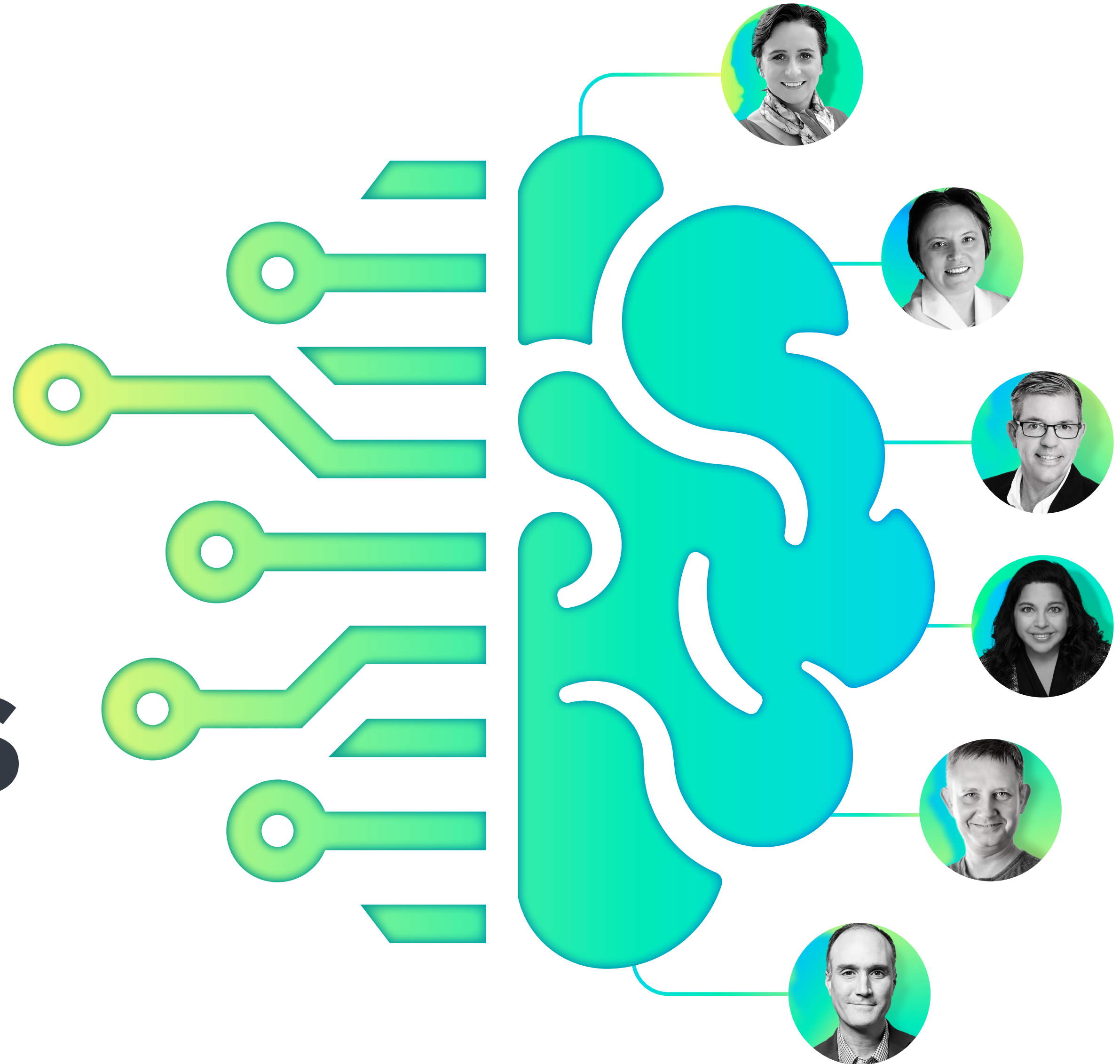


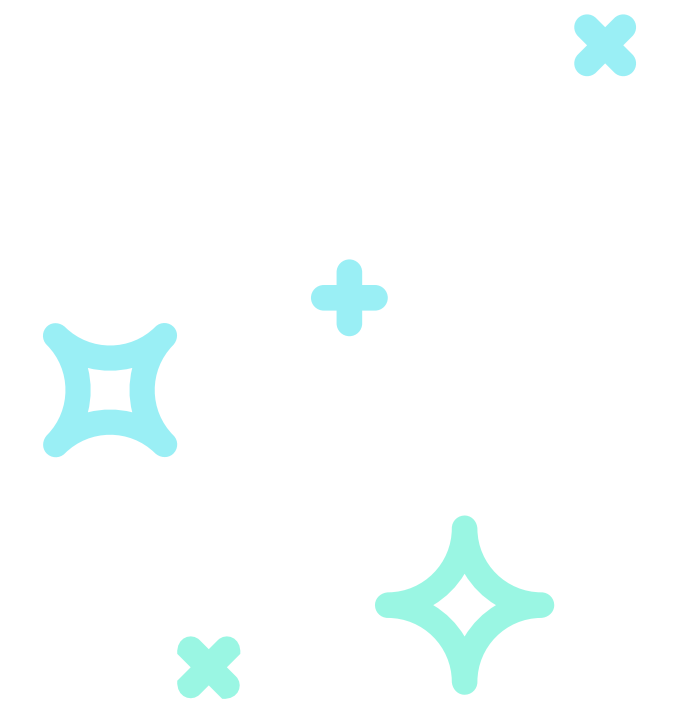


# DATA MASTER PERSPECTIVES

Innovations in Data and AI  
in 2024 and Beyond



Artificial intelligence (AI) is quickly becoming part of everyday life. The emergence of generative AI (GenAI) tools such as ChatGPT, Bard, and GitHub Copilot is accelerating the adoption of AI by making it accessible to people worldwide.



