implementing Lean Six Sigma requires the measurement and display of KPIs, readily accessible to team members. Machine builders possess in-depth knowledge of their equipment and serve as optimal sources of KPI data.



BENEFITS OF CLOUD-BASED KPIs

Cloud-based KPIs yield substantial advantages to machine owners by driving improvement initiatives, predicting failures, and facilitating equipment design and engineering enhancements. Software-as-a-Service (SaaS) solutions deliver outcomes while minimizing or eliminating the need for in-house IT investments, empowering machine builders to provide valuable IoT applications.



UTILIZING OEE CLOUD SERVICES

OEE cloud services enable machine builders to leverage their expertise in delivering valuable IoT apps. By recording machine fault codes and tracking technical reasons for downtime across their customer base, machine builders can identify global causes of preventable downtime for each product line. This information drives improvement projects, facilitates the development of predictive failure alerts, and informs design and engineering improvements to the equipment.



PERFORMANCE BENCHMARKING: COMPARING OPERATIONAL PERFORMANCE

Performance benchmarking, uniquely offered by machine builders with a large install base of connected equipment, allows customers to compare their equipment usage to anonymous peers. This data provides insights for optimization and development of professional service programs, enabling machine owners to measure improvements in machine utilization over time.

With machine builder expertise and cloud services, businesses can optimize proactive maintenance strategies, implement predictive analytics, and conduct performance benchmarking, ultimately resulting increased OEE and ROA.

REAL WORLD IMPACT

Research indicates that using cloud-based KPIs can lead to a 10 to 15% increase in OEE in the first year. This improvement often translates to a 50% increase in ROA.³

ei³'s SOLUTION

With ei³'s PRODUCTION application, machine owners optimize performance by tracking key metrics like OEE, Quality, and Uptime. PRODUCTION provides comprehensive insights at plant, line, and machine levels, offering customizable reports for full visibility into machine conditions and alert notifications for target deviations, enabling efficient production management.

Use Case 3

Quality Management in the Cloud: Improving Production Quality

Manufacturing companies are dedicated to optimizing every facet of their operations to minimize their cost of quality. Machine builders deliver cloud-based solutions to facilitate digital quality management, enabling measurement, testing, and monitoring of product quality.



BENEFITS OF QUALITY MANAGEMENT IN THE CLOUD

Machine builders contribute to cost reduction efforts by delivering cloud solutions that enable digital quality management. By involving themselves in measuring and testing the quality of products produced on their machines, machine companies provide end-users with tools to improve output, becoming part of the manufacturer's continuous improvement process.



IMPLEMENTATION OF DIGITAL QUALITY MANAGEMENT

Cloud-based applications communicate directly with machine controllers, monitoring aspects of machine operation essential to production quality. IoT applications record parameters, provide real-time alerts, and perform long-term analysis, including the measurement of setpoints and actual values for important machine processes controlled by the machine's controller.



AUTOMATIC ALERTS & ANALYTICS FOR QUALITY REPORTING

Machine builders can promptly alert operators when machine operations exceed set limits, enhancing quality and cutting costs. Advanced analytics analyze the correlation between quality test results and machine operation data, automatically generating Certificates of Analysis reports crucial for ISO 9000 compliance. This streamlined process enables manufacturers to create, distribute, and manage quality reports with greater efficiency.

Digital quality management solutions enabled by IIoT technology provide machine owners with tools to improve product quality, reduce costs, and streamline operations. By using cloud-based applications and real-time analytics, machine owners can enhance quality assurance processes and achieve compliance with industry standards, ultimately driving continuous improvement and competitiveness in the market.

REAL WORLD IMPACT

Digital quality management helps end users manage and ultimately reduce their quality costs up to 20%.⁴

ei³'s SOLUTION

With ei³'s **QUALITY** application, machine owners can measure every aspect of product quality. QUALITY enables operators to define and test quality variables, schedule quality assurance tests, manage CTQ parameters for optimal production recipes, and provide SOPs to operators. It ensures compliance with industry standards, generates customizable reports, measures parameters to enhance yield, and facilitates advanced quality management with Statistical Process Control (SPC).

Use Case 4

Energy & Resource Savings: Promoting Sustainability

Efficient resource utilization is essential for economic and environmental reasons. Machine owners can utilize IIoT technology to monitor and optimize energy and resource usage in manufacturing operations.



