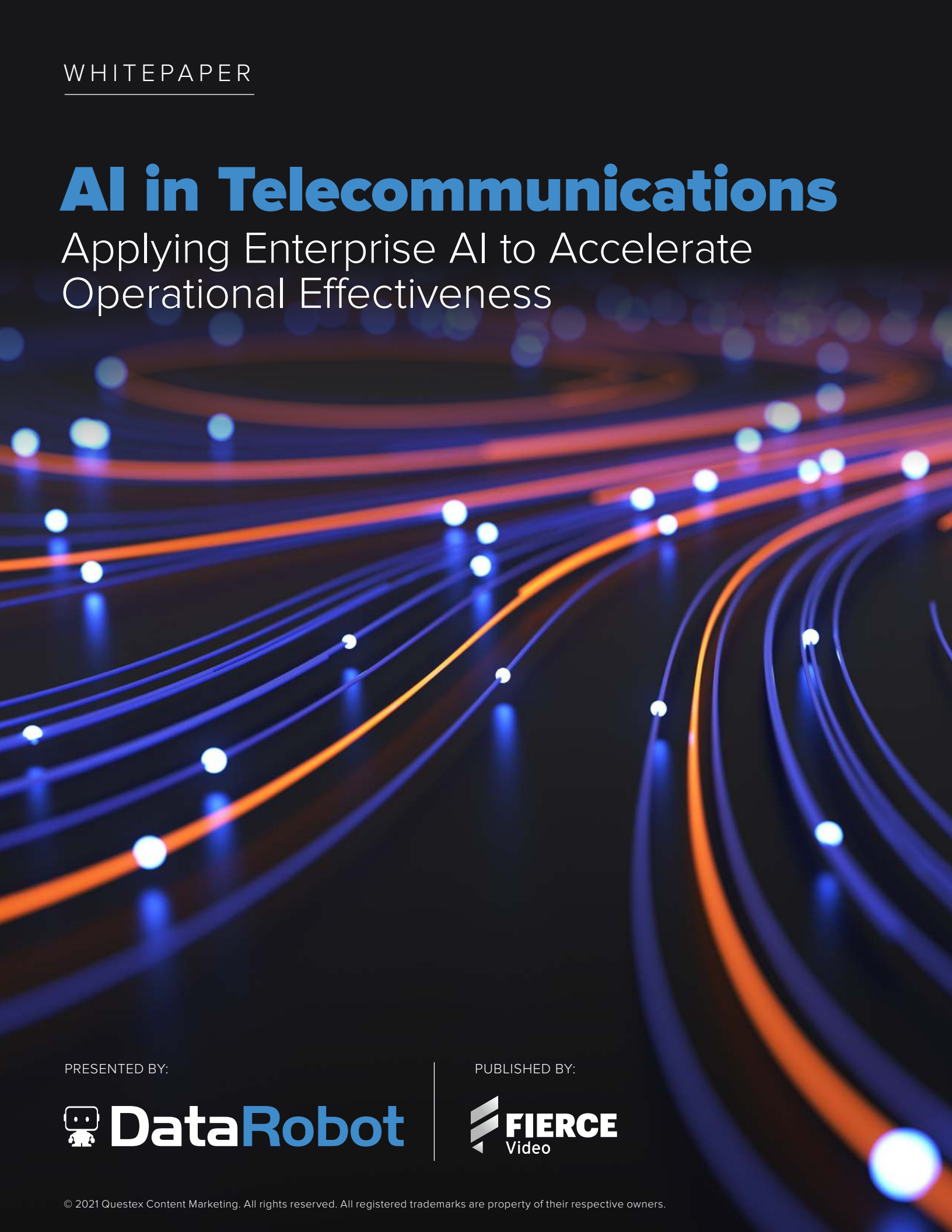
WHITEPAPER

AI in Telecommunications

Applying Enterprise AI to Accelerate Operational Effectiveness



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AI IN TELECOMMUNICATIONS:
APPLYING ENTERPRISE AI TO ACCELERATE OPERATIONAL EFFECTIVENESS

Artificial intelligence (AI) has come a long way from pattern recognition and task automation. Data science and the implementation of analytics, artificial intelligence, and machine learning is evolving from providing analysis and insight to AI solutions that deliver operational and actionable intelligence to increase revenue and reduce costs.

