O3OZONE

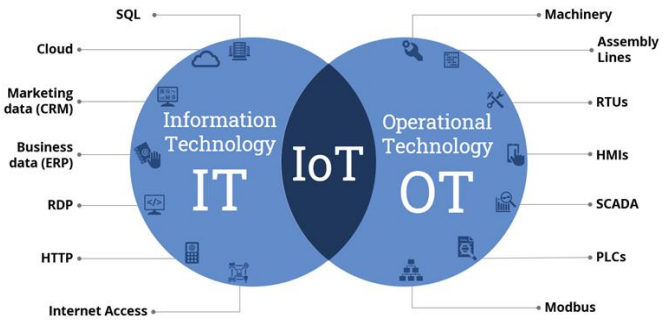
Integrating OT-IT Systems for Industry 4.0

The Road to OT-IT Integration: Challenges & Opportunities

The integration of Operational Technology (OT) and Information Technology (IT) is key to Industry 4.0, helping organizations improve processes, reduce downtime, and use data effectively. However, challenges like legacy systems, cybersecurity risks, and silos remain.

Solutions like the O3OZONE Reference Architecture use containerized microservices, secure data flows, and IoT edge platforms to tackle these issues and drive innovation.

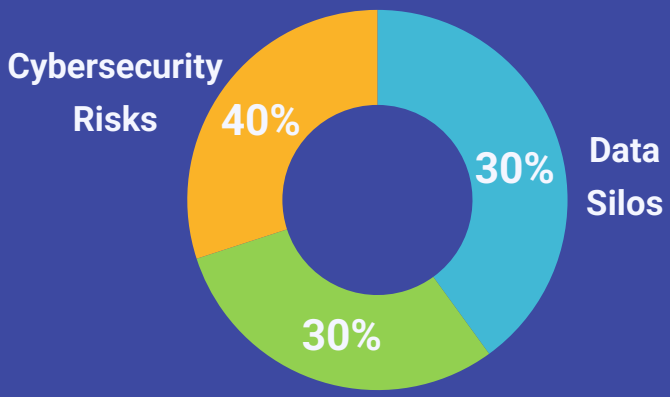
Operational Technology



Information Technology

IT/OT CONVERGENCE

Challenges in OT-IT Integration



Legacy Systems and Incompatibility

OT environments often include aging equipment that is incompatible with modern IT systems. This creates obstacles in achieving seamless integration.

Cybersecurity Risks

Increased connectivity between OT and IT opens up vulnerabilities to cyber threats, particularly when managing critical infrastructure.

Data Silos

Disparate systems lead to fragmented data, limiting visibility and slowing down decision-making.

Unlocking Value : Growth & ROI

The global market for OT-IT integration is projected to grow **from $720 billion** in 2023 to approximately $1.3 trillion by 2030, with a compound annual growth rate (CAGR) of **8.5%.**

This growth is fueled by:

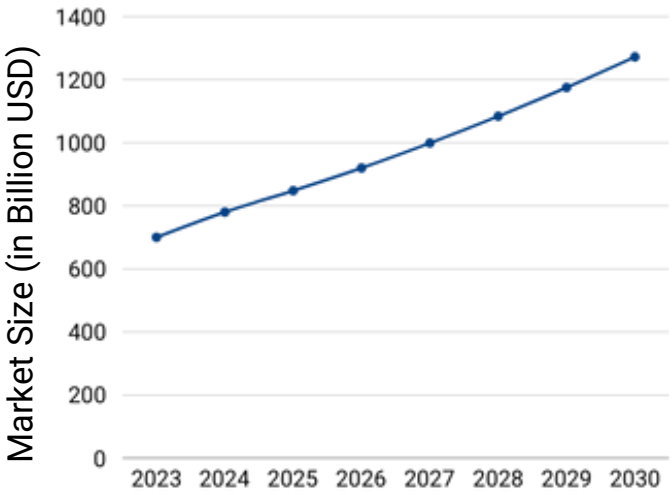
Demand for Real-Time Data

Industries increasingly require real-time monitoring and predictive insights to reduce downtime and optimize operations.

