Analytics Unchained: Unleash the Power of Analytics With Integrated Software

TOPICAL SURVEY

BARC

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Table of contents

The case for vertical integration in analytics

The **effective use of data and analytics** is a challenge for most companies today. Too seldom do companies generate relevant insights as quickly as they desire and need to. Analytics content must be created in an iterative manner and it must not be impeded by the restrictions caused by data silos. The **fast creation** of reliable results and **sharing** them in a secure manner requires **easy-to-use** and seamlessly integrated software that supports the complete analytics cycle from data ingestion to presentation. Only a **vertically integrated** software delivers the required degree of flexibility for users through its **end-to-end** features.

This is a clear shift from the paradigm promoting efficiency through horizontal integration. Creating all reports in a single tool and storing all data in a common data warehouse was meant to boost efficiency. Instead of curbing expenditure, **horizontal integration curbed the innovative capacity** of companies to use their data.

"There is a theory which states that if ever anyone connects all the data silos in an enterprise, they will instantly disappear and be replaced by something even more bizarre and inexplicable. There is another theory which states that this has already happened at your organization."

(Adapted from Douglas Adams, The Restaurant at the End of the Universe)

In this study we examine the requirements of tightly integrated modern data and analytics software. We elaborate on the **obstacles** for re-using data, models and visualizations and the benefits achieved when using **integrated data and analytics software**.

We discuss the following key questions to derive reliable recommendations for our readers:

- How do companies today **generate analytical assets** and how are they used? How do they ensure **quality** and a fast **time-to-insight?**
- How can integrated data and analytics software contribute to **collaboration** and efficiency? What are the **benefits** you can expect?
- What are the key **requirements** for an integrated data and analytics software?
- What are the **hurdles** to the introduction of such a software? How can companies overcome these?

Robert Tischler and Nina Lorenz
Würzburg, May 2021

Management summary

When BI started being industrialized in the 90s, it was largely considered an IT topic as it required fundamental technical expertise. As such, **centralizing competence** to provide stable service was the obvious move to make. By centralizing competence and standardizing tools, cost advantages were expected. What was lost along the way was the **flexibility** businesses required to freely analyze and visualize data in new ways that are fit for quick decision-making.

This brought about the rise of **shadow BI**, which was initially powered almost exclusively by Excel. Change came a decade later with the advent of user-friendly **self-service BI** and visualization tools. Early resistance was largely overcome when these tools were embraced as an opportunity to eradicate the **bottlenecks** created by cost-oriented BICCs. Unfortunately, a general lack of **governing** capabilities, originally perceived as guarantors of flexibility, and the dissemination of analytics into all corners of modern companies overstrained the approach.

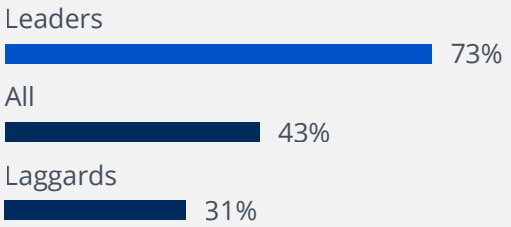
To overcome the defects of earlier generations of analytics and BI software, **vertically integrated data and analytics software** couples the flexibility required for quick insights with governance features for scaling **decentralized** self-service and blending it with central delivery. This technology has been available for some time now and has penetrated many areas. Various developments over time have combined to make them the powerhouses of companies successfully deploying analytics to unearth the value of their **data treasures**.

> *The story so far: In the beginning a centralized BI system was created. This has made a lot of people very angry and been widely regarded as a bad move.*

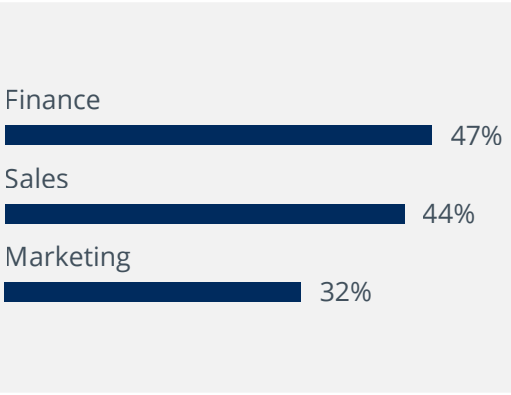
(Adapted from Douglas Adams, The Restaurant at the End of the Universe)

> *Shadow BI is not the root of all problems, it's a mere symptom of missing features or flexibility. And you have to fight the cause and not the symptom.*

Management summary



Companies that already use integrated data and analytics software (n=130)



Top 3 departments that already use integrated data and analytics software (n=133)

01 Enhanced analytics agility: Vertical trumps horizontal integration

Mastery of data usage gives companies an edge over their competition. Converting their data into insights effectively throughout the organization enables them to support decision-making and **drive innovation**. To this end, a good share of companies sees huge potential in **vertically integrated** data and analytics software. While laggards have not fully bought into the benefits of the concept yet, **leaders** have already acted and are reaping substantial rewards. Today, these tools are quicker to implement through the **cloud** and easier to use than ever thanks to **ML-based augmented** guidance features. Powered by these technological innovations, the increasing **scope of analytics** requirements is successfully covered by tailored solutions.

Advanced and predictive analytics, machine learning and AutoML are all prime examples of this increasing scope. While they are not yet supported by integrated data and analytics software as well as reporting and data preparation, they are among the top **investment priorities** for future implementations.

02 Boost time-to-insight with vertical integration and realigned processes

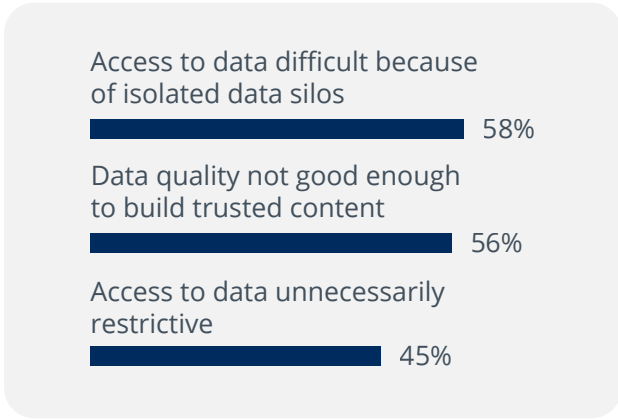
While the prime goal of horizontal solutions was to **leverage synergies** and cash in on economies of scale by serving the whole company, vertical solutions should **increase agility**. And in a dynamic world, flow is more important than scale. Therefore, it is not surprising that integrated data and analytics software is not widely considered as a tool for serving **the whole company**.

As with any tool following **new paradigms**, you must realign analytics processes, roles and responsibilities. This affects requirements and implementation processes as well as the responsibilities of **dedicated developers** at the center of analytics gravity. Increasing data literacy and intuitive tools empower business users but to deliver reliable results, they need decent service from full-time experts.

Management summary

03 Data democratization needs free flow of data and transparency around usage

There will always be room for improvement in the analytics process as demand and expectations rise constantly. And **transparency** is a must to **democratize** access to data in a company. Having comprehensive metadata providing a view on **data lineage** shows where data is used. Knowing where it is used and who uses it makes it easier to agree to share it. A major threat to the free flow of data and ideas are **data silos**, more often created by restrictive **access policies** than by incompatible software. With vertically integrated software, one has to be very **cautious** not to create more of them. **Cataloging** all available analytical assets helps to lower barriers by making visible what others achieve with data.

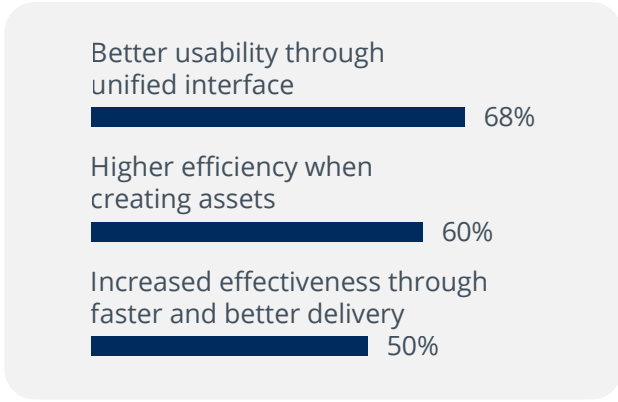


The 3 most common challenges when building analytics assets (n=312)

04 Better usability and tight integration propel effectiveness, speed and efficiency

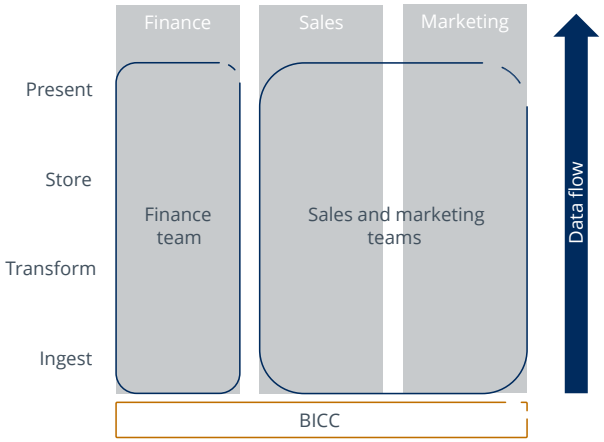
Companies realize various benefits when deploying integrated data and analytics software. The clear number one benefit for companies of all sizes is **better usability** through unified interfaces, integrated metadata and augmented analytics features – but that is only a means to an end. It is an enabler to engage more business users to provide **more relevant results in less time** to inform and automate decisions.

