



Powering the New Age of Manufacturing

How Sight Machine Delivers
the Next Generation of
Continuous Improvement





A Defining Moment for Manufacturers

Manufacturing is at a crossroads. The traditional ways of growing productivity and profits no longer work, and the industry has been at a loss for new ones. But no longer. A solution has been found. The potential is unlimited, and the obstacles are gone. All that remains is for manufacturers to embrace the way forward to a new and transformative future. The time to do so is now.

Here is the full story of what's been broken, and the breakthrough technology that fixes it.

Continuous Improvement Needs a Radical Makeover

Production operations have traditionally been viewed as a cost center to be optimized by discovering inefficiencies and then squeezing them out. Recently, though, many manufacturers have realized that their production capabilities can become a competitive advantage — if they can coax higher output from existing assets, enhance quality and consistency, and engineer the agility to respond quickly to changing market needs and opportunities.

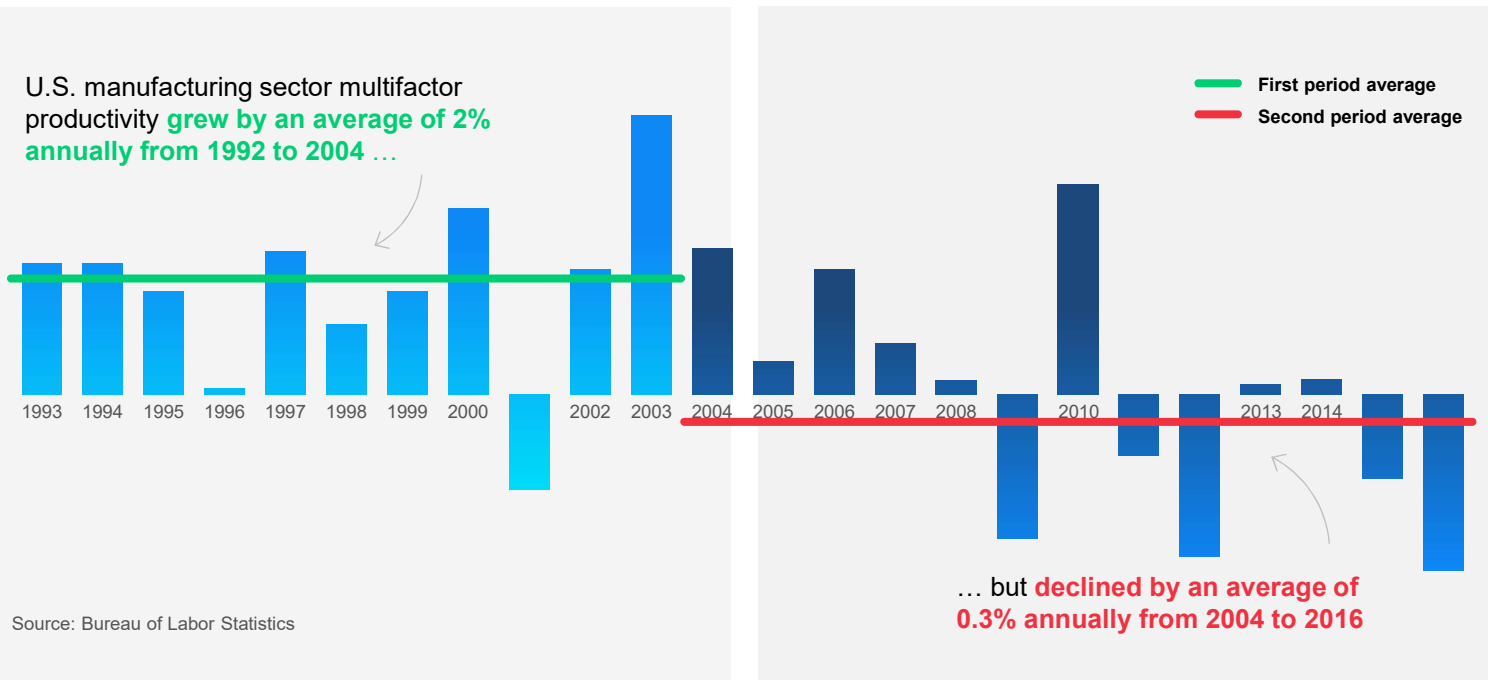
Historically, manufacturers have driven performance through Continuous Improvement (CI) methodologies like lean manufacturing and Six Sigma. While these approaches delivered very well for a long time, by now, most of the gains available through optimizing individual assets and processes have been achieved.

