Unlocking the Promise of Artificial Intelligence and Machine Learning

Using Analytics and Data Science to Increase Value

WHITE PAPER

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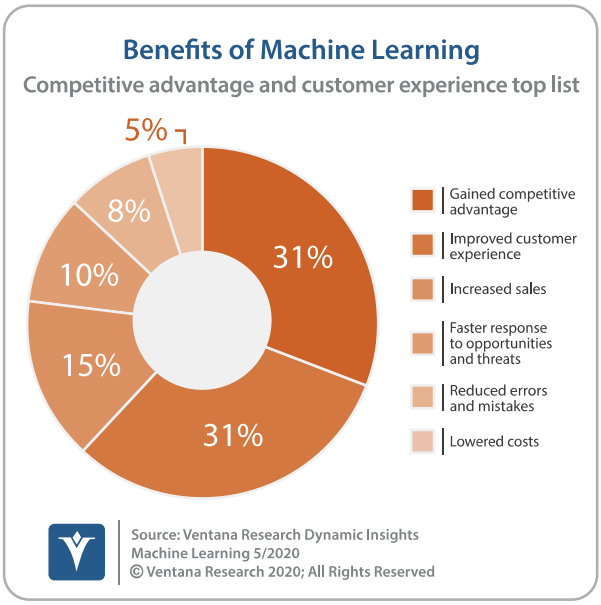
Unlocking Business Value with AI/ML

Artificial Intelligence and Machine Learning (AI/ML) have quickly become difference makers for organizations looking to develop a competitive advantage. AI/ML enables organizations to make sense of the increasingly large volumes of complex information they must process, especially as it becomes ever more important to analyze data in real time. Expecting individuals to sift through millions or billions of data points manually is inefficient, ineffective and unrealistic, so today's data landscape requires algorithmic assistance for individuals tasked with making sense of the data.

AI/ML delivers real and measurable benefits. The most common benefit cited in our research is that AI/ML provides a competitive advantage, and organizations also report that AI/ML enables them to improve customer experiences, increase sales and respond faster to opportunities and threats. These benefits accrue due to the increased use of advanced analytics on data.



For example, one common application of AI/ML is to detect and prevent customer churn. If organizations can analyze data to accurately identify when a customer is likely to stop using their product or service, they can take action to retain that customer. Another application is the optimization of marketing spend by targeting specific segments of the market with the promotions to which they are most likely to respond. These targeted approaches result in both lower spend and higher conversion rates.

Businesses, markets and economic conditions are constantly changing, so AI/ML processes must be able to reflect those changes iteratively. The need for this responsive capability is no different than for other analytics processes used within the organization. And while responsiveness will be valuable under nearly all market conditions, it becomes especially important during periods of crisis and market volatility when responding to new data and unexpected factors.

To enable this responsiveness, AI/ML must be integrated into the analytics processes of the organization. Traditional data scientists and citizen data scientists (business users with the ability to use analytic platforms) may make discoveries using AI/ML, but their insights need to be communicated throughout the organization in a way that is easily understood and easily acted upon. And as with other analytic processes, these analyses must be both repeatable and agile.

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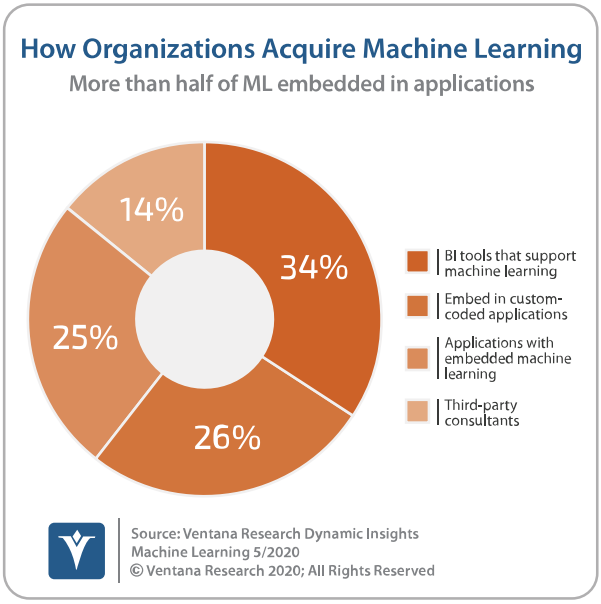
Integrating AI/ML into Analytic Workflows