A look at the **advantages** of deploying integrated data and analytics software shows the stark contrast in **satisfaction**. While vertically integrated software is no magic wand, the satisfaction with results and creation are twice as high on average.



The top 3 benefits gained from integrated data and analytics software (n=131)

Action items



Align analytics teams with departments and value creation

> *Emphasize flow over efficiency and redefine processes when purchasing analytics software.*

We have gleaned the following recommendations from analyzing the pros and cons of vertically integrated data and analytics software and validating them with feedback from your peers:

Analyze the potential for speeding up analytics and promoting it in business units. Vertically integrated tools empower business users and developers to be **more efficient and effective**. Quick and intuitive data preparation, analysis and presentation are key in analytics. Only in **tightly integrated** software can experts refine, reshape and enrich their data and present insights in the most suitable way. And with speed comes **relevance and effectiveness**.

Identify clusters of requirements that can be covered within a unified tool. Be aware that additional tools must provide clear benefits and must **fit into the architecture** smoothly. They must not generate additional **isolated data silos** that limit the innovative power of analytics. Open interfaces and metadata exchange are the technological enablers for the required **transparency** that the organizational framework must follow.

Define principles that guide **collaboration** between units and the BICC in a decentralized analytics environment. These principles must consider the paradigm enabled by vertically integrated analytics software. By dividing work along the data flow and cutting out intermediaries instead of spreading across them, huge benefits in speed and agility can be realized to improve a company's **innovative capacity**.

Action items

We have gleaned the following recommendations from analyzing the pros and cons of vertically integrated data and analytics software and validating them with feedback from your peers:

Reassign and upskill dedicated developers in the analytics organization to **train, coach** and advise **users** in business units and local entities to master their own analytics challenges. Together with **curating data** for shared use and providing **guidance** through best practices, this creates the foundation for evolving a cost center into a successful service shop. While business analysts and data scientists move to center stage in decentralized analytics, the contribution of **developers and data engineers** to smooth operations cannot be overestimated.

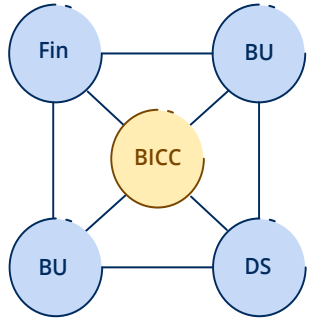
Extend the reach of analytics with user-friendly software for **advanced and predictive analytics** and machine learning that includes leading data preparation facilities. Consider requirements of automating decisions even though they may not be crystal clear yet. Operationalizing, **deploying and monitoring** analytics and ML models in production will be relevant for all companies sooner or later and many are not prepared properly yet.

Catalog all the analytics assets created throughout your organization, regardless of the tools used or the departments that created them. A comprehensive overview of reports, dashboards, data sets and analytics models is the oil to get the engine of your **analytics processes** running smoothly.

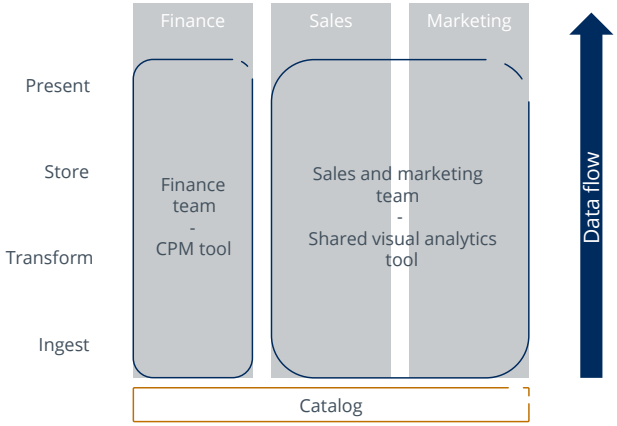
Appreciate the potential of integrated software with exhaustive metadata collection. These easy-to-govern tools deliver common and extensible **semantic models**, collect compelling usage statistics and provide **transparency** into where data is sourced from, how it is transformed and where it is presented.

Consider cloud-based solutions when selecting vertically integrated software. Software as a service combines the advantages of practically unlimited **scalability**, quick set up and **resource-efficient operation**. For modern analytics, the cloud is a platform that can deliver on today's and **tomorrow's needs.**

Decentralized analytics



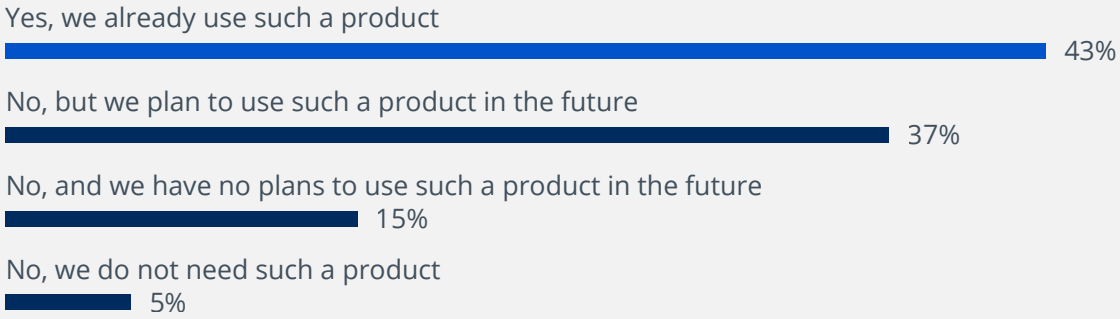
Provide central support to decentralized teams



Catalog all analytics assets across tools and teams

01 Enhanced analytics agility: Vertical integration trumps horizontal integration

Integrated data and analytics software makes its way into the heart of corporate analytics

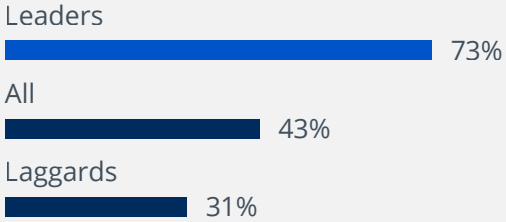


Does your company use an integrated data and analytics product in a single end-to-end environment? (n=307)

Mastery of data usage gives companies an edge over their rivals. Still, many companies constantly struggle to convert their data into insights that help them support decision-making and drive innovation. It follows that enhancing the required capabilities for the data and analytics process is high on the agenda for many organizations.

