WHITE PAPER

How to Choose an AI Vendor

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DataRobot

How to Choose an AI Vendor

What is Artificial Intelligence?

Artificial Intelligence enables computer systems to perform human tasks. Primitive AI systems represented knowledge as a system of rules. Today's AI systems use machine learning to understand the world.

$8-12 BILLION
TOTAL INVESTMENT IN AI IN 2016

61%
BUSINESS LEADERS WITH AI AS TOP DATA INITIATIVE

$58 BILLION
WORLDWIDE SPENDING ON AI BY 2021

AI Drives Business Value

Artificial Intelligence (AI) is in the news. Every day, it seems, we hear new stories about the remarkable things it can do, such as diagnose cancer or detect cybercrime. AI is changing business, improving the quality of work, and making prediction cheaper.

Business leaders see the potential of AI. McKinsey estimates total investment in AI of $8-12 billion in 2016. In a recent survey of 1,600 business leaders, 61% cite AI and machine learning as their top data initiative. Consultant IDC predicts that worldwide spending on AI will reach $58 billion by 2021.

AI TRANSFORMS BUSINESS IN THREE WAYS:

Firms use AI to drive topline growth. Examples include:

- Identify the best prospects for marketing campaigns
- Make targeted offers
- Set optimal pricing and discounts
- Allocate sales effort to the most promising prospects

Firms use AI to cut costs and improve margin. Examples include:

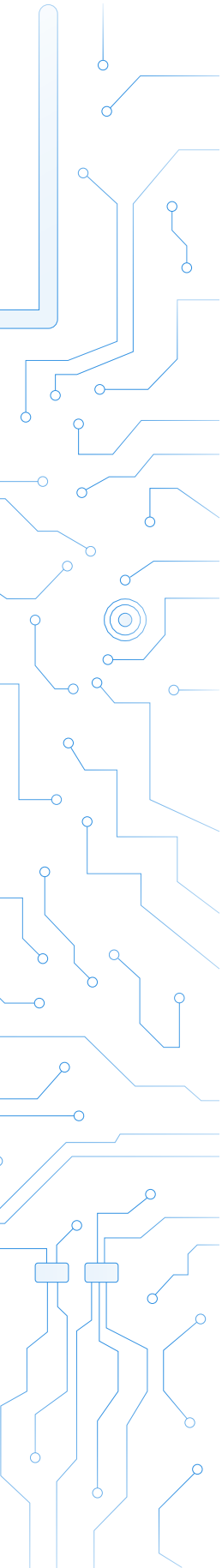
- Reduce excess banking reserves
- Minimize costs of materials
- Adjust call center staffing
- Optimize store locations and inventory

Executives understand the growing cost of compliance. AI helps them manage this burden. Examples include:

- Improve trading compliance
- Better fraud detection
- More efficient casework
- Better customer due diligence

The evidence is clear: AI enhances business, in hundreds of ways.

However, there's a hitch.



Choosing an AI Vendor is Hard

Business leaders want to invest in AI. However, selecting an AI vendor is hard. Let's look at what makes it hard to place bets on AI.

HYPE

Executives are right to suspect vendor claims for AI. Hype is inherent in new technologies, and AI is no exception.

Many of the vendors that tout AI don't deliver it. For example, many database vendors claim to offer AI. Since you need data for AI, they say, a data platform is an AI platform. They even make that claim if customers must use other tools to perform the actual AI work.

Legacy software vendors add AI functions to an aging code base and call it "AI." That's like adding fins to a 1950s Buick and calling it a rocket. Legacy software cannot support AI at enterprise scale.

Another vendor trick: rebrand software as "AI" with no change to the product. One company changed its website domain to "dot ai" and declared itself "AI for the Enterprise." Another tech giant has 100+ products that carry its unique AI brand. Most of these products are legacy software repackaged as "AI."

The Guardian documents the rise of "Wizard of Oz" AI vendors. These vendors claim to offer "AI in a bottle." In reality, they employ data scientists behind the scenes who do the work. This practice is surprisingly widespread.

