

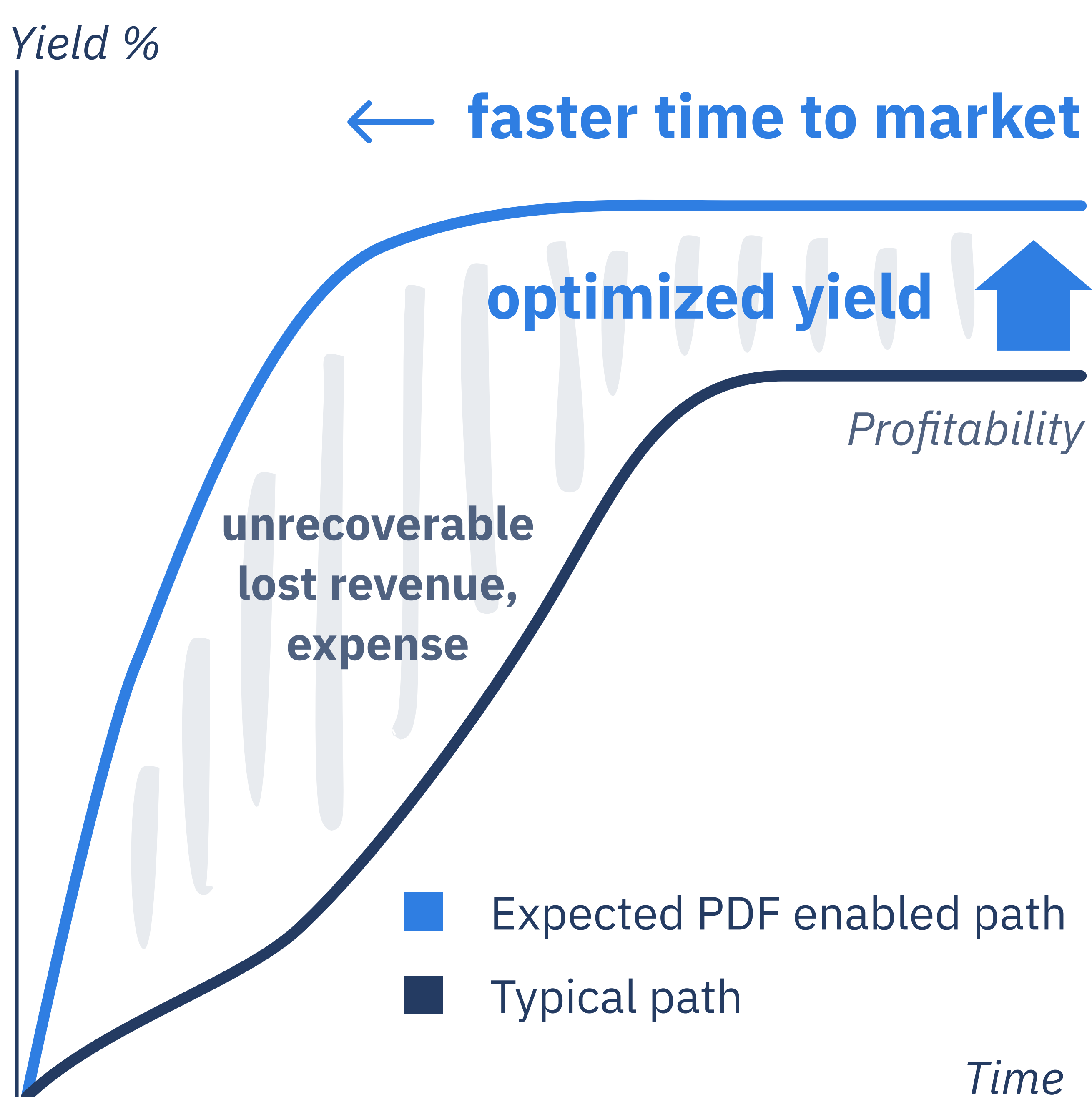
End-to-End battery analytics control platform, and methodology designed to rapidly improve battery cell manufacturing



Addressing the Battery Cell Manufacturing Challenge

A **four-year ramp** of battery cell facility means **billions in additional capital burned** for every new factory, and even a few percent yield improvement at an existing factory can deliver **hundreds of millions more revenue** per year.

PDF is taking its **30+ years** experience of semiconductor **process control** and **yield improvement** to battery manufacturing to help solve this problem.