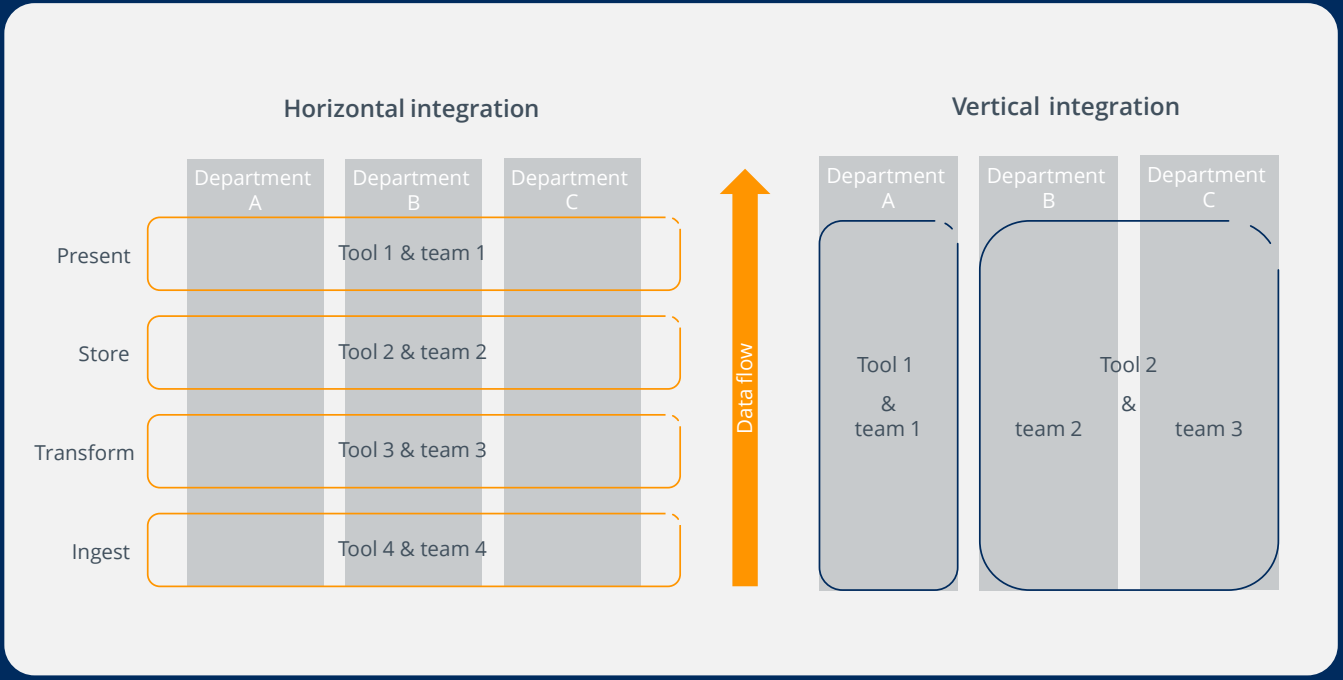
To this end, a good share of companies sees huge potential in **vertically integrated** tools that are known as **integrated data and analytics software**. This type of software provides end-to-end functionally in a unified environment for a variety of use cases. The scope ranges from classic BI to advanced analytics including machine learning. Some have their sweet spot in visual analyses and dashboards, others in planning and performance management or in advanced and predictive analytics.

43 percent of the companies surveyed in this study already rely on **vertically integrated end-to-end software** to support their decision-making. The twist comes when combining the answers of leaders and laggards with their adoption rates. Among the companies that claim to be better than their competitors at leveraging data for decision support and decision automation (**leaders**), 73 percent use a vertically integrated software. Such strong correlations attest to the power of these products. In comparison, significantly fewer **laggards** speed up their information pipelines in a similar way.



Companies that already use integrated data and analytics software (n=130)

Spotlight: How integrated data & analytics software powers end-to-end analytics by aligning tools and teams with data flows



Align analytics teams and tools with departments and value creation for quicker results

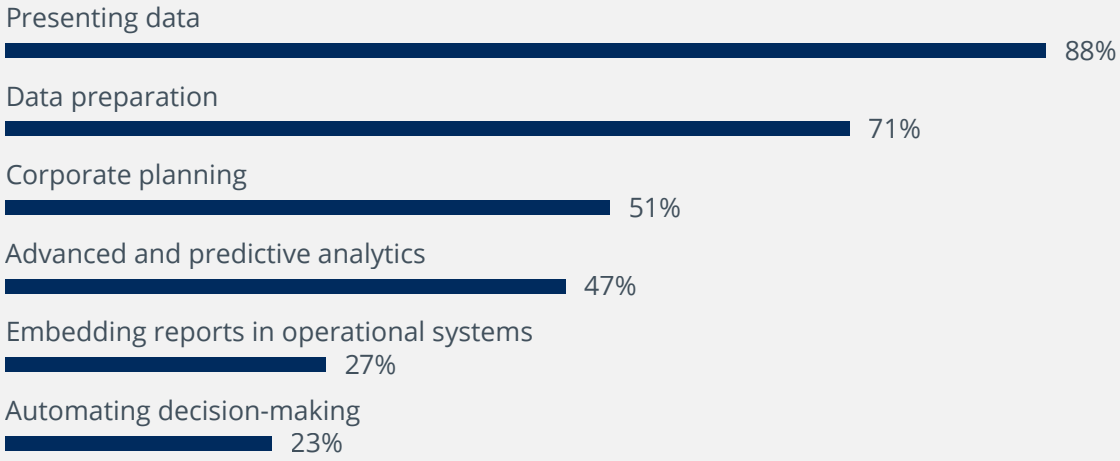
Integrated data and analytics software provides scalable facilities to **ingest, transform, store, analyze and present** data for a wide range of analytics use cases. More than simply focusing on new reports and dashboards, integrated data and analytics software empowers users to create all types of analytics assets. Tight vertical integration coupled with **high usability** fuels decentralized content creation and self-service.

Vertical integration tries to **align analytics process** organization with the data flow. The goal is primarily to **enhance flexibility** and the flow itself. This reorientation de-emphasizes efficiency and economies of scale, the paradigm that is familiar from horizontal integration. Instead, the easier data flow in integrated tools supports **iterative analyses** that are important when exploring new ways of working with data and using it to inform decisions and innovation for the business. At the same time, **metadata** can travel freely too, which increases accessibility to **data lineage** and impact analyses without further effort. Both are vital steps towards increasing **transparency** in data usage.

A major enabler for vertical integration is the **cloud**. It delivers **scalability and efficiency** to deployments of all sizes. As such, cloud is a driver from horizontal to **vertical integration.** If smaller teams can leverage software as a service in minutes, they avoid the need for expert involvement with implementation and integration of heavy-weight software. Running tailored solutions that provide exactly what is needed instead of a general-purpose solution becomes feasible and affordable.

01 Enhanced analytics agility: Vertical integration trumps horizontal integration

Preparation and presentation are the common denominator of integrated tools



What are you using the integrated data and analytics software for? (n=133)

While integrated data and analytics software supports a variety of use cases and functions, it is predominantly used to **prepare** and **present** data. The workflow from retrieving data from a source, transforming it to arranging the resulting insights to support informed decisions is the quintessential **goal of end-to-end analytics software.**

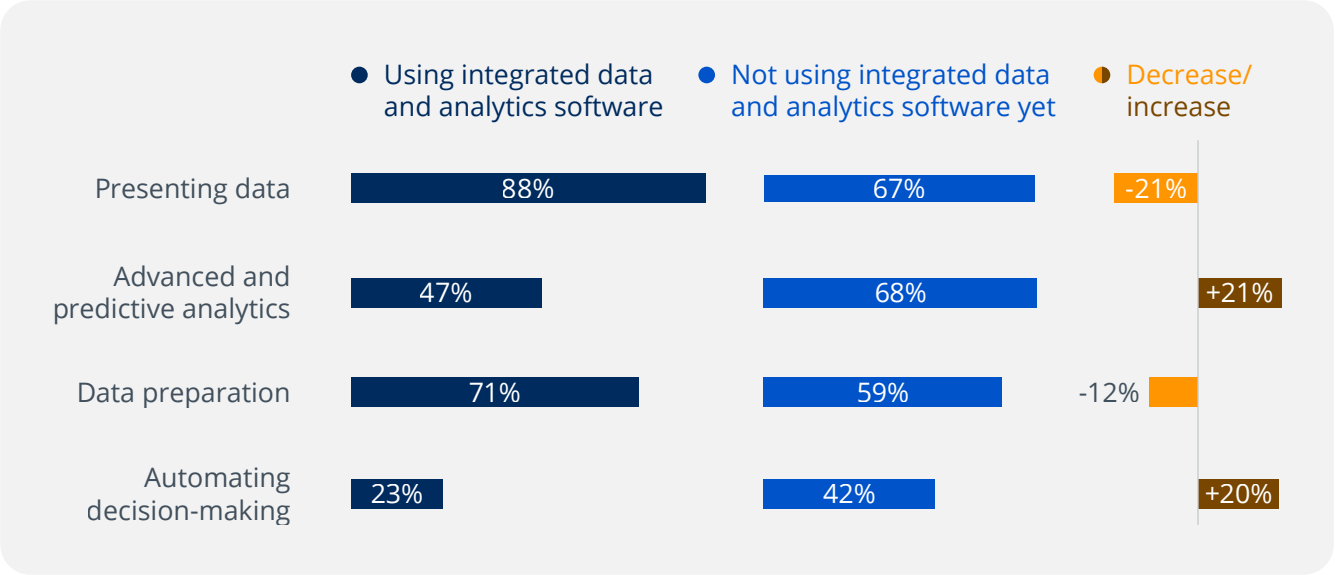
Of note, in this survey, is the high application rate for **corporate planning**. While this is often considered a marginal issue, widespread and frequent use gives testimony of the sophisticated capabilities of **integrated planning and analytics tools** (IP&A). They offer data integration, data storage and presentation facilities within an integrated environment that support corporate planning very well. Later we will see that finance departments are major beneficiaries of integrated data and analytics software, which is not surprising considering the nature of these tools.