"Wizard of Oz" AI vendors offer value for firms who need rapid results. However, these vendors don't help your team build skills. Even worse, they may be difficult to dislodge. The New York Police Department learned this in 2017. Ending its contract with a vendor proved to be a messy affair.

AI can do remarkable things. It can play games or impersonate human Twitter users. However, executives doubt such marketing tricks. Most firms aren't in the business of winning Jeopardy or tweeting. They want to increase revenue, reduce costs, and manage risk. Your AI solution should provide tangible business impact and drive business results.

VENDOR CHURN

Venture capitalists love AI. In 2017, VCs poured $12 billion into AI startups, double the volume in 2016. Wired magazine notes that AI experts can raise capital without an idea, product or business. VCs figure that a tech giant will acquire the company even if it doesn't build anything.

The result: a rapid explosion in the number of companies touting AI. In December 2014, consultant Shivon Zilis compiled a list of 2,529 vendors for an infographic. In the third version of her Machine Intelligence Landscape, she identifies 3,200 vendors. Crunchbase, a public database of startups, lists 6,008 AI vendors. Many of these are under three years old.

A few of those vendors will be unicorns. Many will struggle to grow, and some will fail. The graphic below shows just some of the AI startups that are no longer with us.

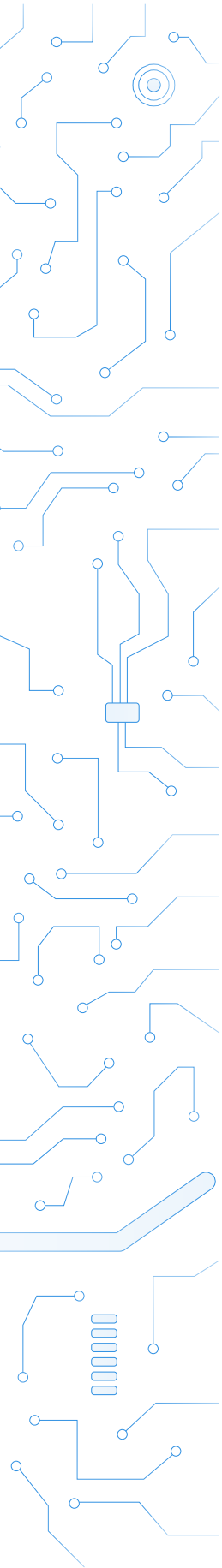
AlchemyAPI	Datalogix	Kogentix	Skytree
Alpine	DataRPM	KXEN	Statistica
Arimo	DataScience	Metamind	Turi
Bonsai	DeepMind	Predictix	Visual IQ
Brainspace	Empirical	Predixion	Wise.io
Datahug	Kensho	SalesPredict	Zodiac

These startups did not simply die. Other companies acquired them. You may think that's not such a bad thing, but think again: acquisitions disrupt customers. Users may experience support issues. Some acquiring vendors discontinue support altogether. This action forces customers into costly migration projects.

Acquisition impairs customer experience. Startups are agile. They innovate to give themselves an edge. Their people work hard to delight the customer.

Acquisition changes that. Customer requests get lost in layers of product management. The best people cash in and exit. Service quality declines, and the product loses its shine.

Vendors come, and vendors go. The conventional wisdom says big vendors are a safe bet. That's no longer true. Growth matters; size doesn't. Look for an AI vendor with a track record of growth and a viable business model.



TECHNO-BABBLE

AI is a complex technical field, with a language of its own. Executives struggle to communicate with AI experts. Executives want to talk about business. Experts speak about hyperparameterization, deep adversarial networks, and TensorFlow epochs. Finding common ground is a challenge.

Techniques within the AI field use different language for similar concepts. For example, neural networks, decision trees, and kernel-based methods all have distinct terms. Machine learning experts think one way; experts in statistics do so in a different way. Deep learning experts use unique jargon. One deep learning framework, TensorFlow, has a language of its own.

