Decision Intelligence: Unlocking the Full Potential of AI for the Enterprise

2024

Aera

Executive Summary

Software is indeed "eating the world," as Marc Andreessen predicted back in 2011. So is your value chain ready to equally thrive in the physical and digital worlds?

The secret to this transition is realizing the full promise of artificial intelligence (AI) and machine learning (ML). Organizations ready for this new digital era are well-positioned to transform themselves into highly efficient, scalable, and sustainable enterprises that earn and retain deep loyalty from their employees, customers, and stakeholders. Deloitte reports that businesses with an AI strategy are 1.7 times more likely to achieve their goals than those without such a vision.[1]

While all businesses can expect to be either enhanced or disrupted by digitization in the near future, only some have taken the proper steps to prepare for it. Most organizations must still overcome significant challenges in their current approach to data and analytics, and most importantly, how to make business decisions and execute on them. Such considerations include strategies and processes to holistically integrate data, intelligence, automation, and engagement.

The solution to these challenges is found in a Decision Intelligence platform – which leverages AI and ML to digitize, augment, and automate business decision making. This whitepaper explores the value of using a comprehensive, composable, trusted, and scalable Decision Intelligence platform to operationalize AI and ML. You'll learn how Aera Decision Cloud™ helps extract maximum value from them in ways that empower business analysts, citizen data scientists, and dedicated data scientists to contribute productively to your company's digital transformation journey.

The Digitization Journey and Its Challenges

> **Software is eating the world … More and more major businesses and industries are being run on software and delivered as online services – from movies to agriculture to national defense.**
>
> – Marc Andreessen, "Why Software Is Eating the World," 2011

These often-quoted passages from Andreessen's Wall Street Journal essay pulled back the curtain on a drastically changing world. Over a decade later, we are beginning to arrive at the point where, as the noted investor and entrepreneur rightfully predicted, "software is also eating much of the value chain of industries that are widely viewed as primarily existing in the physical world."[2]

This revolution has impacted every business. One prime example is Anheuser Busch Inbev, which attributes more than 57% of its annual revenue to increasing digitization during its transitions into a tech-first fast moving consumer goods company.[3] As more data becomes digital, the company can turn that information into more strategic and actionable insights by using advanced analytics.

While data and advanced analytics are not the sole sources of competitive advantage, they can be critical to long-term survival and success. For chief information officers (CIOs), chief data and analytics officers (CDAOs), and many more executives, realizing the power of platforms can transform their companies into tech businesses. According to McKinsey & Co., missing this opportunity can severely slow IT programs and waste 30 to 40 percent of IT project spending.[4]

Most companies have yet to gain the full potential of artificial intelligence (AI). Instead, multiple challenges are getting in the way of their transformation across four critical areas:

Data: Data scientists spend a great deal of time on data collection, integration, and preparation. Data lakes often fail to meet expectations when the data is disconnected from the day-to-day process of decision making: beyond collecting data, companies need enough people and time to prepare and analyze it, and understand its applicability to business problems. Furthermore, the presence of organizational information silos complicates master data management and data protection compliance.

Technology: Companies have been forced to rely on a complex technology stack to drive machine learning (ML) at scale (*see Figure 1 below*).[5] In this modern technology and data infrastructure, dozens of solutions have to be stitched together, from data transformation all the way to model training, development, and integration – making the maintenance of this modular approach and process highly complex and inefficient.