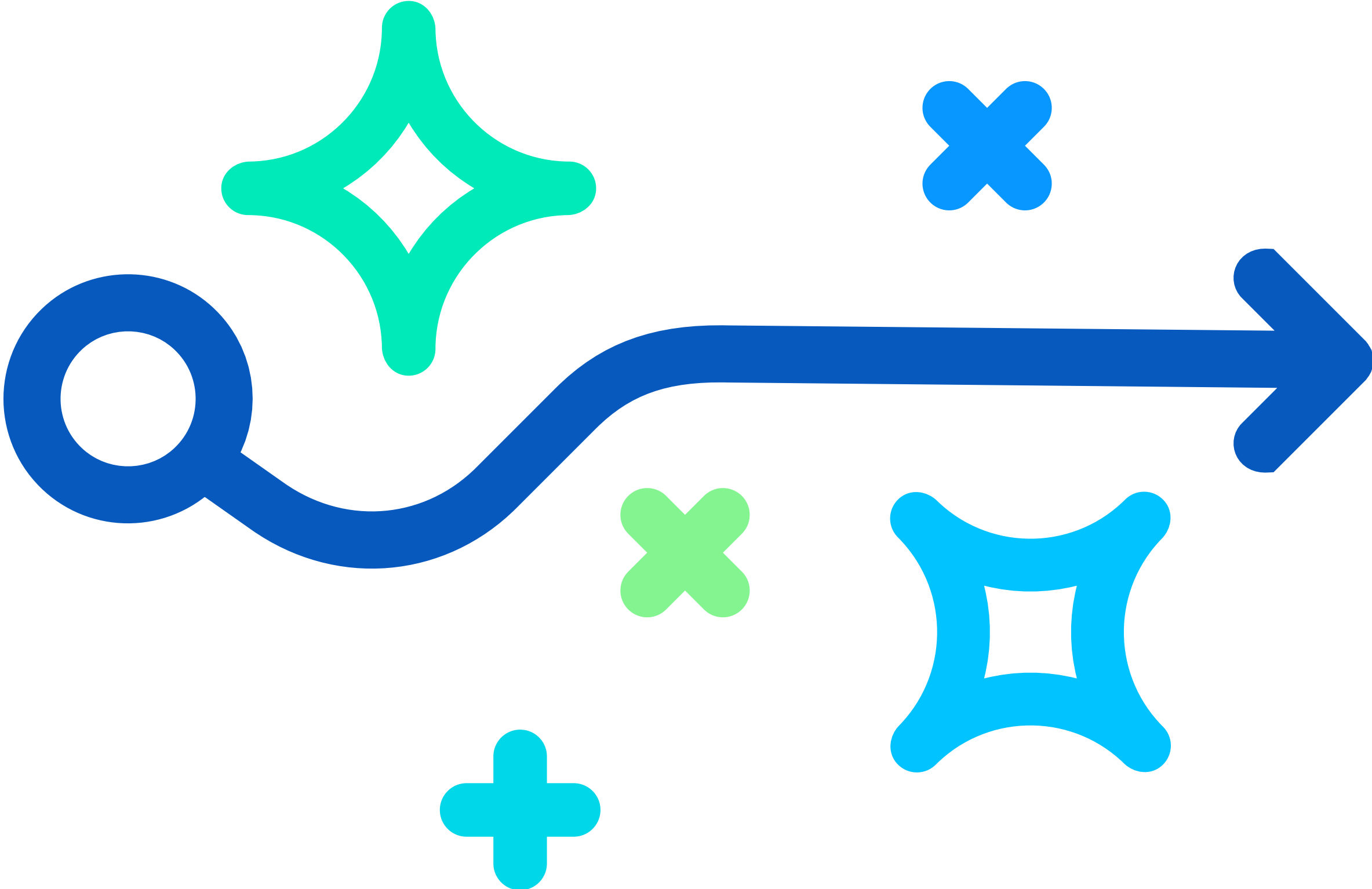
Self-driving cars and AI assistants, once considered science fiction, have become commonplace. In the business world, programmers are harnessing the power of GenAI to expedite the development of code, while marketers rely on it to personalize campaigns for maximum impact.

It's clear that AI is here to stay. But as this next wave of AI offers a world of opportunity, it also presents a number of challenges ranging from the promotion of

misinformation to the introduction of bias and prejudice. As a result, demands for legislation focused on AI are gaining momentum, highlighting the growing need for governance around the safe and ethical use of AI. In the European Union, the **AI Act** aims to regulate the use of artificial intelligence within its jurisdiction, while in the United States, President Biden signed an **Executive Order on AI** that aims to address potential threats posed by the technology.

In business, AI has the power to streamline operations, enhance customer experiences, and revolutionize business models. But these opportunities come hand-in-hand with ethical considerations, potential biases, data privacy and security concerns, and the emerging need to comply with AI-related legislation.

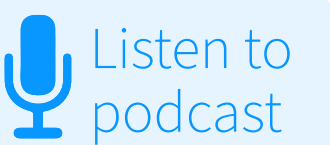
To help you navigate this uncharted territory, we've asked a number of data and AI experts to offer their perspective and advice when it comes to the strategic and holistic adoption of AI innovation. Here's what they had to say.





# With Great Power Comes Great Responsibility

**Salema Rice**, Chief Executive Officer and Founder, CDO Today



Generative AI is our first real inflection point in the world of AI. And while it's scary for Chief Data Officers (CDOs), they know that they must adopt AI within their organizations. Doing so responsibly requires CDOs to prioritize the quality of the underlying data. It's about protecting the data – knowing who owns it, where it's coming from, and where it's going. Because when the data is bad, the results are bad too, even if they sound authoritative (which they often do).

To address the data quality challenge, CDOs should avoid trying to boil the ocean. Instead,

they should prioritize creating data products that focus on delivering the data that is most critical for making quality business decisions. By taking a product-based, dual-velocity approach, CDOs can narrow down the data needed to address a specific problem.

Further, CDOs must also integrate data from across the organization. By breaking down data silos, the business gains a more holistic view of the data that not only helps stakeholders understand what happened in the past, but also why it happened and what's going to happen next.

*“Generative AI is a turning point for a lot of organizations. They want to use data as a product. They want to be a data-driven company. But doing so requires quality data that is protected and secure. And that needs to be top-of-mind for CDOs before they introduce these models company-wide.”*



# What Kind of World Do We Want to Live In?



**Dr. Eva-Marie Muller-Stuler**, Partner EY Data & Analytics and Global Ethical AI Advisory Board Member

Biologist Paul Ehrlich once said, “To err is human. To really foul things up you need a computer.”

