

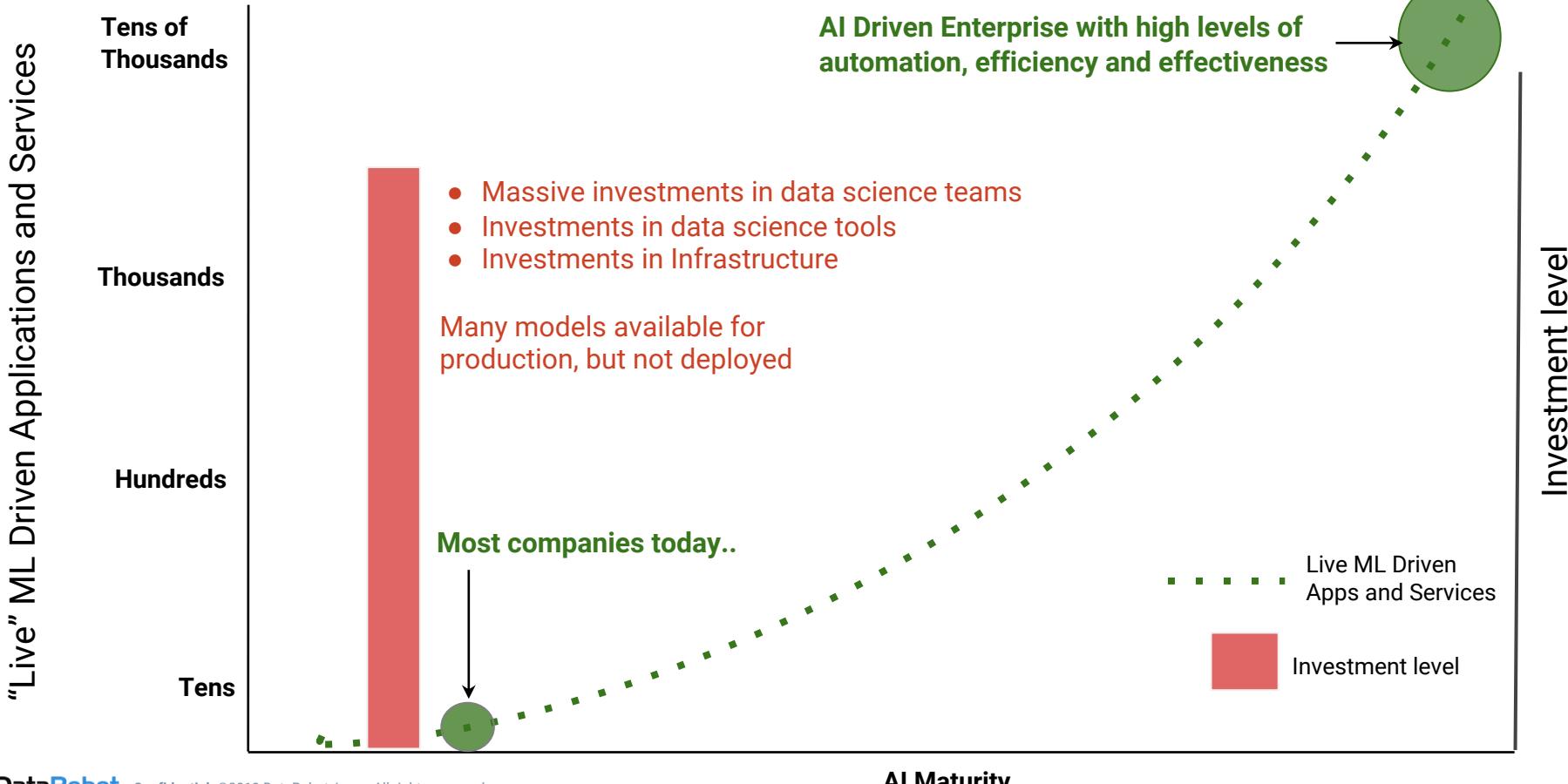


# MLOps - Where ML models meet the real world

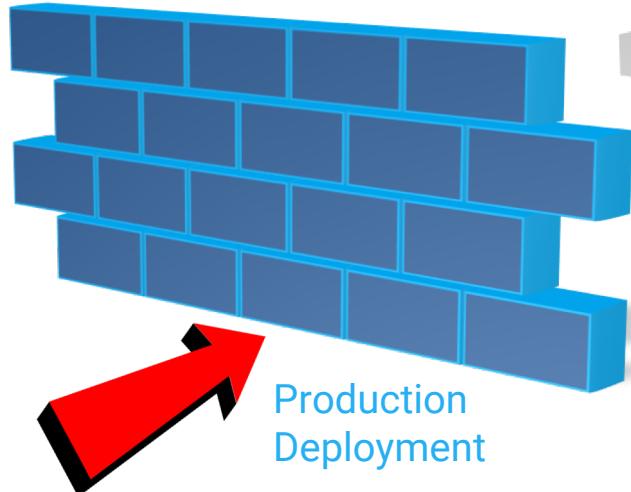
Dan Darnell, Senior Director, MLOps Product



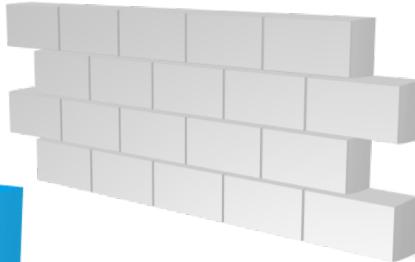
# Building the AI-Driven Enterprise



# Critical Barriers for AI Adoption at Scale



Variety of ML tools across teams make collaboration between data science and IT difficult



## Production Monitoring

ML model behavior is significantly different from traditional software applications



## Production Lifecycle

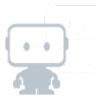
ML-based applications have a complex lifecycle and management process



