



# Foundry AI: Real Results, Real Foundries

How foundry-proven AI tools can transform  
the economics of casting production today.





## The AI revolution has reached foundries, large and small.

AI optimization with Monitizer® | PRESCRIBE delivers an average of 40% lower scrap and as much as 86% less for individual components. More and more foundries are digitizing and building process databases. AI is already supercharging what they can do with that data.

**Planning to wait and see how foundry AI evolves?** You're missing out on competitive edge. Here's how foundries like yours have seen achieved step changes in performance – by moving from digitalization to AI on their own terms.

AI-driven optimization can help you compete and win today, unlocking higher quality and lower costs, fast.

### Foundry AI: why now?

In today's super-competitive global market, accepting scrap rates or defect levels as a given is no longer enough. But no matter how good your team or equipment is, conventional process control methods are hitting their limits. They can only ever react after scrap has already happened.

Data, skills, and time are all limited. If you are purely reactive, today's urgent problems always take priority over long-term solutions.

That's why so many leading foundries are implementing foundry-proven AI tools like Monitizer® | PRESCRIBE. An AI-driven Expert Execution System like PRESCRIBE handles massive volumes of complex process data with ease, recommending the optimum control range in real time.

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### AI helps prevent scrap before it happens, unlocking extra production and profit.

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From green sand molding to die casting, the results speak for themselves: an average 40% lower scrap and as much as 86% less for individual components.

The journey to those results does not have to be complex or difficult. A modular IIoT platform like Monitizer, with support from digital foundry experts, is the proven pathway to this kind of digital transformation, from connecting your first machine onwards.

In this paper, we'll share key learnings from digital pioneers and demonstrate just how quickly you can start to unlock the potential of your data.

### Meet the digital foundry leaders

Digital pioneers in over 30 countries have worked with us here at Monitizer to turn their data into actionable, everyday insights.

From preventing scrap by monitoring a real-time view of production to super-fast fault-finding and AI-driven full-process optimization, they're proof that digital and AI hold the key to mastering the kind of complex data casting processes generate—and extract real value from it fast.

Whether it's continental-wide operations like Grede or single, mid-size foundries like Georg Röth, digitalization drives smarter decisions that unlock extra quality and profit:

- Four months after US casting giant **Grede** deployed the Monitizer | DISCOVER IIoT solution, every foundry running the new system had lower cost of quality. One cut scrap by 50% by reducing sand inclusions. AI optimization comes next.
- Condals Group in Spain cut scrap by 54.1% overall for its AI-optimized compliant castings.
- Japan's **Morikawa** averaged 76.75% less scrap during PRESCRIBE testing.
- Mid-size German foundry **Georg Röth** strengthened repeatable quality and traceability, reduced unplanned downtime, and accelerated troubleshooting and reporting with a real-time process view.
- **Draxton's** plant in Barcelona, Spain, improved casting quality, boosted sustainability, reduced material use and implemented "just-in-time" preventive maintenance. Each user made their own personalized dashboard and set up their own queries to receive exactly the information they want to see.



## Where to start?

IIoT-based, automated data collection creates the foundation for AI and delivers substantial results by itself. It builds a single, accurate database to support live, process-wide KPI reporting via intuitive dashboards. If AI tools and data collection run on the same platform, all data collected via IIoT is then immediately available for AI optimization.

A modular, cloud-based solution like Monitizer streamlines this initial digitalization work. It creates a single, flexible environment that grows with you. Look for a solution that, like Monitizer, ticks these boxes:

- low CAPEX, low risk, compared to a conventional in-house system
- rapid deployment, with value at every step towards AI
- take data from any source and any make of equipment
- run in partnership with expert foundry suppliers

### Here's how our digital pioneers started out:

- **Condals Group** gradually connected all three of its high-volume lines in two locations. It uses this single process view to monitor production, prevent scrap, support maintenance and cut power consumption – and to drive its AI optimization.
- Monitizer's real-time process view and intelligent guidance help **Georg Röth** strengthen process stability on its vertical and flask lines, accelerate root-cause investigations and build a solid foundation for AI with PRESCRIBE.
- **Grede** has deployed the Monitizer | DISCOVER and PRESCRIBE solutions at all of its North American foundries.

## Layering on AI

**“Even if you didn't use any fancy AI features, just having that unified, real-time window into your entire production is worth it on its own”** – Dr Markus Ehrmann, CEO, Georg Röth.