Businesses need people who can bridge the gap between executives and AI experts. McKinsey notes the dearth of business translators, who serve as the link between AI experts and business applications. Business translators combine data skills with industry or functional expertise. Owing to the shortage of such people, executives struggle with AI jargon and buzzwords.

Businesses need people who can bridge the gap between executives and AI experts.

You need to focus on running your business. Look for an AI vendor that explains things in plain language. Seek out AI products that deliver interpretable insights. Avoid vendors that blow smoke and jargon in your face.

Hype. Vendor churn. Techno-Babble. These are some of the issues that make it hard to choose an AI vendor.

You can navigate the fog. Keep reading.

What to Look for in an AI Vendor

Transforming your business with AI is no easy task. Software is necessary, and so is hardware. However, that's not all. You will need process engineering, staff training, and a new approach to business. You're investing in human capital. You need a partner that understands that. Look for an AI vendor that will help you transform your business.

In 2016, a website called Beauty.ai launched a "beauty contest" using AI to judge the winners. Contest organizers used a convenience sample of images to train their model. The sample included no persons of color. As a result, the model learned "whiteness" as an attribute of beauty. It assigned lower ratings to dark-skinned contestants.

PRAGMATIC APPROACH

AI has theorists and "opinion leaders" who publish their ideas in business journals. That's a good thing: theory drives innovation. However, many ideas look great on paper but don't work in practice. Look for vendors who strike the right balance between theory and practical experience.

Executives express astonishment at the cadence of change in AI. Data scientists choose from more than 100,000 open source packages for AI applications. Your firm can't test every package to see which one delivers the most value. Look for an AI vendor that builds testing and validation into its processes. That way, your people don't have to spend time resolving bugs and issues.

AI is dangerous for the same reason it is powerful. Business leaders must trust AI before they can rely on it to solve mission-critical problems. Skilled AI developers use standard practices for testing and validation. Look for vendors who build best practices into their solution. This ensures guardrails help novice users produce viable models. Also, insist on vendors that make machine learning models transparent, clear, and easy to interpret.

VIABILITY

Will your AI vendor still be around in a year? Or three years?

Most startups don't simply go out of business. Someone else acquires them, or acquires their assets. As we noted previously, acquisitions disrupt customers. Acquisitions impair experience. When someone else acquires your AI vendor, you pay.

There is a tradeoff. If your vendor is a big public company, they probably aren't going anywhere. But many big vendors deliver poor customer experience. Just look at these comments by a leading industry analyst. Customers of the largest vendors aren't happy:

"Feedback from reference customers on their customer experience with [Vendor X] was unfavorable, including low scores for inclusion of enhancements/requests into subsequent releases, overall rating of product capabilities and business value delivered. [Vendor X]'s operations also scored poorly, with low scores for documentation, customer support and analytic support."

"[Vendor Y] has one of the lowest overall customer satisfaction scores in this Magic Quadrant. Its reference customers indicated that their overall experience with [Vendor Y] was poor, and that the ability of its products to meet their needs was low."

Big vendors tend to focus on profitability rather than growth. They accomplish that by cutting costs -- and customer support is often the first thing to go overboard. Company X, above, improves profits by outsourcing operations to wherever it can run the lowest-cost operations. The best people from startup days are long gone.

On the other hand, if your vendor is immature, you may be in for a bum-py ride. Early startups are great if you like adventure. If you don't mind serving as your vendor's "guinea pig" while they figure everything out.

Look up a prospective vendor in Crunchbase, a platform for finding business information about private and public companies. Crunchbase compiles information from company disclosures when they secure venture capital.

Check to see when the founders launched the company. Use extra care when evaluating companies that are less than three years old. It takes that long for a startup to get a product into the market, acquire some customers, and get organized for growth.

If a company's last funding round was a "Seed Round", approach with caution. They aren't ready for the big leagues.

Check the company's last funding round. If the last funding was a "Seed Round" approach with caution. The company isn't ready for the big leagues.