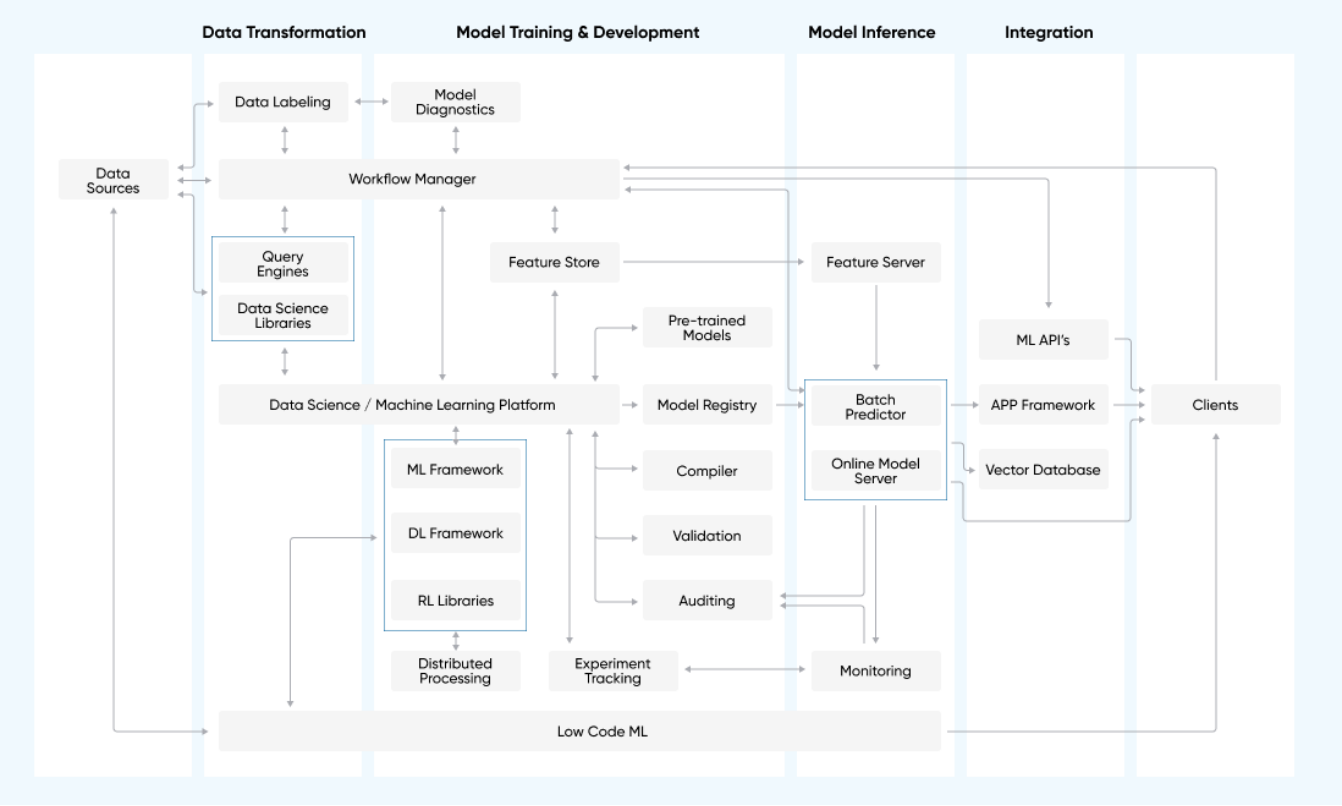


Figure 1: The Disconnected Status Quo of Machine Learning. Today's businesses have been forced to rely on dozens of point solutions and a complex process in order to leverage ML. The resulting process is highly inefficient and far too complex to keep pace with today's business needs and challenges. (Diagram adapted from Bornstein, Li, and Casado, "Emerging Architectures for Modern Data Infrastructure," Oct. 2020.)[5]

Adoption: Even if there is a successful AI/ML outcome (i.e., an ML-based predictive model), businesses today struggle with user adoption. Disparate user experiences make it difficult for individuals to familiarize themselves with the data and leverage the tools to make informed decisions quickly. When every model requires a different interface for users, this complicates the workflow and makes them less likely to act on the AI/ML outputs they receive. Moreover, being faced with different types of inputs and workflows can lead users to interpret these outcomes differently, introducing unnecessary biases into the decision-making process.

When it comes to building and maintaining the ML models themselves, a lack of consistency in frameworks and protocols is also a roadblock. Even more importantly, the lack of connection between a model's output and a specific decision makes it even more difficult to quantify the business impact of AI, making it harder for leaders to see AI's contribution and realize the value of driving further adoption.

Scaling: Many organizations today are challenged with legacy systems and old analytics projects – a fact which, when coupled with business-unit-specific and companywide investment decisions, has led to multiple advanced analytics projects running in parallel – more often than not, across redundant areas of the business. Decentralized and federated operating models have made deploying regional initiatives faster, but have also made it harder for some use cases to scale globally.