The main drawback to traditional CI efforts is their reliance on small, static point-in-time data sets. Rather than system-wide optimizations, these approaches yield results that are by definition local, piecemeal and limited: adjustments that make one machine or process work faster, another more reliable, or a specific process more efficient.

A second challenge is the lengthy timeframe required to manually combine datasets and run the many necessary experiments. By the time results are ready, the original use case has often changed considerably. Owing to these and related drawbacks, conventional CI initiatives no longer generate the kind of returns manufacturers have come to depend on, leaving them without a clear pathway to higher productivity and profitability.

Data-driven insights were supposed to solve these problems, providing the means to power performance to new heights. Manufacturers do in fact now have huge volumes of production data from shop-floor machine sensors, plus inputs on quality, downtime, and energy use. Many have embarked on ambitious efforts to apply this data to a range of use cases.

Figure 1. Production Efficiency is Declining



Why Traditional Continuous Improvement No Longer Works

Unfortunately, most of these initiatives have met with **failure**, owing to what can be termed the manufacturing data “status quo”: the unusable condition of the information, coupled with inadequate tools and methods for working with it.

Data silos. Machine sensor data is housed in a motley assortment of systems that don’t talk to each other. To make matters worse, the various data types come in an array of incompatible formats. Taken together, these factors make manufacturing data so complex to unify and correlate that most of it never gets used.

No system-wide integration. Sensors show what’s going on inside individual machines but not how they interact with one another. In effect, each sensor is a miniscule data silo. Because information is not consolidated and modeled across assets or processes, intelligence cannot be harvested about the way production activities mesh together: how one affects the next, how both impact those that follow, and so on down the production line. These inter-relationships, essential to a system-wide understanding of production, remain undiscovered.

The same deficit applies at the plant-to-plant level. Manufacturers don’t have the ability to see and analyze specific interdependencies between multiple facilities — for example, how defects in one factory’s end product affects activities in the next plant in the supply chain, which uses it as raw material.

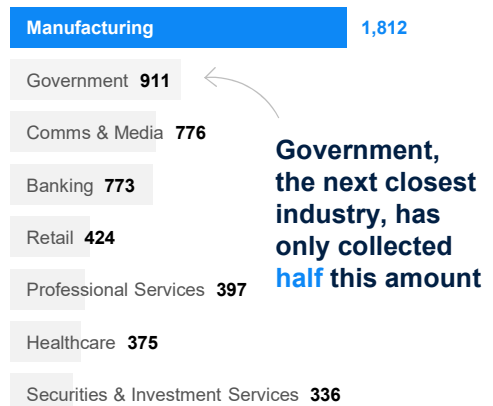
Figure 2. Torrents of Data Are Not Being Leveraged

Since 2010, manufacturing has annually collected

2,000 petabytes

of potentially valuable data ...