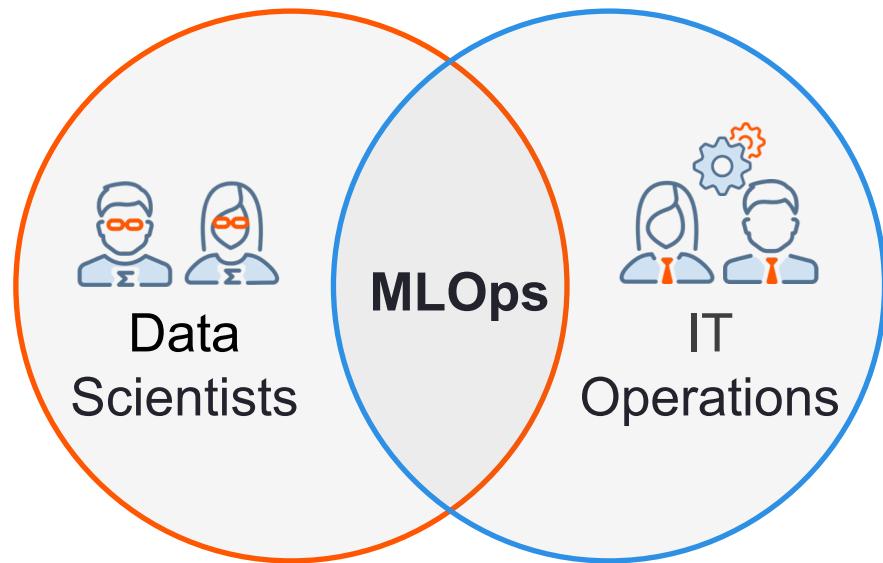
## Production Model Governance

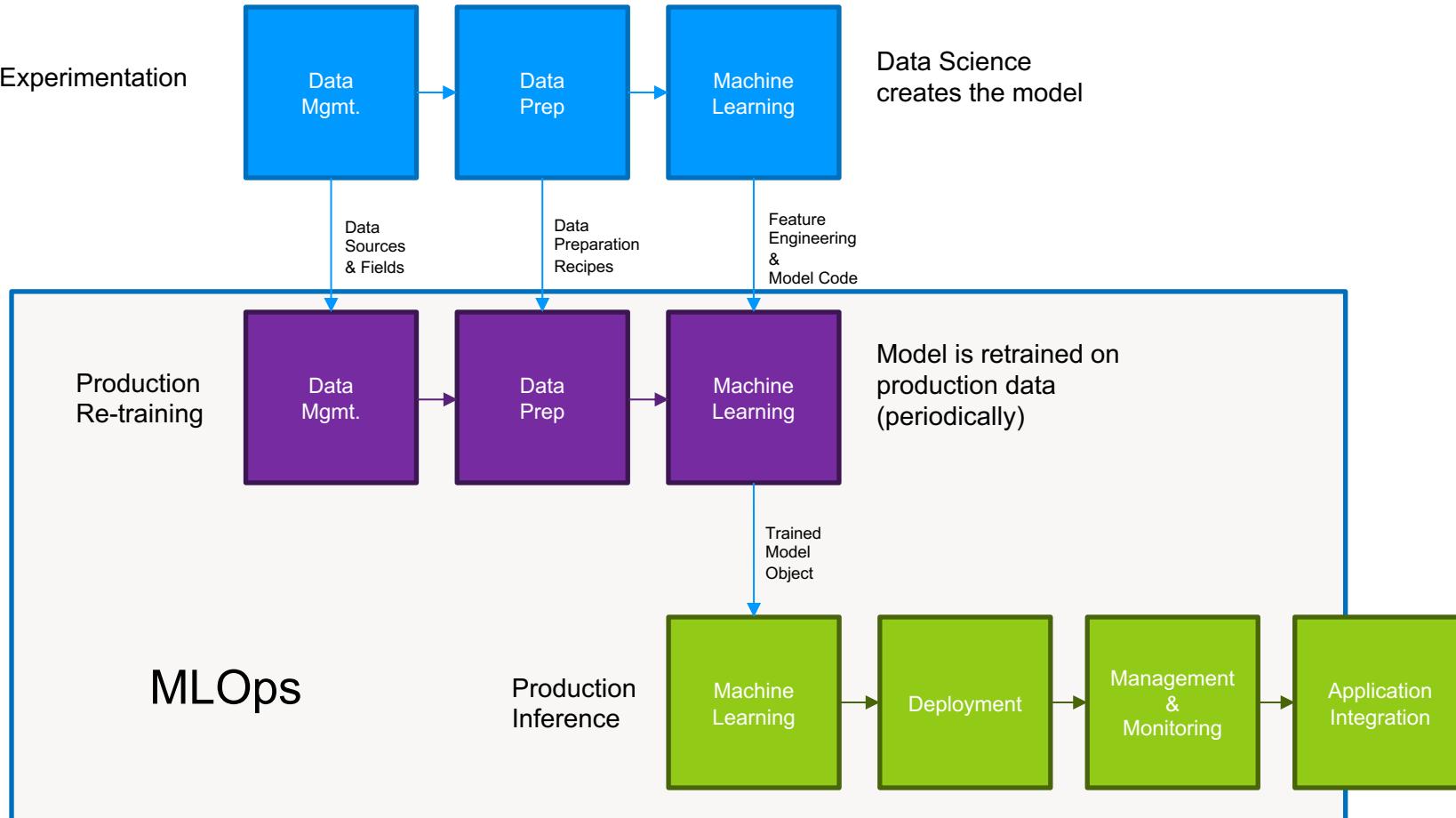
Machine learning models need strong governance practices and tools to minimize risk