Look for venture rounds -- usually labeled Series A, Series B, and so forth. When startups secure venture rounds, they go through rigorous examination by venture capitalists. Venture capitalists aren't perfect judges, but they have skin in the game. Startups that secure venture rounds have proven leadership and a winning product. They make their numbers.

Here's a good rule of thumb. If a startup hasn't secured a new venture round in more than two years, something isn't right. They're unable to persuade investors in the merits of their company. Perhaps their leaders have a poor track record. Possibly they aren't making their numbers. There may be something wrong with the product. A lack of funding does not tell you what is wrong with a startup. It simply tells you that something is wrong.

CEOs of startups that can't find new funding will try to feed you a line. "We're committed to a slower growth path, so we cut our burn rate." This is invariably nonsense. Growth is the only currency among startups. If a vendor isn't hungry for growth, it will soon be toast.

You should also look up the company in LinkedIn. LinkedIn will tell you how many people the company currently employs. It tells you whether headcount is growing, flat, or declining. Look for vendors that are big enough to meet your needs, and show steady growth.

MODERN SOFTWARE ENGINEERING

Look for an AI platform that is scalable and elastic.

Above all, it means the ability to support the needs of large enterprises.

The Varied Definitions of Scalable

Do You Need Graphical Processing Units (GPUs)?

If you think you have the world's most magnificent hammer, the world looks like a nail. That's how some vendors sound. They want you to believe you should make GPUs the center of your AI strategy. Fact check #1: you may need GPUs for some use cases, but you don't need them for all of your use cases. Fact check #2: you may need GPUs for model training, but you don't need them for production. Fact check #3: the most advanced AI users look beyond GPUs to TPUs and FPGAs. Bottom line: look for AI software that runs on your standard hardware.

Machine learning workloads use a lot of computing power. However, they use that power for a short time. An AI platform should scale on demand. That way, you don't have to invest in more hardware than you need.

As mentioned earlier, some vendors add features to a legacy code base and call it AI. That isn't going to scale. Look for an AI platform with a modern foundation. Your platform should work with today's virtualized and containerized IT architecture.

Firms have a wide range of choices for cloud computing. Some embrace the public cloud. Others invest in private clouds and virtual private clouds. Some eschew cloud computing altogether and require an on-premises solution.

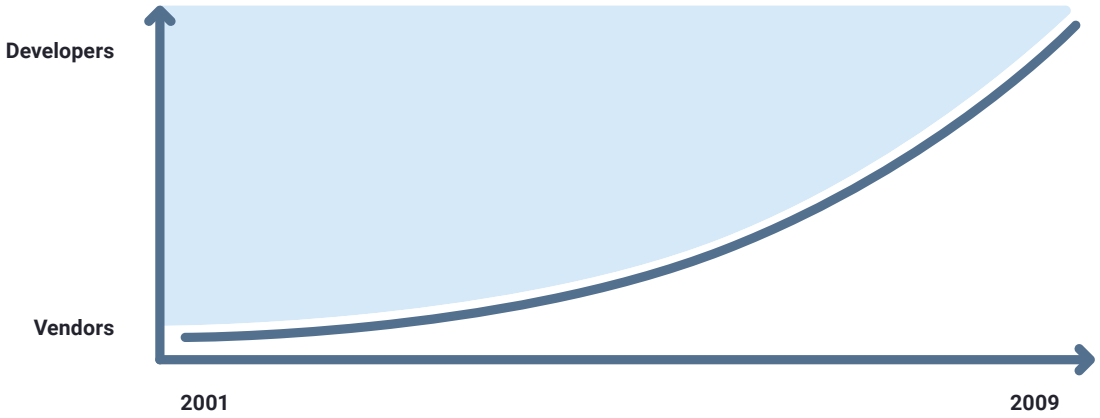
AI development uses a lot of computing power for a short time. Many firms choose to provision this work in the public or private cloud. AI deployment workloads are different. They use one record at a time, repeat many times, and require high speed. Most firms provision AI deployment workloads close to the business application. These applications can be either on-premises or in the cloud.

