



# MLOps: Taking AI/ML From the Basement Into the Boardroom



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*Developing a machine learning model is relatively easy compared to putting it to work and achieving real impact. Let's look at how MLOps, the backbone of productizing machine learning, helps make sure that AI initiatives deliver on their promises.*

Machine learning is everywhere. From facial recognition to medical diagnosis and autonomous vehicles, AI and ML-based technologies are becoming ever more integrated into our daily lives, whether we realize it or not. In fact, we're

taking the machine learning for granted – Netflix recommends a movie based on your other watch history, Google accurately completes a search suggestion, and that smart assistant lets you control your home with the sound of your voice. These are great examples of machine learning models that reach end users and create measurable impact. But if you've ever tried developing and releasing a machine learning model yourself, you already know that getting from A to B can be a challenging affair.

Let's be honest, developing a training model for an AI use case isn't the hardest part. What's more difficult to achieve is to make sure the model is operational and always up to date. From data collection and integration, to model training, deployment, performance monitoring, and iterations, there are several stages of the AI/ML workflow that must be managed efficiently, not to mention the need to coordinate the stakeholders involved in the development of a machine learning solution. This is, essentially, what MLOps (Machine Learning Operations) is all about.



Source: edX Course: MLOps for Scaling TinyML (HarvardX)

The machine learning lifecycle encompasses the entire model development process, from data collection and preparation to model deployment and iterative improvement. On the other hand, MLOps is the operational side of machine learning, focusing on aspects such as automation, collaboration, and best practices to ensure efficient and

reliable deployment of models. MLOps includes activities such as automating machine learning workflows, simplifying the complexity involved in model development, ensuring reproducibility of results, continuously improving models, and tracking and versioning model versions.

Let us look at the essential stages in the machine learning lifecycle, and how MLOps helps with each:

1. Data collection and preparation: MLOps ensures that the data is collected from the right sources, that it is of enough quality and relevance for training a machine learning model, and that the preparation and preprocessing phase is automated as far as possible.
2. Model training: MLOps provides tools and processes to rapidly experiment with different machine learning models, evaluate and compare their performance, and select the best model for deployment.
3. Model deployment: MLOps automates and streamlines the deployment process, including creating and running containers, hosting the model, sending it to production, and setting up automated test suites and monitoring systems.
4. Model performance monitoring: MLOps helps to continuously monitor the performance of the model and detect any anomalies or discrepancies. It also implements systems to trigger alerts for outliers or faulty behaviors.
5. Iterative improvement: MLOps helps to determine the best parameters for model tuning, retraining, and

optimization, and keeps track of the changes to ensure reliable predictions over time.

MLOps helps to improve the efficiency of machine learning initiatives and their chances of success while mitigating the risks of them failing. By streamlining the development, deployment, and management of machine learning models, MLOps is the backbone of AI initiatives, ensuring that they always live up to their full potential.

With this, MLOps Engineers should be in high demand – the skills needed for this role include AI/ML knowledge, strong software engineering skills to be able to automate the MLOps processes, and a good understanding of the infrastructure and architecture of ML systems. Effective communication with stakeholders is also a must. If you're looking for an exciting career in the AI/ML space – MLOps is an up-and-coming discipline you should definitely get into!