

# TruEra for AI in Manufacturing

Driving business results and trust with AI quality analytics, testing and monitoring.

## Manufacturers face challenges building high quality AI and delivering ROI on AI initiatives

Artificial Intelligence and Machine Learning (AI/ML) have the potential for far-reaching impacts on manufacturing. High quality ML systems have been proven to deliver real ROI in use cases such as forecasting, predictive maintenance, predictive manufacturing quality, smart manufacturing, and more.

However, most manufacturers encounter significant barriers to developing high quality ML systems:

- **Data science teams often lack ML development, evaluation, and testing tools** that can help them build high quality systems in a fast, agile manner especially when faced with data challenges such as imbalanced data sets, large numbers of potential features, and variable data quality.
- **Data scientists encounter challenges securing buy-in from necessary stakeholders** whose approval is required to place a model into production.
- **Data scientists find it hard to explain ML model behavior and errors** (e.g., false positives and false negatives) to stakeholders and operators, due to the black box nature of ML systems. This inhibits adoption and sustained operational impact. This inhibits trust and adoption, operational impact and continuous mode improvement.
- **Once models are in live use, ML engineering teams lack model monitoring tools** to monitor and efficiently debug data quality and ML model drift issues. This makes it hard to ensure sustained performance and ROI over time.

## TruEra solves the AI quality problem, helping manufacturers capture real business value



### Drive ML model quality and ROI

Provide data science teams with unique tools to analyze accuracy, reliability, stability, conceptual soundness, and bias.



### Achieve model transparency, build trust

Finally explain fully how your model works and its key drivers to enable adoption and achieve operational impact.



### Ensure sustained performance and ROI

Monitor data quality, ML inputs, accuracy and score drift and debug root causes fast.

# TruEra AI Quality Management Overview

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## Leader in AI Quality

TruEra fills a critical gap in your AI stack, explaining and testing model quality throughout the lifecycle. TruEra's AI Quality Management solutions explain, debug, and monitor machine learning models, leading to higher quality and trustworthiness, as well as faster deployment. Backed by years of pioneering research, TruEra provides value across the model lifecycle, is independent of model development platforms, and embeds easily into your existing AI ecosystem.

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## TruEra Diagnostics

Experience fast, accurate, and scalable AI Model Quality and Explainability that improves quality and builds trust, helping models deliver sustained ROI.

- **Best-in class explainability**  
that is more accurate and performant, based on years of research
- **Deep model testing & evaluation**  
for assessing AI model quality, including errors, bias, stability, reliability, and conceptual soundness
- **Universal approach**  
that scales across model development platforms, use cases, and ML model types



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## TruEra Monitoring

Easily track and troubleshoot machine learning model performance. With unique analytics, TruEra Monitoring goes beyond basic observability solutions by enabling faster root cause analysis and action.

- **The broadest, deepest**  
view into model data quality, fairness, consequential feature drift, observed & estimated accuracy and global and segment model performance drift
- **Fast, precise root cause debugging**  
that saves data scientist time and effort
- **Easy deployment and scaling**  
across hundreds of models in production

# TruEra Use Cases in Manufacturing

## Forecasting

- Efficiently evaluate and improve forecast accuracy for important product, geographic or other segments
- Help identify and address data challenges (e.g. low volume products, bad or incomplete data)
- Evaluate and debug common forecast modeling challenges (e.g. overfitting, conceptual soundness of features)
- Identify high error segments to inform iterative improvement and situations under which forecast teams may not use model output
- Explain reasons for forecast output to help stakeholders interpret and use forecast downstream
- Efficiently assess and debug ML model accuracy, drift and operational performance

## Anomaly Detection

- More efficiently identify and debug conceptual soundness and performance of anomaly detection
- Explain why the model is predicting an anomaly to improve trust in the model and achieve stakeholder buy-in
- Monitor and debug potential quality issues in anomaly model input data
- Monitor the effectiveness and stability of the anomaly output on an ongoing basis

## Predictive Maintenance

- Iteratively improve performance, address overfitting and imbalanced data set challenges
- Efficiently evaluate and explain quality differences across data segments (e.g. equipment types)
- Explain predictions to operators to take “next best” action, build trust
- Debug and explain false positives and false negative errors
- Estimate, monitor and debug accuracy (even without labels)
- Monitor and debug feature drift, model score (e.g. failure probability) drift and quality of data inputs, which can often be fragile

## Warehouse Management

- Aid in model selection and model performance optimization
- Explain predictions to operators to take next best action, enable collaboration and built trust
- Monitor and debug data quality issues and ML model drift

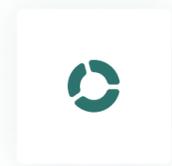
## Predictive Quality (Smart Manufacturing)

- Build high performance models overall in conjunction with manufacturing process subject matter experts
- Enable much greater efficiency in evaluating multiple models trained across multiple manufacturing sites
- Help assess and debug overfitting and imbalanced data sets challenges
- Explain predictions to operators to take next best corrective manufacturing actions, gain insights into drivers of low quality manufacturing performance and build trust
- Debug and explain false positives and false negative errors
- Monitor and debug quality of disparate, fragile data sources and ML model drift across many customers/ segments

## Operations Automation

- Provide early warning when data drift is likely to impact the accuracy of models used to automate operational processes
- Assess the reliability of the model to determine the appropriate level of human supervision

# Why Use TruEra for Manufacturing?



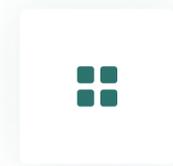
**Model quality management through the lifecycle: development, validation, and monitoring**



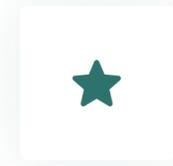
**Differentiated support for key manufacturing use cases**



**Easily embedded into your AI tech stack**



**Broad support for different ML model types, data types, and platforms**



**Best-in-class explainability to support model adoption and high-quality, ongoing model operation**



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