Look for flexible and portable AI. You may need to host the platform in the cloud, on-premises, or a combination of the two. Remember that your needs may change as you add use cases. Look for a platform that allows you to change your approach without a costly "lift and shift."

Open source software is the key to innovation and value. The speed of change in open-source projects is remarkable. In six months, the TensorFlow project became the leading machine learning project. Leo Breiman first introduced the Random Forests technique in 2001. Developers released an open source version right away.

A leading analytics software vendor took nine years to deliver its version of the algorithm. In some areas of machine learning, such as deep learning, open source software is the only viable option.

Some vendors offer closed software that users can query from Python, R, or Scala. They claim that this makes them "open source compliant." It's a bogus claim. Machine learning algorithms are the most dynamic part of the AI ecosystem. Your AI vendor should take advantage of that innovation, not compete with it.



Value matters. The Mercedes AMG S65 Coupe is an excellent car. For $241,195, you get a V-12 engine whose 621 horses will take you from 0 to 60 miles per hour in four seconds flat. Still, if you're shopping for a fleet of cars, you're going to check out Fords, Chevys, and Toyotas. The same principle holds in AI. If you want to scale AI to transform your business, choose a platform that delivers the best possible value.

In practice, that means three things. First, look for AI vendors that build on a foundation of open source software. Second, develop your AI solution on commodity hardware. Avoid solutions that force you to make risky bets on new technology. Third, choose a platform that is simple to deploy and manage. Avoid high maintenance costs that consume your gains from AI.

SUPPORT FOR A BROAD RANGE OF USERS

We hear a lot about data science "heroes." However, real AI projects take a team effort. The table on page 10 shows an example, from a leading insurer.

- Project and program managers
- Junior data scientists
- Network specialists
- Other IT specialists

CONTRIBUTOR	ROLE
Business Analyst	Work with stakeholders, define requirements
Lead Data Scientist	Principal investigator, responsible for model accuracy and validity
Peer Data Scientists	Provide an independent review of the project
Machine Learning Specialists	Provide expertise in sub-specialties, such as image recognition or natural language processing
Compliance Specialists	Verify that project complies with organization policy and applicable regulations
Data Engineers	Develop production data pipelines
DevOps Specialists	Provide provisioning and support for AI platform
Data Management Specialists	Manage source and target data platforms
Application Developers	Develop end-user applications
AI Engineers	Embed AI in end-user applications
Systems Administrators	Support production infrastructure
Security Specialists	Maintain compliance with security policies

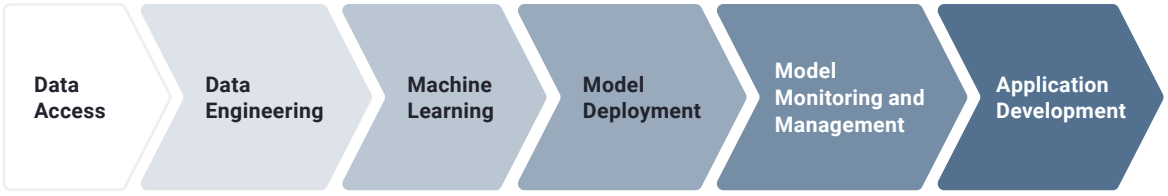
Some vendors seem to think that all AI contributors are the same. They figure that everyone wants a drag-and-drop interface. Alternatively, they believe that everyone wants a programming API. In reality, you're going to need to support diverse users:

- Business leaders want dashboards to track overall results from the AI initiative
- Business users want quick insights in a visual format that's easy to manipulate
- Expert data scientists, want to code in Python or R
- "Citizen" data scientists prefer a graphical tool
- Developers need to integrate AI into production applications
- IT admins want a management console

It's not enough to have many different client applications. Some users prefer to work with their favorite apps like Microsoft Office or Tableau. They don't want another client. They want to be able to work with AI from the tools they use today. Seek a vendor that offers the open APIs and business partnerships that make that possible.