Advances in AI are giving humans the ability to do so many amazing things. But humans are biased. And so are the datasets we’re feeding into the models we’re building. That’s why it is so important that we ensure the models are transparent. That they are fair,

accurate, and safe to use. That they protect our security. And that the data we’re using to train them is accurate and complete.

As AI takes hold, the topic of ethical and responsible AI is quickly emerging as one organizations must address. Are we doing the right things as we adopt and use AI – and are we doing them in the right way? Many times, we’re not. And that’s because there is a gap

between the AI buzzwords and true understanding of how to implement it in a responsible and transparent way.

As organizations begin to adopt GenAI and other emerging generative technologies, they need to anticipate the impact they will have on the business. Data leaders must consider how the underlying data will impact the validity of the results. And, where needed,

fix the errors and collection biases to ensure the model produces outcomes that are as fair and accurate as possible. As well, users must learn how to challenge the models when results appear inaccurate.

The significance of data quality cannot be overstated. That's why businesses must consider the skillsets they need to ensure the

transparent and ethical use of AI. Data scientists are important, but so too is looking beyond the whiz kid in a hoodie. Accept diversity and employ experts who may break the mold. And if you're a data scientist, here's my advice: your appearance doesn't define you. Know your strengths, be prepared, and remain authentic.



*“We are in a world where we have to learn to accept our diversity. We have to learn that it doesn't matter what you look like. You can be at the top of the game technically in your field. Know your core strengths, be prepared, and know your subject better than anyone else. Stay true to yourself, and don't be intimidated by others in the room.”*

**Dr. Eva-Marie Muller-Stuler**

# From Skeptical to Mesmerized... and Terrified!



**Randy Bean**, Founder and CEO of NewVantage Partners and Innovation Fellow at Wavestone

Developments in AI are accelerating at an unprecedented rate. With GenAI tools like ChatGPT just over a year old, the conversation is now starting to shift to newer AI technologies. Artificial general intelligence (AGI) is a state where AI can perform human cognitive tasks better than the smartest human. And experts believe AGI will be available as a general capability within the next two to three years.

When I first heard this prediction, I'll admit I was skeptical. But after hearing more, I was mesmerized, and admittedly a little bit terrified! Advancements in AI are going to be here faster than we expect. And businesses need to be ready for it.

Managing data as an asset is a good first step in preparing for the wave of new technologies coming our way. But according to the

**Wavestone Data and Analytics Leadership Annual Executive Survey 2023**, only 39.5% organizations said they were doing so, down from 46.9% just five years ago. And only 20.6% said they've established a data culture, down from 28.3% five years ago.

So why are these numbers going down? Simply put, managing data is getting harder. Every single minute of every single day, 18



million gigabytes of data are added to the global sum. And new technologies like GenAI and AGI are advancing faster than we ever could have imagined just a few short years ago.

Generative technologies offer a wealth of opportunity for businesses. But data leaders need to be thinking about how they will

apply these new AI technologies – and what guardrails they must establish to safeguard the use of them. Prioritizing data quality is critical, perhaps even more so than ever before. The integrity of the models is ultimately determined by the quality of data we feed into them. That’s why data quality is so essential – it directly impacts the outcomes we can achieve.



*“It’s incumbent upon us as human beings and business professionals and data professionals, especially knowing what we do, to do everything that we can to safeguard the use of AI and to ensure the quality and integrity of the data that goes into these models. It’s easier said than done. But over the past 20 years, there’s been such an advance in data quality and data cleansing capabilities that hopefully we’re moving in the right direction.”*