Making the leap to fully automated operations driven by AI is not a simple process. However, communication service providers (CSPs) are moving in that direction. Nearly half of CSPs surveyed have at least one evolving AI business case, and 54% are using AI to automate an individual operations function.[1]

1 Source: TM Forum, 2020

While challenges remain, applying AI across CSP operations is a concept that is gaining traction.

Executives know that next generation networks and services will require AI to make the greatest positive impact on their businesses. For 64% of CSPs, the scale and complexity digital services including IoT and 5G bring to operations can only be automated and economically executed with AI.[2] Unless the operations model becomes less costly, more capable and far more automated, 5G business models may not work.

To effectively infuse AI into existing and future operations, CSPs must go beyond siloed use cases and basic automation to establish an AI-driven development environment that goes beyond IT. Users including data scientists, developers, business analysts, engineers, product managers and others must be able to apply AI within their own processes to optimize operations and improve customer experience across the business.

For CSPs, the volume and complexity of data being captured, analyzed, and processed requires an enterprise AI platform that is easy to use and seamlessly integrates into existing systems and data environments at scale. For always-on telecom operations, this means infusing the business with AI, using millions of values from dozens of sources in order to deliver actionable intelligence for network operations, customer experience management, and revenue assurance.

To accomplish that, AI needs to be available to subject matter experts (SMEs), business analysts, and users beyond data scientists. An end-to-end platform that is accessible by both data scientists and SMEs makes data scientists more effective by automating repetitive tasks, as well as enabling others to develop AI models without the need for code development and knowledge of AI algorithms.

This ebook will discuss how AI can improve CSP operations and challenges that operators face in applying this powerful strategy. We will also introduce a solution for establishing an AI development environment that can be used by both data scientists and SMEs to take full advantage of existing systems and data, while optimizing the use of expensive and specialized staff. By deploying an applied AI development environment that is readily available and easy to use, operators can quickly implement solutions that use AI to address business, customer, and operational challenges specific to the telecom sector.

2 Source: TM Forum, 2020

DIGESTING THE DATA

The deployment of next generation network technologies, including 5G, IoT and SD-WAN, enable the creation and delivery of complex services that include distributed cloud and multi-access edge computing (MEC). Geographic distribution of physical and virtual network and service elements requires a level of intelligent management that existing OSS/BSS solutions were not designed to deliver.

CSPs are currently applying AI within individual OSS/BSS solutions to automate basic tasks and support repeatable decision processing. Data is captured and distributed to numerous systems and individuals or dumped into a giant data lake for analysis and processing later. For most operators, OSS/BSS solutions remain siloed.

There is a wealth of valuable data available that can readily benefit all aspects of a CSP's business. As the volume and complexity of network elements, services, applications, virtual elements, customers and third-party integration required to deliver new, innovative products continues to grow, the amount of data collected and processed by operators is staggering.

Equally staggering is the *value* of that data. A trained eye might see possible trends, roadblocks, or future behavior; applied AI can use that knowledge to anticipate events and take action before the quality of service (QoS) is affected or a customer is frustrated, for example. When experts are overwhelmed with troubleshooting incidents and solving problems, they may struggle to adjust a service as a customer is using it or notify a network engineer of a troubling trend. Regardless of skill, even the most experienced staff cannot manage the increasingly large volume of complex events from multiple sources without the aid of Automated AI solutions.

Injecting or wrapping OSS/BSS solutions and data with AI code enables users to transition AI into operations at their own pace and derive the benefits of AI without massive system upgrades. By wrapping existing systems and data with AI capabilities, you get maximum advantage from existing solutions while adding the intelligence that is so desperately needed by CSPs.