... but discarded all but **1%** of it

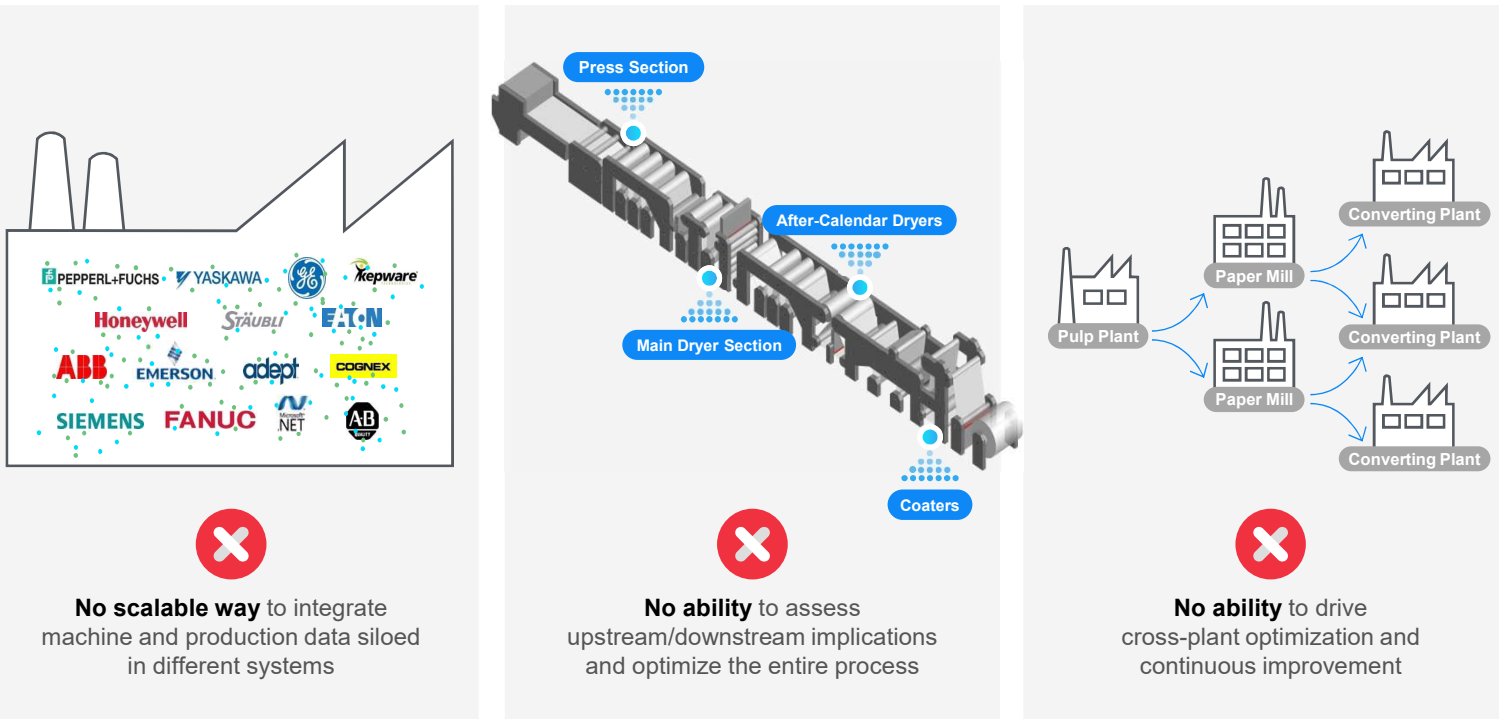


Government, the next closest industry, has only collected **half** this amount

Lack of real-time visibility. Manual data collection is a clear mismatch for the dynamism of real-time streaming data. Instead of a continuous flow of input, the best you can get is a static snapshot or two, frozen in time. These don't show engineers what's happening when it's happening, or changes as they occur. For example, if a machine's performance veers out of normal range five minutes after the data is sampled, no one will know. And when in due course an outage eventually occurs, its cause will not be traceable.

Manual processing. Data has to be collected and blended manually, a task that is practically impossible on the scale of hundreds to thousands of streaming inputs. Data analysts therefore proceed by creating narrowly-focused use cases, cherry-picking small relevant datasets, and ignoring everything else. For each project, the selected data is extracted and batched, analyzed retrospectively, and the results are written up in a report. Applying these insights to other machines or use cases would require adding to and changing the dataset, which in turn would break the algorithms. The net effect is a series of pilot projects that just don't scale.

Figure 3. The Data Challenge: Lack of System-Wide Visibility



Source: Sight Machine, 2019

What's Needed: A New Generation of Continuous Improvement

To turn production into an engine of profitability and competitive advantage, manufacturers need a new kind of Continuous Improvement, one that operates at the system-wide and supply chain levels. The key is tapping into the intelligence buried inside the immense volumes of production data that are currently going to waste. Three new capabilities are required:

System-wide models. The entire universe of data needs to be consolidated and its interrelationships modeled, to reveal what's going on in production as a whole... and beyond that, across factories to the entire supply chain or plant network.

Real-time streaming. The hundreds to thousands of sensor data streams must be collected and evaluated on a continual basis. This will give engineers and analysts a real-time window into production so they can spot problems as they arise and take corrective action in time to avert consequences.

Digital manufacturing expertise. Manufacturers need expert advice and training in converting system-wide, real-time intelligence into high-level predictions and operational actions that deliver real production improvements.