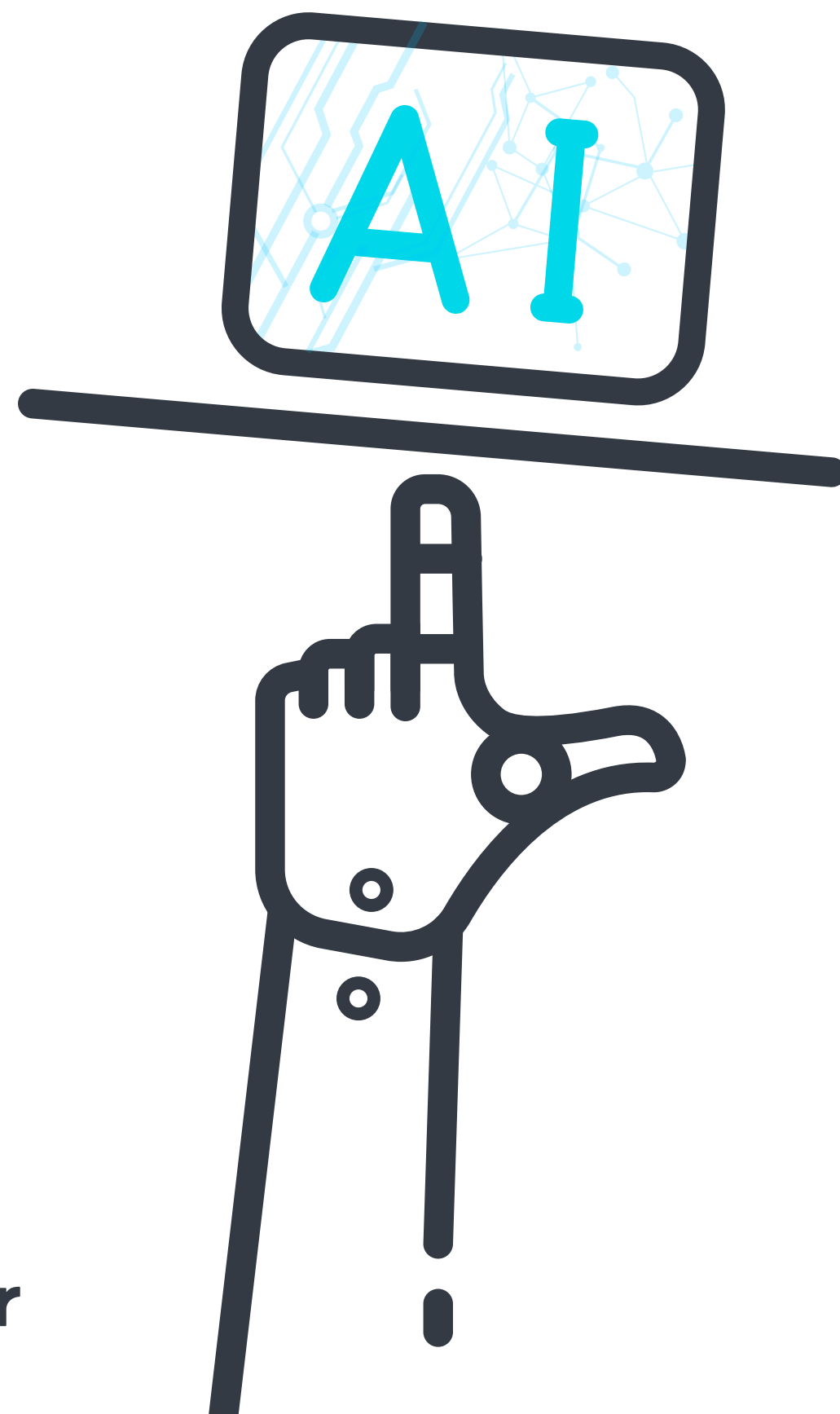
**Randy Bean**

# It's About Finding the Balance

**Misha Advena**, Head of Analytics at Miro



 Listen to podcast



There is no one right way to organize a data team. To some extent, the stage and maturity of an organization will dictate the way to structure the team. However, there are a number of considerations worth noting.

To start, the roles within a data team are changing and evolving all the time. When I began my career, analytics engineers didn't exist. And today, they play a critical role in

many organizations. The emergence of this role signals a shift. Analysts need to be closer to their business stakeholders. They must still have technical skills, but it's equally important that they understand what the business team is trying to accomplish, as well as their challenges in doing so. Then, using metrics, analysis, and data insights, they can be a knowledgeable partner and find a way to help them.

The question of centralized vs. distributed data teams often comes up as well. Conventional wisdom says that most organizations start with a centralized data team with a handful of analysts who do everything. Then, as the organization expands, the need for the data team to have more functional expertise grows. New data teams emerge, often as part of the business. Neither way is right or wrong. It really just depends on what the business needs.

But what I have seen in organizations with super strong functional teams is the creation of data silos. The same data points start appearing in different ways, and you find two teams working on the same thing – or nobody working on it at all. On the flip side, when data teams are highly-centralized, they become too far removed from their business counterparts. Their work becomes more oriented towards completing a task versus driving business decisions, which is the wrong mindset. The best option is balance.

*“Essentially, you need people who can do it all, who are technical enough, who can write code, who can build beautiful visualizations, who truly understand the stakeholders, and who can take insight and present it in a way that your non-technical stakeholder can understand. And who can think about the data and the result. It's never conclusive – never black and white. But they need to have a point of view and have a way to combine the data with the context stakeholders have, and then connect the dots and ensure that decisions people are making are not necessarily the correct one, ones that are more likely to be correct than not.”*

**Misha Advena**



# Be Problem Spotters, Not Just Problem Solvers



**Joel Shaprio**, Clinical Associate Professor of Data Analytics, Northwestern University's Kellogg School of Management, and Chief Analytics Officer, Varicent

Data teams have a tendency to take on a project and go heads-down and try to solve it. This is not, necessarily, the wrong approach. But I do believe it's a missed opportunity.

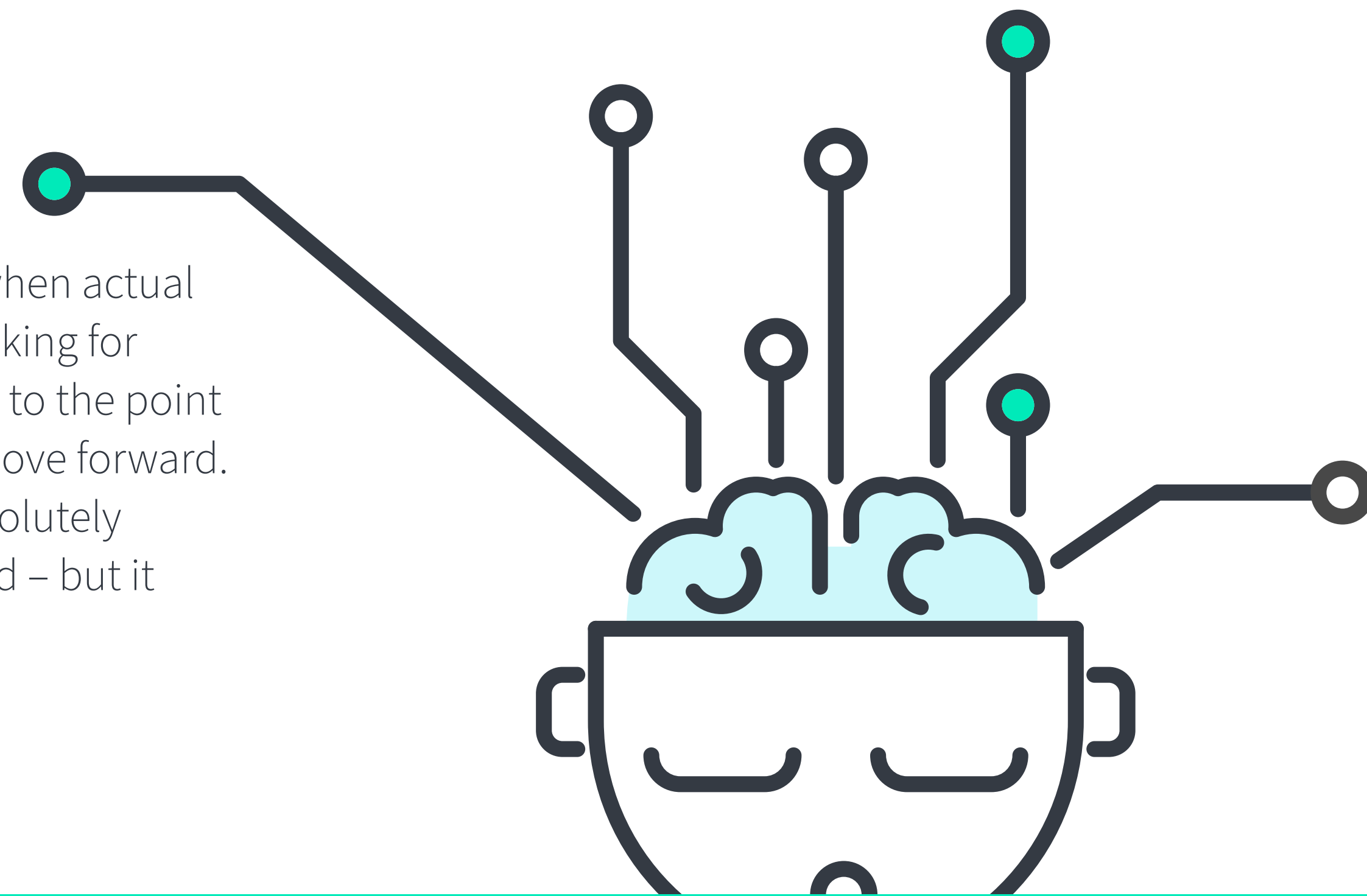
When we think about increasing the value of data, we need to empower the next generation of data leaders to be problem spotters, not problem solvers. Here's why.

