mindsdb

THE CASE FOR MACHINE LEARNING DEMOCRATIZATION IN THE ENTERPRISE

INTRODUCTION: WHY BUSINESSES STILL DO NOT EXPLOIT THE FULL POTENTIAL OF THEIR DATA

There's a growing interest in artificial intelligence (AI) in the business world. Businesses realize that through AI, they can increase profits, reduce costs, and drive innovation.

Although businesses both large and small can benefit from the power of artificial intelligence, enterprise companies are poised to see the biggest benefit from embracing AI. This is because most enterprises collect massive amounts of data. How these companies interact with and manage their data impacts their bottom-line growth.
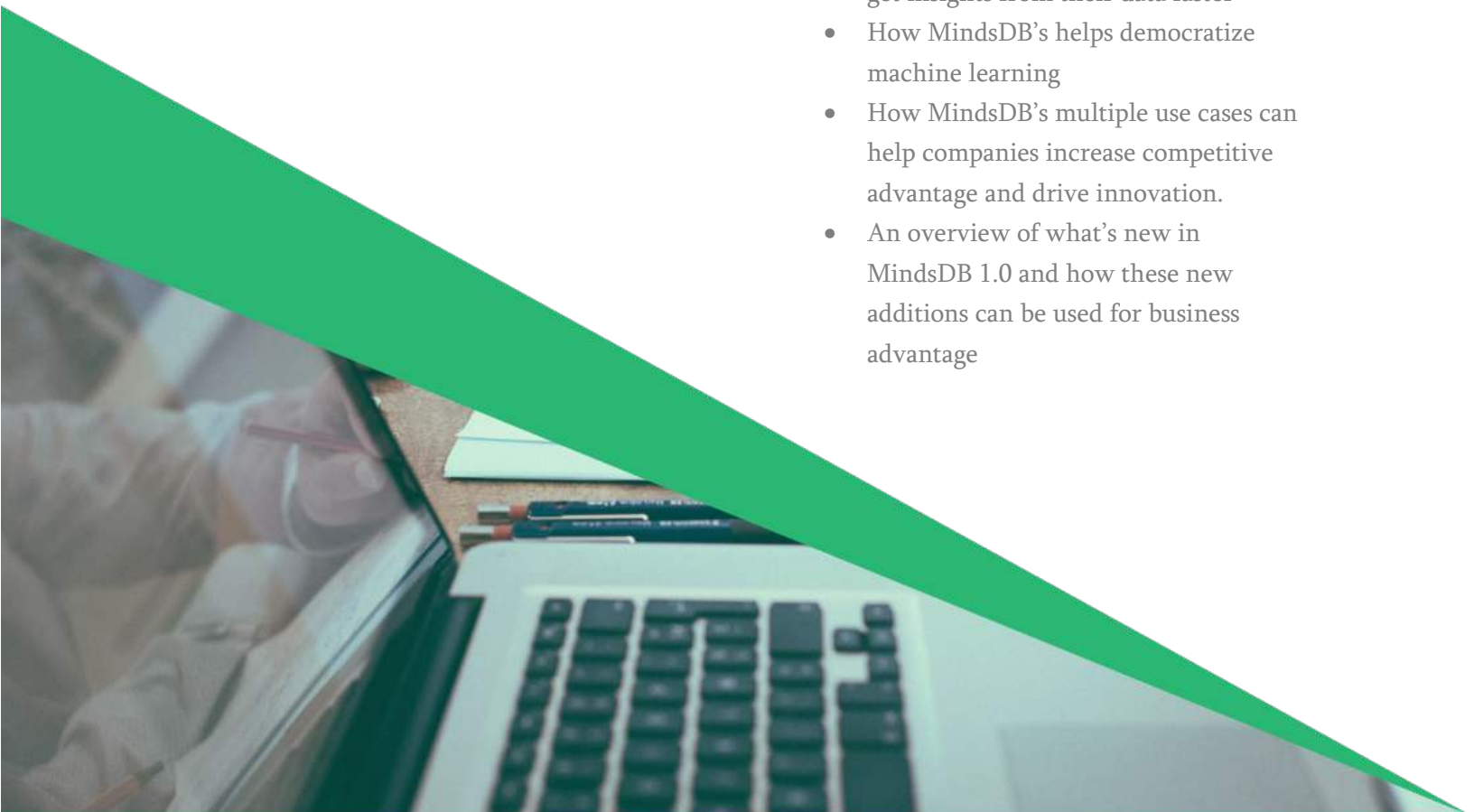
Still, few of these companies have data strategies that allow them to leverage the power of AI for their business benefit.

