Artificial Intelligence and the Analyst

Redefining roles in the age of augmented analytics

The vision of artificial intelligence (AI) portrayed in the media is that it will displace humans and completely automate decision making. In today's reality, machines actually act as assistants, augmenting, not replacing human understanding or judgment. With all the hype around AI, it is easy to lose sight of how machine learning has already transformed the way we work, particularly in the realm of data analytics.

The state of artificial intelligence in analytics

Machine learning is now built into existing business intelligence (BI) platforms, often referred to as "augmented analytics" or "smart analytics." According to Gartner, it is "transforming how analytics content is developed, consumed, and shared." These capabilities surface in every stage of the analyst workflow, often as recommendations that inform business decisions. They can identify behavioral trends within an organization to provide suggestions—like which data sources to use in data prep or analysis, or which analytical content is the most relevant to answer a particular question. Machine learning is also built into natural language capabilities, helping interpret human intent and semantics behind questions. Other areas include advanced and predictive analytics, helping to automate statistical analysis. In addition to built-in capabilities, BI platforms also offer integrations with machine learning applications and services so analysts can take advantage of open source algorithms.

All of these advancements represent what Constellation Research calls the "next era of democratization," where data analysis opens up to even more users. With machine learning being built into every stage of the analyst workflow, the age of AI is already here. It is changing analytics processes, while elevating the role of analysts in organizations, positioning them as champions of data literacy and broader data use.

AI augmentation will elevate analysts and business users

AI-powered features within BI platforms will augment data analysts, making their work faster, more efficient, and more accurate. But it doesn't stop there. There is also the promise that machine learning will bring domain experts—people embedded in the business—closer to their data by removing technical barriers to data analysis. Gartner forecasts "decision support and/or augmentation as the largest type of AI by business value-add," more than other types like agents, decision automation, and smart products. By 2021, "augmented analytics will create $2.9 trillion of business value and 6.2 billion hours of worker productivity globally."

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> As AI technology evolves, the combined human and AI capabilities that augmented intelligence allows will deliver the greatest benefits to enterprises.
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> —SVETLANA SICULAR, RESEARCH VICE PRESIDENT, GARTNER

The growing adoption of modern BI—also known as self-service analytics—means that more people are doing data analysis on their own. But the size of data within organizations is also growing and the full cycle of analytics—from collection to data prep to analysis—is often time consuming, regardless of the tools. This can hinder people from performing analysis on their own. "Sometimes the barrier isn't skills or data, the barrier is time," shared Richard Tibbetts, Product Manager for AI at Tableau.

AI-powered augmentation can accelerate the search for insights by trimming the search space, surfacing relevant data to the right person at the right time, and by suggesting fruitful paths for analysis. Machine learning will also remove a lot of tedious, manual work, allowing humans to stay in the analytical flow and focus on high-level creative tasks.
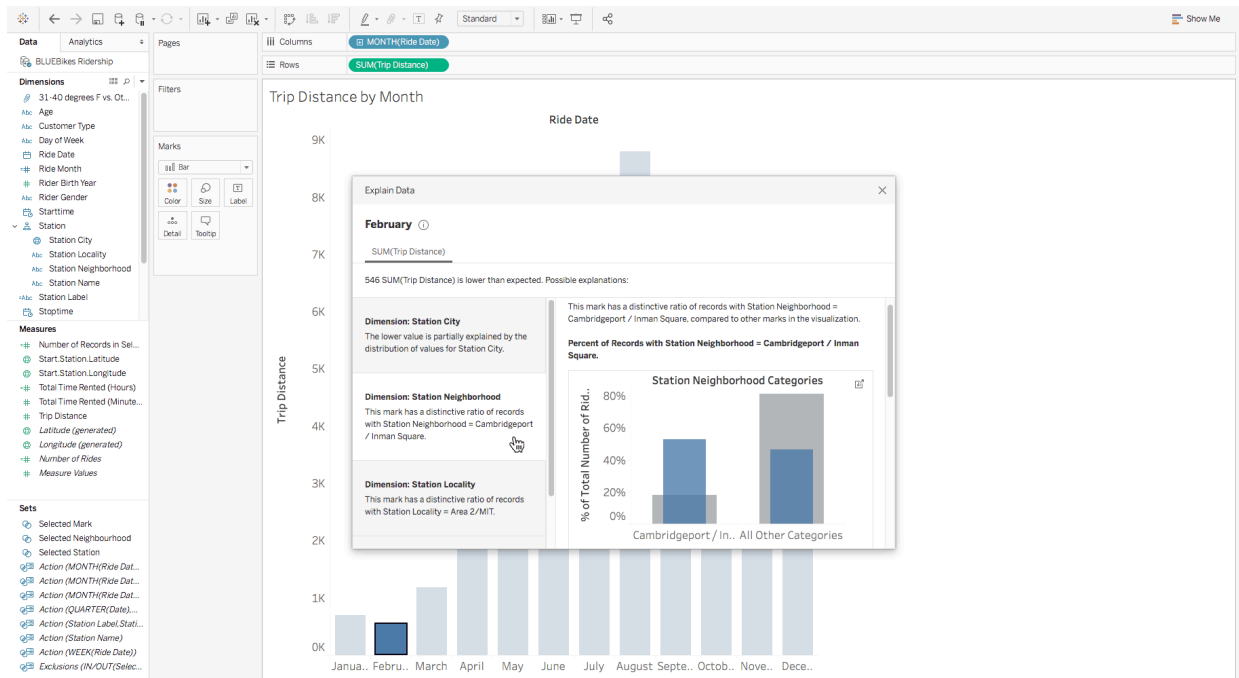
Machine learning-powered features like Explain Data in Tableau provide explanations for data points that may be different than expected. Explain Data evaluates hundreds of potential explanations and the most likely ones are delivered as a combination of natural language and visualizations, so that they can be further explored with Tableau.

