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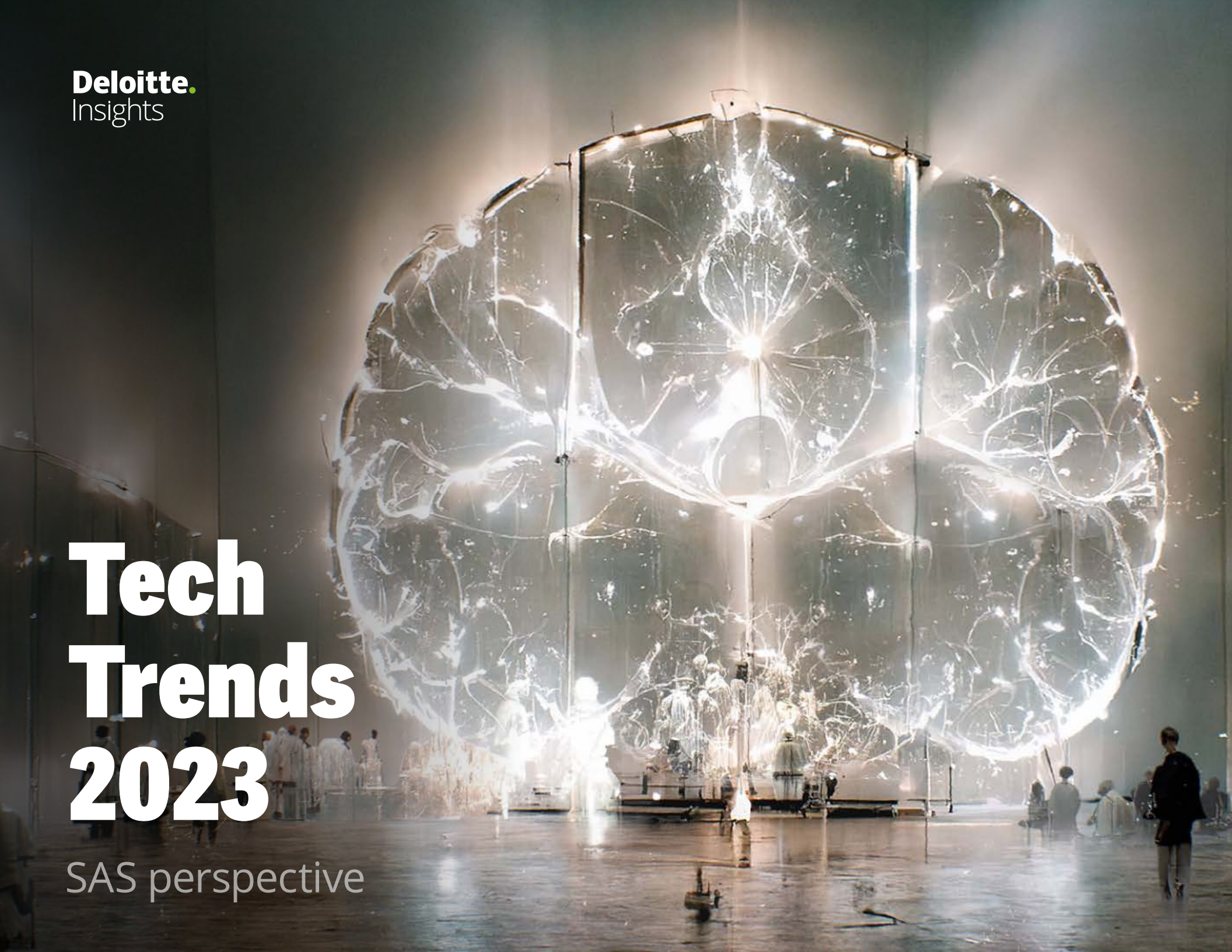

Tech Trends 2023

SAS perspective

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Introduction

What are the data and analytics implications of the trends identified in Deloitte's Tech Trends 2023 report? If you're not asking that question, you should – because this year's trends are teeming with possibilities for analytics-generated insights. Ignore them, and you could be missing important opportunities to gain the competitive edge that comes with all the data these trends will generate.

In this companion report to Deloitte's Tech Trends 2023, SAS has zeroed in on a few of the most important analytics considerations for leaders assessing each of these trends. As a longtime Deloitte partner and one of the leading providers of analytics solutions in the world, we've spent years helping business and technology leaders put tomorrow's technology trends to work today. This report will give you a head start.

