Machine Learning Life-Cycle Tools and Technologies

IDC's *Machine Learning Life-Cycle Tools and Technologies* analyzes the tools, technologies, and platforms for building, training, tuning, running, and scaling the end-to-end life cycle for artificial intelligence (AI) and machine learning (ML) solutions — including generative AI — from experimentation to production. Across the themes of AI build, machine learning operations (MLOps), foundation model operations (FMOps), data labeling, and trustworthy AI, this research program analyzes data pipelines, data platforms, model build platforms, model pipelines, and model monitoring for traditional and generative AI applications and models. By providing actionable insights into buyer behavior, this research also helps vendors understand the end-user needs, gain competitive insights, and differentiate themselves in the market.

MARKETS AND SUBJECTS ANALYZED

- Data annotation and labeling software platforms
- Data pipelines for AI/ML including bias assessment/remediation, feature extraction, and data reuse and drift
- Automated feature engineering and hyperparameter tuning
- AI platforms for traditional machine learning and generative AI
- Responsible AI — fairness, explainability, adversarial robustness, and transparency tools and algorithms
- Model orchestration — validation and pipelines

- Model deployment — scaling
- Model monitoring
- ML data and concept drift
- Dynamic retraining
- Model optimization
- Machine learning operations and foundation model operations
- Foundation model training, tuning, and integration
- Synthetic data

CORE RESEARCH

- Data Pipelines
- Machine Learning and Foundation Model Operations (MLOps/FMOps)
- Model Pipelines
- Model Monitoring
- AI/ML Platform Adoption

- Impacts of Generative AI and Machine Learning
- Responsible AI
- AutoML Software Market Analyses and Predictions
- AutoML Build and MLOps Software Forecasts and Vendor Market Shares
- End-User Surveys

In addition to the insight provided in this service, IDC may conduct research on specific topics or emerging market segments via research offerings that require additional IDC funding and client investment. To learn more about the analysts and published research, please visit *Machine Learning Life-Cycle Tools and Technologies*.

KEY QUESTIONS ANSWERED

1. What are the trends and opportunities for artificial intelligence and machine learning life-cycle management from experimentation to production technology offerings for vendors?
2. How do traditional AI and generative AI interweave?
3. What are the strategies for scaling AI/ML within the enterprise?
4. How are vendor offerings in the AI and ML life-cycle management markets differentiated?
5. What challenges do enterprises face in scaling the AI and ML life cycle?

COMPANIES ANALYZED

This service reviews the strategies, market positioning, and future direction of several providers in IDC's *Machine Learning Life-Cycle Tools and Technologies* market, including the following:

Altair, Appen, AWS, C3 AI, Chatterbox Labs, Cloudera, CloudFactory, Databricks, Dataiku, DataRobot AI Platform, Domino Data Lab, dotData, Fiddler AI, Google, H2O.ai, Hewlett Packard Enterprise (HPE), Hive, IBM, Iguazio, iMerit, Labelbox, MathWorks, Microsoft, ModelOp, Oracle, Palantir, Red Hat, Sama,

SAP, SAS, Scale AI, Snorkel AI, Superb AI, TELUS International, Teradata, Tonic.ai, TruEra, V7, Watchful AI, and Weights & Biases