"Think of machine learning capabilities within BI tools as consultants who are trained in statistics," explained Rachel Kalmar, Data Scientist and Staff Product Manager at Tableau. They surface the results of advanced algorithms as recommendations. Both analysts and business users can employ their domain expertise and human judgement to bring business context to these recommendations, determining the best route for their analysis. This means they're able to work faster, increase accuracy, and find insights that would have possibly taken days or months to surface.

Domain knowledge has always been important for analysis, but features fueled by machine learning make this skill set even more critical. Smart explanations and visualizations provide more information to the user, but no data set is complete and there will be gaps where humans need to fill in the necessary context. The person analyzing the data needs to know the business and the data well enough to understand which path to follow and which action to take. This means that analysts need to have a deep knowledge of the business, while domain experts need to deeply understand the organization's data.

"The final objective of data analysis is always a human one," said David Crawford, Director of Software Engineering at Alation. "The job of analysts will be to point the AI to the right questions to be analyzed and to decide how to apply that analysis to problems in the real world."

## Analysts will champion data literacy to make the most of machine learning

In the age of modern BI, analysts are championing data culture, empowering fellow employees to analyze data on their own. This allows analysts to focus on more strategic tasks, like curating data sources and creating strategic dashboards, while domain experts can explore data related to their expertise. But this is only successful when organizations have prioritized analytics proficiency across departments so people can confidently speak and understand the language of data.

Machine learning features offer up explanations and showcase how results would change if inputs were different; for example, providing possible explanations when a value is higher or lower than expected or within the range of natural variation. They will also surface data concepts like expectations and uncertainty, forcing people to come to terms with the gaps in their data knowledge. But machine learning explanations are only useful if the consumer understands data concepts and how they relate to their own business data.

One of these data concepts is causality; for example, if two things occur together, did factor A cause factor B, B cause A, or C cause A and B? "Causality is something machines haven't quite figured out, but humans can often determine through their own experience and judgement," shared Eric Brochu, Staff Software Engineer for Machine Learning at Tableau. "Knowing the role of things like confounders and controlled experiments is another element of data literacy in the age of machine learning."