Aside from corporate planning, **advanced and predictive analytics** have turned into a vital application scenario. To this end, many advanced and predictive analytics tools have been built from the ground up to support data preparation, analysis and model deployment in a single tool. It is not surprising that nearly one half of companies address the challenges with a high need for agility in vertically integrated tools.

A gap that integrated data and analytics software has yet to fill is operationalizing analytics either by **embedding reports** or deploying analytics models to **automate decision-making**. Smaller companies use their integrated tools as the Swiss Army knife for these uses cases more often, while larger companies tend to employ specialized tools for operationalization more often. Some companies also use the tools to feed data to further applications for data-driven decisions. So, the uses of these tools are quite diverse even though they share a **common approach**.

01 Enhanced analytics agility: Vertical integration trumps horizontal integration

The next wave of implementations will be driven by the need to explore data with advanced & predictive analytics



What are you using the integrated data and analytics software for? (Actual vs. planned, excerpt, n=133/113)

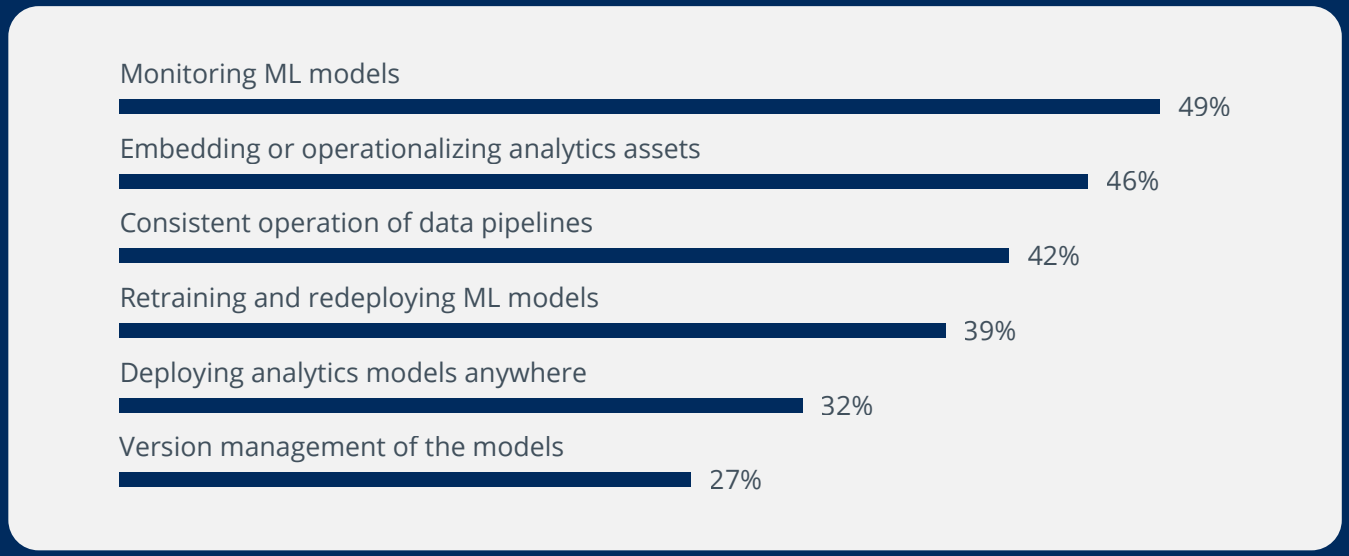
Trends become visible when comparing the expectations and applications of companies that **already use** their integrated tools today with companies that plan to do so in the future. While there are similarities, there are also striking differences worth exploring. The consistent extension of the scope of analytics and BI is one of the most important trends in the field and impacts integrated data and analytics software purchasing. Respondents say they want to make greater use of **advanced and predictive analytics** more often.

Similarly, they intend to **automate decisions** by **operationalizing and deploying analytics models** in production. Automating decisions with integrated software is especially important for **large companies** that have yet to adopt the right tool to cash in on the huge potential of decision automation.

As we have shown, sophisticated end-to-end integration helps users to quickly iterate through the **analytics cycle**, thus shaping and improving the results. Increasingly leveraging vertical integration marks an **upcoming shift in purchasing behavior** as companies who often relied on loosely coupled open-source components for advanced analytics are now making strategic moves towards end-to-end integration. They expect **higher quality** from better metadata integration as well as easier operationalization of results.

Unlike planned implementations of advanced and predictive analytics, **presenting data** in reports, dashboards and data stories is already commonplace. Therefore, it is expected that companies will want to fill their gaps before enhancing what already works well. This results in reduced importance of presenting data for **future purchases**.

Spotlight: Keep data and ideas flowing to innovate – vertical integration in the data science lab



Where do you observe significant challenges when operationalizing and maintaining analytics and ML models? (n=266)

In explorative scenarios, the full power of vertical integration becomes obvious. Data science largely relies on **iterating** through data preparation and model building **quickly** to unlock the secrets hidden in data assets. Splitting this process between multiple teams creates friction and reduces the **flow of ideas** and data because explaining what you need takes time and the results often fall short of expectations.

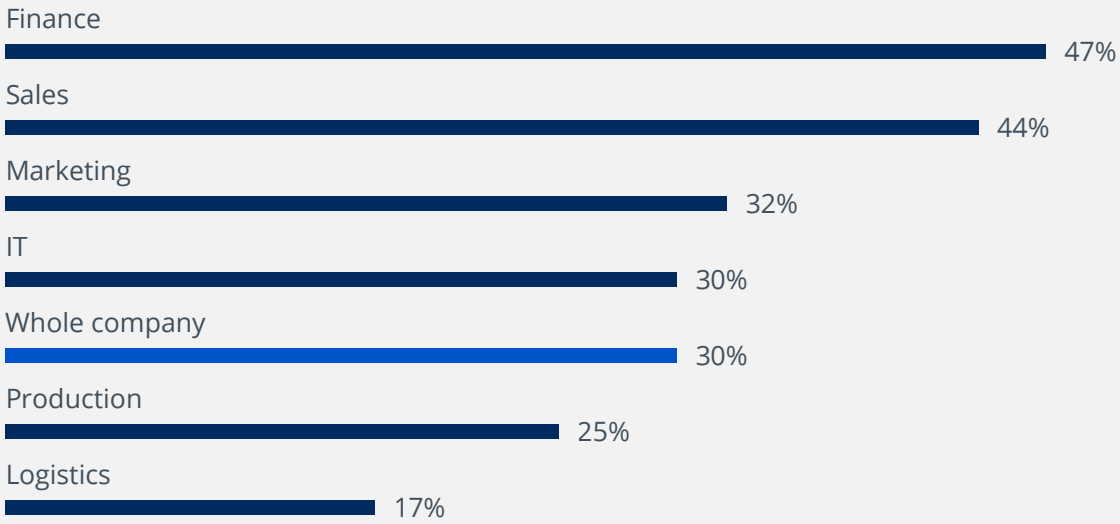
Tightly **integrated software** on the other hand enables experts and business users to carefully reshape the data that feeds the analyses and to carefully examine it from all different angles. The iterative approaches here allow team members to reframe and dig deeper into their business questions without slowing down their investigations by consulting experts from outside the team. Therefore, respondents – as we have seen – want to invest in **vertically integrated software** to support their advanced and predictive analytics. A breakdown of user types shows that data scientists and data engineers are frequent **asset creators** in organizations of all sizes – and they are even more prevalent when integrated tools are used.

The **explorative** advanced and predictive analytics differs from tactical and operational BI in various ways. **Operationalizing** the results and models is one of the areas where this becomes most obvious. We see that a prime challenge of respondents in that area is the **monitoring of machine learning** and analytics **models**. Maintaining analytics models requires special facilities to monitor the **validity** of models and detect **data drift**. These features cannot be found in tools aiming at classic BI. It requires tools that specialize in advanced analytics and supporting data scientists.

User types that regularly create analytics assets (excerpt, n= 267/274)

02 Boost time-to-insight with vertical integration and realigned processes

End-to-end analytics has its sweet spots, but enterprise-wide analytics remains elusive for most



Which departments use integrated data and analytics software? (n=133)

A look at the adoption rates of integrated data and analytics software within the organizations surveyed sheds light on current usage. While the primary goal of horizontal solutions was to leverage synergies and cash in on economies of scale by serving the whole company – which organizations often failed to do anyway – **vertical solutions increase agility** in a dynamic world. As a consequence, only a minority of respondents report that the tool is used throughout their **whole company**.