It's clear that good data is critical to successful telco operations, but if the SMEs that have intimate knowledge of existing systems and processes have to wait for AI support, companies incur higher costs with fewer benefits. Hurdles like this are part of the reason why 80% of AI projects fail to deliver on their intended promises.[3]

3 Source: Gartner, 2020

MAKING THE JOURNEY TO AN ENTERPRISE AI PLATFORM

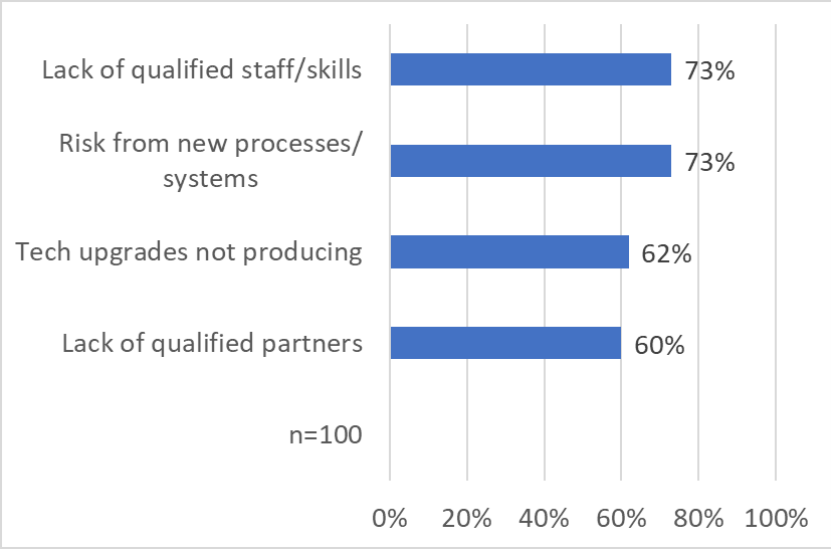
Telecom operators collect multiple terabytes of data from infrastructure, applications, customers, and devices every day— data that is becoming one of the most important assets that operators have. The volume and complexity of that data requires an enterprise AI platform that is powerful enough to rapidly digest mountains of data, flexible enough to adjust to changing operational conditions, and usable by business analysts and SMEs so that business units don't have to wait months for a data scientist to design and develop basic functionality or create a "what-if" model.

However, data volume is not the biggest challenge operators face when looking to implement AI across business units and operations. Specifically, a lack of available talent to both CSPs and contractor partners combined with the inability to utilize data from multiple sources and systems are not producing the benefit that operators need.

Even if a CSP is able to hire data scientists, their time is often spent doing tedious, manual work instead of the strategic work necessary to drive value, which does little to increase revenue or reduce expenses. Though many data scientists initially resist an AI platform, a solution that is designed to be data science-friendly and more intuitive actually frees up their time to work on optimizing operations and adding business value.

Likewise, an AI platform that is also friendly to business analysts and SMEs enables those with intimate knowledge of an operating process and the associated OSS/BSS solutions to integrate AI and rapidly deliver results.

The next step in applying AI to create value for operators is improving the process for creators of AI models and scenarios. CSPs require an applied AI development environment that accommodates a wide variety of data and users.