Data experts, like analysts, data scientists, and data stewards will continue to be these champions of data literacy, while novice users will be expected to invest time in learning data skills. Capabilities like natural language processing (NLP)—also powered by machine learning—will support these efforts, offering an introduction to data concepts. With an intuitive interface, users can get answers simply by typing their questions into a search bar. As more people in an organization become data literate, these champions will also provide guidance on data collection and changing business processes for an organization to make the most of machine learning.
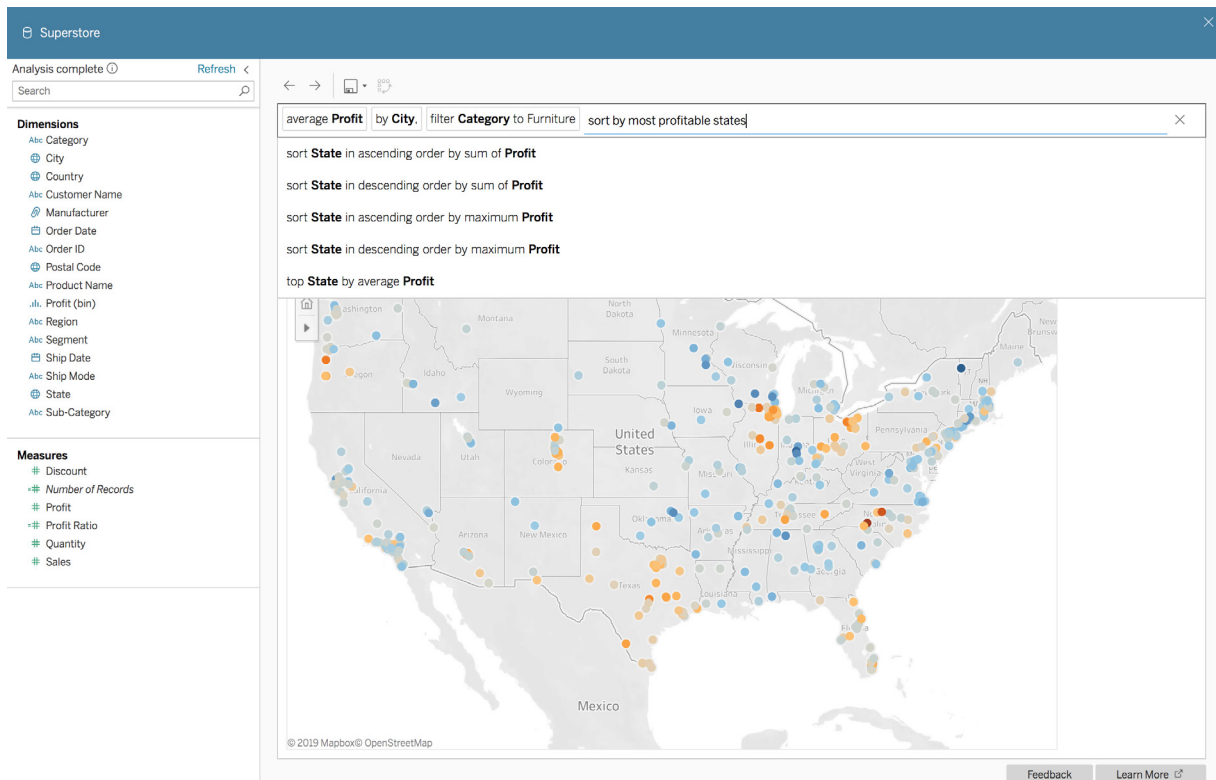
Natural language interfaces like Ask Data in Tableau will assist in data literacy efforts. Users can simply type their question about a data set and get an answer in the form of a visualization.

"The emergence of AI does not mean that an algorithm will tell you how to run a business. It will be the domain experts that help ensure that AI is adopted and trusted in an organization," says Richard Tibbetts.

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A lot of conversation around AI is around automating decision making, but the most important decisions are still made by people looking at data.

—RICHARD TIBBETTS, PRODUCT MANAGER FOR AI, TABLEAU

Machine learning will require conversations between domain experts and data experts

When new tools emerge, there is always a period of adjustment. The same goes for features powered by machine learning. Since these features will be embedded into existing workflows, strong communication between data champions and domain experts will help users find success and encourage adoption.

The most prominent way that these conversations will surface is through dashboards. With machine learning features acting as the "statistics consultant" in BI platforms, domain experts can understand "the why" in their data with explanations for unexpected values. This means analysts no longer have to take an analysis all the way to the conclusion. Instead, they can set up these domain experts with the right data and the right context to drill down into the data points that matter to them; for example, a starter dashboard that allows for interactivity, exploration, and adaptation.

In the same way, analysts that build dashboards for others should be aware of how people are using machine learning features and encourage open communication about the explanations and the data itself. This will reveal knowledge gaps around the data, which will help drive education and data literacy efforts across an organization.

For this to work, organizations need to have a solid foundation of modern BI, where collaboration is built into the analytics process. Modern BI has opened the doors for users across all skill levels to answer their own questions, while balancing agility with IT's need for security and governance. For modern BI platforms, machine learning features are an extension of this paradigm. They represent another step towards digital transformation, nudging organizations away from traditional BI and into a modern, self-service environment where everyone can ask questions of their data.

Conclusion

Machine learning will continue to advance modern BI, opening up conversations around data management, data literacy, and work processes. To get the most out of machine learning, it is critical that organizations select tools that enable domain experts to be full participants in the data analysis process. Meanwhile, as the role of the analyst evolves with technology and self-service analytics, advanced users will take on more strategic responsibilities within their organizations.

There is still a lot to learn and a lot more to come with new applications for machine learning and BI, but as the size of data continues to grow, these advancements will help humans get a deeper understanding of their data in less time. The age of AI is here and the future is bright.

Learn more about Explain Data, Tableau's new AI-powered feature that helps you understand the "why" behind unexpected values in your data. To explore more features, read about Tableau's investments in smart analytics.

About Tableau

Tableau is an easy-to-use, enterprise-ready business intelligence platform that helps people see and understand data through self-service analytics at scale. Whether on-premises or in the cloud, on Windows or Linux, Tableau leverages your existing technology investments and scales with you as your data environment shifts and grows. Unleash the power of your most valuable assets: your data and your people.

Additional resources

6 Myths of Moving from Traditional to Modern BI

Webinar Series: Embracing the Modern BI Evolution

Tableau Data Management: Governing self-service analytics at scale