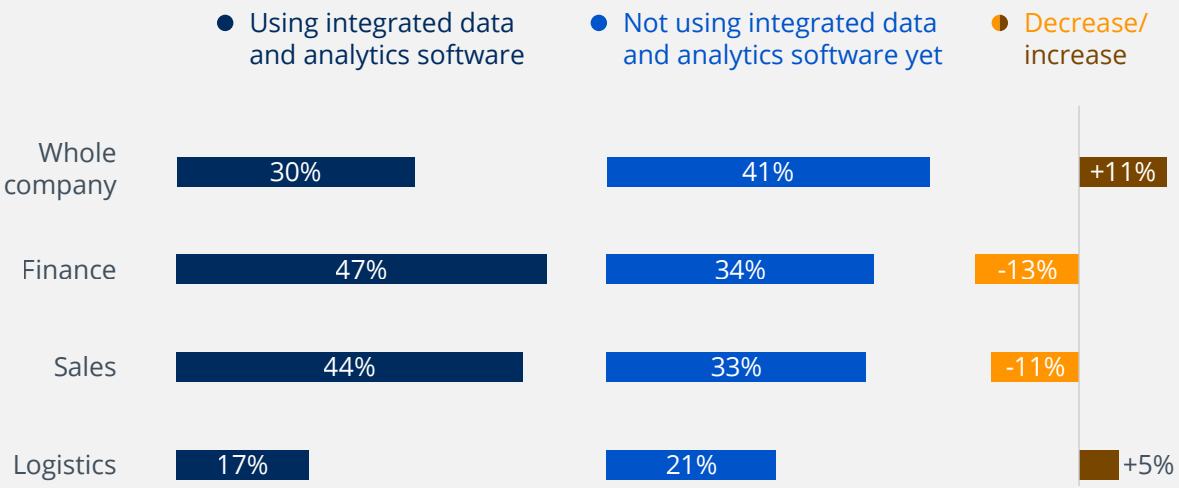
Corporate planning emerges as a major use case for integrated data and analytics products as we will see later in this study. That is one reason why **finance** departments are the heaviest users of integrated software. Especially in the last year, the growing need for finance and controlling to **become more agile and responsive** to changing needs has peaked, resulting in elevated interest in new planning tools during these times of upheaval.

In **logistics** and **production** (including quality management), low latency and **detailed data** are required more often than aggregated data and KPIs. These areas are sometimes a weak spot in integrated data analytics software, and the use of such tools in these departments is low as a result. While using integrated data storage makes tools more flexible to respond to changing needs, it typically comes at the price of **higher latency**, which can be a challenge when serving various operational use cases.

> *Vertically integrated software is the answer to the data and analytics challenges of a dynamic and turbulent world.*

02 Boost time-to-insight with vertical integration and realigned processes

Vertically integrated software should boost adoption by providing more relevant insights



Which departments use integrated data and analytics software? (Actual use vs. planned, excerpt, n=133/113)

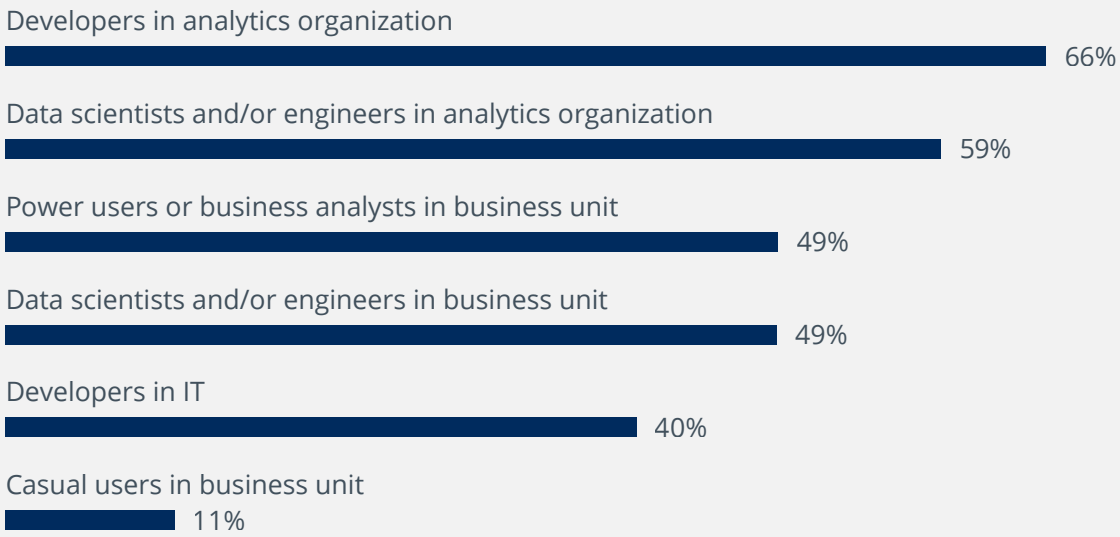
When comparing the **current use** of integrated data and analytics software with the **imagined use of potential customers**, the desire for enterprise-wide deployment stands out. This is a wish that should be treated with caution. While it is tempting to standardize on a single platform, covering the needs of diverse departments or divisions often requires purchasing a solution that manages to **reconcile** extremely **heterogeneous requirements**. Eventually, this approach results in the acquisition of **expensive** tools that exceed any single department's needs but at the same time require lots of maintenance and effort for smooth operation.

So, companies have to find **clusters of requirements** that can be covered efficiently with a single tool. Often the overlap between users is narrow when tools are deployed along departmental lines. Using multiple tools in sync requires **common data management.** And it goes without saying that the tools must be **open to interact** with each other to allow the reuse of analytics assets. Dedicated developers and data scientists assist users in business areas to fulfill their information requirements in an effective and efficient manner.

> *Companies increasingly strive to satisfy the information needs of the whole organization with integrated data and analytics software*

02 Boost time-to-insight with vertical integration and realigned processes

Analytics experts become increasingly important to ensure business user productivity and high quality of results

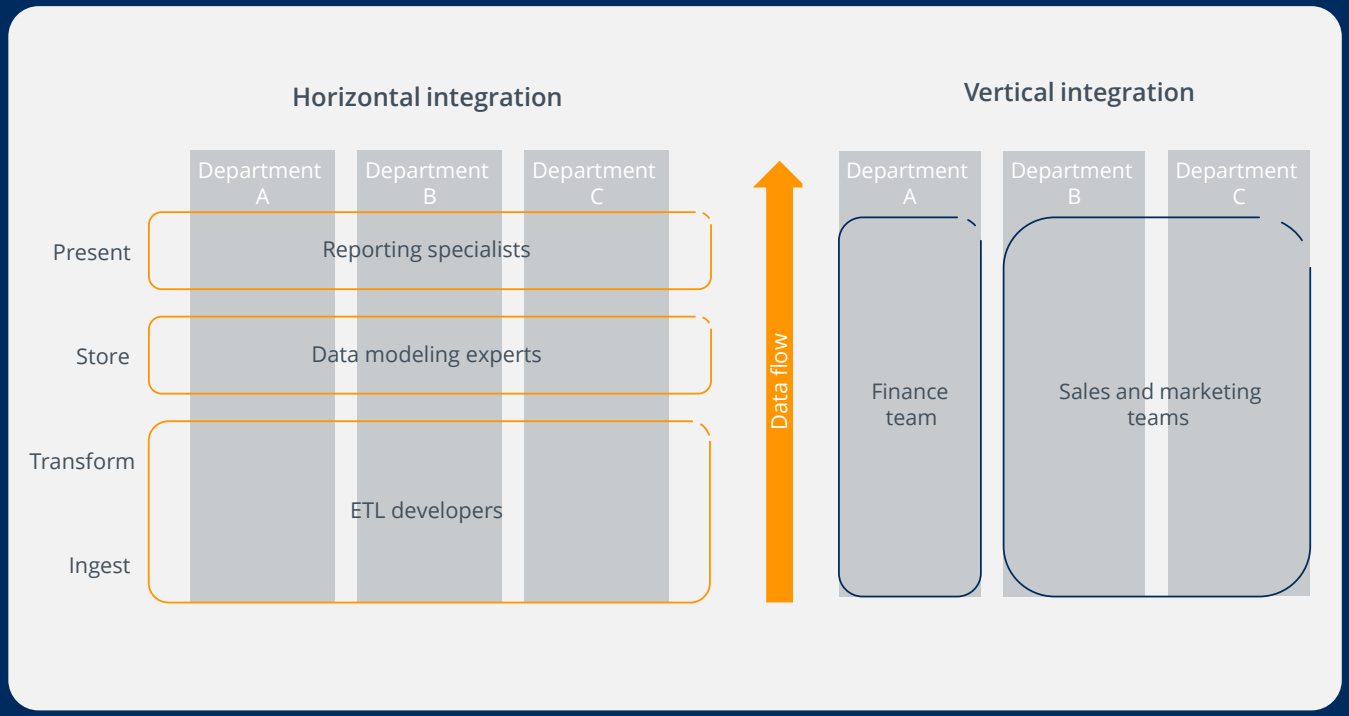


How often do the following user types create analytics assets in your company? (only "regularly", n=295)

After clarifying who consumes content from integrated data and analytics software, we need to look at the distribution of **asset creation** across the organization and the impact of the tools used. **Analytics assets** are all the resources created throughout the analytics cycle. They include data assets such as **data sets** and models, which are the results of data preparation. On the advanced and predictive analytics side, these assets are **analytics models** and algorithms (including ML). Similarly, in performance management the value creators are scenarios and **planning** and forecasting **models**. Finally, **reports, dashboards**, visual analyses and **data stories** are in themselves analytics assets.