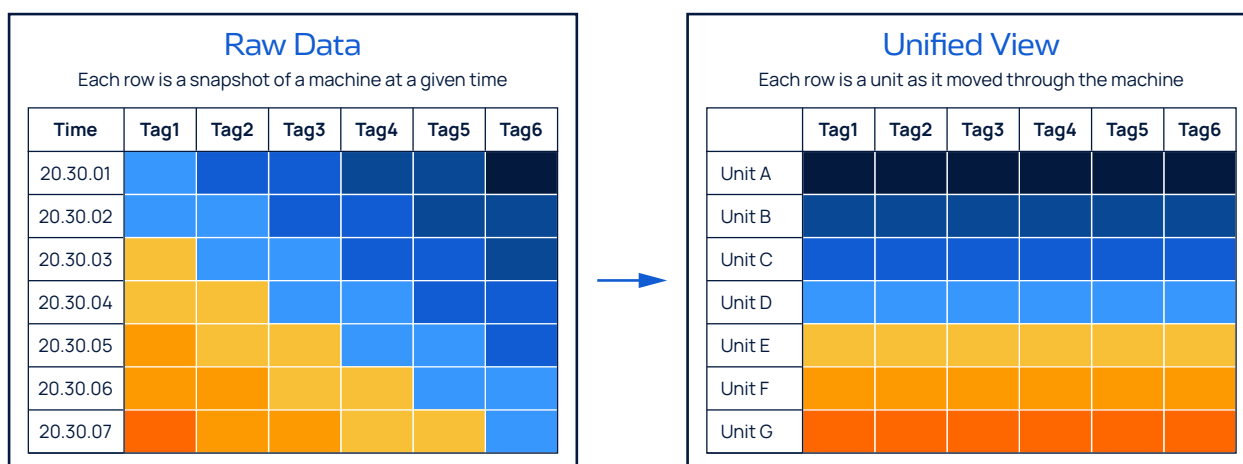
Once you are collecting process data, AI is a natural progression. The next step is to transform raw process data and final quality results into a structured dataset linked to individual casting batches. This dataset will feed the AI analytics pipeline.

But first, check you're in best shape for deploying AI. Run an audit to examine the process database's coverage, traceability and reliability, along with internal foundry workflows, use of insight and operational capabilities.

- Are you collecting all the essential parameters? Or are there gaps?
- Can existing data infrastructure collect data and make it available in real time?
- Can you trace every casting through the whole process?

Expert initial configuration simplifies and accelerates this project step. For example, Georg Röth's IIoT system captured all the data points required for optimization, right from the start.

Building the data pipeline for AI also strengthens manual root-cause analysis. Georg Röth can now compare two batches side by side—one produced in a stable process window and one with a deviation—and immediately see difference in their parameters.



**Figure 1:** Turning raw, time based machine data into a unified, batch level view enables full process traceability.



Here are some of the scrap reduction foundries of different types and sizes have achieved with AI (using Monitizer | PRESCRIBE):

- Across two green sand molding lines, **Condals Group** has cut average scrap rates by over 54% at its facility in Manresa, Spain, for parts that are compliant with PRESCRIBE's process prescriptions.
- Also in green sand molding, Japan's **Morikawa** started to implement the full Monitizer suite in early 2021 and rapidly progressed to optimization, with an average 76.75% less scrap during initial testing.
- An HPDC foundry cut scrap by 52% in one test cell. Fully deployed, this equated to annual savings of over \$135,000.
- An LPDC foundry cut scrap by 29% through PRESCRIBE's improved data management and process control. Fully deployed, it would save €500,000 annually and increase production volume by 2.4%.

### Beyond scrap reduction: How AI transforms your foundry

Applying AI to find your foundry's zones of high quality, stable production definitely reduces scrap. But it also unlocks higher performance across material use, energy consumption, knowledge base and much more. So while the scrap reduction may give you a quick payback on your digital investment, the benefits don't end there. You'll see:

- Improved productivity
- More stable production
- More sustainable production

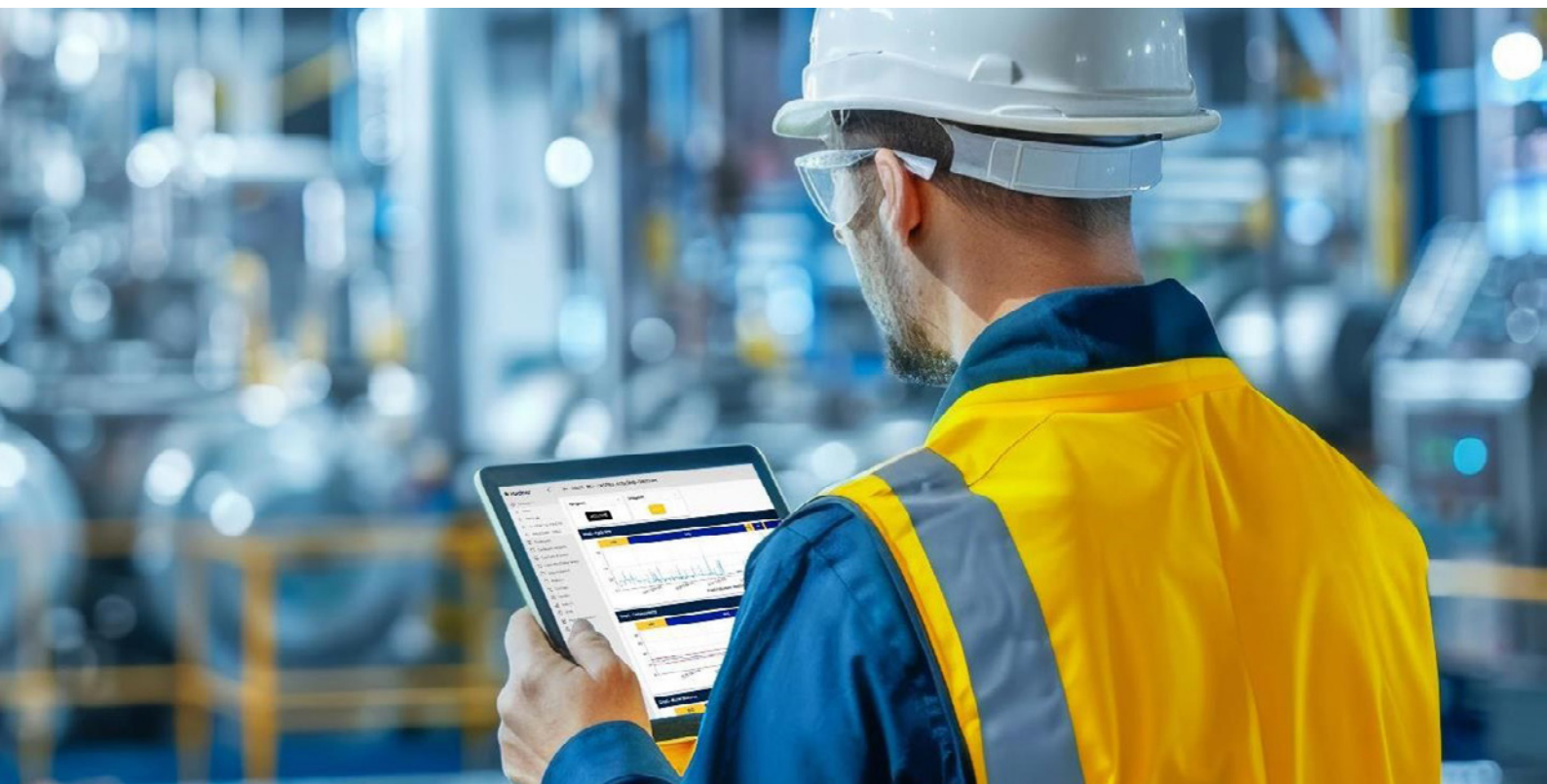
As experienced workers retire, almost every foundry struggles to find new skilled labor. AI can capture decades of collective expertise by analyzing historical data, turning complex process decisions into simple prescriptions.

Deploying this real-time advice on the shopfloor means your production is less dependent on scarce, highly experienced staff and the system, as at Georg Röth, explicitly guides both fresh and veteran operators in maintaining optimal parameter ranges on their equipment. At Grede, if a machine runs outside its "green" operating zone, the supervisor is alerted automatically.

Real-time data supports operations but also global business intelligence for executives, from live machine KPIs for individual machines to plant-wide or group-wide metrics, like real-time overall equipment effectiveness.

Management can track foundry digital and AI's performance minute by minute, from downtime reduction to the energy costs (and carbon emissions) saved through not remelting and recasting scrap. For example, if a foundry melting 50,000 tons annually reduces its scrap rate from 5% to 3%, this could equate to an annual saving of about 600 tonnes of CO<sub>2</sub>.<sup>1</sup>

1. Calculation sourced from case study referenced at presentation by ItalPressGauss during EUROGUSS 2022 - 'Monitizer: turn data into value'.