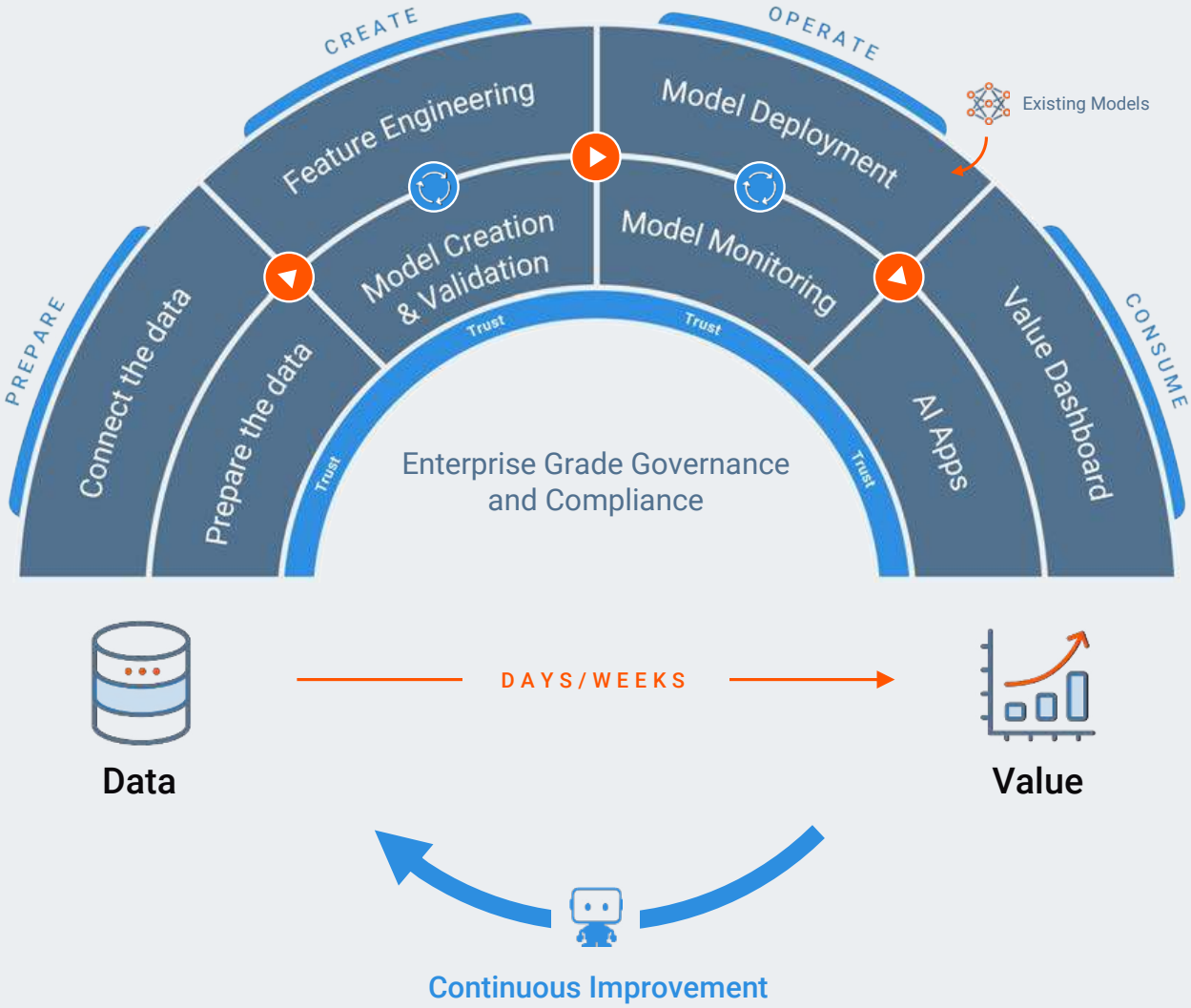


Source: ICT Intuition, LLC, DSP 2020

Specifically, an applied AI platform must enable these functions reliably at the scale required by CSPs:

- Connect the data
- Prepare the data
- Engineer features
- Create and validate models
- Deploy models
- Monitor and manage models
- Apply governance and ensure compliance

Companies struggle to find Data Scientists. An applied AI platform delivers a standardized environment that can eliminate much of the manual and repetitive work performed by data scientists to prepare data and deploy models. Likewise, an environment that enables business analysts, analytics engineers, product managers, and customer-facing operations personnel to understand and adjust the application of AI to their own processes helps to foster trust and improve the efficiency and job satisfaction of data scientists.



RESPONDING IN REAL TIME

Analytics and automation have been a necessary part of network and customer-facing operations for many years. However, these capabilities have been fixed and hardwired to existing workflows. When AI is added to existing OSS/BSS, analytics and automation operators can understand network and customer behaviors and respond before the events happen rather than after the fact.

Injecting AI into CSP operations helps teams to take action based on intelligence gleaned from current, archived, and analyzed data as it happens. AI code requires constant updating and adjustment to maintain accuracy and reliability. When AI directs a response, it is critical that it be the right one. By continuously analyzing incoming data, comparing it to previous cases, and aligning it with what is happening now, AI can help teams take action quickly.

With an end-to-end view of the customer journey, CSPs can understand customer behavior and take immediate steps to solve problems, upsell, present alternate offers, apply discounts, or determine churn propensity while optimizing utilization of network and computing resources and applications. That includes interpreting targeted data about the network, services, support, billing, security and utilization.