Through the glass: Immersive internet for the enterprise

Immersive worlds may capture the imagination, but we should consider what tangible value the metaverse brings to business.

Identifying the human need

In today's new world of hybrid work environments, executives are hyper-focused on two areas: enabling employees to feel more connected at work and creating immersive experiences to increase productivity.

As we've seen in the headlines, the metaverse is a virtual environment that drives collaboration and communication. The concept is intriguing, both personally and professionally, so it's not surprising Deloitte included it as a 2023 Tech Trend. But before we think about ways to adopt the metaverse, we must first identify the human need that we are trying to address or the human capability we are trying to scale; then we can talk tech.

Considering the engagement model

Let's consider the top social media platforms, which fundamentally serve a human need to scale relationships and communication – Facebook with personal relationships, LinkedIn with professional networks, Twitter with real-time news and YouTube with personalized content and learning. Each platform allows for casual and quick interactions, enabling people to be present in both digital and real worlds at the same time.

Now let's consider a metaverse environment. Regardless of using an AR/VR headset or traditional mouse and keyboard, this engagement model demands people to be fully present in the virtual world. Yes, applications like video games are engaging, but in business, pure engagement is not enough.

> Creating a 3D office for employees to gather around a virtual water cooler may improve employee connections, but not necessarily increase productivity.

Exploring the art of the possible

The military, for example, uses virtual environments to conduct complex training that would otherwise prove difficult, expensive or dangerous. When conducted virtually, teams can learn complex maneuvers and experience the realism of live operations from the safety of their devices. The metaverse can also enable surgeons to visualize and simulate intricate medical procedures. George Washington University adopted an advanced VR tool for neurosurgery, where surgeons can virtually examine a patient's brain and body ahead of an operation.

Supply chain simulations can also be valuable. Imagine creating an immersive environment that understands shipping lanes and materials. You could simulate what happens when a lane closes, or gas prices rise. The information density of this environment is complicated enough in the real world that a traditional dashboarding system won't work. Instead, a 3D gaming environment can model the complexity of the enterprise and deliver incredible insights.

As you can see, there have already been incredible results that showcase the art of the possible with the metaverse.

When this concept becomes more pervasive, industry pioneers will seek to leverage more immersive technologies. But with any technology discussion, we must first answer the most important question: "What is the human need?"

One of the most important AI transparency tools is the model card, which specifies the intended purpose of a model, key data inputs for the model, how it performs over time, and more.

AI gains credibility: Learning to trust our AI collegues

Most significant technology breakthroughs emerge to a chorus of concerns about trust. In that regard, artificial intelligence is not unique.

Learning to trust new tech

Consider the early reluctance of both individuals and companies to trust cloud-based services for handling or storing sensitive data. Today, cloud is ubiquitous in personal and enterprise computing alike. We learned to trust the cloud. Still, AI feels different. Workers in particular are suspicious of AI because of its potential to take over their jobs, among other concerns. This is the type of profound issue that sets AI apart, although a broader look at the history of technological advances reveals many similar moments, such as the dawn of word processing.

Transparency is critical

Suspicion and mistrust grow in the face of a lack of transparency. A number of promising approaches have already emerged for providing the level of transparency and "explainability" required to help workers better understand and trust the AI tools that will proliferate and work alongside them in the coming years.

Trends in action

There is not yet a standard for these model cards – different solution providers and users construct and deploy them in different ways. In our experience, there are five features every model card should include to cultivate trust among the people who will depend on them:

- **Statement of intent and limitations:** What is the model's purpose and intended use, what are the out-of-scope use cases, and what are the model's limitations and ethical considerations? This information allows a user to assess which contexts are appropriate for this model to be applied.
- **Summary of training data set:** What are the scope, source and lineage details of the data set used to train the model? This helps users identify any gaps within the data set and consider whether the training data was appropriate for current use cases.
- **Metrics:** Which metrics were used to determine model success? This can include metrics on aspects such as accuracy and fairness.
- **Responsible party:** Who is accountable for this model? Identifying the responsible party is a basement requirement for accountability and transparency.

Model cards should be as dynamic as AI itself – no small challenge given AI's ongoing rapid-fire evolution. No matter what twists and turns are ahead, these features should provide a sturdy framework for model cards as their importance grows in the face of AI proliferation.

Above the clouds: Taming multicloud chaos

For the data scientists and developers who use analytics to extract insights from massive volumes of data, it's easy to see the appeal of operating in a metacloud environment.

