# Azure MLOps DevOps for Machine Learning

For our client, a top 5 CPG player, Machine Learning has been in use for predictive modeling to aid business decisions. Over time, the number of ML models have increased and hence the frequency with which they must be retrained and redeployed has also increased. A faster and more efficient operationalization of ML models is required to provide accelerated delivery of business value.

**PacteraEdge** has helped them achieve an automated and streamlined Machine learning workflow using MLOps - integration of the well-established DevOps practices with the Machine Learning Life cycle.

Reproducible CI/CD Pipelines have been built to automate repetitive tasks involved in model development and deployment.

A reusable approach to structuring the Machine learning code into discrete steps has been adopted, which confers the benefits of modularity to ML projects. Code, data and environment are all versioned and meaningful metadata, including data and code versions, has been added to models to help identify a specific model later.

Automatic retraining of ML models has been set up in the event of data refresh or data drift.

Cost-efficiency has been achieved by making resources in Azure to automatically scale down when not in use.

Governance, security and quality assurance have been enforced at every step as per Enterprise policy guidelines.

## AT-A-GLANCE:

**Customer**: Top 5 CPG company

**Customer Size**: More than 37,000 employees

**Country**: United States

**Industry**: Food and Beverage

**Products and Services:** Microsoft Azure

## Customer challenges

Our client is the third-largest food and beverage company in North America and the fifth-largest food and beverage company in the world, with eight $1 billion+ brands.

They wanted their ML models to reflect the fast-changing consumer buying patterns and a faster productionization to increase the business ROI. Additionally, they preferred not to manage VMs and required a Serverless Architecture to maintain models. They also wanted to leapfrog on the automation journey to avoid manual interventions in ML Lifecycle.

## Pactera EDGE Solution

Pactera EDGE implemented MLOps using various Azure Services to manage ML lifecycles through a pipeline of version control, test, build  and deployment steps.

*Azure ML Pipelines* are used for speed and flexibility in building and maintaining ML workflows.

CI/CD has been implemented using *Azure DevOps*. Resource creations and maintenance have been automated by using *Infrastructure as Code.*

*Azure Functions* have been created to automatically retrain models on every data refresh also to scale down resources when they are idle.

## Customer Benefits

With the adoption of MLOps,  development of ML models is structured and automated. Checks are performed at every phase of lifecycle thereby increasing quality.  Data Scientists can focus more on developing ML models and worry less about productionizing, retraining and redeployment. The reproducible workflows enable faster delivery of ML enabled applications. Model performance Data can be collected to validate model performance at regular intervals. With Azure, every component can be made Serverless and be auto-scaled which results in a cost-effective approach of implementing MLOps.

*Automation of ML workflows reduces human errors and facilitates faster operationalization*

*Data Scientists are made more productive by shifting their focus from productionizing models and maintaining servers to creating robust ML models*

*MLOps with Azure is cost-effective as compute is auto-scalable and  the modular nature of pipelines help avoid running expensive steps unnecessarily*

## LEARN MORE

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