The responses indicate that analytics assets are increasingly created across the entire organization. While dedicated **developers** still shoulder a large portion of the effort, **data scientists** and **business users** actively participate in gleaning and distributing insights from data. The rise of **decentralized self-service analytics** and business-user-friendly tools does not render expert developers and engineers redundant. In fact, the opposite is true: it changes their role from implementation to tasks that add more value such as **coaching, curating and consulting** to build the foundation that business users and data scientists require to shine. So, the better the work of the experts behind the scenes, the better the performance of the people on the stage when the spotlight is on and it matters most.

Spotlight: Align processes and responsibilities with new technology for elevated results



Create powerful teams that can deliver analytics from source to presentation

Besides the technological drivers for the rise of vertically integrated data and analytics software, we also observe **organizational** changes that impact demands. Firstly, it is the increasing **data literacy** that puts business users in the driver's seat when it comes to understanding and presenting data that informs their respective business areas.

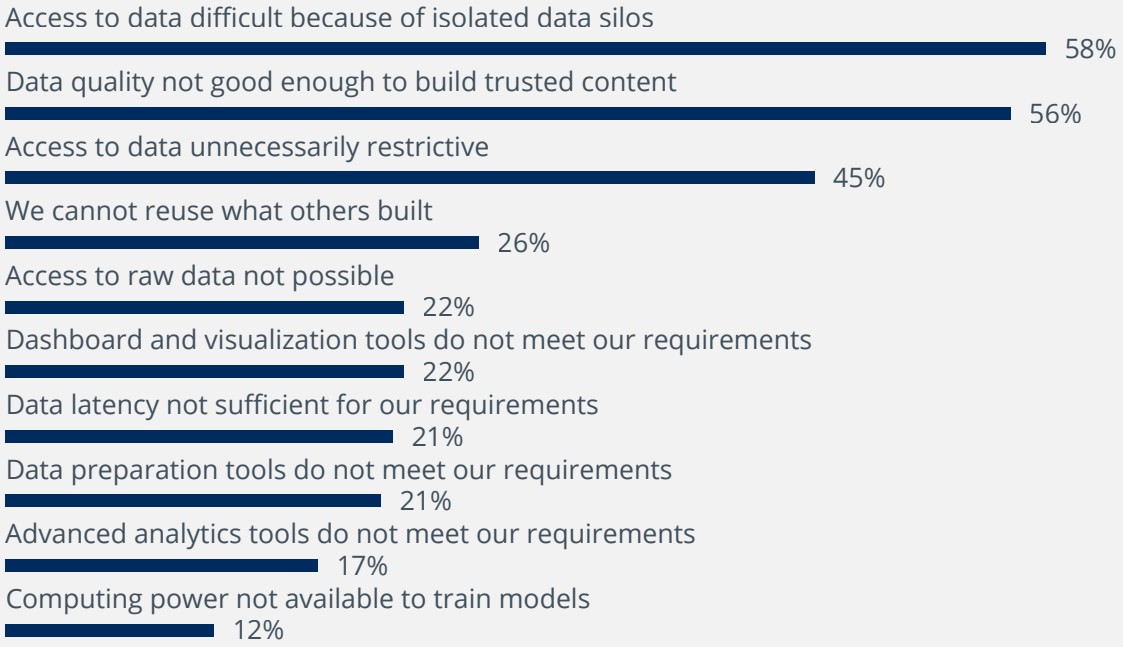
The **shift in purchasing power** from IT to business departments is another driver for this development. And last but definitively not least: we are seeing a surge in **decentralization** and self-organization in businesses around the world. Running data and analytics software that supports decentralization is the logical continuation of these developments.

Additionally, as the **scope** that analytics and BI must cover **widens**, it is no longer feasible to satisfy all the various requirements within a single tool. And for the increasing number of valuable explorative use cases, **iterative analyses** are a necessity. This is true for visual analyses as well as for data science. Both speed up explorations by **cutting out** the need to 'translate' business requirements to developers. Many self-service adopters were hoping to reduce the effort of building new content, only to realize that, unlike Ikea and McDonalds, they only shifted workloads within the company.

Different tools require **different approaches**. Teams or even individual experts must be capable of preparing, analyzing and presenting data without external help. Eliminating the need to consult various teams truly removes this significant effort and decisively speeds up content creation. Therefore, **leaders** are more likely to leverage vertical integration.

03 Data democratization needs free flow of data and transparency about usage

Transparency creates confidence in results & their proper distribution bringing down the inhibitors of free access



What significant challenges do you observe when building analytics assets? (n=312)

The analytics process is yet to be perfected in most companies and it can be expected that there will always be room for improvement as demand and **expectations rise constantly**. However, it is often unnecessarily hard to build analytics assets. Many hurdles are instilled by the companies themselves rather than by gaps in technology. The study shows **access** as an overarching problem.

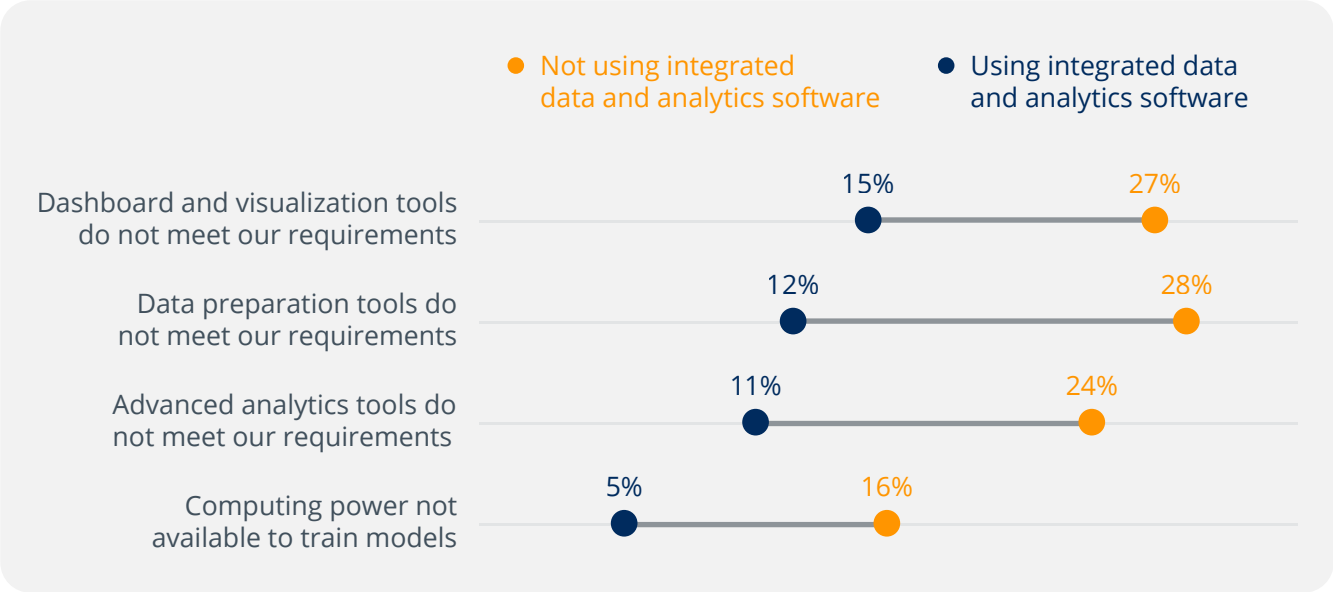
In all cases, the problem begins with **data silos** whether it is the drawing of data or the organizational barriers that result in **restrictive and exclusive access.**

Transparency is of vital interest when removing barriers. Having a comprehensive **data lineage** and **impact analysis** at hand quickly shows where data is used. Knowing where it is used and who uses it makes it easier to agree to **share** it with others for the benefit of the organization. So, transparency removes reasons to be over-cautious and unnecessarily tight restrictions for granting access to data assets. Putting it the other way round: Transparency is a prerequisite to **democratize access to data** in a company.