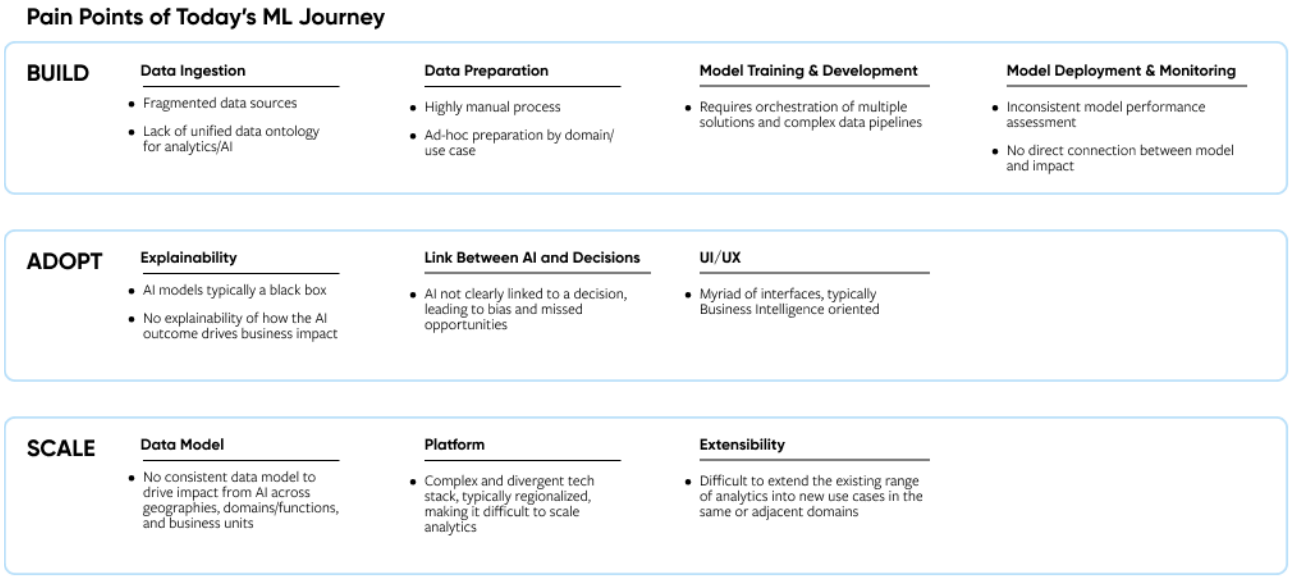


Figure 2: **Pain Points of Today's ML Journey, from Development to Impact.** Today's solutions can easily process large volumes of data, while compute power is also more readily available. However, a number of challenges have prevented AI and ML from being operationalized to solve business problems at scale – particularly across siloed business units, legacy systems, and/or different parallel analytics initiatives. (Source: Aera Technology analysis)

Decision Intelligence Fulfills the Promise of AI and Machine Learning

Decision Intelligence is the killer use case for AI, providing the means of operationalizing data science, democratizing the decision-making process, and enabling both continuous learning and the capture of institutional knowledge.

According to a Gartner® report:

> **When designing decision models, organizations have traditionally been subjected to two principal forces: analytics and process modeling systems. Analytics needs process mapping to operationalize its insights; process needs data to get smarter. To build adaptable and resilient systems, organizations should reassemble their decision mechanisms through the decision intelligence discipline.[6]**

The key to operationalizing AI and ML, and to extracting maximum value from embedding them into business decisions, is creating a foundational infrastructure with a single platform that supports these four pillars of Decision Intelligence, as shown in Figure 3:

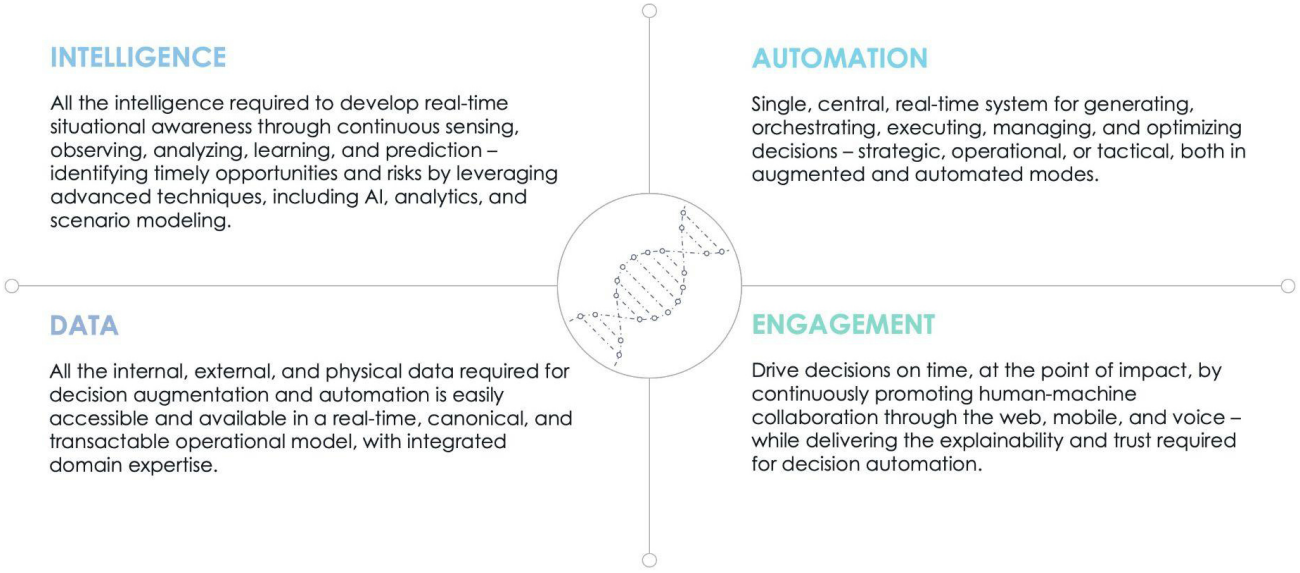


Figure 3: The Four Pillars of Decision Intelligence.

Data

The ability to extract and harmonize transactions at scale (i.e. numbering in the billions) from complex enterprise systems and external data sources to create an open, composable, and transactional data model focused on decisions. This platform ingests, transforms, and harmonizes data from these sources, then applies operational dimensions and KPIs to provide the required business context.

Intelligence

The ability to operationalize advanced techniques including optimization, predictions, modeling, and artificial intelligence (AI) within the decision-making context. This platform must incorporate domain expertise within models geared toward all areas of the business, with the flexibility to bring or build your own models to address specific challenges – in context, in real time, and at scale. Doing so allows companies to digitize the institutional knowledge of their experienced decision makers, ensuring that staff turnover doesn't deprive the company of valuable context and information.