Reasons for this include:

I. Companies struggle to realize how to actually use AI.

II. Enterprises find the cost of embracing AI to be both time-consuming and expensive.

III. Companies struggle with determining which of their business challenges make the most sense to use AI to address.

In this white paper, we will focus on the third point: Which business challenges make the most sense for AI. We will also address:

- How machine learning democratization enables companies to get insights from their data faster
- How MindsDB's helps democratize machine learning
- How MindsDB's multiple use cases can help companies increase competitive advantage and drive innovation.
- An overview of what's new in MindsDB 1.0 and how these new additions can be used for business advantage

Democratization removes resource constraints

Data science today has a huge barrier to entry in terms of both its cost and requirement for specialized talent. Machine learning democratization removes these barriers by making data science no longer the realm of *only* data scientists. Machine learning democratization provides anyone with an interest in data science with the opportunity to explore the field.

Historically, data science was even more specialized than it is today. For a long time, the only people considered data scientists and allowed to write models and learn from data had PhDs. This meant that only the most specialized of specialized engineers were able to provide these companies with information to use for business purposes.

As enterprises began to collect more data, it became increasingly difficult to relegate all their data-related tasks to such a small group of people. This provided more people with training in data science and statistics—who weren't PhDs—with the opportunity to work on data science related projects.

The Case for Democratizing Machine Learning

Machine learning, a branch of AI, enables computers to learn without being programmed to. The computer takes a model that it's initially provided with and learns from it to ultimately create more models. This is to say that, as long as you have information to provide it with, the computer continues to get smarter and is able to efficiently and quickly solve problems that may be impossible for humans to solve.

Any conversation about using machine learning at the enterprise level should include an exploration of machine learning democratization. This is because enterprises are focused on the bottom line and machine learning democratization affects it.

Data scientists is still a bottleneck

Even though most enterprises have moved on from requiring that only PhDs work on machine learning initiatives, little progress has been made to expand data science opportunities to people without technical backgrounds in data science.

This need for people who've been trained as professional data scientists limits companies' ability to tap into potential knowledge streams. Hosts of people have an interest in learning from data, but don't have the technical credentials.

Enterprises that want to make the most of their data should move past these rigid requirements and allow anyone in any part of their organizations to perform data science.

How can people who don't have the technical training perform data science?

The answer to that question lies in machine learning. With machine learning, once a model is trained, the computer can do the remainder of the work. Professionally trained data scientists are experts at developing and deploying models. Once that initial work is done, additional manual iterations on that model don't make the best use of a data scientist's time.

Still, these data scientists can train a model and then use machine learning to allow the computer to do what it does so well: learn. This is a method that has worked for many enterprises we speak to who have one or two data scientists on staff. These enterprises don't have the resources to have their data scientists test and deploy every model without the help of machine learning.

How to democratize machine learning with MindsDB

Although requiring data scientists to train a model before letting machine learning take over works, there is a better way to accomplish the same task.

MindsDB helps increase access to machine learning so that data scientists do not have to participate in the first step of this process. **With MindsDB, anyone can train and test a model without being a data scientist.**

Additionally, MindsDB does this with speed. Questions that traditionally take data scientists anywhere from days to months to answer can now be answered by engineers, business stakeholders, marketers, or any one at any level of your organization within minutes.

By removing the technical requirement, MindsDB allows anyone to be a data scientist and thereby democratizes machine learning.

MindsDB's Machine Learning Use Cases

MindsDB was created to be a solution that helps anyone ask and answer any predictive question using machine learning. Thus, its use cases are varied among application, department, and industry.

Banking & Finance: analyzing financial and transactional data

Companies in the banking and finance sectors contend with the dual challenge of mitigating risks while remaining competitive. Some specific challenges these companies face include analyzing risk, managing and preventing fraud, and improving the customer experience. A data strategy that utilizes the power of AI can help solve for all of these tasks.

AI enables those in banking and finance to combine both structured and unstructured data to make decisions that are backed by data that make a real impact on their margins and help them increase competitive advantage.

