



# MACHINE LEARNING

## TURN CONNECTED PRODUCT DATA INTO USEFUL BUSINESS KNOWLEDGE

As today's products, from small medical devices to commercial vehicles and aircraft, become more interconnected and smarter, they generate troves of data that can be used to better achieve business goals. Digital Innovation technologies and techniques – such as machine learning (ML) – are key to effectively extracting value from this data. ML uses sophisticated algorithms and models to drive desired business outcomes such as accurately predicting equipment behavior to reduce risk or improving product development processes.

Our team identifies where ML can provide the greatest benefit, from integrating its capabilities into product design or to help automate development and test processes for greater speed and accuracy. Reducing transmission and storage costs, replacing code bases built to cover every variation of a product malfunction, or generating thousands of test scenarios are just a few areas where ML is being employed in today's products and product development landscape.

### ML BENEFITS

**45%** of ML adopters report success in extending data analysis efforts and increased data insights.

**Over 50%** have seen demonstrable ROI.

Source: Machine Learning: The New Proving Ground for Competitive Advantage, MIT Technology Review and Google Cloud <https://www.technologyreview.com/s/603872/machine-learning-the-new-proving-ground-for-competitive-advantage/>

### USE CASES

**Data transmission and storage.** In-flight aircraft, commercial vehicles, and mobile medical devices are examples of products with limited connectivity. ML algorithms can perform analysis and processing on equipment or on the network edge and send only pertinent data or results over constrained network connections, saving on transmission and storage costs.

**Acting on device data.** Processing capabilities on systems with limited connectivity can be tapped to evaluate on-board data, analyze it, and use the results to take immediate action, rather than delaying action only when the aircraft, vehicle, or device is connected to a host network or system.

**Workforce optimization.** By identifying and applying ML to routine tasks, your valuable talent can be placed on higher-value tasks. Tribal knowledge from experienced workers can also be captured and automated as these experts near retirement.

**Creating comprehensive test beds.** As products become more complex, the number of testing scenarios can balloon far beyond what human test engineers can create. ML can build on known tests and generate hundreds or thousands of scenarios to thoroughly vet products for quality.

**Streamlining device performance.** Automated processes rely on each device in the process being able to operate accurately and consistently. Companies often develop massive code bases designed to deal with an endless array of conditions that interfere with smooth device operation. ML models can replace these code bases to allow devices to identify changing conditions and act more quickly and efficiently.

## CORE CAPABILITIES

**Industry-honed expertise.** With decades of experience in highly regulated industries including aerospace, medical devices, and transportation, we have the depth of knowledge to understand where ML can have the greatest positive impact on products and development. We stay focused on ensuring compliance with stringent industry regulations and meeting aggressive market windows.

**Whole-systems perspective.** We bring a fresh, big-picture perspective on where ML can eliminate unnecessary coding, deal more intelligently with data storage and transmission, and automate processes like verification and testing.

**Culture of collaboration and learning.** We have built our practice on regularly adopting new techniques and technologies that are proven to improve product development processes. We apply this passion for learning to identifying areas where ML can increase speed, accuracy, and quality.

**Best-of-breed technologies.** Our team has experience using market-leading tools and technologies from AWS, Azure, and Google Cloud, and can determine which approach is best suited for your specific business needs – whether cloud-based, on-premises, or a hybrid.



## TOOLS & ENVIRONMENTS

- Azure Machine Learning
- Azure Machine Learning Studio
- AWS SageMaker
- Google Cloud AutoML
- Google Cloud Machine Learning Engine
- Python
- PyTorch
- TensorFlow
- scikit-learn
- Apache MXNet
- XGBoost
- Keras