Automation

A single, central, real-time system for generating, orchestrating, executing, managing, and optimizing decisions – whether strategic, operational, or tactical. Decision logic is digitized by orchestrating the intelligence to identify risks and opportunities, then look for optimal solutions. Once a decision has been made, the platform takes action within the source transactional systems, autonomously.

Decision automation – also known as "human out of the loop" – becomes achievable as users gain confidence in Decision Intelligence and define business rules that allow routine, repetitive, or non-value-added tasks to be executed by the platform, at scale and in real-time. As we discuss further below, the ability to automate decisions will deliver a vital new competitive advantage.

Engagement

An explainable user experience that gives you full visibility into the data and intelligence behind every recommendation, down to the transaction level. The ability to rely on a single platform and interface, alongside the increased visibility and trust delivered by such a platform, addresses the issues with user adoption mentioned above and makes it easier to quantify the benefits of AI for decisions made across the enterprise.

Democratizing AI and ML with Aera Decision Cloud™

Organizations that fully augment and/or automate decision making collect data, process it, deploy decision logic on top, engage with users, and write back into the transactional systems. Accomplishing this process on the scale of a large enterprise would have been considered impossible not many years ago. But a Decision Intelligence platform enables this across virtually every type of business, business unit, and job function – with significant benefits across the organization. According to Gartner,

> **Multipersona DSML platforms offer a shorter time to value by empowering more people across the organization through ease-of-use and the augmentation or automation of activities as much as possible. ... With DSML becoming ever more pervasive and business-critical, personas are not limited to expert data scientists. They also include business experts, self-service business analysts or other people that don't have a technical background in programming or machine learning.[7]**

Aera Decision Cloud™ has enabled this level of AI and ML integration at dozens of companies, allowing users across the enterprise to contribute to more sustainable, intelligent, and efficient decision making:

- **Business analysts:** Guide the improvement of processes, products, services, and software through data analysis
- **Citizen data scientists:** Perform some data science work, but don't have a formal background or role related to advanced analytics, statistics, or related disciplines
- **Dedicated data scientists:** Offer experienced expertise in the creative use of data by developing strategies for analyzing data; preparing data for analysis; exploring, analyzing, and visualizing data; building models with data using programming languages; and deploying models

Regardless of their expertise or their proximity to data intelligence, users want to make better decisions more quickly, with increasingly large volumes of data. But, more importantly, they need to take the right actions at scale and across the enterprise.

Within the AI and ML "status quo" we described above, doing so can be incredibly challenging and frustrating. Without a single platform and unified decision data model it can be difficult to achieve a workflow that delivers the right business context:

> **"You've got to run five reports, look something up, call someone, look up your email, and so on. What we want to try to do is bring all that together so that people are making decisions in context, in real time."**
>
> – Supply Chain Innovation and Business Transformation Manager
> Global Petrochemicals Company

Overcoming this hurdle requires a deep understanding of how people make decisions and, ultimately, a system that learns from those behaviors as they exist today and evolve tomorrow.

Aera Decision Cloud does so by digitizing, augmenting, and automating decision making. It goes beyond simple reports and KPIs, giving specific and prescriptive recommendations of actions that optimize business objectives against complex, interrelated constraints, and real-time data. It becomes a virtual member of your team, acting like a trained digital analyst – delivering well-researched and informed business recommendations, and taking action autonomously once a decision has been made. And, Aera learns from every decision and its outcome, thus improving future recommendations.