Many times, the people in an organization who understand the data are not the same as the people with the advanced technical skills. They are the ones who have a holistic understanding and perspective on the data, making it easier to spot trends and missed opportunities. When data teams can actually surface those kinds of insights, their role shifts to one that empowers the business team.

So the onus is on the data team to understand the business. But it's absolutely imperative that this communication and understanding go both ways. Business leaders must also understand the data so they can define what it is they need to solve their business challenges. They need to give the data team clear direction, otherwise the data team will spend weeks or months working on a project they don't fully understand.

Further, data teams and business teams alike must not let perfect be the enemy of good. It's problematic when teams think to themselves "I don't have perfect data, therefore I can't move forward." Really good strategies exist to help organizations gain access to really good data. Sometimes it's about knowing where to look. Other times it's

about using proxy measures when actual data doesn't exist. If you're looking for perfection, you'll always come to the point where you believe you can't move forward. Don't let that stop you. It's absolutely essential that your data is good – but it doesn't have to be perfect.



*“One of the most common points at which a data project can fail is when people think to themselves, “I don't have perfect data.” So I either need perfect data or I can't go forward. And that's problematic because often you don't have perfect data...[but] you can do some valuable stuff with imperfect data for sure.”*

**Joel Shaprio**

# Start With the Why

**Elena Alikhachkina**, Data and Technology Pioneer,  
Global Data Power Woman

When it comes to embracing AI within an organization, it's important that you start by asking yourself "why." It's not just about implementing a solution. It's about connecting that solution to your business strategy so you can drive meaningful results.

Further, when it comes to thinking about the successful use of AI, it's critical that you consider the quality of the data. Finding quality training data is essential

to your success. Many organizations invest in creating more sources. This is a road to nowhere. Instead, they should invest in improving the quality of the data they have.

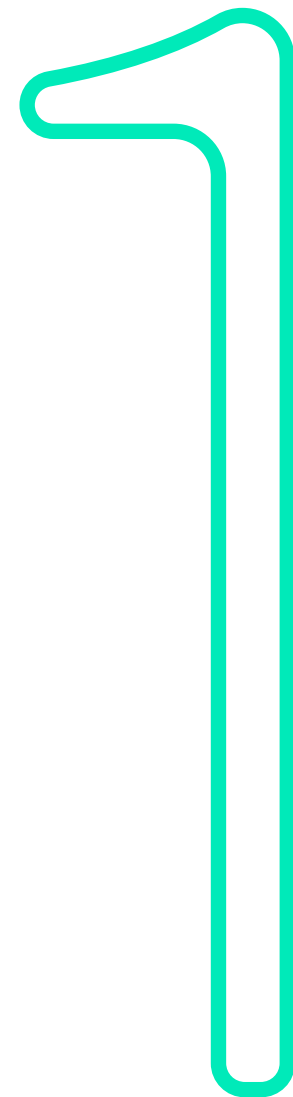
Implementing a data product strategy will help you improve the quality of your data for use in AI. Start with consumption end points – not sources. And hire a data product manager to implement and manage your data product strategy.



*“The majority of data management organizations are treated like cost centers. I don't like this. Data product managers should have the same mindset as product managers for items that are sold in stores. Think about the users of your data products as paying for them. What is the ROI? It's a really different mentality.”*



# Key Trends to Keep an Eye on in 2024



## AI is Here to Stay... So Now What?

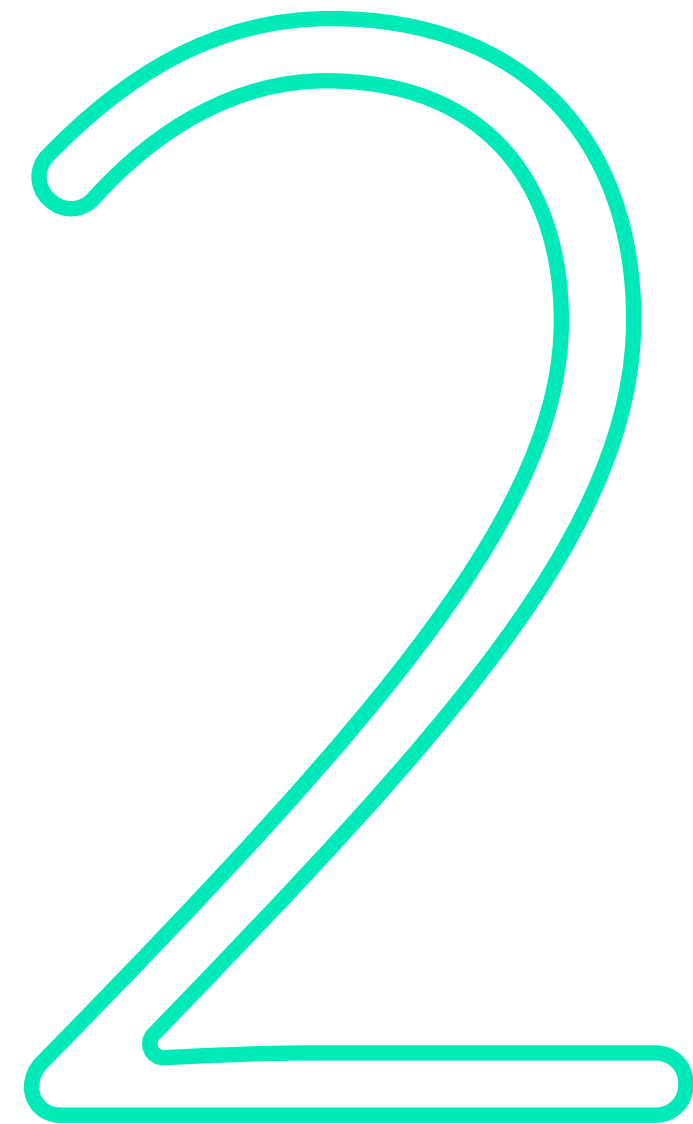
We're in an era where AI is transforming the way we live, work, and interact with the world around us. And as we embrace this new technology, it's critical that we learn not only how to harness the power of AI, but also how to navigate the complexities it introduces into our lives.

