

# Data science for process manufacturing

Reach new levels of yield, throughput, asset utilization, and product quality

Amidst the Industry 4.0 revolution, there's tremendous promise for manufacturers to use connected digital technologies to gather rich data and use predictive analytics to innovate every aspect of their production processes. However, many manufacturers lack the team of data scientists required to deliver on the promise, and the talent pool is thin. With the right tools, a new breed of 'digital engineers' can upskill themselves in order to tap into the power of machine learning, without highly specialized data science expertise. Machine learning can then be applied to design smart products, forecast demand, run smart factories, optimize production processes, ensure quality, reduce production downtime, and manage supply chain risk.

## Data science helps improve process manufacturing in these areas:

### Yield optimization

By collecting and analyzing the right data, data scientists or digital engineers can use machine learning to understand what variables influence recovery, how changes to those variables affect output, and define targets for process controls to help achieve optimal yield.

### Quality control

Digital engineers, who bridge the gap between the business and data sciences, can help monitor product design as well as production outputs, and can use AI and machine learning to identify and fix product quality risks before they become an issue.

### Preventative equipment maintenance

By collecting and leveraging text data from maintenance records, IoT data including sensors, power consumption, thermal imaging, vibration and acoustic signatures, digital engineers and data scientists can use machine learning to develop models that can revolutionize maintenance processes.

**\$27B**

invested by manufacturers in AI by 2027

**90%**

increase in failure detection rates using AI

**3X**

more data science job postings vs. job searches

**2 Year**

average data scientist turnover

## Process manufacturing benefits from data science:

### Higher throughput and yield

Optimize production processes for higher throughput and yield from existing facilities

### Less production downtime

Predict non-conforming activities in advance to waste less time certification and compliance

### Improved productivity & quality

Leverage shop floor data to maximize collaboration and teamwork and ensure everyone is leveraging the very best practices



## Multinational steel manufacturer improves product quality by predicting defects

steel manufacturing is a multistep, energy-intensive process and defects inevitably occur. Each process step must be understood, measured, and mastered in order to identify defects as early as possible, remediate the problem, and produce the highest quality product. By leveraging a wide array of data collected by sensors at every step and applying a machine learning-based, time-series analysis, Arcelor Mittal was able to build a model that predicts defects and catches them early in the process. Identifying the occurrence of a defect as early as possible in the production chain is highly valuable, as it spares the cost of going through the rest of the production steps for a defective final product.

## How RapidMiner optimizes manufacturing processes

The RapidMiner platform helps process manufacturers recognize and unlock previously unseen potential for existing and new operations. Using the power of machine learning without requiring experienced data science and data engineering teams, manufacturers across automotive, agriculture, biotech, chemical, food, petrochemicals, pharmaceuticals, and other applications are able to understand, recognize, and optimize planning of batch and continuous systems, process control, and defect prediction, in order to drive revenues, cut costs, and avoid risks.



**RapidMiner** is reinventing enterprise AI so that anyone has the power to positively shape the future. We're doing this by enabling 'data loving' people of all skill levels, across the enterprise, to rapidly create and operate AI solutions to drive immediate business impact. We offer an end-to-end platform that unifies data prep, machine learning, and model operations with a user experience that provides depth for data scientists and simplifies complex tasks for everyone else. The RapidMiner Center of Excellence methodology and the [RapidMiner Academy](#) ensures customers are successful, no matter their experience or resource levels. More than 40,000 organizations in over 150 countries rely on RapidMiner to increase revenue, cut costs, and reduce risk.