# What is MLOps?

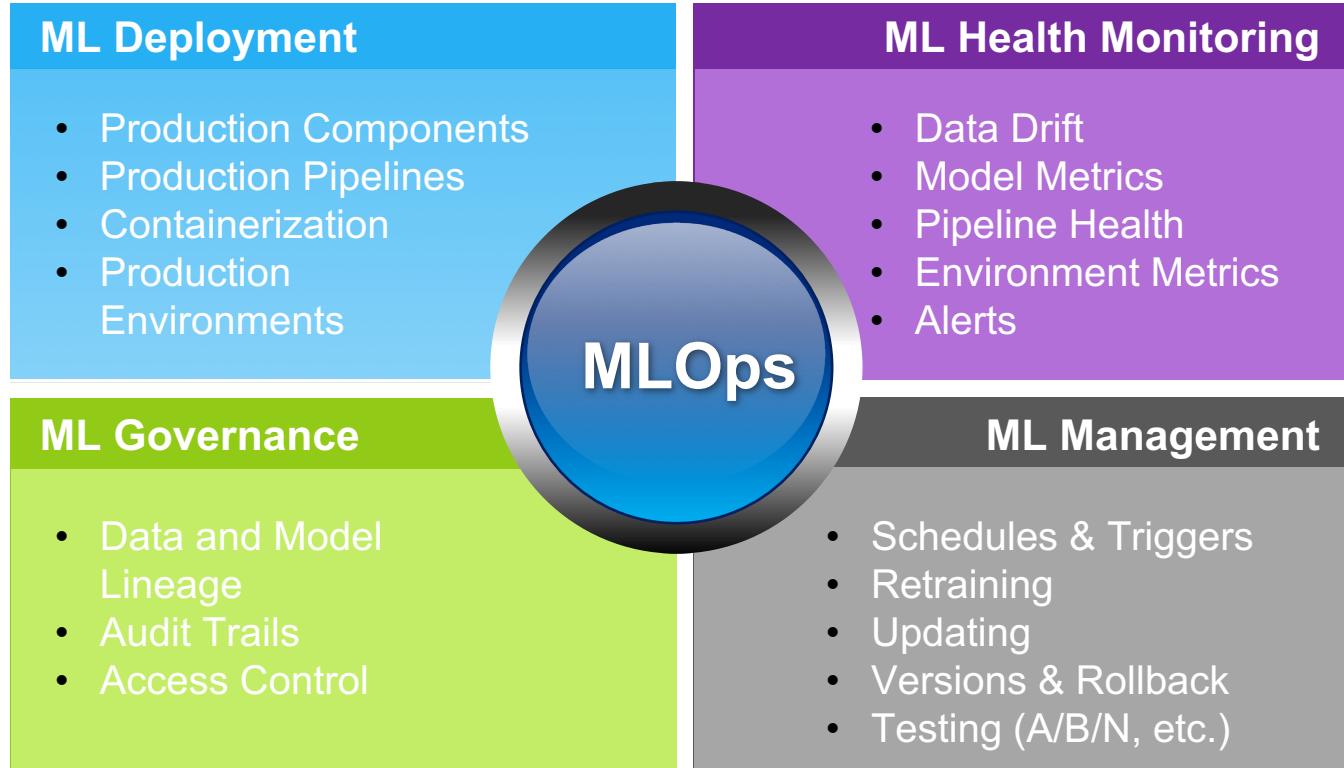


**Machine Learning Operations (MLOps)** technology and practices provide a scalable and governed means to rapidly deploy and manage ML applications in production environments.





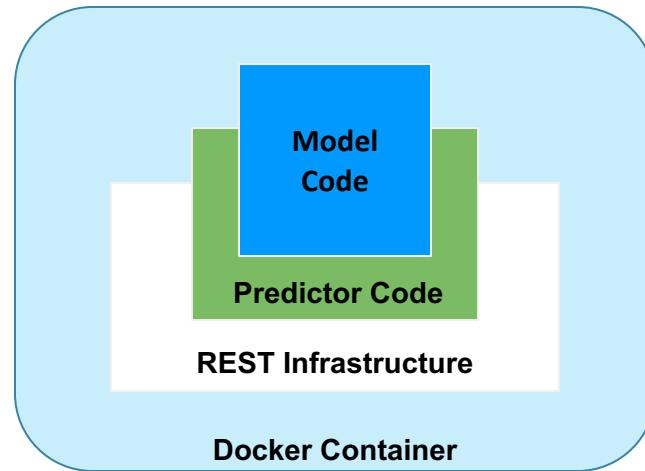
# MLOps Overview



# Deploying ML with Docker and Kubernetes



- Real-time inference pipelines are wrapped up in docker containers
- Use Kubernetes to deploy those pipelines
- Use Kubernetes to scale up or down based on resource needs





# ML Pitfalls for Kubernetes Deployment

- Tracking metrics across multiple replicas of inference
- Monitoring against data science or business specific SLAs is a separate effort
- Scaling to meet specific data science goals is an extra effort
- Manual upgrade of trained models