Today, the **AI market globally** is worth over \$136 billion. And, it's expected to reach \$1.81 trillion by 2030, representing 13x growth over the next decade.

Adopting AI is no longer a question. It's an imperative. Using AI, organizations can future-proof their business by:

- Boosting operational efficiency and drive greater ROI
- Powering exceptional customer experiences
- Spotting new opportunities to grow the business
- Safeguarding the business from unforeseen risks

Organizations that fail to embrace AI in a responsible way will fall behind or go out of business. It's that simple.



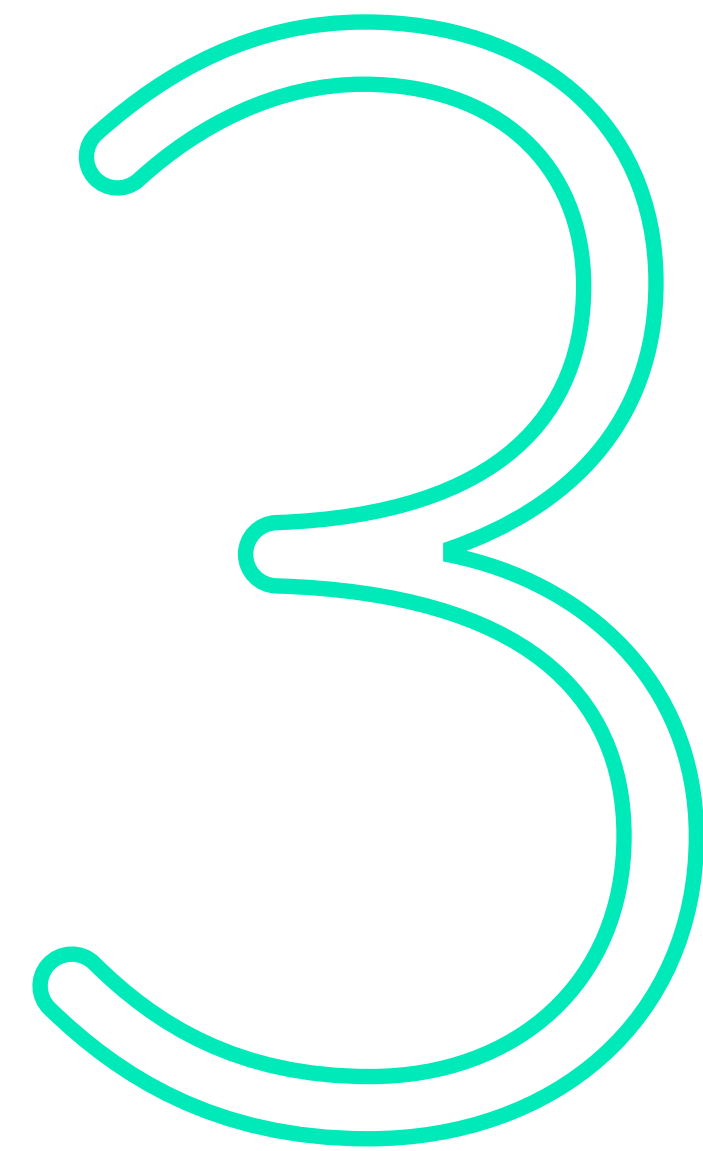
## Data Quality Matters

Data is the driving force behind AI. And when faced with challenges related to responsible and ethical use of AI, it's imperative that organizations prioritize improving the quality of their data. When AI models use high-quality data, their results will be accurate. And accurate results lead to better, more trustworthy decision-making. Consequently, businesses can grow their revenue, deliver outstanding customer experiences, and improve operational efficiency.

In contrast, when organizations use incomplete, incorrect, or outdated data, the models are more likely to return inaccurate results. And these results cost organizations a lot of money in missed opportunities

and inefficiencies across the business. In fact, according to Gartner, bad data costs organizations, on average, over \$12 million annually. Even worse, inaccurate results increase the potential for making decisions or taking actions that could cause reputational harm.

Simply put, the success – or failure – of AI depends on the quality of the data. But as the volume and complexity of data continues to grow at an exponential rate, ensuring its quality becomes increasingly difficult. That's why organizations must rethink how they deliver clean, trustworthy data at scale.



## Data Quality in an AI-Driven Era: Why MDM is No Longer Sufficient

Traditionally, organizations have used master data management (MDM) as a way to improve the quality of their data. Today, that's no longer sufficient. Traditional MDM solutions simply can't keep pace with an organization's need to deliver clean, trustworthy, consumable data at scale for use in AI. Here's why.

- **They're rules-based:** Traditional MDM solutions use rules to clean and master data. But when data changes, rules must change, too. Not only is the effort to write, modify, and maintain rules time-consuming, but it also requires significant human effort. And that makes it difficult for traditional MDM to keep up with the volume and complexity of modern data.
- **They're manual:** Humans play a significant role in the configuration, curation, and maintenance of rules in traditional MDM solutions. However, as data

continues to grow and evolve at an unprecedented pace, relying solely on human-driven approaches proves insufficient in meeting the ever-increasing demands of the business.