AI uses data collected data from multiple sources inside and outside the business to rapidly detect and mitigate fraudulent activity, analyze customer behavior, or understand faults. To execute intelligent actions in real-time, AI-wrapped OSS/BSS must be capable of large-scale data collection, correlation, processing, and distribution.

Achieving this level of real-time sophistication with AI is extremely difficult and expensive using existing systems and resources. For this reason, it is important to have a platform that has access to real-time, operational and historical data from a wide variety of sources regardless of where it is stored or how it is being used. Augmenting existing OSS/BSS to react quickly based on AI direction requires broad access to reliable and current data. By using a common AI creation platform, your business ensures that data from any source is rapidly and reliably applied to end-to-end AI operational use cases.

AN INTELLIGENT WAY TO ADD INTELLIGENCE

There is no doubt that incorporating AI will genuinely benefit CSPs. The difficulty lies in the ability to inject AI into existing OSS/BSS functions and making that AI development environment available and accessible to individual business units and users. By using DataRobot, all key stakeholders can now extract business value from their data.

- **AI Creators** (data scientists, software developers, and business/data analysts) can gain access to hundreds of the latest machine learning algorithms, with full transparency and control over the model building and deployment process. This simplifies the process of building, tuning, and deploying models.
- **AI Operators** (IT, DevOps) can put machine learning models into production with just a few clicks, then govern, monitor, and manage those models over their entire lifecycle.
- **AI Consumers** (business executives, analytics and department leaders) can leverage pre-built AI applications to apply AI and data-driven decision-making to accelerate return on investment (ROI) and reduce total cost of ownership (TCO).

DataRobot delivers on these key requirements with an enterprise AI platform that accelerates and democratizes the end-to-end data science process all the way from data to value.

DataRobot is best known for its continuous and end-to-end automation across the entire lifecycle. For machine learning development we offer visual, AI-assisted data prep, automatic feature discovery and engineering

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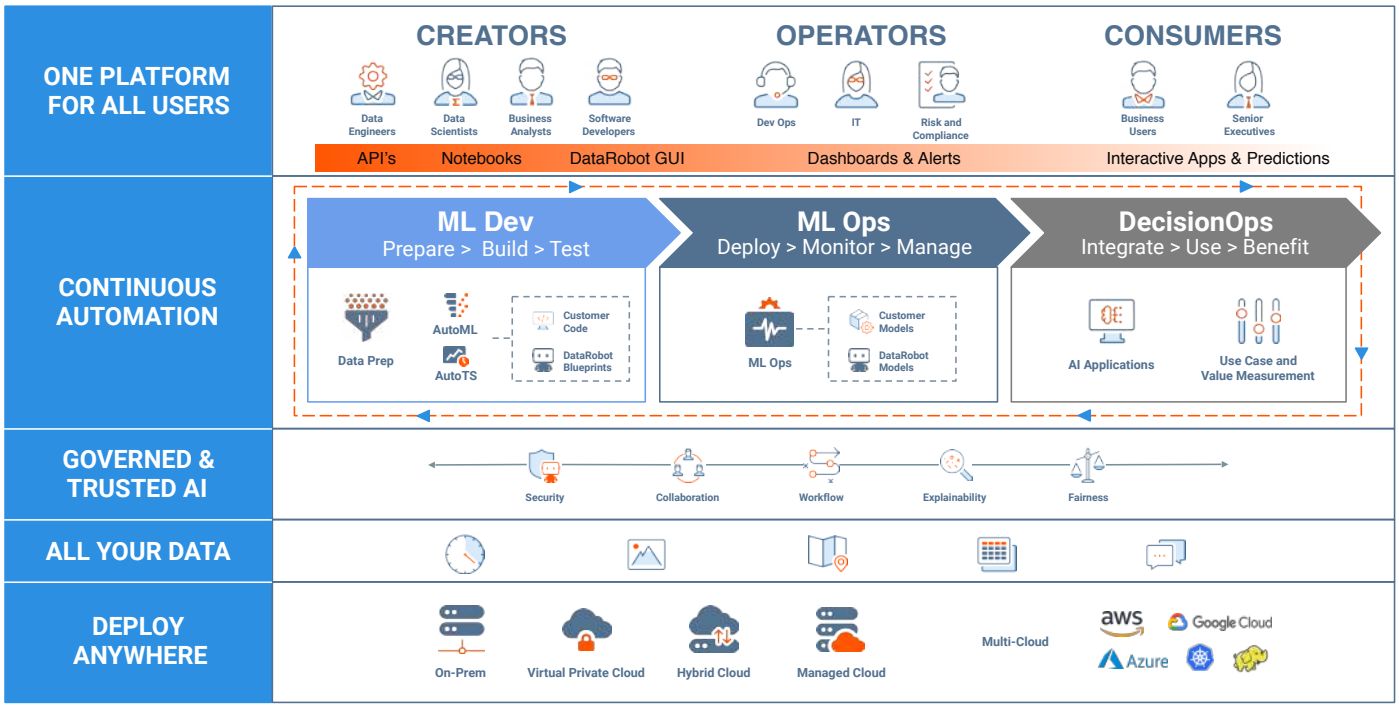
— Dan Wright, CEO at DataRobot