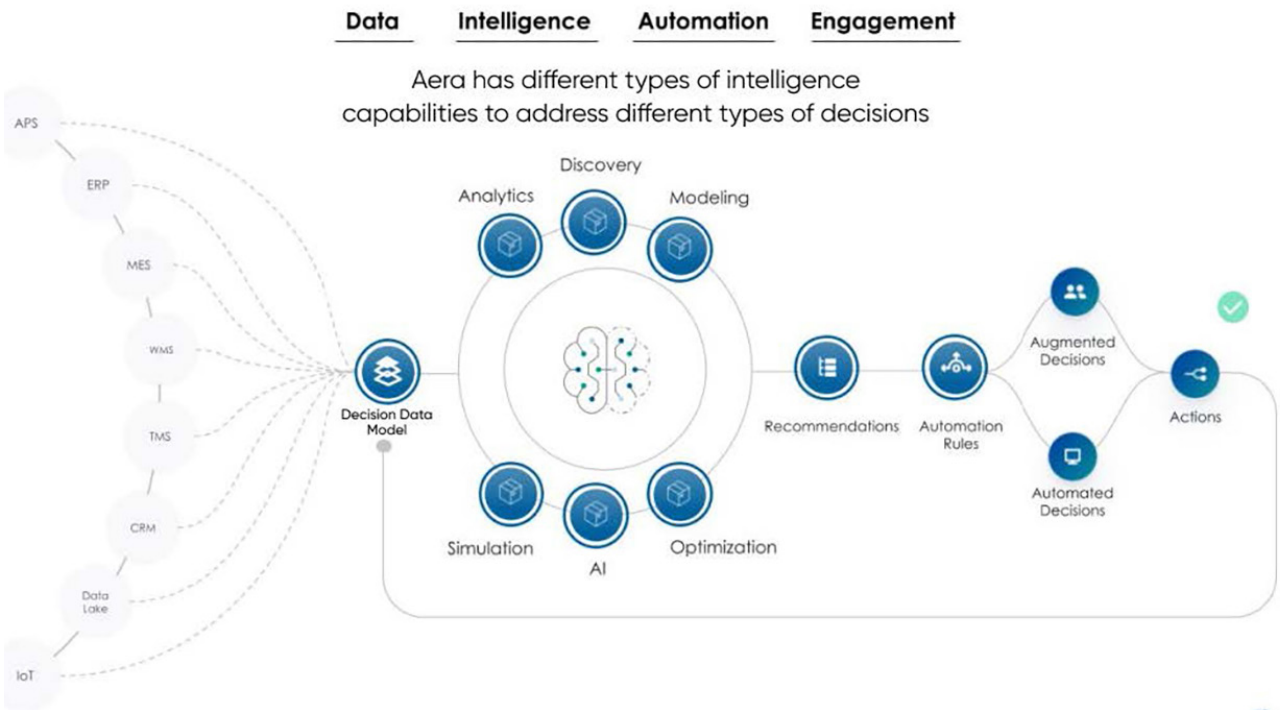


Figure 4: Operationalizing AI and ML with Aera Decision Cloud. Internal, external, and physical data is aggregated in real time into the Decision Data Model – an organized, virtual data set for your entire enterprise and ecosystem. Intelligence is applied to create and evaluate scenarios and make a recommendation on the best course of action. Automation rules are evaluated to determine if decision making should be augmented (with human input) or automated (without human input). Once a decision is made, the results are written back into the data model – which then writes back all the changes to the underlying transactional systems, while it is also being refreshed with updated data. The result is an active dataset with two-way integration with your transactional systems, which also retains the memory of all the decisions that have been made, their contexts, and the resulting outcomes.

One Aera user credits Decision Intelligence with being able to deliver a higher level of intelligence and insight to every user type:

> **"We're really targeting to get the user base into the system and use it – not just the IT group or elite supply chain professionals. It's for the everyday user; that's the value for us. [...] Aera lets you know, 'This is what we saw – and if you just click here, I'll take care of it for you.' So you don't have to log into three systems to figure this out."**
>
> – Business Unit Executive Director, Global Healthcare Company

Fast, effective ML operationalization with Aera Cortex™

The Decision Intelligence platform also operationalizes ML in ways that deliver well-researched and informed business recommendations for producing the right outcomes.

By combining real-time data, ML results, and automation, your users can build plans, run scenarios, and automate previously manual decisions with flexibility – with no requirements for coding or technical knowledge. Such a meaningful and accessible approach to operationalizing ML projects is achieved through Cortex™ (*see Figure 5*), the data science engine powering Aera Decision Cloud. It integrates the Decision Intelligence platform with live, harmonized data sets coupled with domain-specific algorithms, optimization techniques, and automated machine learning (AutoML) capabilities.