MindsDB uses AI to analyze large volumes of financial and transactional data and then provides those in banking and finance with specific insights related to fraud detection, credit scoring, risk management, loan recovery, and insurance pricing among other areas.

MindsDB Use Cases by Industry

them to take immediate action on these insights.

Energy: building smarter energy systems

The energy sector is one of the biggest producers of data. Energy companies typically have millions of data points for any data set.

Energy companies can use AI to better forecast outages, demand, and maintenance systems.

With MindsDB, energy companies can leverage the power of machine learning to make accurate predictions that allow them to not only make good use of all their data points but also build smarter energy systems.

Healthcare & Pharmaceuticals: predict treatment outcomes

Due to its typically sensitive nature, healthcare data often poses a great challenge for most operations teams who must determine how best to put all the data they're collecting into good while remaining compliant.

AI empowers companies in the healthcare and pharmaceutical sector to predict treatment outcomes, prevent adverse patient events from occurring, automate disease identification and diagnosis, and predict drug success rates.

MindsDB's uses machine learning algorithms to provide healthcare practitioners and pharmaceutical companies with easily interpretable predictive insights that allow

Insurance: improve predictions on insurance cases

Due to its competitive nature, the insurance sector has come to realize that it must use data to compete. Understanding how best to leverage the data that they collect poses a challenge for companies in this space as the possibilities are vast.

AI allows insurance companies to connect all their data from customer to product to marketing. This then makes all these data points easier to process by insurance agents.

MindsDB's use of AI makes it easy for insurance companies to increase pricing accuracy, improve risk differentiation, and provide customer personalization.

Manufacturing: use data to optimize process and system

Modern manufacturing business models require that manufacturers maximize efficiencies and optimize operations in order to produce high quality products while keeping costs low. This is often easier said than done considering the amount of data manufacturers must collect and analyze to place themselves in a position in which they can accomplish those tasks.

Whereas manufacturers of yesterday had to contend with siloed data, supply chain inefficiencies, and the lack of proper infrastructure to support their growing data needs among other challenges, innovative manufacturers now turn to artificial intelligence to help them meet these challenges and increase efficiencies.

MindsDB help manufacturers leverage the power of AI to **increase output, reduce errors, and take control of their systems and processes**—thereby positively impacting their bottom line.

Through **Predictive Maintenance**, manufacturers can be proactive about their maintenance by determining precisely when equipment should be taken offline for maintenance. This not only helps **minimize equipment failure**, but also **reduces errors and lessens unplanned downtime** and, as a result, helps minimize costs while increasing operational efficiencies.

Relatedly, **Quality Assurance** is a goal of most manufacturers that machine learning is able to facilitate. AI can predict and classify abnormalities in the production line and also take direct action when it notices those abnormalities to reduce the likelihood of products with defects making it all the way down the production line.

AI can also have a significant impact on manufacturing when it comes to **Inventory Management**. This area allows manufacturers to prevent forecasting errors and reduce missed opportunities associated with low production outputs as well as the capital waste associated with excess inventory.

Other AI use cases in manufacturing include supply chain management, real-time IoT, and equipment optimization.

MindsDB's machine learning capabilities can solve for each one of the aforementioned manufacturing use cases regardless of a manufacturers' team size thereby allowing them to have better control of their data and meet the requirements of modern day manufacturing.

Retail & E-Commerce: predicting customer needs

The retail and e-commerce landscapes are one of the most competitive landscapes. Not only do companies in this space need to remain innovative while staying connected to customers and meeting their expectations, they must also manage and optimize legacy and supply chain systems that are often not set up for the ways retail and e-commerce products are sold today.

AI can help retailers who collect vast amounts of customer and product data, but don't fully utilize said data to begin to learn from it. Using machine learning algorithms that are able to process varied data types through automated means, retailers and e-commerce suppliers can use both historic and real-time data to optimize operations and future proof their businesses.

MindsDB places the power back in the hands of retail and e-commerce users by utilizing AI to enable them to obtain business intelligence that allows them to improve customer segmentation and the customer experience, better forecast demand, and prevent churn among many other use cases.

Although most enterprise software solutions are really good at helping solve problems across industries, few of them are able to have an impact on the departmental level. MindsDB is one of the few.

MindsDB Use Cases by Department

Cybersecurity: learn from your data to better protect your organization

Cybersecurity's biggest challenge isn't that of threats, but of data. Due to the volume, variety, and velocity of it, data poses an ever-evolving set of difficult tasks for those who work in cybersecurity.