and automated machine learning and time series. For models in production, the DataRobot MLOps product enables you to establish a center of excellence for all your production models no matter how they were created or where they are deployed. And the DataRobot AI Applications and Use Case Value tracking tools put the predictive power of AI right into the hands of frontline users to improve decision-making and help them understand the true ROI of their AI initiatives.

The key to AI success is automating the development and integration process. Tools including automated machine learning (AutoML) and machine learning operations (MLOps) enable SMEs to rapidly prepare data, share datasets, develop use cases, define features, and manage changes while eliminating the burden on data scientists to define and develop use cases and track down relevant data.

AutoML enables SMEs to automatically build models that incorporate their specific subject matter knowledge. MLOps brings together data scientists and telco operations professionals to manage the machine learning lifecycle and bridge the gap between the data teams who build and train machine learning models and the operations teams responsible for implementing processes. With AutoML and MLOps, team members with an expertise in engineering, fulfillment, or customer-facing

DataRobot Enterprise AI Platform



processes can create an AI solution without having to fully understand the complexities of data science.

Likewise, the data scientist is no longer required to spend precious time on data preparation or manual process definition but can devote their energy to algorithm development and integration. Enabling individuals who are most directly involved with OSS/BSS solutions to start the applied AI process means that the resulting use case is more relevant and the dataset more complete.

The DataRobot enterprise AI platform analyzes available data on a scale required by some of the most complex, data-intensive industries in the world. Iterative algorithms and automated machine learning refine automation by creating blueprints and reducing time-to-deliver AI functionality. Specifically, the DataRobot platform provides value to the following functions:

- **Machine Learning Development –** Data is prepared from any combination of sources in any location including text, images, location, numerical, categorical and others. Automation aligns new requirements with existing AI code and DataRobot blueprints to take advantage of existing and proven capabilities.
- **MLOps –** As an AI solution is deployed, the platform monitors usage and performance while updating existing models and blueprints with timely and accurate information. The DataRobot AI platform enables operators to maintain all production models in one place regardless of how they were created or where they were deployed. To ensure transparency and auditability, security and governance are paramount and applied across every use case, workflow, and development effort to ensure transparency and auditability.
- **Decision Ops –** Intelligence is readily available to users for decision support and strategy development. As the AI applications are used, metrics are gathered and KPIs determined to understand value, revenue impact, and effectiveness. These metrics can be reported directly or integrated with existing systems and even customer portals.

Management of AI is essential, and 70% of operators believe that CSPs need a management layer for AI.[4] By seamlessly integrating AI into existing business processes, the DataRobot platform is also able to seamlessly integrate management of AI functions.

4 Source: TM Forum, 2020

EXAMPLES OF USE CASES

Forecasting Capacity and Managing RAN Upgrades

Using enterprise AI, CSPs can more accurately predict the load on each Radio Access Network (RAN) site to avoid making expensive upgrades before they are necessary. Existing percentage growth estimates are not accurately predicting where or when upgrades might be needed. By adding AI to the planning process, RAN upgrades can now occur when and where they are needed, resulting in more accurate planning and reduced capital spending.