Rise of IIoT Adoption

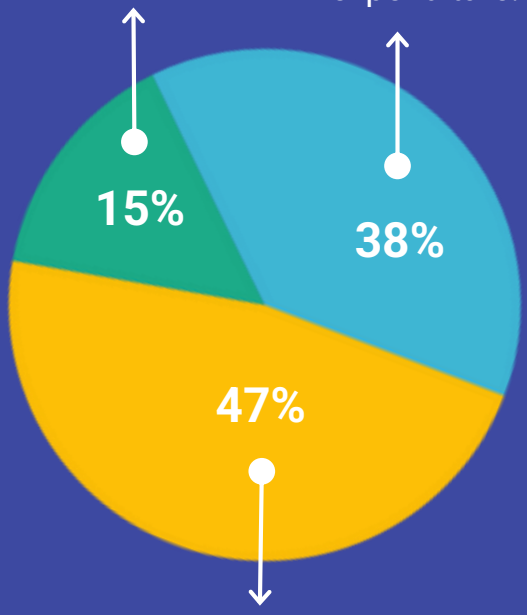
The Industrial Internet of Things (IIoT) enables seamless data sharing between OT and IT systems, fostering operational efficiency.

IT/OT Convergence Market Size Projection (2023-2030)

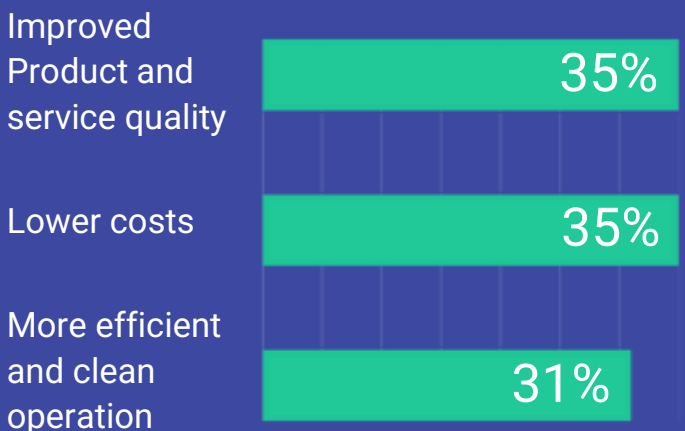


have executed IIoT projects and have yet to realize any value

have executed IIoT projects and, although realized some value, the current cost does not justify the expenditure.



of companies who have implemented Industrial Internet of Things (IIoT) projects have **realized rapid payback.**



Source: IDC's Worldwide IT and OT Convergence Survey, July 2022

IT-OT Transformation in Action

Case Study

A Global Automaker

Problem

The automaker faced challenges integrating their programmable logic controllers (PLCs) with their manufacturing execution systems (MES), resulting in high costs and inefficiencies.

Solution

- Implemented a flexible Industrial Internet of Things (IIoT) platform to enable seamless IT-OT integration.
- Transitioned from traditional OPC-based interfaces to a data-centric platform with native drivers, ensuring plug-and-play compatibility.

Impact

- Reduced custom coding requirements, accelerating project timelines.
- Enhanced scalability across multiple plants, reducing overall integration costs.

Case Study

Eli Lilly's IT-OT Transformation

Problem

Eli Lilly struggled with fragmented data and cybersecurity concerns while attempting to implement advanced analytics and digitization efforts.

Solution

- Formed cross-functional teams bridging IT and OT experts to create integrated workflows.
- Prioritized cybersecurity by embedding advanced security measures in their OT systems and aligning IT protocols.

Impact

- Enhanced operational efficiency by streamlining processes across teams.
- Improved data accuracy for analytics, enabling better decision-making.
- Strengthened cybersecurity measures to protect sensitive pharmaceutical operations.

Key Strategies for Seamless Integration

To achieve seamless OT-IT integration, organizations should follow a structured approach:

Assess Current Systems

Evaluate the existing infrastructure by conducting a system audit to identify legacy systems and their limitations while defining integration objectives that focus on operational efficiency and scalability.

Establish Secure Data Flow

Ensure safe communication between OT and IT systems by deploying VPNs, firewalls, and secure protocols, while also setting up role-based access controls to minimize unauthorized access.

Leverage and Edge Platforms

Enable scalable integration by designing hybrid solutions that combine edge computing with multi-cloud platforms to ensure real-time data synchronization between OT devices and IT systems.

Feedback and Optimization

Regularly monitor system performance to identify bottlenecks or inefficiencies, and use analytics to refine workflows, ensuring continuous improvement through feedback loops.

