Lessons from the Field in Building Your MLOps Strategy

Harpreet Sahota, Data Scientist @ Comet
Agenda

What is MLOps?
Agenda

- What is MLOps?
- The When
Agenda

What is MLOps?  The When  The How
Agenda

- What is MLOps?
- The When
- The How
- Measuring Success
MLOps is popping up everywhere...

Understanding MLOps to Operationalize Machine Learning Projects

Introducing MLOps
How to Scale Machine Learning in the Enterprise

Practitioners guide to MLOps:
A framework for continuous delivery and automation of machine learning.
What is MLOps?
Successful MLOps Implementation depends on…

Technical perspectives

Strategic perspectives
Not enough information is available on how to think about MLOps *strategically.*
When to start implementing an MLOps Strategy
MLOps is needed now, more than ever, as companies transition from using machine learning in an exploratory way to using it as a core operational software component to deliver value.

Christopher Brossman
Director of Data Engineering, The RealReal
80% of AI projects will remain alchemy, run by wizards whose talents will not scale in the organization

Gartner, 2020
The pain and frustration your teams experiences will grow.
What happens if I don’t adopt an MLOps strategy?
Your Life Without an MLOps Strategy
Your Life Without an MLOps Strategy

Inefficient workflows and manual processes
Your Life Without an MLOps Strategy

“Copypasta” code from place to place
Signs You Need an MLOps Strategy

Painfully long ramp-up times
Your Life Without an MLOps Strategy

Deployment lags because everyone is busy
More signs you need an MLOps Strategy...

Long retraining cycles
More signs you need an MLOps Strategy...

Scaling issues
More signs you need an MLOps Strategy...

Technical Debt
More signs you need an MLOps Strategy...

Lineage and traceability
You should start implementing an MLOps strategy when...

- Team size starts approaching 10+
- You’re noticing the warning signs
- You don’t “need” it yet
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How to start implementing an MLOps Strategy
Various shapes and sizes of machine learning teams
Teams do these activities differently

- Data Sources
- Modeling Strategies
- Production
Mission critical

Real-time

Batch jobs

Business decisions
Team Size

Team Structure
Hire an MLOps Architect once there are more than 10 people building models on your team.

Chris Brossman
The Real Real
Creating value for your business with ML depends on...

Structure  Communication  Collaboration
How can I create value out of machine learning for my business?
How can I create value out of machine learning for my business?

What machine learning can do

What’s valuable for your business
How can I create value out of machine learning for my business?
Data Scientists shouldn’t work in silos
Reporting should be transparent and consistent
We **track** our model development process **live**. Then **transmit** development **updates** via **sharable**, easily **accessible** **live reports**!
Design a reporting structure so stakeholders can track progress and impact.
What about tooling?
Modularity

Reusability
Welcome to the pipeline jungle

ETL  Training  Evaluation  Deployment
Even if your platform is...

Robust

Reliable

Remarkable
You will still feel growing pains
A framework for vendor selection:
Look for tools that solve specific problems

- Gather information
- Identify manual processes
- What takes too long?
- Where can we improve?
A framework for vendor selection: Data-driven evaluation

Specify features

Identify troublesome workflows

Test and verify with a pilot
A framework for vendor selection: Build a proof of concept

Be swift
Beware of tool proliferation and **tight integration** with any one tool, because in just a few years the **landscape will drastically change** once again.

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**Christopher Brossman**

Director of Data Engineering, The RealReal
How to start implementing an MLOps strategy…

- Keep things modular
- Connect data scientists and stakeholders
- Select tools that solve specific problems
How to measure the value of your MLOps Strategy
An experimental model development process

This is an iterative process, experimentation is expected.
It's hard to measure a moving target
How Uber measures value during model development

Assess marginal impact on...

- Time to model-ready dataset
- Time to prod-ready model
- Volume of experiments
An automated model deployment process

Automate all of this

Production ready model → Unit Tests → Model Deployment → Model Monitoring → Alerting → Retraining
How Uber measures value during model deployment

Engineering hours saved on manual tasks
Adopting an MLOps strategy is a crucial and challenging set of decisions.
Recap

Don’t ignore the warning signs
Recap

Don't ignore the warning signs

Communication is critical
Recap

Don’t ignore the warning signs

Communication is critical

Aim for reusability
You

Success

The Path

You

Success

The Path
A final note

Processes and best practices will become standardized.
A final note

And it could be the differentiator between you losing or winning in your industry.
Powering data scientists at these great companies

Experiment Management
Model Management
Model Production Monitoring
Try Comet - it’s free!

tinyurl.com/trycomet
Questions?

tinyurl.com/trycomet
Thank you!

Harpreet Sahota
Data Scientist @ Comet

Let’s connect on LinkedIn!