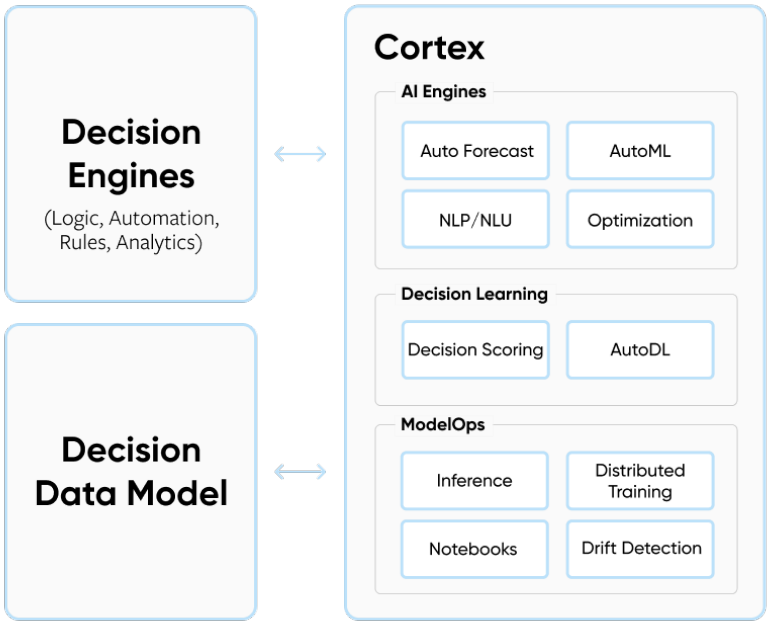


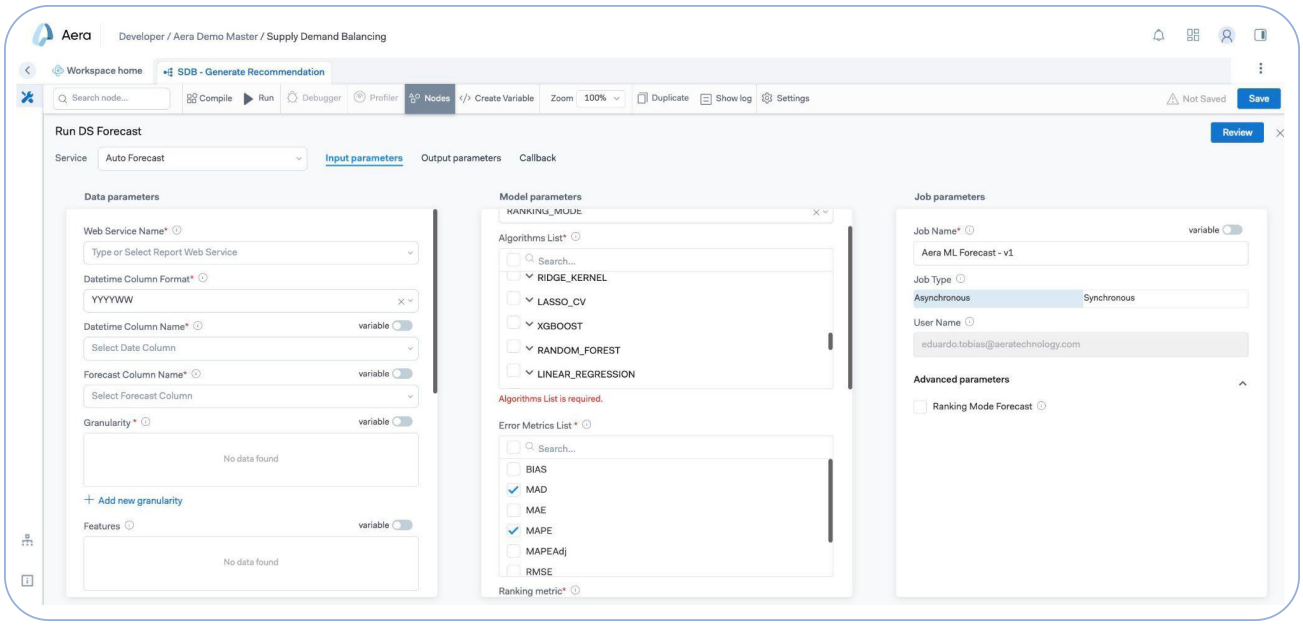
Figure 5: Modeling in Aera Decision Cloud with ML-Driven Recommendations. Aera Decision Cloud creates a two-way Decision Data Model, both reading data from enterprise systems and data repositories and writing decisions directly back to those sources. Both recommendations and the impacts of decisions made are used to define key metrics and/or events that impact future decisions, and to determine the set of predictors for target variables. Businesses can benefit from a self-optimizing platform that is always learning, with the ability to offer a confidence score that shows the probability of a given impact if a recommendation is accepted.

What makes Cortex unique is its ability to facilitate a closed-loop cycle of machine-driven planning, execution, and learning across the business. You can manage data, elevate the value of your decisions, and monitor outcomes. Moreover, you can operationalize ML on a wide variety of deployment options, including Security Protocols and Data Models, Create Your Own Model, Bring Your Own Model, or Host Your Own Model.

Leveraging Cortex allows all types of users to gain the benefits of collaboration enhanced with truly explainable and understandable AI. Data engineers can publish clean, live datasets for data scientists to use. Data scientists can publish ML models for use by their colleagues. Data analysts can run analytics from work published by those data scientists. And developers can use the ML models published by data scientists to create new Skills for Aera to apply to business problems, then return the outcomes from those processes to data scientists in order to improve the models.

Furthermore, adding AutoML capabilities automates the training and deployment steps traditionally done by trained data scientists to deliver ML models – dramatically democratizing AI and increasing end-to-end lifecycle productivity.[8]

Machine Learning Applications: Improved Forecasting and Faster Model Development



AutoForecast – Aera enables users to add value to their business quickly, regardless of their ability to code. Using an intuitive, no-code interface, Aera Cortex™ helps teams create better forecasts with the AutoForecast Service. All users need to do is provide basic information, identifying the metadata and configuring the forecasting task. The Auto Forecast Service scales to thousands of grains easily, and its forecasts are always up-to-date, with live data and results that feed into production systems.

AutoML – Empowers users to run machine learning experiments for predictive models. AutoML helps preprocess the data (for example, by identifying missing data) and sets performance indicators of the model (hyperparameters). AutoML ranks the models and selects the one with the lowest error rate.

Aera Cortex gives you the ability to create and customize models at any level, along with a rich set of tools to monitor their a pplication and improve those models over time.