Another troubling issue is **data quality or lack thereof**, which results in lack of trust. Once trust is lost, both in the reports and the data that feed them, the downward spiral begins, and the analytics teams have their hands full. Poor data quality requires lots of patching up, so the gaps that should not exist in the first place, create substantial effort. These workarounds put even **more pressure** on notoriously **strained analytics resources**.

03 Data democratization needs free flow of data and transparency about usage

Yet another fancy dashboard feature does not justify creating more data silos



What significant challenges do you observe when building analytics assets? (by using an integrated software, n=287)

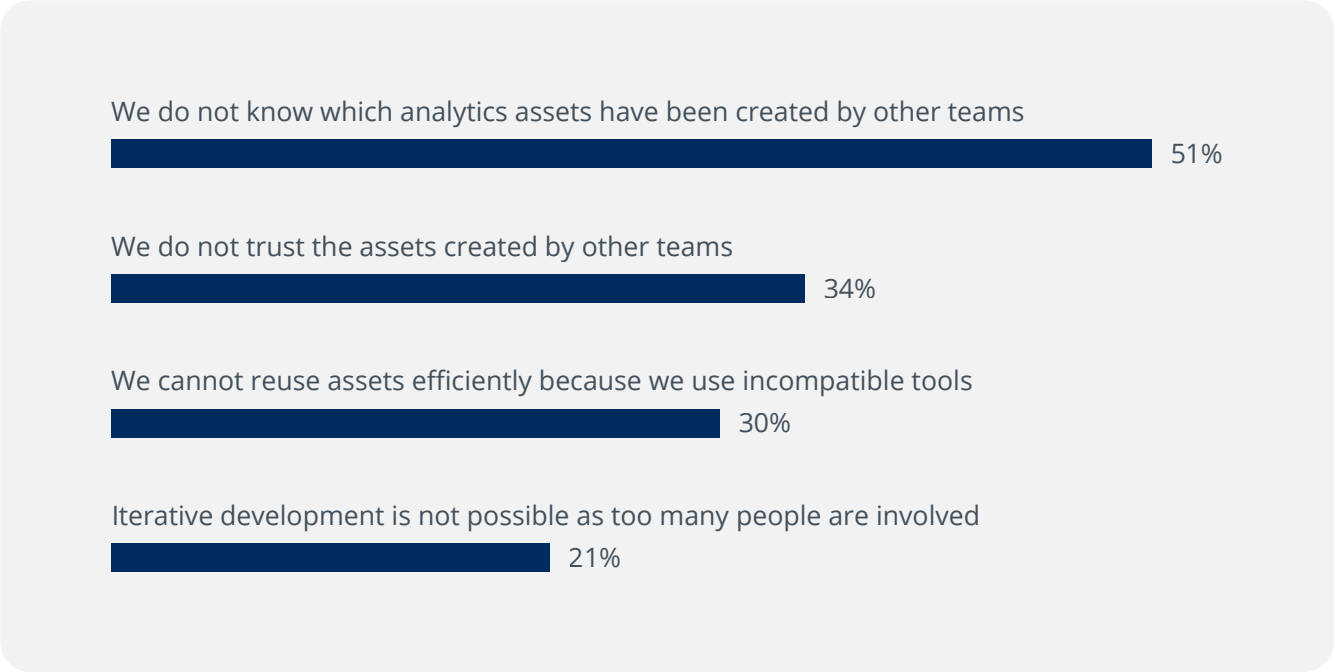
Many companies have an additional problem: tooling. Some respondents feel they are not sufficiently equipped with the tools they need. The tools either lack proper **data visualization** and **dashboard** features, or they do not have the functionality required for **data preparation** or **advanced analytics**. Though these issues are less troubling compared to many others, companies that do not rely on vertically integrated tools (yet) report these issues **twice as often** as others. This clearly shows that while integrated tools may lack a few features here and there, they are better equipped to deliver their power to users.

Creating fancy dashboards in new tools that are not open to exchange analytics assets should be carefully contemplated. There is probably less you can gain from a new dashboard tool compared to the **hidden costs that come with** newly formed data silos. But extending capabilities to cover areas not currently supported duly **justifies new software** (e.g., ML or planning). When investing in new analytics software, it is of utmost importance to ensure that **data can float freely** within the organization. It must be clear how well new tools fit into and extend the existing or desired architecture.

There is a fine line between exercising the necessary caution and delivering less than what is required. Both overextending caution and too little consideration of the risks will result in the same **chaos**. This is what many companies have experienced over the last two decades. If users do not have the tools they need, for example, to visualize and share insights, they will resort to the lowest common denominator. In many companies, this means tons of **ungoverned spreadsheets** circulating inside the company and beyond: a nightmare in terms of data security, efficiency and support for innovation alike.

03 Data democratization needs free flow of data and transparency about usage

A clear view of what is available and what is used how promotes trust in others and their work



What are the most significant challenges when sharing and reusing analytics assets? (n=291)

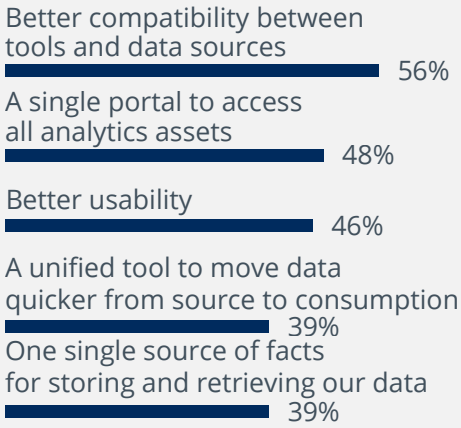
As we have seen, **transparency** about analytics assets and the distribution of results are of high importance for successful analytics projects. **Leveraging and reusing assets** created by other teams, departments or with the help of other tools is similarly important for quality and efficiency but cannot be achieved on a large scale without transparency. It therefore follows that initiatives for **data democratization** will fail if not supported by comprehensive transparency.

If developers and users alike **do not know what data sets**, dashboards or analytics models **are available**, they will simply not use or even reuse and enhance them. While it seems easy to remove that hurdle, it is the number one issue reported in this survey. Nowadays, **data catalogs** are increasingly put in place to provide an overview and support sharing. This is a shift for many companies as such a move requires them to acknowledge that the **number of analytics tools will increase** with the variety of tasks that need solving.

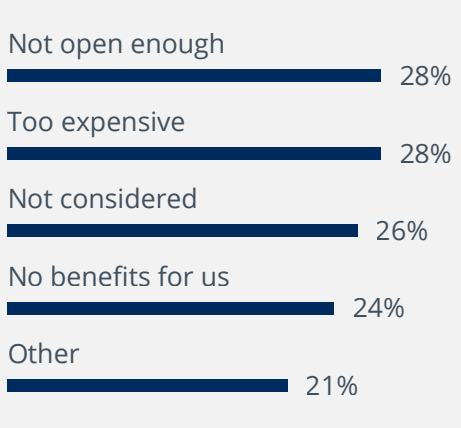
Absolute transparency about where data comes from and how it has been shaped, transformed and enriched is a prerequisite for **trust in the assets and results** created and delivered by other teams. Sharing metadata between tools is often cumbersome, comes with limitations and requires additional integration effort. **Data lineage** within a vertically integrated analytics software is easy to obtain, which is an important foundation of the software's success in satisfying customers.