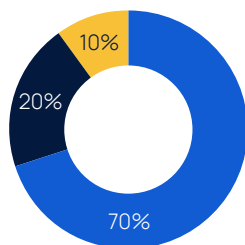




## Key ingredients of AI success (it's not just about software)

Software is just one component of a digital foundry solution. One recent report<sup>2</sup> outlined the ideal AI project focus as:

-  70%: People & Process
-  20%: Tech and Data
-  10%: Algorithms



Rapid and lasting success requires a commitment to project and change management, and that means empowering your workforce. This does not have to be complicated or overwhelming. The roadmaps and examples exist; simple things make a difference.

The projects we've supported have shown us what works: Involve employees early, explain the project goals, how they will benefit, and train them thoroughly. They already know the foundry's machines, processes, and metrics inside out so ask which KPIs they need. Choose a system that supports non-technical users, so supervisors can create and edit KPIs and dashboards without any specialist IT skills.

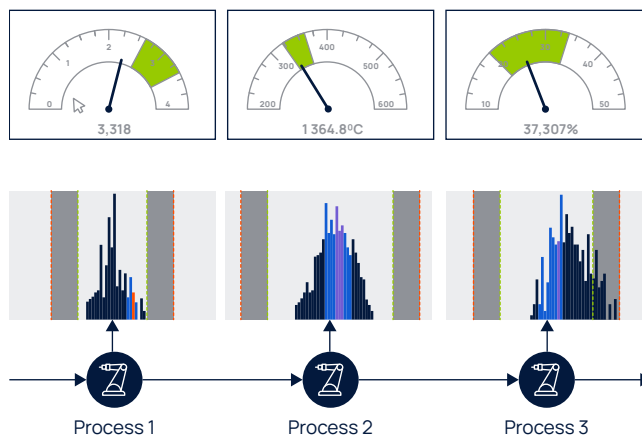
In production, the system should guide operators in maintaining high quality production, alerting them when any parameters start to drift out of tolerance. Digitalize at the speed that makes sense to you, so everyone can see early wins.

One way of showing early wins is to deploy AI optimization first where it will deliver the most value, for example, high margin parts with high scrap levels. A digital partner with foundry experience can guide you through challenges like these.

Once AI is deployed, two 'Cs' determine how fast your results materialize and how good they are. The Cs are compliance and coverage.

**Compliance** - how precisely operators follow AI-suggested setpoints on their machines— is a major AI success factor. High compliance maximizes AI's effectiveness in cutting scrap. Rates lower than 80% stops it working.

Motivated operators and supervisors will have higher compliance, so work hard at securing their buy-in. Consider installing screens in every operating area showing how close they are to target ranges. Also consider



**Figure 2:** Live control ranges delivered via dashboards show operators how closely production complies with the control plan in real time.

targeting compliance with existing internal setpoints first to raise user engagement before moving to AI.

**Coverage** - how many patterns or dies have enough data for statistically valid modeling—also strongly influences AI success in cutting scrap foundry-wide. Extend AI coverage to as many lines and patterns or cells and dies as possible.

Repeat the cycle of measure-control-optimize as you put AI into full production: plugging data gaps, eliminating bad data, tightening setpoint ranges and training staff. This aligns well with other best-practice approaches to manufacturing optimization, such as Lean Six Sigma.

## Conclusion

AI loves foundry data. Deployed right, foundry AI can unlock new production headroom, increase profitability, and reduce costs—significantly. It can give your entire team the information they need to make smarter decisions to reduce scrap and stabilize processes. The AI keeps learning and your operation keeps improving as you move towards optimal performance.

Countless foundries around the world have proven that AI can deliver real results. They've also shown that real, long-term value from an AI investment happens when technology, data, people, internal systems and suppliers come together and work in harmony. This does not have to be difficult.

Monitizer's partnership model for success works for foundries, time and again. We provide a dedicated team to support you, working in tandem with experts from our fellow brands at DISA, Simpson, StrikoWestofen and Wheelabrator, plus a host of other OEM suppliers. **The future of foundry is here. Be part of it.**

2. BCG - AI Adoption in 2024: 74% of Companies Struggle to Achieve and Scale Value

<https://www.bcg.com/press/24october2024-ai-adoption-in-2024-74-of-companies-struggle-to-achieve-and-scale-value>