

Deliver Breakthrough Performance for your Manufacturing Operations

with Overall Equipment Effectiveness (OEE)
from Persistent Systems, powered by AWS

The digital transformation revolution is radically reshaping the way organizations create and deliver value, modernizing legacy processes and systems to achieve breakthroughs in efficiency, effectiveness and agility. A full 89% of organizations have adopted or have plans to adopt a digital first strategy, according to IDG's *2018 State of Digital Business Transformation* report.

One of the primary battlegrounds is the factory floor, where the benefits of Industry 4.0 – automation, interconnectivity, real-time data analytics, and machine learning/AI – are facing fierce resistance from aging equipment, unclear migration paths and legacy thinking. Strong leaders and managers committed to achieving a sustainable competitive advantage need solutions to help them turn the tide and deliver the full benefits of digital transformation in all aspects of their business. The current inefficiencies on the factory floor are simply too obvious and the benefits too great to ignore any longer.

The Opportunity Cost

If you're responsible for your company's manufacturing operations, you know firsthand how costly and disruptive equipment failures on your factory floor can be. Even the smallest incident can have massive consequences, including:

- ✓ **Idle equipment lines and operators downstream**
- ✓ **Missed shipping and volume targets**
- ✓ **Reduced customer satisfaction and profitability**
- ✓ **Disruptions to the supply chains of your downstream partners, if applicable**
- ✓ **Emergency repair costs to bring in the right field technicians**
- ✓ **Expedited shipping of repair parts from remote depots to your location**



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Despite the massive risks asset downtime can create for your operation, your business, your reputation and even your career, many factory managers and other stakeholders are still flying blind when it comes to the current and near-future status of the machinery and other assets you depend on. That's due to several factors:



Multiple Vendor Setup

Most manufacturing operations rely on equipment from a variety of OEMs, each of which may have their own proprietary reporting capacity – if it exists at all.



Aging Equipment

Unlike many other business functions, manufacturing equipment is built with longevity in mind, so it's not uncommon to rely on decades-old equipment built before connectivity (and interconnectivity) was even a consideration.



Data Islands

Even if your assets can deliver status updates to a Data Historian application (also referred to as a Process Historian or Operational Historian), it's likely production-level information about the operations of each asset's performance, not process metrics.

In order to get a complete picture of your end-to-end process performance, you must piece together a variety of different reports and outputs to get the true process performance metrics that matter most to your business. And if you're looking for a broader picture of your process performance across multiple facilities? Good luck.