AI/ML analyses should be treated like any other metric in an organization, which is to say they must be subjected to the same standards of rigor and control as analyses performed using other techniques. The quality of AI/ML analyses is dependent on the quality of the data used in the analyses, so collecting the data and ensuring its quality need to be part of a disciplined process with standard, repeatable workflows. This is not trivial, and indeed the most common AI/ML challenge organizations report in our research is accessing and preparing the data. These processes of accessing and preparing the data are also the two most time-consuming tasks organizations report within their analytics workflows, so this underscores the importance of ensuring that these processes are as robust and efficient as possible.

To maximize the value of AI/ML analyses, the results must be accessible to users within their standard analytic processes. Repeatable analytic workflows should also be used for sharing the results with subject matter experts and line-of-business personnel. Utilizing AI/ML within existing analytic workflows can help ensure the information is delivered and acted upon in a timely way. Our research finds that organizations prefer to deliver AI/ML via the business intelligence (BI) and analytic tools they already have in use. Familiar tools make it easier for line-of-business personnel to approach these new techniques and access the results of AI/ML analyses.



When AI/ML analyses can be accessed via tools already utilized within the organization, more users can benefit from the analyses without needing to be data scientists. This means the techniques and benefits can proliferate across departments and business units. For example, if AI/ML models can be used to indicate which deals are most likely to close, salespeople can use that data in their standard analyses to prioritize where they spend their time. In marketing, AI/ML models can generate customer segmentation data that can be used in standard analyses to build lists for upcoming promotions. In IT, AI/ML models can generate figures about the likelihood of system failures, which can then be included in the dashboards and reports used to monitor these systems.

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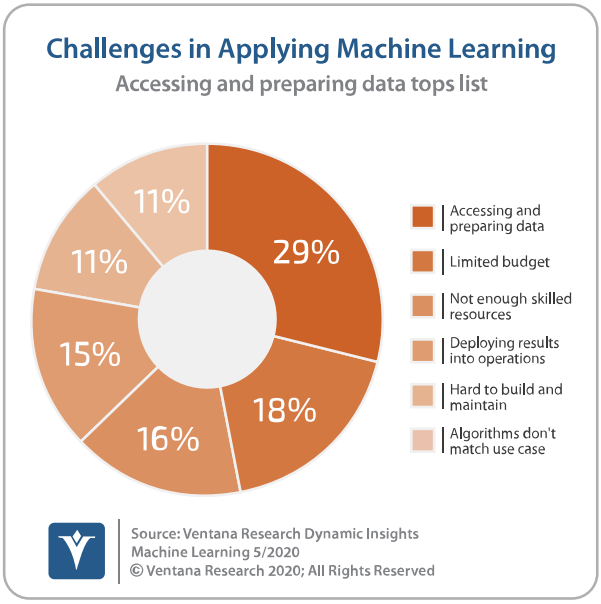
Adoption and Democratization of AI/ML Through Analytics

AI/ML is still new to many organizations. We find that more than two-thirds (68%) of organizations have been using AI/ML for less than two years or have not yet begun their AI/ML journey. Given the value these techniques provide, organizations must proactively encourage adoption of this capability or risk being left behind by the competition. AI/ML can be intimidating however, which creates roadblocks to adoption. Our research indicates that a lack of AI/ML skills within the organization can be a problem with one in six (16%) citing it as their most significant challenge.



Overcoming this challenge is important, since organizations will gain increasing value from the benefits of AI/ML as they find ways to make it more accessible. Automation can improve accessibility, thus allowing more individuals the opportunity to contribute to the process. As noted above, data preparation is a key challenge to analytics adoption, so automating data preparation increases the productivity of both skilled data scientists and citizen data scientists. Similarly, automating analytic model development allows skilled data scientists to explore alternatives more thoroughly and more quickly while at the same time enabling citizen data scientists to perform analyses they might not otherwise have been able to achieve. And to reiterate, integration with widely used analytics tools makes the results of the analyses more accessible across the organization.