SUPPORT FOR THE AI LIFECYCLE

Executives complain that it takes too long to get AI into production. On average, according to Gartner, it takes three months to deploy a model. That's the average; in some cases, the cycle time is six months or a year. Defining a process for AI from data through deployment is the key to reducing cycle time. Look for an AI vendor that understands and supports the complete lifecycle.



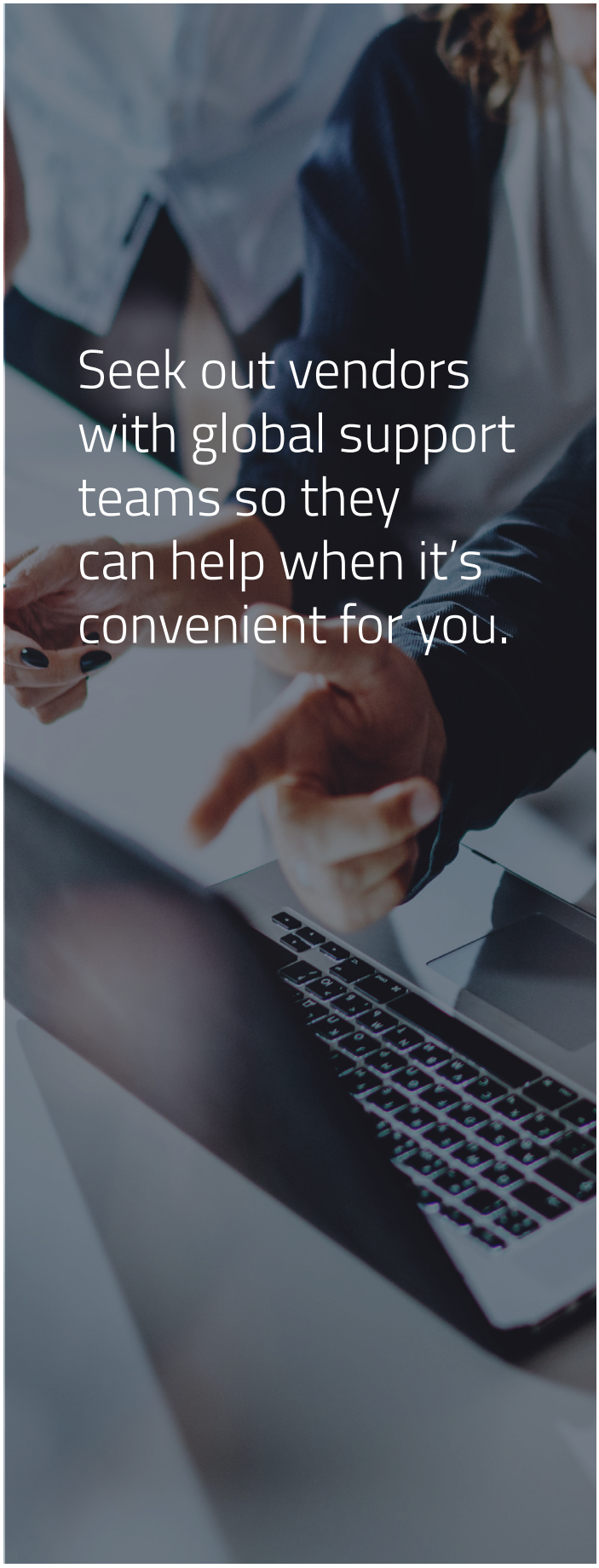
AI requires data and lots of it. Your people need secure access to internal and external data. Data platform vendors say that it makes sense to co-locate AI workloads in their data platform. In theory, that reduces the amount of time your developers spend moving and copying data. In practice, you realize those savings only if all of the data you will ever need for AI is in one place. That's rare. Focus instead on ensuring secure remote access to your source data.

Every machine learning algorithm needs data structured in a single denormalized record for each case. Most firms store data in many different tables, or in an unstructured format. That means every machine learning project needs work to prepare the data for analysis.