After all, analytics workloads are not only resource-intensive – they're also highly variable and differ in terms of importance and urgency. The concept of a metacloud offers the ability to spin out different workloads to the right cloud environment for the job, or even back to mainframes. This is an exciting proposition for data scientists, who could prioritize large-scale, mission-critical jobs by moving them from desktop machines and on-prem servers to a more flexible, scalable cloud environment at a moment's notice, getting much faster results. Easy? Not necessarily. But certainly smoother and faster than whatever happens in most large organizations today.

Green lights – and warning signs

For other stakeholders, though, the prospect of running analytics through a metacloud is more complicated – and maybe even dangerous. Finance leaders and C-level executives, for example – people who regularly make decisions based on analytics-driven insights – are keenly aware that the meter is running every second an analytics workload is being run through the cloud. The bigger the workload and the longer the runtime, the more it will cost. Nobody wants to be left holding the bill for a massive, unplanned analytics-in-the-cloud exercise. So, decisions regarding metacloud-driven analytics workloads must be made with all these variables in mind, in order to deliver the best results at the right cost.

> While the metacloud is not a practical reality yet, it's coming.

Fortunately, this is exactly the type of business challenge that analytics tools were built to address. As organizations find smarter ways to manage their reliance on several cloud environments at once, analytics, AI, machine learning, and automation capabilities will help inform these decisions. Experienced users of analytics will be given choices regarding where to run analytics workloads, based on several factors, like the type of analytics model being run; the size of the job and how long it will take; the best cloud environment for that job; and cost.

Of course, human decision makers will ultimately be making these decisions, not machines. And while machines will be able to determine where analytics workloads can run with the least cost, humans will maintain responsibility for weighing a higher cost against an organization's business goals.

Help is on the way

So are these analytics capabilities – many of which evolved from more rudimentary tools like schedulers, which have been used by all types of analytics teams for years. And that's very good news for analytics decision makers who are expected to deliver the world without blowing up IT budgets.

Flexibility, the best ability: Reimagining the tech workforce

For IT and business leaders focused on analytics, the technology talent crunch isn't new. Finding – and keeping – qualified data scientists has posed a dire challenge since the field of analytics ignited years ago.

Finding low-tech ways to keep high-tech talent

Anyone with the rare ability to combine strong analytical skills at the data level with keen business insights is a sought-after commodity. And there still aren't enough of them to go around. This has big implications for the everyday operation of analytics programs, leaving a razor-thin margin of error. With no signs of the talent shortage abating anytime soon, there are no easy answers. Leaders have to look for every possible advantage, often in unexpected places.

Getting started

One of the most effective strategies for lessening the impact of the analytics talent crunch is decidedly low-tech: In-person collaboration When organizations encourage and enable their people to engage in person, they're able to gain more clarity on project definitions, data source outcomes to navigate this miniscule margin of error. Here's what you can gain with more in-person collaboration.

Preserve finite resources for mission-critical programs. Misguided, resource-intensive analytics programs are a growing problem today. Analytics teams who are working together in person tend to have a much keener ability to identify, refine, or redirect such projects, preserving key talent for more mission-critical initiatives.

Nurture new talent – and retain seasoned veterans. The faster new talent can get the insights and experience they need to make meaningful contributions, the better. And the longer you can hang on to seasoned analytics veterans, the greater the odds of ensuring continuity across critical analytics initiatives. In-person engagement helps secure these bonds.

Create and sustain a true analytics culture of innovation. Great analytics minds are wildly creative. And while creativity can happen in isolation, it is often accelerated by the types of conversations and interactions that take place in person.

One of the most effective strategies for lessening the impact of the analytics talent crunch is decidedly low-tech: In-person collaboration.

Stay flexible

In-person collaboration may seem counterintuitive at a time when remote collaboration is all the rage. Many professionals today view remote working as a mandatory requirement for their employment. It's important to remain flexible – make a strong, strategic case for in-person collaboration, and find ways to maximize in-person time while giving workers the remote time they need to thrive. It's a balancing act. But finding the right balance has never been more important.

In us we trust: Decentralized architectures and ecosystems

Any security checklist for Web3 will prominently feature analytics, for obvious reasons. The entire idea of Web3 is built around data, and the responsibility for all the activities required for creating trust in the data – managing, cleansing, analyzing, sharing – resides squarely within the domain of analytics. Data without analytics is value not yet realized.