Using AI, cybersecurity teams can reduce the load placed on them by the 3 Vs of big data. With AI, cybersecurity teams can automate security testing, uncover endpoint vulnerabilities and, set security benchmarks.

MindsDB empowers cybersecurity teams to stay ahead of potential threats by predicting when and where they're most likely to happen. By using MindsDB, cybersecurity teams can identify patterns and monitor activity for suspicious signs. Learn from your history to help protect the future of your organization.

Finance

Finance teams are all about the numbers. Naturally then, they understand the importance of collecting and effectively working with data. However, due to the nature of the types of data finance teams work with—both structured and unstructured—their relationship with their own data isn't always symbiotic.

AI can help improve the way finance departments engage with data. AI can help those in finance with everything from risk assessment to fraud detection and prevention to trading.

Finance teams can use MindsDB to speed up workflows and create models that allow them to recognize and make better decisions. Use our predictive analytics capabilities to predict future spending, plan better, automate tasks and processes, and spot and fix compliance issues.

Marketing

Marketers have always understood the importance of data. To measure the effectiveness of their campaigns, most marketers deal with data at some level in their role. However, as typically creative types, these individuals aren't usually tasked with making sure that their data works for them.

AI can be the secret ingredient for marketers who want to see their efforts deliver big for their organizations. AI can make an impact on marketing teams' customer engagement, loyalty, and retention strategies as well as allow them to optimize on internal marketing spend and advance ROI.

MindsDB makes it so that any member of a marketing team—regardless of technical ability—can utilize the power of AI in their efforts. Leverage the data that you're already collecting to predict what your customer will do next, improve the customer journey, and measure success.

Operations

Operations teams are tasked with making sure that a business runs smoothly, remains profitable, and hits its targets. Given these goals, effectiveness and efficiency tend to be top-of-mind priorities for these teams. As a result, operations departments contend with massive amounts of data that they must turn into meaningful information.

AI allows operations teams to get the information they need. With AI, operations teams can manage a broad range of procedures and processes, including performance monitoring, capacity planning, availability, automation, and analysis, at scale.

MindsDB enables operations teams to obtain true business intelligence. By working on top of all the major BI solutions, including Tableau to IBM Cognos Analytics to Qlik and SAP Business Objects among others, MindsDB lets you build a single source of truth. You then have the ability to not only answer specific

business questions, but also the option to deploy your own predictive solutions.

Sales

Sales organizations are focused on delivering results. Yet, they often only interact with data if they can see the direct impact it can have on their results. When its potential isn't immediately observable, some sales organizations find themselves underutilizing the data that they have at their disposal.

AI can help change the relationship sales teams have with data by making its value undeniably clear. AI gives sales departments competitive advantage by allowing them to understand not just their prospects, but also what strategies work best.

Using MindsDB's powerful machine learning capabilities, sales teams can boost sales by improving their pipeline generation, making more accurate forecasts, and preventing churn through predictions. Use your data to understand the kinds of messaging your customers and prospects engage with to better sell to them.

These are only some of the departments that MindsDB is able to help answer questions.

Even though MindsDB has applications for each of the aforementioned departments, we can help people who work in human resources, purchasing, and R&D, among other areas, ask and answer predictive questions as well.

When it comes to the ways that MindsDB can be applied, the options are numerous.

MindsDB Use Cases by Application

Credit Scoring

Determining which customers to give credit to is often one of the most challenging endeavors financial institutions face. If they extend credit to customers who are likely to be irresponsible with the credit, these institutions risk losing a ton of money. With machine learning, these organizations can obtain accurate models that illustrate customer credit risk. Using these models, MindsDB helps financial institutions determine customers' credit worthiness in an effort to reduce risk.

Customer Lifetime Value Optimization

Focusing on obtaining and nurturing customers to ensure continuous revenue is a logical step for most businesses. Determining the value each customer will have on the business over their lifetime as a customer is equally important. By using advanced machine learning algorithms, MindsDB helps you not just understand who your customers are, but also what you can expect from them and the value they will provide to your business over their lifetime as a customer.

Fraud Detection

Fraud techniques keep getting more advanced. Those who make it their business to defraud businesses don't take any days off, so businesses must prioritize fraud detection to lower risk. Using fraud detection algorithms, MindsDB scores transactions that may seem fraudulent and automatically flag and reject them. Our predictive models help you identify and prevent fraudulent by providing you with real-time and historic insights.