Data scientists run experiments to test the power of different algorithms. A single project can require hundreds or even thousands of experiments. For each trial, data scientists manipulate data for best results with a particular algorithm. Data scientists call this process feature engineering. In addition to training models, data scientists must validate the models and prepare performance metrics. Automating this task speeds time to value, and ensures the use of consistent methods on every project.

AI teams deploy approved models into business operations. Deployment approaches fall into two major categories: batch and real-time. In batch deployment, a process scores new data on a fixed schedule and stores predictions for use. In real-time implementation, a process produces predictions for each transaction on demand.

Models are valuable assets. They are expensive to develop and contain embedded intelligence that must remain secure. An AI process must include a way to store and catalog models, so they are accessible to authorized users. In addition, the quality of AI models degrades over time. The AI platform should track and flag models that underperform.



AI produces value by supporting a business process. Application developers bridge the "last mile" between the AI platform and an end user. They work with languages like Java, .Net, node.js, Ruby, or Scala. Your AI platform should provide the APIs and SDKs developers need for speedy work.

COMMITMENT TO CUSTOMER SUCCESS

Transforming your business with AI is hard. Some vendors will try to tell you it's easy if you buy their product. Don't believe them. Seek out vendors that understand the challenge and design their offerings accordingly.

Rome wasn't built in a day. You're going to need time to develop your AI platform, but you need results now. Look for a vendor that offers you a managed service on demand. To avoid lock-in, make sure that you can transfer work to your on-premises or private cloud platform when you're ready.

You're going to need technical support. Look for a vendor with a large and experienced support team with the know-how to work with your enterprise platforms. For timely support, seek out vendors who have global support teams. That way, they can help when it's convenient for you.

Why not outsource your AI? Because you want to build the skills of your people. That means an investment in training. Look for a vendor that offers structured training courses, for efficient knowledge transfer.

For rapid business value, you want to supplement your people with skilled experts. However, some service providers want to maximize billable hours. You don't want to be locked into a restrictive services agreement. Your AI vendor should provide you with well-designed programs delivered by people who know how to get things done.

AI is hard. You need a vendor that understands the challenges and has the resources to make your team successful with AI.

DataRobot: Your AI Partner

Hype, vendor churn, techno-babble. Taken together, these things make AI seem dark and dangerous. Exaggerated claims are tiresome. Listening to techno-babble is like eating a word salad.

Hi. We're DataRobot, and we'd like to be your partner for AI. You have business problems. We'd like to help you solve them. Sure, we have scientists and engineers working here. Smart people building cool software. But our conversations with you will focus on the needs of your business, not the coolness of our algorithms.

You want a partner that's going places. We're rapidly building customer relationships. We focus relentlessly on making our customers successful with AI. We're building the best team of customer-facing specialists in the industry.

Don't let anyone tell you that AI is easy. AI is hard and you will need help.

You need high performance. We built DataRobot from the ground up for high performance on commodity hardware. Everywhere: in public and private clouds; on-premises; in bare-metal and Hadoop clusters.

When you drive value with AI, you will need to support many different types of users. We get it. DataRobot presents a simple and intuitive interface for the novice user. You can easily export our graphics to your favorite productivity tool. For users who want to write code, we present a Jupyter API.

For early value, you're going to need to rethink how your organization manages the AI lifecycle. Instead of siloed tasks, you need seamless handoffs -- or no handoffs at all -- from data to deployment. At DataRobot, we aim to support the complete AI lifecycle with a best-in-class solution.

Finally, don't let anyone tell you that AI is easy. AI is hard, and you will need help. DataRobot offers you a full range of value, including software, services, and training.

Think through the ideas we've outlined in this paper. Then, let's get together and talk.

And, here's a promise: we will never serve you a word salad.

DataRobot

DataRobot helps enterprises embrace artificial intelligence (AI). Invented by DataRobot, automated machine learning enables organizations to build predictive models that unlock value in data, making machine learning accessible to business analysts and allowing data scientists to accomplish more faster. With DataRobot, organizations become AI-driven and are enabled to automate processes, optimize outcomes, and extract deeper insights.

Learn more at **datarobot.com**