Lack of Real-time Information

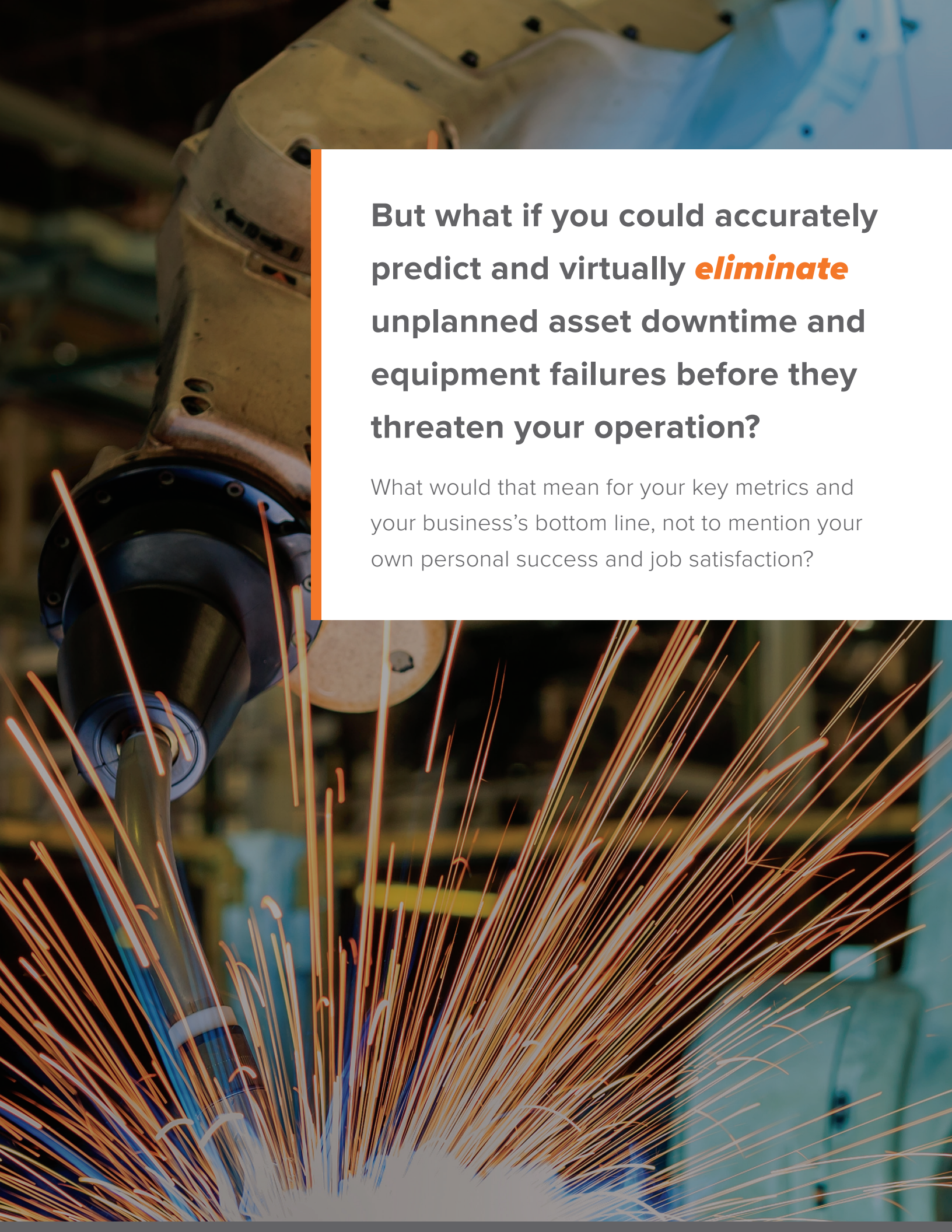
Most Data Historians ingest information throughout the day, then deliver reports in batches, often reporting on the previous day's performance. While this may be somewhat useful for you in terms of quantifying performance or helping you identify maintenance issues, it has little to no value when it comes to helping you prepare for future downtime events.



Higher Capital Expenses

Running and maintaining on-premise servers to support your Data Historian can be costly, not to mention the software licensing for the reports. To make matters worse, enabling other locations and stakeholders to access your data and reports requires purchasing additional licenses and networking equipment, severely limiting the value and scalability of the operations information you've captured.

As a result, factory managers or supervisors spend their days poring over a variety of yesterday's reports for any bit of information that can help compute their KPIs and preempt imminent equipment failures that can put their entire operation at risk.

A close-up photograph of an industrial robotic arm in a factory setting. The arm is metallic and blue, with a welding torch at the end. Bright orange and yellow sparks are flying out from the point of contact, creating a dense spray of light. The background is blurred, showing other industrial equipment.

But what if you could accurately predict and virtually **eliminate** unplanned asset downtime and equipment failures before they threaten your operation?

What would that mean for your key metrics and your business's bottom line, not to mention your own personal success and job satisfaction?



Unlocking the Potential of Your Factory Operations

The growth of connected, intelligent devices known collectively as the Internet of Things (IoT) continues to accelerate, with an estimated \$64 billion being spent in the Industrial sector alone in 2018.¹ Nearly two in 10 enterprise IoT projects underway today are focused on Industrial applications.²

Advancements in IoT make it possible for you to connect with the legacy equipment and machinery on your factory floor that has been silent until now, allowing you to measure and monitor your full asset portfolio for the first time.

Perhaps more importantly, these comprehensive data streams create an opportunity to use past performance as an indicator of future behavior – a glimpse into the near future for factory floor managers and operations executives. But IoT advancements alone can't deliver on this promise; other technologies need to be recruited to turn these streams of data into information you can act on.

Platforms like Overall Equipment Effectiveness, or OEE, from Persistent Systems deliver the more comprehensive solution factory and operations managers need to fully capitalize on IoT and their assets investments alike.

OEE brings together four leading-edge technology trends on your behalf:



IoT

Smart devices and retrofitted sensors deliver comprehensive information about your entire asset portfolio in real time. Sharing this flood of data through a centralized, manufacturer-agnostic IoT Gateway, with its ability to write to both the cloud and legacy Data Historians for a set amount of time, helps to ensure a smooth transition.



Cloud Computing, Powered by AWS

AWS is the global leader in cloud, eliminating capital expenses in favor of a more economical and lower risk “pay as you go” model. AWS’s Hybrid Cloud Philosophy saves money, reduces processing latency and offers the ability to provide some services even if cloud connectivity is lost. In addition, the AWS Security Framework ensures the integrity of your critical data at rest and in flight.