Inventory Management

The guesswork around determining how much of any product or item needs to be produced can have a huge impact on capital for any company that must deal with inventory. Artificial intelligence can cross-reference items in any given data set with trends in the data to automatically determine the correct inventory amount a company will need to have on hand. MindsDB's powerful platform takes advantage of these AI capabilities to provide you with a robust tool that takes the

guesswork out of determining product demand.

Predictive Maintenance

Predictive Maintenance enables error prediction and prevention. MindsDB allows users to train and deploy models that monitor the performance of any product, equipment, or circumstance to reduce unplanned downtime. With MindsDB, you can stop failures before they happen.

Quality Assurance

Quality Assurance is no stranger to automation. Still, artificial intelligence helps take QA's affinity for automation to the next level by focusing on continued testing. A tool like MindsDB makes it so that you can reduce test coverage overlaps, increase predictability in testing, as well as detect and prevent defects.

Loan Recovery

Loans can be expensive. Loan recovery can be even more so. Banks and financial institutions that provide loans need the assurance to guarantee that the loans that they provide will be paid back in time. Machine learning models can allow loan providers to streamline the loan recovery process. MindsDB uses these models to help loan providers identify at-risk customers, predict loan recovery dates, and allow them to organize their debt collection efforts.

Each of these aforementioned use cases are only a sampling of the ways that MindsDB can help enterprises use their data to transform their business. [To learn about additional use cases and applications, visit MindsDB.com/Resources/Use-Cases]

MINDSDB 1.0 PUSHES BOUNDARIES OF MACHINE LEARNING

MindsDB provides use cases for almost every industry, department, and application. While MindsDB has always provided accurate, secure, and fast predictions, those features are requirements for any company that offers machine learning solutions.

MindsDB 1.0—our latest release—broke the rules for what is possible with machine learning.
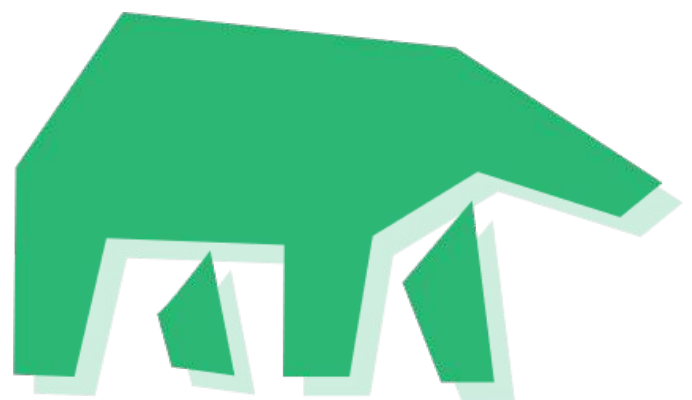
Although we strive to remain the most accurate, fastest, and most secure predictive insights tool on the market, we challenged ourselves to evolve the solution to deliver what more enterprises need from their machine learning models: explanations.

MindsDB 1.0 adds explainability to all predictions. Now not only can you ask questions of your data, but you can receive answers that explain themselves. This gives you context that empowers you to trust its conclusions even more.

Additionally, MindsDB 1.0 comes with a GUI that allows you to visualize your results. Visualization makes understanding the answers you receive as clear as possible.

GETTING PREDICTIVE INSIGHTS WITH MINDSDB

MindsDB's work toward democratizing machine learning, providing explainability and visualization of results are all efforts to make it easier for companies of all sizes to get predictive insights from their data.

How do we enable this?

We do this by:

1.) **Allowing anyone to learn and make predictions** from their data with no machine learning experience.

Currently, all it takes is one line of code for someone to be able to deploy a model on MindsDB.

2.) **Providing explainability**. MindsDB's models answer the following questions when learning:

a.) What is interesting in my data and why?

b.) When can I trust this model and why?

c.) When I should not trust this model and why?

d.) How can I improve this model?

When the data is making predictions, it asks and answers the following questions:

a.) Why this prediction?

b.) Why not something else?

3.) Remaining state of the art.

MindsDB is determined to remain a state of the art solution by continually testing the bounds of what's possible in the realm of machine learning to make it easier for businesses to use machine learning to ask and answer all of their most important questions.