Network rollouts, such as 5G or IoT, take a long time to complete and consume the bulk of capital expenditures. Using applied AI to accurately predict where and when construction, expansion, redistribution, and retirement are needed shortens the planning process and better aligns planning to future reality. Regularly refreshing the models with data from existing sources as well as public sources (i.e., building permits, zoning changes) not only improves initial designs but enables timely adjustments to ensure engineering plans remain valid throughout the build.

Traffic Management

As utilization increases in a particular location or at a certain time of day, traffic can be re-routed to available capacity and resources. Virtual elements can be quickly added or subtracted to address dynamic demand, emergencies, or outages at the edge of the network without impacting other locations and customers. Customers can be automatically notified if there is a problem. This can help reduce the number of customer calls, and those that do call can receive the same information via automated voice response.

Fighting Fraud

A large healthcare company used what it knew about fraudulent claims to predict where the next fraudulent claims would come from. Using the DataRobot platform to operationalize and manage models, leads were presented to the fraud department, investigated, and stopped before damage was done. The company quantified the benefit at $10 million.

From fraud detection to churn prediction, applying AI analysis to mountains of transactions helps operators understand customer behavior and experience, while identifying threats and taking immediate action. Based on an understanding of user behavior, location, and history, customers can be automatically notified about suspicious transactions and companies can take immediate action to block fraudulent usage and avoid charges.

Rapid Response to Shifting Demand

A global retailer needed to proactively address shifts in market demand to provide products that customers wanted, when they wanted them. Traditional forecasting techniques were proving inaccurate and unable to accommodate short product lifecycles, diversity of products, and the volume of data. By integrating DataRobot across the entire demand forecasting process, the retailer was able to accurately predict the full product lifecycle and manage demand in a timely manner, resulting in annual savings of $400 million.

Using propensity modeling, operators can better understand which new services customers will pay for. Forecasting demand in specific areas at specific times or seasons helps operators understand where and when capacity is needed and whether that capacity is available from existing resources, partner resources, or will require additional engineering. “What-if?” modeling using the DataRobot enterprise AI platform can test messaging, refine demand estimates, and target marketing.

Customer Experience Management

A large retailer used the DataRobot platform to analyze past transactions to better target digital customers. The online conversion rate increased from an average of 3% to an average of 4.35% as model accuracy improved. Given the large volume of online transactions, the retailer realized an additional $1.4 million in revenue.

Nearly 60%[5] of all customer transactions are digital. Applied AI helps operators understand what customers are searching for, who is searching, why they are searching, and what the right answer is. AI can help answer a popular or common question immediately or the most common answer can automatically be pushed to the top of the search. Then, if warranted, product managers can be notified that a majority of users are having problems with a specific feature and can make adjustments quickly.

5 *DSP 2020*, ICT Intuition, LLC; 2020

Making Data Science Efficient

Numerous organizations are leveraging the DataRobot enterprise AI platform and improving the efficiency of their data science teams by offloading a substantial amount of manual and time-consuming effort to the platform.

The DataRobot platform accelerates AI use case throughput by increasing the productivity of data scientists and empowering non-data scientists to build, deploy, and maintain AI without having to learn traditional data science methods. Instead of spending weeks or months developing and testing a few hand-coded machine learning models, your current team can build hundreds of models and deploy the best performing model in hours to help solve complex, high value operational challenges.

ABOUT DATAROBOT

DataRobot is the leader in enterprise AI, delivering trusted AI technology and enablement services to global enterprises competing in today's Intelligence Revolution. DataRobot's enterprise AI platform is a cloud-native, scalable platform that democratizes data science with end-to-end automation for building, deploying, and managing machine learning models. This platform maximizes business value by delivering AI at scale and continuously optimizing performance over time. The company's proven combination of cutting-edge software and world-class AI implementation, training, and support services, empowers any organization – regardless of size, industry, or resources – to drive better business outcomes with AI.

With a singular focus on AI since its inception, DataRobot has a proven track record of delivering AI with ROI. DataRobot has offices across the globe and $750 million in funding from top-tier firms, including New Enterprise Associates, Sapphire Ventures, Meritech, and DFJ Growth. For more information, visit datarobot.com, and join the conversation on Twitter and LinkedIn.

Find out more about DataRobot's capabilities in Telecommunications.

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