Organizations can also increase adoption by providing a common scalable analytics platform that can be used by analysts with all levels of analytics skillsets. A common platform allows novices to get value from AI/ML in an environment that is trusted and understood by data science experts. Line-of-business personnel with subject matter expertise can create valuable analyses and identify associations in the data with little or no assistance. Experts can derive further value from the data by performing deeper, more complex analyses. A common platform also provides a framework to help citizen data scientists grow their skills within the platform.

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Transparency and Governance

Data scientists and other advanced users may trust AI/ML, but organizations must establish trust in these techniques among the uninitiated. Not all AI/ML happens in a black box, but it may not be understood by many and it can be challenging for line-of-business personnel to trust analyses that rely on AI/ML algorithms they don't understand. One way to increase trust is by providing transparency into the models being used.

> **Data scientists and other advanced users may trust AI/ML, but organizations must establish trust in these techniques among the uninitiated.**

Explaining the key features of a model or the combinations of factors that lead to a specific customer segmentation or recommendation will remove some of the mystery. Building a history of usage and success based on those models also helps establish trust, as does reporting on the accuracy of the models and comparing actual results from operational systems with predicted outcomes.

Even if generally accurate, care must be taken to understand and prevent bias in AI/ML models. Without monitoring and correction, models based on biased data will result in biased analyses. The modeling process simply repeats the patterns of the past unless those biased patterns are detected and corrected. For example, decades of discrimination based on gender or race could be reflected in lending data or compensation data. Analytics tools can help expose bias in historical data prior to the modeling process, leading the organization to adjust the data prior to using it for modeling. These same tools can be used to track and analyze bias in the results of AI/ML analyses to ensure any bias has been eliminated.

Just like other analytics processes, AI/ML processes need to be governed. As a starting point, AI/ML analyses should be performed on data that is considered trusted or certified by the organization. Once a model is developed, both the model and its output should be reviewed and certified for use by others. Analytics tools are valuable instruments to test the output of models and review their accuracy. Any changes to the models should also be approved and governed, and these approvals should be cataloged with other certifications of data and analyses. Numerous regulations can impact AI/ML as well and should be considered in an organization's governance policies. For example, regulations about the use of personally identifiable information (PII) could impact the data used to develop models, or regulations about the decision-making process when granting loans often require documentation of factors impacting the decision. Again, BI and analytic tools can be used to report and track much of the compliance information needed for both governance and regulatory requirements.

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Deploying and Managing Models

Like with other analytics processes, harnessing AI/ML requires a mix of creativity and discipline. Creativity is helpful while exploring the data and developing the model, but once a model is developed, discipline is important to ensure proper deployment of the model. This discipline is often referred to as "ML Operations" or "MLOps." MLOps is tasked with making sure the analytic process is repeatable – including the data preparation tasks that were necessary to feed data into the model – and packaging and deploying the process as a unit to ensure the model functions properly. Models must also be deployed in a way that can provide insights at the scale required by the specific business process. Since models are often developed on a subset of the data, care must be taken when deploying to make sure the models operate properly at scale.

Models will need to change over time, so an organization's MLOps should anticipate these changes. Market conditions, competitive situations and the overall economic environment are never static, and thus the accuracy of nearly all models begins to decline immediately after the model is created. Data on which the model was originally trained is subject to dynamic factors, so MLOps processes need to be established to retrain models regularly with new data. Organizations must measure and monitor accuracy and how results of analyses that utilize the models drift from their original targets.

> **Models will need to change over time so an organization's ML Ops should anticipate these changes.**

ML Ops discipline also should include processes to create and deploy updated models so that accuracy is maintained over time. Once a new model has been developed, it needs to be put into production, and these deployment processes should be automated as much as possible. Changes in the model may also include corresponding changes to the data preparation processes, so any changes to the model should be documented and subject to review and governance as noted above.

The Clear Case for AI/ML Value

The value of AI/ML is too great for organizations to ignore, especially as business analysts are tasked with extracting more value from increasingly large data sets while using fewer resources. Nearly three quarters (72%) of participants in our research plan to increase their usage of AI/ML, and none indicated they would decrease their usage. This resounding endorsement of AI/ML suggests it shouldn't be restricted to a few individuals in the organization. The results of AI/ML analyses should be distributed widely throughout organizations using familiar mechanisms such as the analytics and BI tools already in use. In this way organizations can maximize the value of their AI/ML investments.

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