Data Visualization

Humans are visual creatures, able to process visual information up to 60,000 times faster than written information. So Persistent Systems UX/UI specialists equips OEE with a variety of customizable, highly intuitive and easily actionable dashboards to help you understand your environment and act decisively.

These dashboards and visualizations allow you to monitor your highly complex production systems and processes with a glance, complete with alerts and warnings when an asset is performing outside of the thresholds you’ve set. The in-depth information you need to act decisively and avoid downtime incidents is never more than a few clicks away.

You’ll also be able to use OEE’s built-in visual modelling tools to identify and address potential performance bottlenecks throughout your specific processes, improving your process metrics.



Data Analytics

OEE is set up to capture the unique tolerances of each asset, along with your specific KPIs and any business and process rules you identify as important. While OEE continually collects the asset performance and process information in real time, it uses machine learning to sift the data, identifying any anomalies or areas of non-compliance to bring to your attention.

OEE also has the ability to look backward into your historical asset performance data to identify trends, root cause analyses and other actionable insights.

OEE leverages the latest IoT, cloud, data visualization and data analytics technologies to give you real-time, actionable insight regarding the performance and process outputs of your entire factory floor, allowing you to:

- ✓ Increase uptime and employee productivity
- ✓ Meet and exceed process and output targets
- ✓ Deliver with consistent quality and volume
- ✓ Minimize repair costs
- ✓ Reduce repair part expenses and inventories
- ✓ Maximize asset lifespans and ROI



Why Persistent Systems

PREDICTIVE ANALYTICS

While OEE enables you look to into past metrics to conduct trend and root cause analysis and get a sense of what might lie ahead, Persistent Systems can help you take the next step into true predictive analytics.

Our engineers and data scientists can properly model the data streams that OEE collects, then apply AI to the structured (and unstructured) data sets to predict the likelihood of when and how your assets might breakdown based on each asset's anomaly thresholds and historical performance data.

This way, you'll be able to identify, mitigate and potentially even prevent the expected downtime event from happening, keeping your assets fully operational and allowing you to proactively address potential situations before they can impact your business.

A SMOOTH MIGRATION THAT PAYS FOR ITSELF

While every manufacturing organization seeks the benefits that an OEE solution can provide, a smooth path to migration isn't always clear, especially in a mission-critical area of the business like the production floor.

With more than 9,000 engineers and technical experts worldwide and more than 29 years of software and migration experience, Persistent Systems is used to developing and successfully executing platform migrations like this. OEE's IoT Gateway can also be programmed to write to the AWS cloud and the legacy Data Historian for as long as needed until you're comfortable shutting down the legacy on-premise solution.

Our engineers can get each asset on your factory floor set up quickly, including communication to the IoT Gateway, establishing performance parameters, and the like. At the same time, Persistent's UI/UX team will fine tune the dashboards to your exact specifications and business rules to maximize your ROI and set up any alert notifications to contact specific users through a number of available channels.

Once your seamless migration is complete and your factory floor is being constantly monitored by the OEE in real time, the benefits will be both concrete and immediate. The increase in uptime and productivity alone typically pays for the entire OEE investment within 4-6 months.

The vision of Industry 4.0 and the lasting competitive advantage it can deliver is a compelling one for manufacturing organizations. But for many companies encumbered with aging equipment and costly, on-premise data capture and reporting solutions, the vision can remain frustratingly out of reach.

Solutions like Overall Equipment Effectiveness from Persistent Systems blend the latest technologies into a single solution designed to help legacy manufacturers receive the full benefits of the digital transformation on their factory floor, allowing managers and other stakeholders to unlock and extract the maximum performance from the assets and processes in their control.

Let Persistent Systems challenge your preconceptions of what's possible. Visit persistent.com/OEE to find out more and schedule a demonstration.

About Persistent Systems

Persistent Systems brings the collective expertise of more than 10,000 employees worldwide to your greatest business challenges and opportunities, including more than 9,000 engineers and technical staff focused exclusively on support, development and innovation.

During more than 29 years in business, Persistent has grown to more than \$480 million in annual revenue, cultivating strong partnerships with the most innovative and trusted brands in technology along the way, including IBM, Amazon, Microsoft, Oracle, Salesforce, and more. 14 of the top 20 technologies companies in the world trust us to help them get ahead and stay ahead of their competition.

Visit [persistent.com](https://www.persistent.com) to find out more

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