Maximize the Value of AI and ML Throughout Your Business

Over the last few years, companies have looked to AI and ML to orchestrate data to support decision making. Now, the stakes are even higher as companies face more pressure on service levels and supply-side operations. In addition, there is a shortage of skilled people with the right level of experience to make choices that optimize your business outcomes on a continuous basis.

Changes in technology will also impact how companies address these challenges. According to a Gartner report, "By 2026, 50% of organizations will have to evaluate analytics and business intelligence (ABI) and data science and machine learning (DSML) platforms as a single and composable platform due to market convergence." Gartner further recommends in the report that the data and analytics leaders responsible for analytics, BI, and data science solutions should "build upon existing D&A investments by evaluating the embedded analytics capabilities offered by your enterprise standard ABI and DSML platforms [and] explore vendors that have specialized in embedded analytics, particularly when deploying large user-scale experiences and/or to stakeholders outside your organization."[9]

Despite these changes, one thing is always true: your company's value is the sum of its decisions, as noted in this *Harvard Business Review* article on business transformation:

> **Contrary to popular belief, performance is not determined solely by the nature, scale, and disposition of resources, important though they may be. An army's success depends at least as much on the quality of the decisions its officers and soldiers make and execute on the ground as it does on actual fighting power. A corporation's structure, similarly, will produce better performance if and only if it improves the organization's ability to make and execute key decisions better and faster than competitors.[10]**

Your ability to leverage Decision Intelligence to make the right decisions faster, better, more frequently, and more efficiently is critical than ever. Data science in isolation is simply an academic exercise – unless it is tied to a particular decision. At the same time, many decisions go unaddressed today because companies lack the time and/or the people to do so.

With Aera, companies can predict what will happen, and provide decision support to their teams ("human in the loop"). Companies also benefit from Aera's predictions based on data ("human on the loop"), where teams take action based on Aera's recommendations. And, finally, Aera enables decision automation – "human out of the loop" – as users gain confidence in those decisions and define business rules for automation.

By combining data, intelligence, automation, and engagement, Aera Decision Cloud learns from decisions and their outcomes to improve the quality and accuracy of decisions over time. This enables your company to address more decisions, and to move between the three modes of decision support, augmentation, and automation seamlessly as conditions evolve (*see Figure 6*).

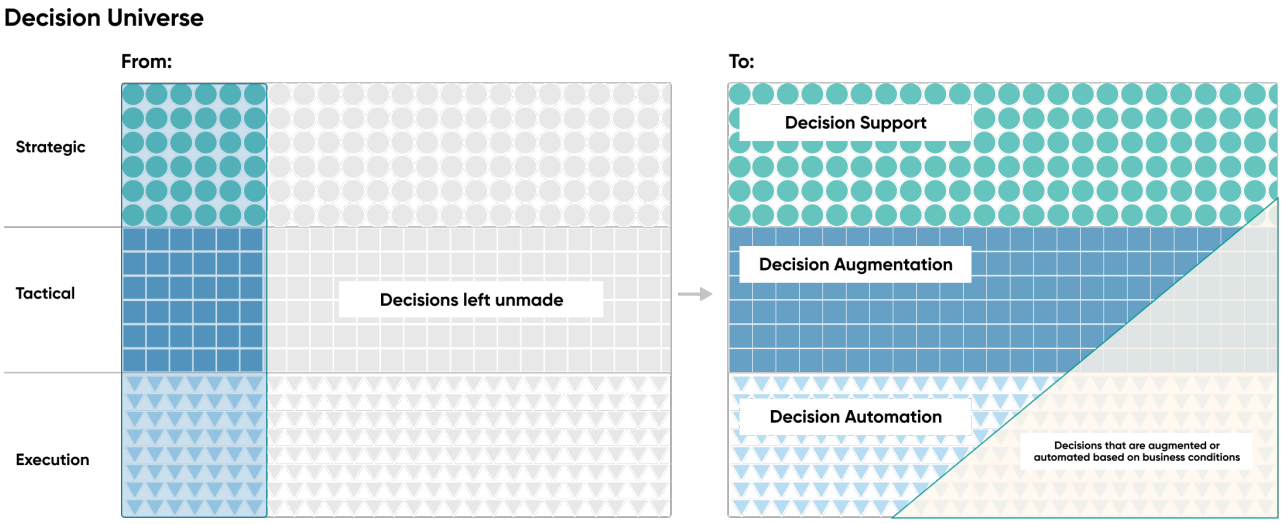


Figure 6: The Value of Decision Intelligence. Companies presently rely on limited, manual, analog, iterative decision-making processes. Meanwhile, the demand for decisions is outpacing the ability of organizations to make them, and the gap continues to widen. The net effect is that many important decisions are either unmade or are made suboptimally, hindering business performance. Decision Intelligence, enabled by Aera Decision Cloud, has allowed large global companies to address more decisions at the moment of impact – augmenting or automating many day-to-day operational and tactical decisions, and freeing leaders and teams to focus on strategic and value-added decisions and opportunities.