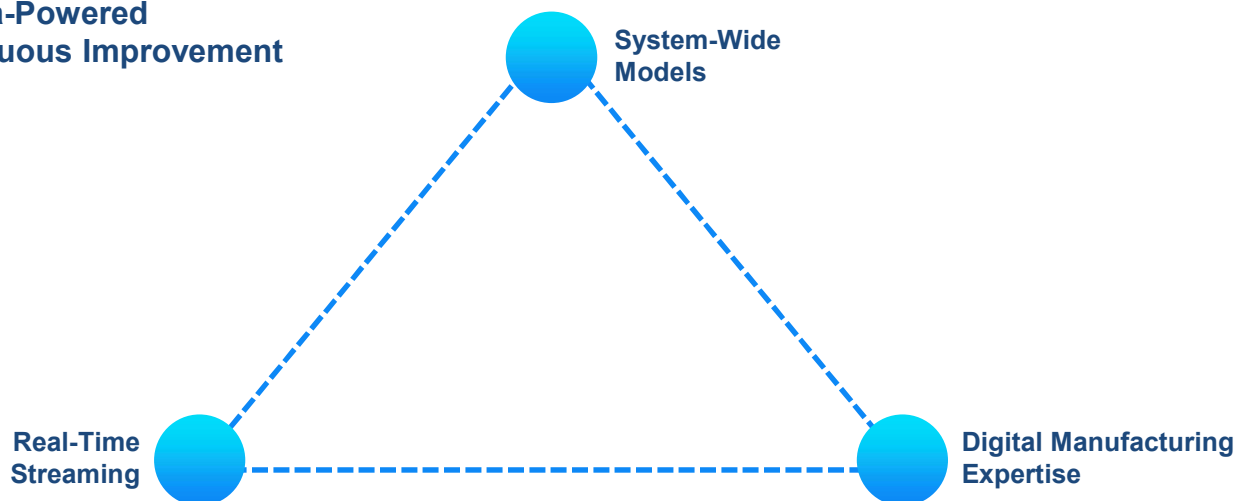
Answering the Need: Why Now Is the Inflection Point

It's one thing to define new capabilities. It's quite another to deliver them. But just within the past few years, several breakthroughs have made this possible:

- Streaming pipeline technologies that automate the process of data transformation and integration
- Standardized data models that digitally represent production processes across all manufacturing industries
- Innovations in AI and machine learning that empower analytic algorithms to deliver actionable insights

Sight Machine has painstakingly integrated these innovations into a platform and services that enable system-wide Continuous Improvement. Manufacturing has now arrived at a truly historic moment: with the Sight Machine solution, forward-looking companies finally have the means to move full-speed ahead into a new and transformative future.

Figure 4. The 3 Essentials of Data-Powered Continuous Improvement



Source: Sight Machine, 2019

Creating the Future: The Sight Machine Solution

Sight Machine delivers the essentials of data-powered Continuous Improvement, by providing:

A Manufacturing Data Platform with three layers:

- **Data acquisition software** that collects and unifies production data in one central place
- **A streaming data pipeline** that continuously processes, transforms, and blends sensor data as it's generated in real time
- **Standardized, configurable manufacturing models** into which the blended data is channeled to digitally represent a specific production process from end to end