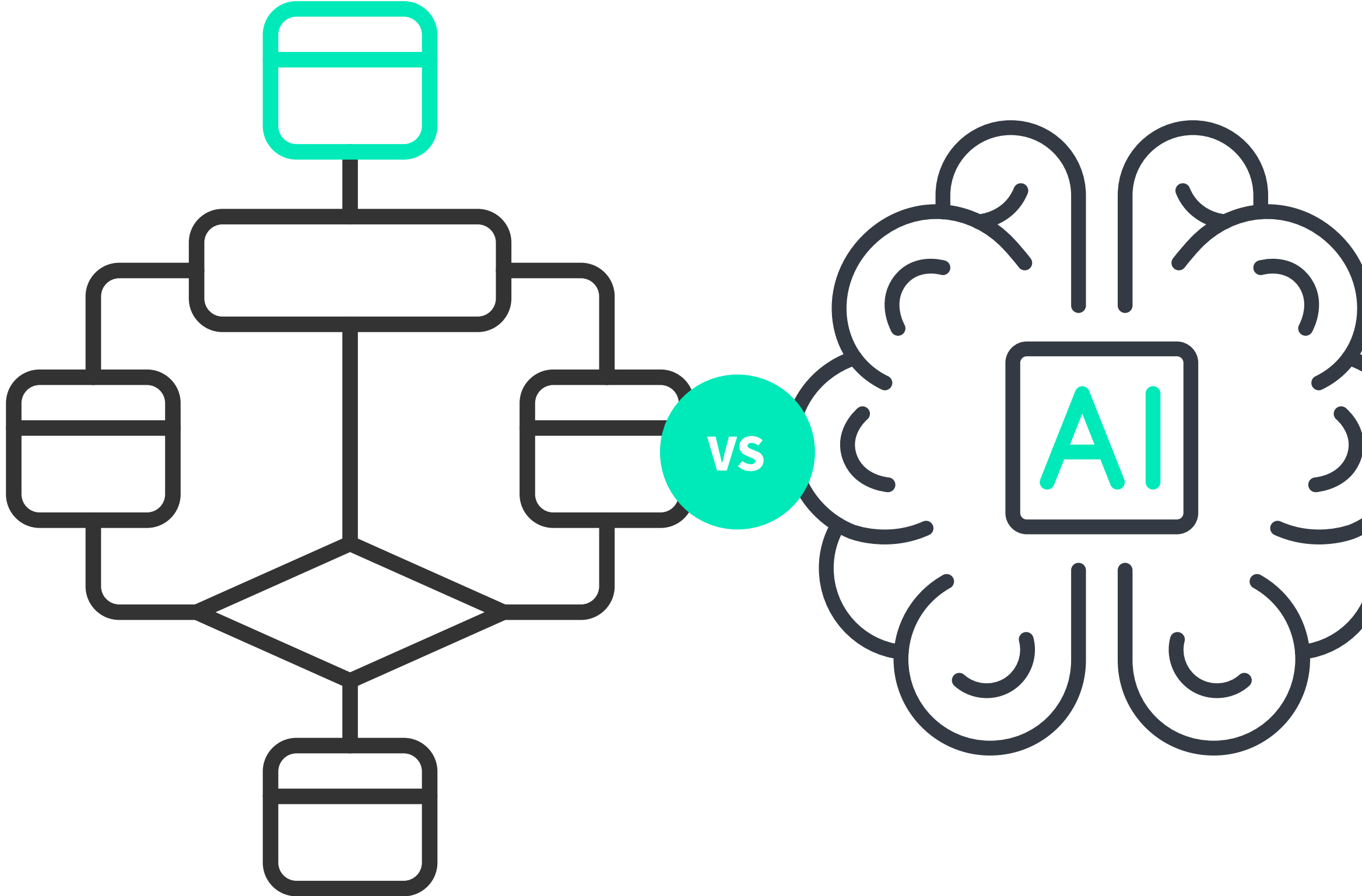
- **They're built for static data:** Traditional MDM solutions work best when data is static. But data today is dynamic, causing traditional MDM solutions to struggle when it comes to mastering the ever-growing, complex nature of modern data.
- **They're centralized:** Traditional MDM relies on centralized control, where data governance and management are tightly controlled by a central authority or department. This approach leads to bottlenecks and inefficiencies, making traditional MDM a poor choice when it comes to improving data quality.

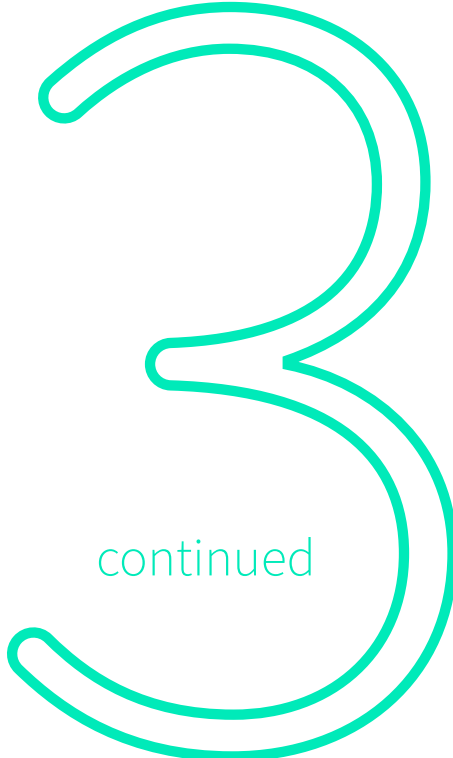




The good news is, there is a better way to make your data better. Data products make it easier and faster for organizations to deliver clean, trustworthy, consumable data at scale. They make data tangible for everyone across the organization by providing ready-to-consume sets of high-quality, reliable, and accessible data that people throughout the business can easily use to solve business challenges.

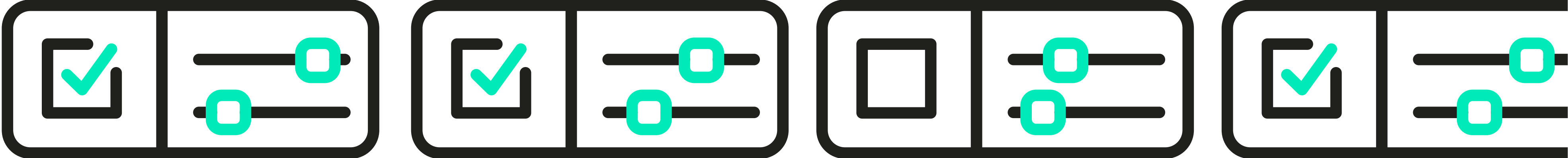
The best data products are organized based on business entities and governed by domain. They consist of comprehensive, clean, curated, and continuously-updated data sets that are aligned with key business entities, making them consumable by both humans and machines across the entire enterprise.