Solutions Highlights

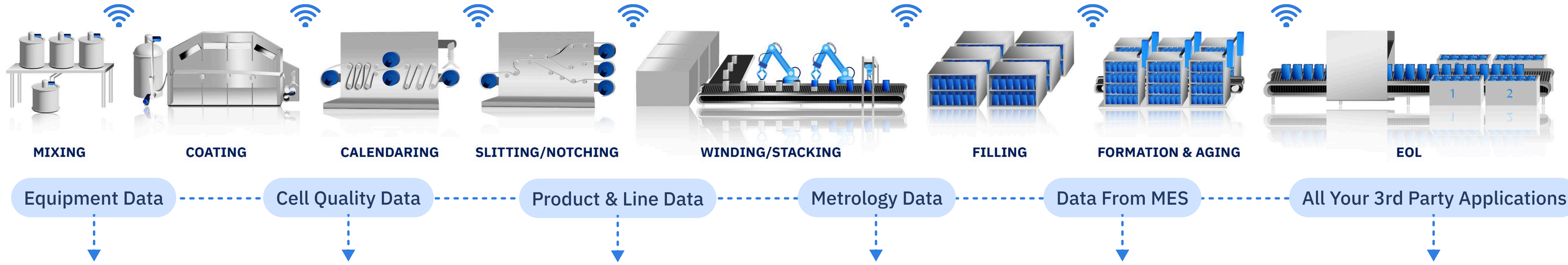
- Collect & organize manufacturing-related data
- Align & harmonize data types across processes, lines, & products
- Manufacturing analytics for root cause diagnostics
- AI/ML assisted extraction of key characteristics from data
- Low-cost & effective tiered data storage
- Optical inline vision inspection system for defect detection
- ERP connection for financial & planning applications

Problem with Status Quo

Tackle the chaos of battery manufacturing with our **Exensio® Analytics Platform**. We streamline messy data, pinpoint elusive problems, and cut down on production iterations. Our software optimizes processes, improves yield, and reduces scrap ensuring safety and efficiency in the field. **Say goodbye to data headaches and hello to manufacturing excellence.**

