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# How to Get Started on Your MLOps Journey

Organizations with growing machine learning (ML) practices tend to encounter several challenges that make it difficult to operate an end-to-end ML practice. These challenges include significant increases in compute resources and data volumes, an increasing number of manual steps as operations scale, ML code that breaks down due to iterations in production, and the fact that ML code is just a small piece of a larger data ecosystem.

Machine-learning ops (MLOps) offers a solution to these challenges. According to [CIO.com](#), “MLOps integrates the core principles of DevOps with machine learning. This brings the DevOps concepts of continuous integration, observability and high software quality practices together with the world of data scientists and applied AI engineers, to ensure that machine learning solutions are delivered in a reliable and sustainable form into an organization’s production environment.”

Given the popularity of ML, it only makes sense that MLOps is a hot market, with a variety of vendors claiming to have MLOps solutions. MLOps has developed a lot in the last couple years, and everyone is trying to create an end-to-end experience. MLOps tools can aggregate and orchestrate multiple tools for putting models into production and

performing continuous training and monitoring. However, just as there is no single DevOps tool, there is no single MLOps tool. It’s important, therefore, that organizations use best practices, stay flexible, and discern hype from reality when choosing MLOps solutions.

## Who should do MLOps?

MLOps isn’t for everybody. Organizations that are “data mature” and have encountered the aforementioned challenges will realize higher value from MLOps. These are often large organizations with more than a couple ML models and that think about ML from a programmatic perspective.

Your organization may be well suited for MLOps if:

- » You have thought leadership in many areas driven by a well-governed data environment and a data science team.
- » You rapidly deploy technology platforms for specific business problems.
- » Data-driven insights are ingrained in processes and are accessible across the business to drive action.
- » Data and insights are integrated seamlessly into new use cases.



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## What does an MLOps project look like?

A typical MLOps project comprises the following steps:

1. Prove out the value of MLOps from a people, process, and technology perspective through the lens of one critical use case.
2. Develop a proof-of-concept MLOps platform, using an MLOps ecosystem (for example, for Microsoft: MLflow, Azure DevOps, and [Azure ML](#) components).
3. Drive the selected use case models through the MLOps platform, broken down into individual phases as appropriate.
4. Develop a [strategic change management](#) plan, in parallel, to ensure scalability and support people enablement.

World Wide Technology (WWT) applied this approach to a copper miner's ML practice, which, although relatively mature, was encountering "last-mile" challenges. These included inconsistent methods for continuous integration/continuous delivery (CI/CD), deploying models, and tracking performance; a lack of visibility into the full landscape of models currently in production; and inefficient processes for refreshing/retraining models. By applying the above four-step approach to building out MLOps, WWT helped the copper miner accelerate the journey to a standardized method for performing ML work. These included:

- » Applying DevOps principles to ML development and deployment
- » Accelerating "productionization," monitoring, and refreshing/retraining of models
- » Providing standard methodologies for building, tracking, and reusing ML pipelines



## How to get started

MLOps brings DevOps standards to ML models, with the goal of achieving easier scalability and production. As organizations enable MLOps, they address common challenges that make it difficult to implement an end-to-end ML practice. WWT helps organizations cross that last mile to make MLOps a reality. To learn more, go to [wwtconsulting@wwt.com](mailto:wwtconsulting@wwt.com) or [wwt.com/topic/data-analytics](http://wwt.com/topic/data-analytics).

## Key lesson from the real world: The people aspect is critical

Although technology and process have their place in MLOps, people are a critical component of a successful MLOps practice. Creating and maintaining an ML model is a multi-step process, with different people contributing at different times. An integrated [people-enablement approach](#) can accelerate the transformation to a successful and adopted MLOps practice. As with DevOps, doing MLOps well requires clarity of roles, responsibilities, and expectations.

MLOps belongs to the practitioners—the data scientists, ML engineers, and others. MLOps can't and shouldn't be imposed on them. Rather, organizations should give practitioners space to experiment and discover what works best for them. A human-centered approach that shapes an experience and creates an environment that enables teams to thrive in their new ways of working helps deepen commitment to the organization and its strategy.

Leadership's support and understanding of the value of MLOps are also essential to the project's success. Any change, MLOps included, can elicit understandable resistance. A network of champions can facilitate adoption, by sharing messages and best practices about MLOps, how it will take place, and how it will help everyone. Those in the champion network can also serve as superusers who help guide team members through the process.