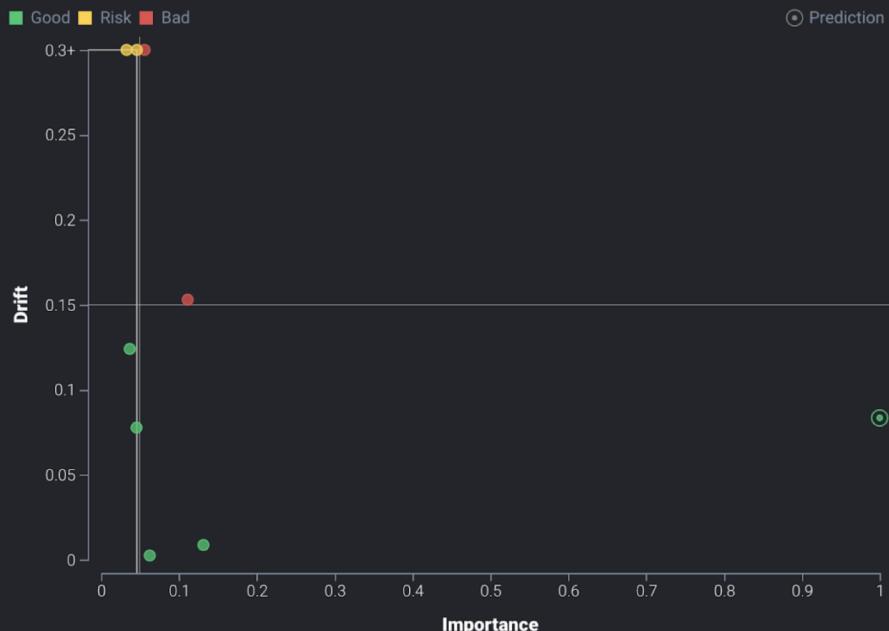
# Production Model Health

2018-10-05

2019-07-19

## Feature Drift vs. Feature Importance

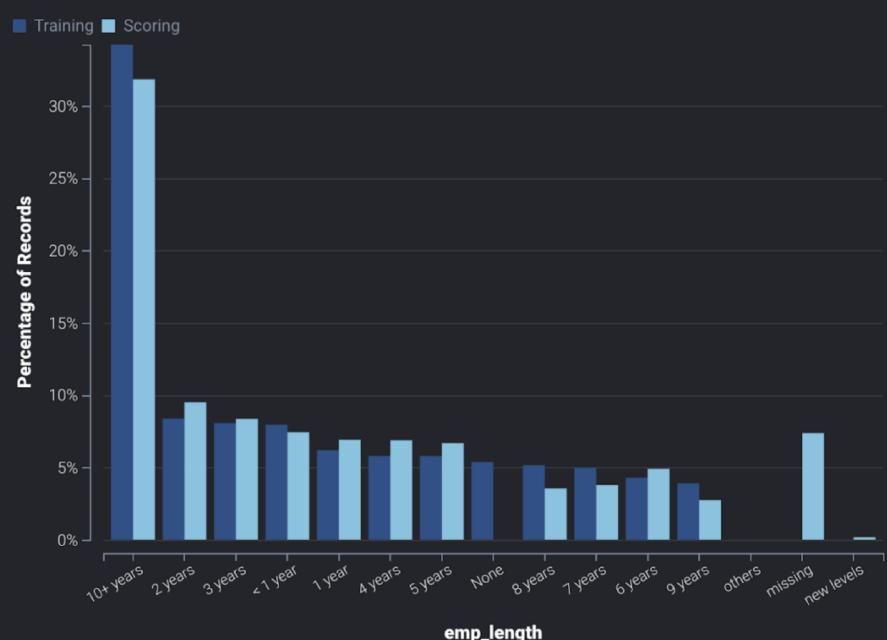
Drift between the training data and the data provided for scoring from 2019-05-01 to 2019-07-19



## Feature Details

emp\_length

Differences in data distributions between the training and scoring periods.





# Production Model Governance

## Production Access Control



Full control of users and groups with access to production systems

## Auditable User Actions and System Events



Capture of all information needed for security and compliance

## Traceable Results



Ensuring that results can be traced back to model versions

# The MLOps Advantage



- **Finally deliver the value of AI** by easily deploying and managing models from multiple ML platforms in production
- **Proactively manage production models** to prevent production issues and ensure model trust
- **Safely scale AI projects** and maintain control over production models to minimize risk and comply with regulations

DataRobot