Will we be prepared for a Web3 world?

If you're wondering if analytics capabilities will be ready to handle the demands of a Web3 reality, there's good news – they're already prepared today. While Web3 will present significant data challenges, they are likely to be roughly in line with similarly large-scale endeavors such as the dot.com boom (mid-1990s) and advent of the big data era (mid-2000s).

Leaders should instead focus on the integration and interoperability issues that will determine our collective ability to create trust through decentralized architectures and ecosystems. Because this entire environment relies not only on tight, highly disciplined coordination between a wide range of players (partners, competitors, cloud providers, regulatory bodies, consumers and many more), but also between an equally broad range of stakeholders within each individual organization.

Analytics capabilities will be ready for Web3, leaving important time to focus on integration and interoperability issues.

Build on existing tools and capabilities

One important way to speed the transition to Web3 is to select analytics tools that come prewired with collaboration capabilities, including:

- **Regulatory compliance** "Are we compliant with privacy and data-sharing standards everywhere this data originated?" If the answer is "We're not sure," or worse, "No," we'll never gain trust in a decentralized world. It's a lot easier to answer this question confidently in organizations that are using analytics systems that already account for global regulations and are actively updated by the analytics provider.
- **Open source integration** If the Web3 switch were flipped into the "on" position today, the ecosystem would be instantly crowded with open source tools and systems. A year or so after that, an unpredictable mix of new open source capabilities will have entered the field of play. This requires a high degree of flexibility and commitment on the part of analytics solutions when it comes to open source capabilities, requiring the ability to accommodate open source integration seamlessly alongside more traditional systems.
- **Built-in risk management capabilities** In a Web3 era, threats multiply exponentially, with bad actors ready to wreak havoc at a moment's notice and generative AI capabilities only adding fuel to the fire. Meanwhile, regulators are writing the rules while the game is already in play. With organizations' reputations at stake, the risks of a Web3 world must be vigilantly managed and mitigated. Fortunately, many effective risk management tools are built into advanced analytics solutions and are evolving every day.

Connect and extend: Mainframe modernization hits its stride

While many organizations have moved parts of their IT infrastructure in the cloud, mainframe applications and processing still appear in hybrid strategies. Here's why.

Mainframes in action

In our experience at SAS, IT leaders remain cautious about abandoning their mainframes in favor of cloud processing for three main reasons:

- Mainframes are still excellent at doing what they do best. In an analytics environment, that is the ability to crunch large volumes of data efficiently and expeditiously.
- The fixed costs of mainframes provide valuable predictability for budget planning purposes.
- Mainframe processing is the culmination of years' worth of experiences unique to the business.

Finding the right tool for the job

Replicating the power and speed of mainframes at scale in a cloud environment can be challenging, even as significant advances in cloud capabilities continue to unfold and at some point may offer these benefits. Today, however, senior decision makers in IT and the business are wise to carefully consider their operating environment and the types of analytical jobs being run as part of any due diligence involved with moving mainframe processing to the cloud.

For analytics jobs, play to the strengths of both cloud applications and mainframes.

In an analytics environment, this is about playing to the strengths of both cloud applications and mainframes.

Can you have the best of both worlds?

Where does this leave analytics leaders who are excited to take advantage of the benefits of the cloud, such as its ability to scale up or down without the need for provisioning new hardware, while also reluctant to jettison the mainframe capabilities they use day in and day out? A hybrid cloud-mainframe environment can help a company leverage the agility and resiliency of the cloud with the proven reliability and raw processing power of mainframes. It's a sensible idea in theory – but how does it work in practice?

In an analytics environment, this is about playing to the strengths of both cloud applications and mainframes. Use the mainframe to clean, prepare, manipulate, manage, and crunch large volumes of data. In the cloud, users can take advantage of features that are unique to these solutions, including:

- Reporting
- Visual analytics
- Visual statistics
- User-friendly user interfaces
- Streaming data, event stream processing, IoT, and AI tools

In a job that may require 10 hours of processing time, data preparation can consume as much as 9.5 of those hours – that's where mainframes can be useful. The remaining time can be used by more nimble, application-rich cloud solutions that make it easier for a wider range of users to derive insights from the data using analytics tools and techniques. For business and technology leaders looking to get more from legacy systems alongside newer capabilities, it's all about using the right tools for the job.

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"Great analytics minds are wildly creative."

— Bob Messier, Sr. Vice President
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