How it Works

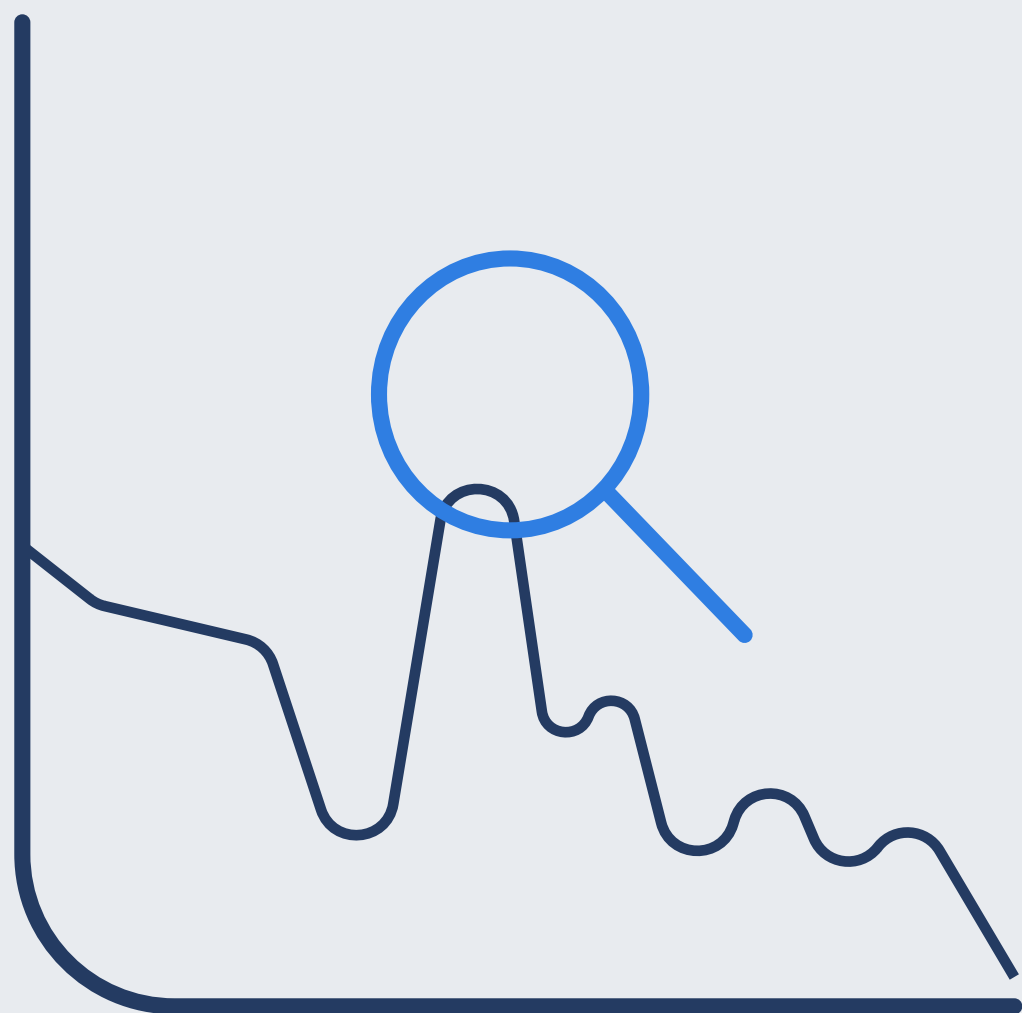
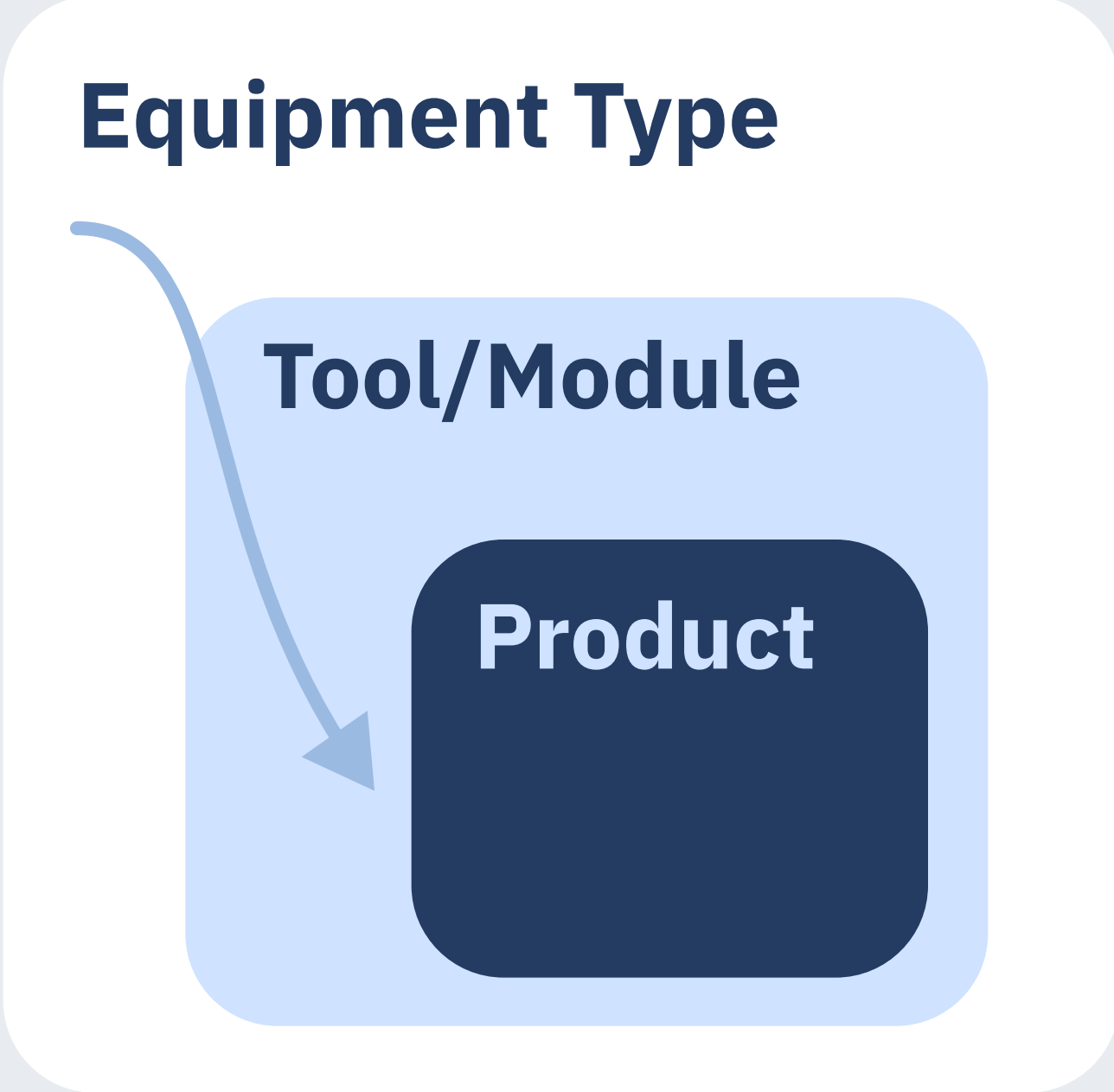
Combine factory information to detect & diagnose root causes of issues



- 1 IoT/FDC sensor connection, feature extraction
- 2 feature characterization and data alignment
- 3 Correlate root cause and remediate with PDF Exensio* AI/ML pipeline

Model to Align & Act on Your Data

Data Alignment -----> Feature Extraction ----> Applications



Using AI/ML, discover root cause of problems and act on them using diverse applications:

Reaching steady-state faster
continuous process improvement & factory optimization

- Examples*
- Factory efficiency trends**
how much dry air/power/process gases are used based on a productivity
 - Quality excursions/root cause analysis & action**
dashboards, alerts & automation
 - Predictive maintenance**
minimize down time across new/switched and existing equipment
 - Scrap reduction**
virtual metrology to predict failure, based on tool information, to take action ahead of fault occurrence

Industry 4.0 Battery Factory Analytics Platform

- 80% less data wrangling
- 50% faster yield learning
- 50% fewer quality excursions

results based on typical Exensio® customers

Our Partners



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