With Aera Decision Cloud, you can fulfill the full potential of AI and ML capabilities and maximize the value your business gains (*see Figure 7*). As noted above, the platform acts like a trained analyst, delivering informed, data-driven recommendations and taking action autonomously to update source systems – recording the context and outcomes of decisions.

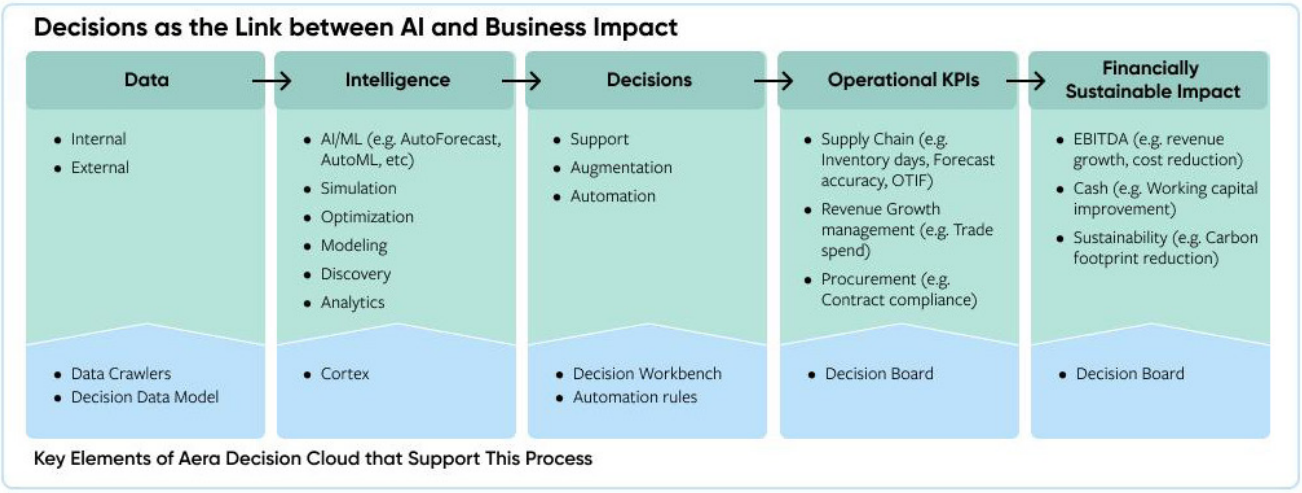


Figure 7: Integrating AI and ML with Decision Making to Maximize Business Impact. Connecting AI and ML with decision making across the enterprise enables faster, more efficient business processes. Aera Decision Cloud's functionality makes it possible to achieve end-to-end visibility and value.

As a result, you can accelerate your ML lifecycle, optimize operational efficiency, and increase the adoption of new models that produce the strategic outcomes you need to drive lasting growth. Most importantly, you gain a consistent platform and user interface that scales the capabilities necessary to drive ongoing success across your entire enterprise.

References

1. Beena Ammanath, Susanne Hupfer, and David Jarvis, "Thriving in the Era of Pervasive AI," Deloitte Insights," 2020.
2. Marc Andreessen, "Why Software Is Eating the World," The Wall Street Journal, August 2011.
3. "3Q22 Results," Anheuser Busch Inbev, October 2022.
4. "The Platform Play: How to Operate Like a Tech Company," McKinsey Digital, February 2019.
5. Matt Bornstein, Jennifer Li, and Martin Casado, "Emerging Architectures for Modern Data Infrastructure," Andreessen Horowitz, October 2020.
6. Gartner, Innovation Insight for Decision Intelligence Platforms, Erick Brethenoux, 15 March 2022. . Gartner is the registered trademark and service mark of Gartner, Inc. and/or its affiliates and is used herein with permission. All rights reserved.
7. Gartner, "Market Guide for Multipersona Data Science and Machine Learning Platforms," Pieter den Hamer, Carlie Idoine, et al.., 2 May 2022.
8. Holger Hürtgen, Sebastian Kerkhoff, Jan Lubatschowski, and Manuel Möller, "Rethinking AI Talent Strategy as Automated Machine Learning Comes of Age," QuantumBlack AI by McKinsey, August 2020.
9. Gartner, "Market Guide for Embedded Analytics," Anirudh Ganeshan, Julian Sun, et al.., 14 February 2023.
10. Marcia W. Blenko, Michael Mankins, and Paul Rogers, "The Decision-Driven Organization," Harvard Business Review, June 2010.

About the Company

Aera Technology, the Decision Intelligence company, empowers global enterprises to make smarter, faster decisions. Its platform for AI decision automation, Aera Decision Cloud™, seamlessly integrates with existing systems and data sources to automate and scale decision making with accuracy and speed. Known for its proven, exceptional performance and value generation, Aera is the trusted choice of market leaders in consumer products, life sciences, chemicals and industrial, technology, and more. Partnering with Aera, enterprises are building more sustainable, intelligent, and efficient organizations. Visit aeratechnology.com.

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