Data analytics tools and applications usable across manufacturing industries

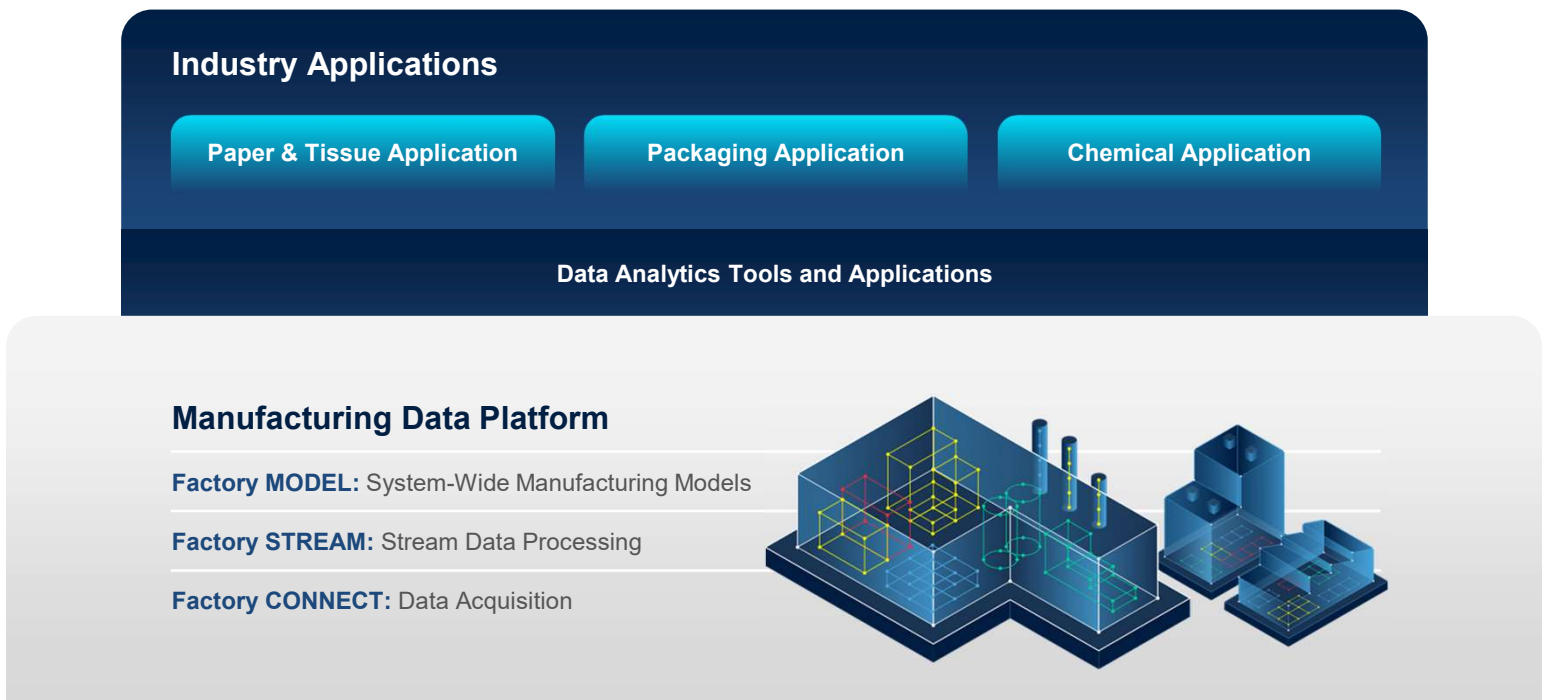
Pre-built data analytics applications for specific industries such as paper & tissue, chemicals, and packaging, which harness AI and machine learning to provide:

- **Descriptive and predictive analytics** that tell you what's happening inside production
- **Prescriptive analytics** that tell you what actions to take to produce system-wide optimizations

Highly-focused expertise and services to define and prioritize the right use cases, and turn data-powered insights into operational action for continuous improvement. We show you:

- How your data landscape works
- What questions to ask to drive value
- How to map your data to production processes
- How to make analytics results usable for operators and other non-technical people