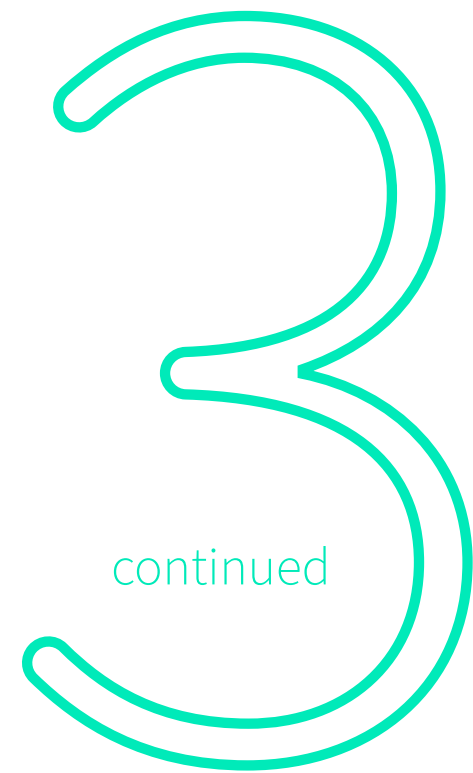




# 4 Essential Capabilities of Data Products

- **Built for consumption:** Data products put the power of data in the hands of individuals, allowing them to extract insights, uncover patterns, and spot opportunities to enhance the business. Using intuitive interfaces, users can visualize data in impactful ways, and derive actionable insights effortlessly, even if they are not a data expert.
- **Mastered using AI/ML:** Data products blend the power of AI with human intelligence to continuously adapt to changing business needs and improve data at scale. Using sophisticated algorithms and ML-driven models, data products become smarter and more intuitive over time, making it easier to connect and transform data faster than using traditional, rules-based approaches.





- **Designed to improve data quality:** Effective data products provide the tools and capabilities to standardize, refine, and validate data, helping organizations to spot where data is incomplete, inaccurate, duplicative, or outdated. Then, using pre-integrated APIs and reference sources, data products can source and onboard trusted providers without the need to maintain custom connections.
- **Engineered for enrichment:** Today, the best sources to enrich data exist outside the organization. Data products include robust enrichment capabilities that link internal and external data using unique IDs, allowing businesses to match their data with trusted vendors that best align with business needs.

Discover why traditional master data management is becoming obsolete for ensuring data quality in favor of AI-powered data products, and explore their powerful capabilities. Dive deeper into the topic by reading [\*\*Mastering Data Products: The Definitive Guide to Enhancing Data Quality\*\*](#).

Using data products, organizations can drive better business outcomes by delivering the clean, accurate, continuously-updated data needed for decision-making. By uniting AI with human intelligence to improve data quality and enrich data with first- and third-party data, businesses can revolutionize customer experiences, drive greater ROI, boost operational efficiency, and avoid risks.





## The New Data Culture

As AI takes hold, organizations must also consider its impact on their overall data culture. From new roles and increased collaboration to ethical considerations and the need to comply with emerging regulations, it's clear data cultures are evolving.

Because AI requires human oversight, collaboration across the organization is becoming increasingly important. It's no longer acceptable for data to live in silos, with access limited to a select group of individuals. Instead, organizations must break down data silos and integrate their data so users can work together to spot opportunities, reveal vulnerabilities, and increase efficiencies.

To help foster a stronger sense of collaboration across the business, savvy organizations are hiring data product

managers to bridge the gap between technical data teams and business needs. **Data product managers** oversee the entire lifecycle of data products, prioritizing user-centric development, ensuring alignment with the organization's data strategy, maintaining data quality and governance, facilitating cross-functional collaboration, and optimizing products based on feedback and metrics. They also explore monetization opportunities, manage data-related risks, stay informed about industry trends, and play a crucial role in leveraging data products effectively to create business value.

Finally, as ethical concerns grow and new, AI-related legislation emerges, organizations must increase their focus and take the necessary steps to safeguard the business from harm.

# Tamr: The Leading Data Product Platform

At their core, data products are reusable data assets that make data tangible for everyone across the organization. By providing consumable data sets that are high-quality, trustworthy, and accessible, data products form the foundation for analytical and operational use cases so that people throughout the business can embrace AI and solve business challenges.

Tamr provides the data product platform businesses need to deliver the clean, accurate, continuously-updated data that enables organizations to embrace AI

and drive business outcomes. Our innovative data product platform is the first of its kind to unite AI with human intelligence to improve data quality.

Ready to make your data better? [Take a test run](#) of Tamr and see how our data products help your organization work smarter.

Want more insights on the future of data and AI from the industry's leading experts? [Subscribe](#) to the Data Masters podcast.

Attribute Name	Value
Company Name	Citigroup
Full Address	388 Greenwich Street, New York, NY 10013
Phone	1 (888) 248-4226
URL	citi.com
Ticker	NYSE: C
Alternative Names	Citigroup Inc.   Citi

Attribute Name	Value
DUNS	19-732-9691
CapIQ ID	391687
Pitchbook ID	10024-75
Dow Jones Profile ID	1074476
LEI	6SHGI4ZSSLXCXQ5BB395
FIGI	BBG0016YYT55

	Retail	Online	Salesforce	Hubspot
Retail	30,250	50,123	61,412	65,984
Online	50,123	20,124	30,444	55,842



As the leader in data products, Tamr enables customers to accelerate their time-to-value by delivering validated, trustworthy insights. Tamr's data products are the first of their kind to unite AI with human intelligence to improve data quality and enrich data with first- and third-party data so businesses can revolutionize customer experiences, drive greater ROI, boost operational efficiency, and avoid risks. Using Tamr's cloud-native and SaaS solutions, industry leaders such as Toyota, Western Union and Novocure uncover the insights they need to stay ahead of the competition in a rapidly-changing business environment.