Deploy IoT Microservices

Use containerized microservices to streamline tasks like production monitoring and workflow management by identifying specific use cases such as predictive maintenance and implementing modular, plug-and-play services to enable scalability.

Foster Collaboration

Bridge the IT-OT divide by building cross-functional teams, conducting workshops to align goals, and establishing shared metrics for success, such as improved system uptime and cost savings.

Results and Future of Integration

Operational Improvements:

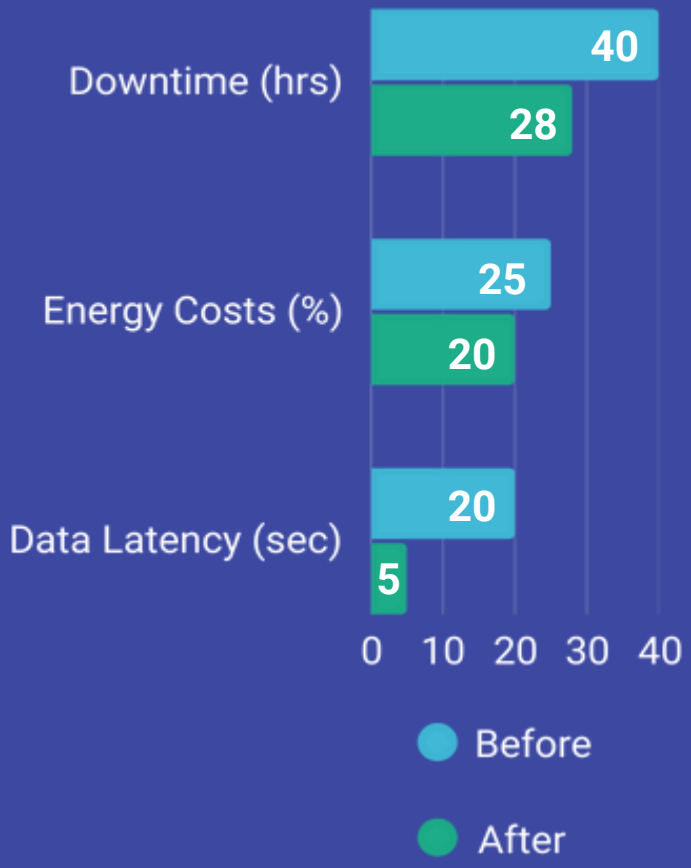
- Reduced downtime by **30%,** minimizing disruptions and enhancing productivity.
- Optimized energy consumption, resulting in **20%** lower utility costs.

Data Integration Success:

- Unified data across facilities through a centralized IoT Edge Platform and data lake.
- Achieved real-time insights into production workflows.

Scalability:

- Modular architecture allowed seamless addition of new facilities and processes without major overhauls.



Source: Grand View Research

Why OT-IT Matters

The convergence of OT and IT is no longer optional but a necessity for industries aiming to thrive in a competitive, data-driven landscape. With frameworks like O3OZONE Reference Architecture, organizations can overcome challenges and unlock significant opportunities, from predictive maintenance to sustainable operations.

Monitor Batches Throughout Your Factory with O3OZONE

O3OZONE seamlessly integrates with your ERP system, enabling real-time data capture, analysis, and traceability across your entire manufacturing process. Built on globally recognized GS1 standards, it allows batch tracking at any operational stage, providing instant insights on machine numbers, production timestamps, supplier details, and other critical data.

With advanced analytics, intelligent reporting tools, and AI-driven insights, O3OZONE transforms raw data into actionable intelligence. Manufacturers can detect trends, identify inefficiencies, prevent costly issues, and optimize performance in real-time.

By streamlining operations, enhancing regulatory compliance, and supporting predictive maintenance, O3OZONE empowers industries to drive efficiency, quality improvement, and sustainable growth.

Meet Regulatory Compliance

Many industries have strict traceability requirements and regulation, especially food and beverages, pharmaceuticals, and automotive. O3OZONE makes audits easier by collecting, processing, and analyzing traceability data and producing reports.

Improve Quality Control

Identify and address quality issues early for improved consistency. Integrating O3OZONE with your ERP for full traceability helps reduce waste and meet customer quality expectations.

Optimize Supply Chains

Reduce costs by optimizing your supply chain. Track products and components back to their origin to identify bottlenecks and inefficiencies. This leads to better inventory management, reduced lead times, and improved resource allocation.

Contact Us Today