Figure 5. The Sight Machine Solution



Source: Sight Machine, 2019

Digital Manufacturing that Really Works

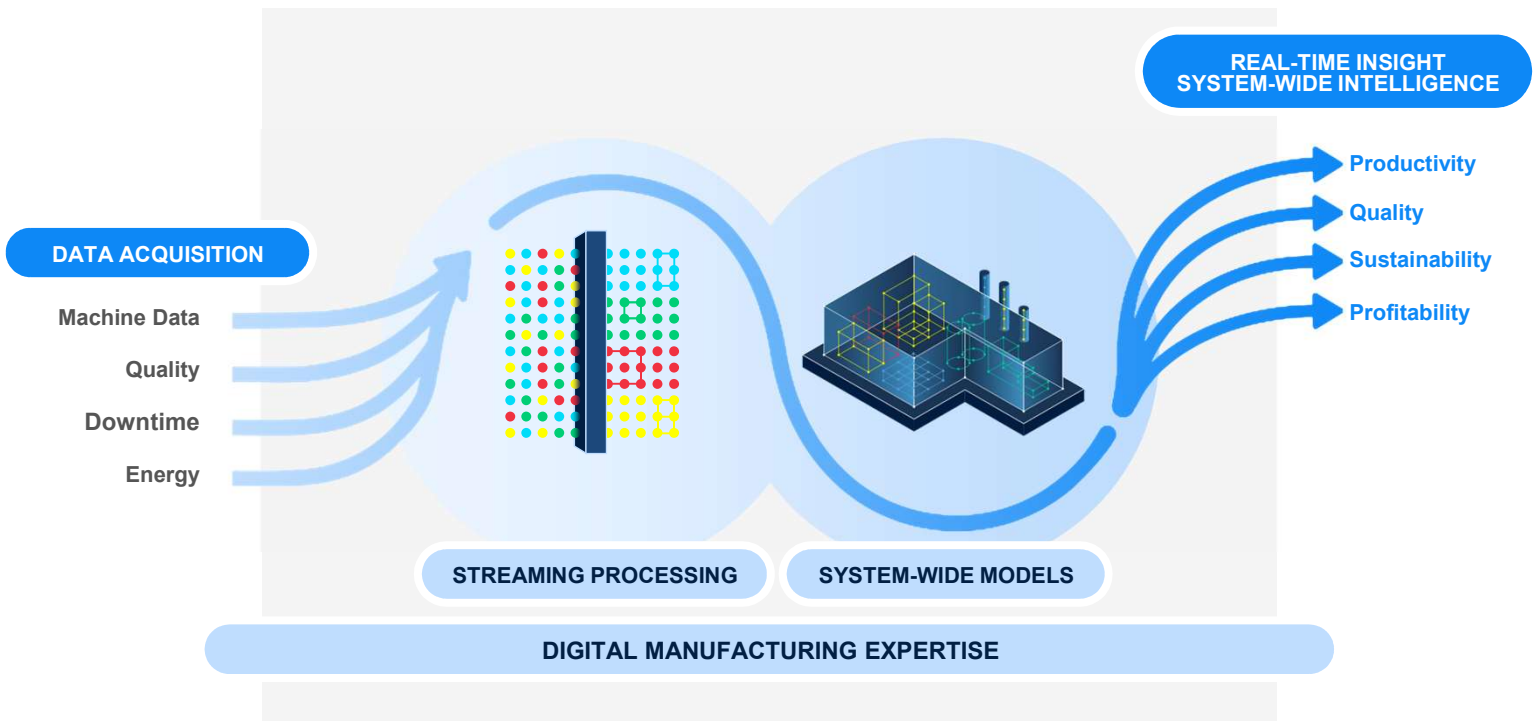
Hundreds of manufacturers worldwide are using Sight Machine on a daily basis to achieve dramatic results.

One of a kind. The Sight Machine solution has no equal. There is nothing else in the market that enables data-powered, next-generation Continuous Improvement.

Rapid deployment. The solution is typically deployed, configured, and operational within a matter of weeks, not many months.

Continuous value. You can modify the Sight Machine manufacturing models to add new or replacement machines, new processes, and additional end-products. You can also build custom analytics applications to address any conceivable use case.

Figure 6: How Sight Machines Delivers Next-Generation Continuous Improvement



Source: Sight Machine, 2019

Transformative Results: Examples

Global Paper Manufacturer

- **Challenge:** Reduce 10%-to-15% scrap rate
- **Solution:** The company leveraged the Sight Machine platform to analyze thousands of sensor readings for every machine touching paper rolls. Optimal machine set points were identified to increase production speeds while maintaining quality.
- **Production Improvement:** \$6 million in identified yield increase at the single plant. Enterprise-wide returns will be an order of magnitude higher.

Large Dairy Producer

- **Challenge:** Boost production by increasing efficiency
- **Solution:** Sight Machine combined data streams from production equipment with MES process data and ERP raw materials data, enabling end-to-end traceability of each batch. Analysis of the blended input generated optimal production settings to increase output.
- **Production Improvement:** \$11 million in identified opportunity from higher output.

Major Auto Manufacturer

- **Challenge:** Reduce downtime through predictive maintenance of 1,200 robots at each facility
- **Solution:** Blending sophisticated modeling of each robot with real-time signal analysis of sensor data, the Sight Machine platform supplied accurate predictions about which robots are likely to experience machine failure.
- **Production Improvements:** (1) Preemptive servicing of at-risk equipment reduced catastrophic machine failure and associated downtime and costs, yielding \$1.8 million in identified annual savings at just a single facility. (2) Thanks to the ability to pinpoint which robots need service, maintenance resources have been optimized: the number of machines requiring expensive manual inspection has been reduced by 89%.

Take the First Step
toward Your Future

Visit www.sightmachine.com to find out more, and to register for a virtual live demonstration of the Sight Machine solution.

