

Case Study:

ML Ops With CI CD



Company overview

- **Elient name:** Confidential
- Services: MLOps, AI ML
- **Technology:** Spark, MLFLow, Vertex AI,
- Industry: E-Commerce
- **O** Location: US
- The system needed
- Deploy ML models efficiently using a continuous integration and deployment pipeline.
- Monitor model drift and performance metrics to trigger automatic retraining when necessary.

A leading e-commerce company approached us with a requirement to build a robust MLOps framework for automating the end-to-end ML lifecycle

The challenges

- → Automate data ingestion, preprocessing, and feature engineering to enhance model performance.
- → Ensure model versioning and reproducibility across multiple training iterations.
- → Deploy ML models efficiently using a continuous integration and deployment pipeline..
- → Model Versioning and Reproducibility: Ensuring consistency across multiple training iterations.
- → Automated Training and Deployment: Eliminating manual steps in ML model deployment.
- → Scalability: Supporting high-volume transaction data in real time.
- → Performance Monitoring: Tracking model drift and automating retraining when necessary.
- → CI/CD Integration: Creating an efficient workflow for continuous model updates.

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Outcome

The solution delivered multiple benefits through the use of various MLOps Processes -

- Initial Implementation:
 - Delivered an MLOps framework that automated the entire ML lifecycle.
 - Reduced model deployment time by 60% through CI/CD automation.
 - Improved model accuracy by 15% with continuous monitoring and retraining.
- Post Optimization:
 - Scaled to support multiple models and real-time inference with minimal latency.
 - Integrated automated rollback mechanisms, achieving 99.8% uptime.
 - Enhanced reproducibility with MLFlow-driven experiment tracking and version control.

The approach



The solution

Phase 1: ML Model Development

Developed a scalable ML pipeline by automating data processing, training, and experiment tracking.

- 1. Data Pipeline Implementation
- 2. Model Training and Optimization
- 3. Experiment Tracking

Phase 2: CI/CD Pipeline for MLOps

Automated model deployment and monitoring using containerized workflows and real-time tracking.

- 1. Continuous Integration (CI)
- 2. Continuous Deployment (CD)
- 3. Monitoring and Automation