BENEFITS OF ENERGY & RESOURCE SAVINGS

Sustainability is increasingly valuable to manufacturers and their customers. Machine builders promote product sustainability to gain a competitive edge. Having an IIoT application to measure, analyze, and track energy usage underscores the benefits of efficient machine operation.



USING IIoT FOR SUSTAINABILITY

Bringing energy consumption data into the cloud enables advanced analysis, optimizing resource utilization. Efficiency information identifies energy-efficient machines and drives alerts for abnormal consumption patterns. Predictive analytics assist in reducing energy consumption, contributing to cost savings and sustainability efforts.

IIoT for energy and resource savings offers significant benefits, increasing operational efficiency and promoting sustainability. By monitoring and optimizing resource usage through IIoT applications, machine owners strengthen their competitiveness while reducing environmental impact.

REAL WORLD IMPACT

Predictive analysis helps improve operations, resulting in an average 4% annual reduction in energy consumption among ei³ customers.⁵

ei³'s SOLUTION

With ei³'s **SUSTAIN** application, machine owners effectively monitor energy and resource consumption to optimize utilization, minimize costs, and enhance sustainability. SUSTAIN serves as a comprehensive measurement tool, tracking data on energy, water, and waste from all enterprise assets. It tracks sustainability KPIs, monitors consumption trends, evaluates carbon intensity, and enables scrap rate benchmarking. Additionally, it supports businesses by facilitating ESG reporting and CO₂ emissions taxation.

Conclusion: Maximizing IIoT Potential

In today's evolving industrial landscape, IIoT technology provides the means to take your operations to the next level, driving operational efficacy and productivity while prioritizing environmental consciousness. The four solutions outlined in this whitepaper highlight various ways businesses can accomplish this, ensuring competitiveness in the market.

Use Case	Key Benefits	ei³ Solution
IoT-enabled remote service and aftermarket programs	Reduced downtime, prompt service, improved plant productivity	SERVICE application →
Increasing machine utilization: Leveraging cloud-based KPIs	Increase in OEE, benchmark performance for industry standards compliance	PRODUCTION application →
Quality management in the cloud: Improving production quality	Enhanced product quality, automated CoAs, ISO 9000 compliance, reduces quality costs	QUALITY application →
Energy & Resource Savings: Promoting Sustainability	Efficient resource utilization, ISO 5001 compliance, cost savings	SUSTAIN application →

Partnering with industry leaders such as ei³ can drive impactful change. Employing ei³'s custom solutions allows users to access expert insights while ensuring that their security remains a top priority. This approach enables businesses to unleash the full potential of their machinery, ultimately empowering them to pioneer new standards of excellence in industrial innovation.

References

1. "Industry 4.0 Model Factories", April 2016, Erhard Feige et al, McKinsey Digital, <https://operations.excellence.mckinsey.com/files/downloads/2016/digital40modelfactoriesbrochure1.pdf>
2. Mat Robyr, "Machines as a Service Enabler", (Paper presented at the ARC Industry Forum, Orlando, Florida, February 2014).
3. Robert C. Hansen, Overall Equipment Effectiveness a Powerful Production/Maintenance Tool for Increased Profits, (New York: Industrial Press, Inc. 2002),
4. Cf. T. Bauernhansl, M. ten Hompel, B. Vogel-Heuser (Ed.): Industrie 4.0 in Produktion, Automatisierung und Logistik (2014)
5. Maxime Verstraete, "The Business Value of Superior Energy Performance®, Certifying Increased Energy Productivity under ISO 50001", (Paper presented at the Better Buildings Summit, US Department of Energy, Washington, D.C., May 2016).

Ready to get stated?

REQUEST A DEMO OR CONSULTATION

Take the first step towards unlocking the full potential of your manufacturing operations by scheduling a personalized demo or consultation with our team. [Contact us →](#)

DOWNLOAD ADDITIONAL RESOURCES

Dive deeper into the world of manufacturing optimization with ei³'s extensive library of resources. Download case studies, white papers, and product brochures to gain valuable insights into how our solutions have transformed businesses like yours. Whether you're looking to enhance machine utilization, improve quality management, or promote sustainability, our resources offer actionable strategies for success. [Access our library of resources →](#)