03 Data democratization needs free flow of data and transparency about usage

Prospects request even tighter integration and want to connect to all sources and targets



Which functions would an integrated data and analytics software require to become relevant for your company? (Top 5, n=61)



Why doesn't your company need or want to use an integrated data and analytics software? (n=58)

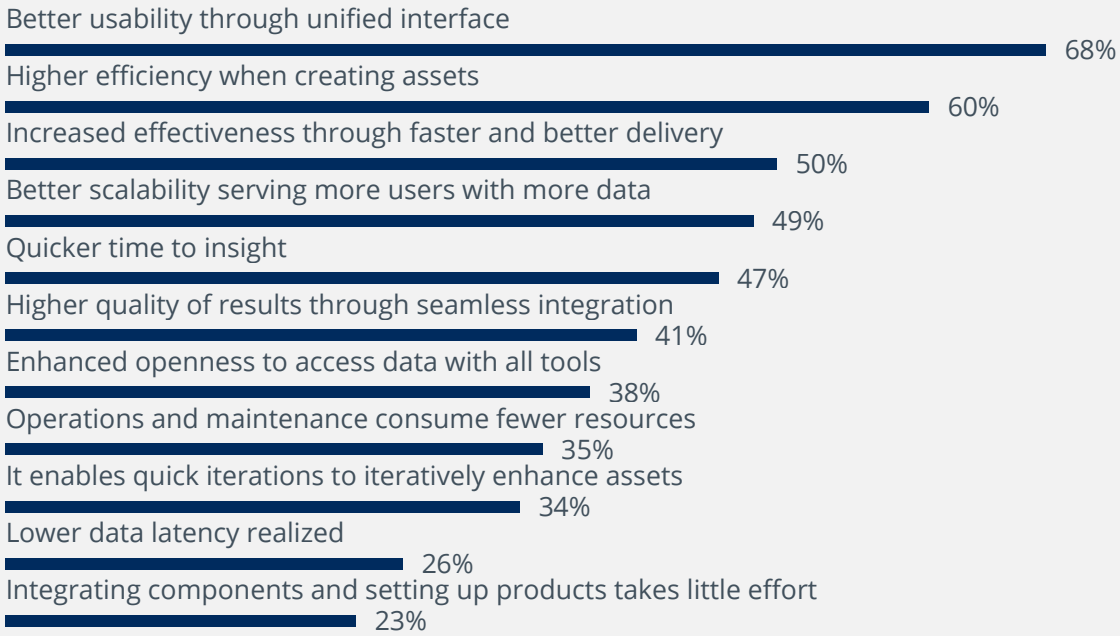
While many organizations have already gone all-in on integrated end-to-end tools, others are still hesitant as they do not see the tools fitting their current requirements. Most often, these companies are seeking **better compatibility with the data sources** they use. This integration could come with better and faster **connectors** to a larger number of sources, or extended capabilities such as **change data capture** or **pre-defined** transformations and models for lower implementation and customization effort.

Better compatibility with sources is also an aspect of **openness**, one of the top reasons mentioned for not using an integrated data and analytics software. **Open interfaces** are currently one of the most important characteristics of modern analytics and BI tools. They allow the integration of tools to **reuse analytics assets** in an efficient and secure manner either by granting **access to internal data stores** or even the metadata layer and making embedding reports and models easy by relying on established standards. This openness is key to combining vertically integrated products without impacting efficiency.

Many companies want to offer a **single portal** to access all analytics assets to their users or have a **single source of facts** for storing and retrieving data for analytics. While there are benefits to this approach, such as **better usability** through a unified interface, it often remains an elusive goal for larger companies. As we have already shown, standardizing on a single tool can significantly decrease flexibility and the power to innovate from data.

04 Better usability and tight integration propel effectiveness, speed and efficiency

Modern software allows you to do more with less – be more efficient and effective



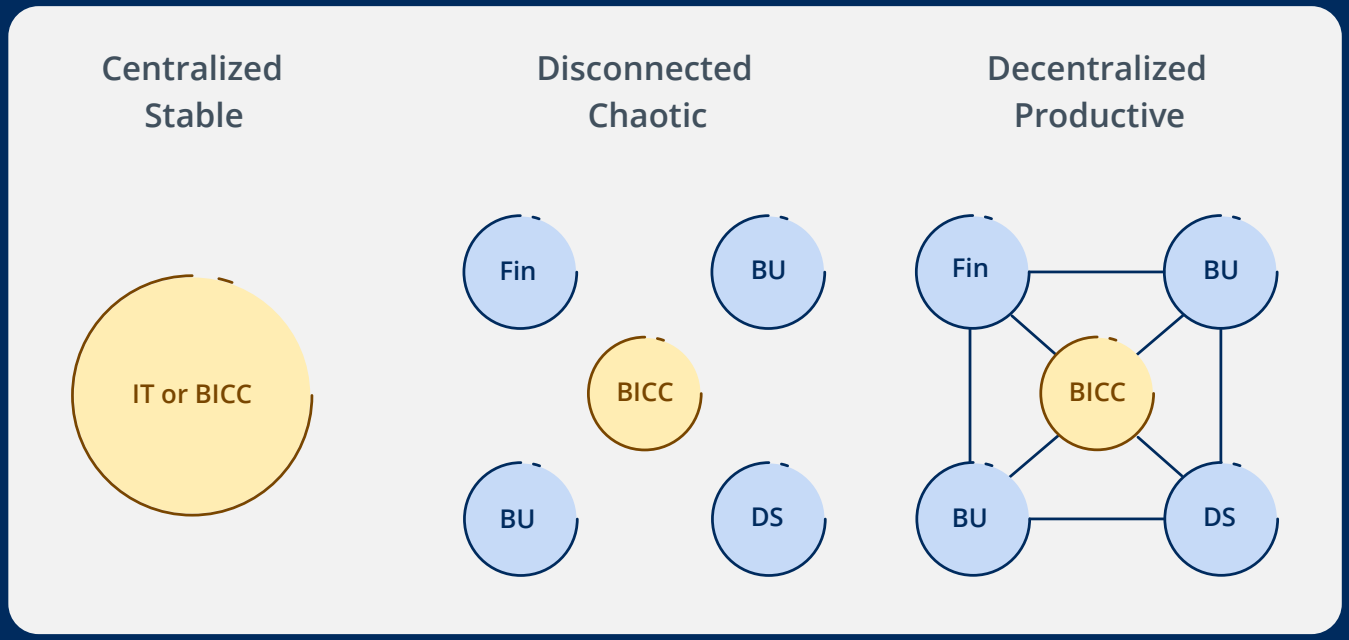
What benefits does your company gain by using an integrated data and analytics software? (n=131)

Companies realize various benefits when deploying integrated data and analytics software. The number one improvement for companies of all sizes is **better usability**. Tools that tightly integrate and bring functions for data preparation, data storage and the means to present data through a **unified interface** allow users to interact quicker with data to analyze and enhance data iteratively. Vertically integrated end-to-end tools empower business users to be more **efficient and effective** by cutting out intermediaries and delivering **better results faster**.

Higher usability and efficiency ultimately lead to **quicker time to insight**, which is another benefit gained by nearly half of the companies surveyed. Additionally, good usability is one of the enablers for **successfully decentralized** analytics asset creation through self-service in business departments or local entities of larger corporate groups. Removing the need to use multiple tools with often lackluster metadata integration helps analytics experts to produce results with **higher quality**. This outcome therefore counters the frequent argument against self-service that it produces unreliable results.

While vertically integrated tools are often considered inefficient when asset creation is distributed across an organization (decentralized), it is worth mentioning that in large companies, **higher efficiency** is the number one benefit realized. Additionally, these companies often report improvements with **scalability**, even though they have the most challenging requirements in that area.

Spotlight: Governing decentralized analytics in vertically integrated software



Reaching high flexibility and quality with connected decentralized creation (source: https://medium.com/the-innovation/guided-analytics-is-dead-long-live-self-service-analytics-6076df18d697)

If analytics cannot be centralized and **decentralization** is a reality, how can companies **connect their efforts** and **govern assets**? While some of the early representatives of vertically integrated software were typically deployed in a disconnected manner and effectively contributed to information silos, their modern successors offer governance facilities and are **more open to exchange data**, metadata, reports and analytics models.

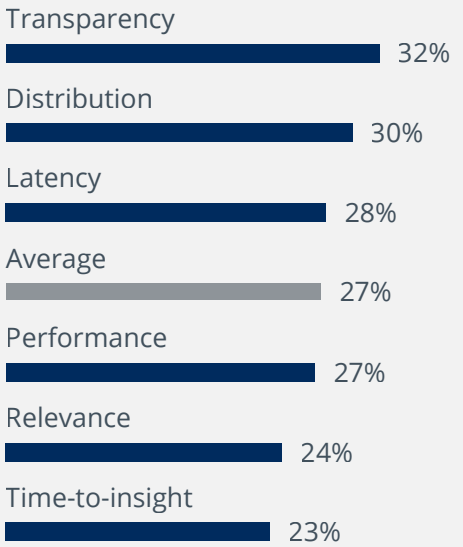
A common and extensible **semantic layer** within the tools is the foundation for **governing** analytics assets. It helps to ensure the consistent use of master data, dimensions and KPIs across applications. At the same time, metadata must travel freely between all components, providing **data lineage** and impact analyses without further effort, so that it may increase **transparency** over data usage.

Moving from centralized or disconnected to **decentralized self-service analytics** changes the roles of expert developers and engineers. They increasingly focus on enabling business users through **coaching, curating and consulting** instead of implementing solutions. This is a result of the altered orientation of analytics organizations as **service shops**. **Teams and processes have to be aligned** with the technology to make best use of it.

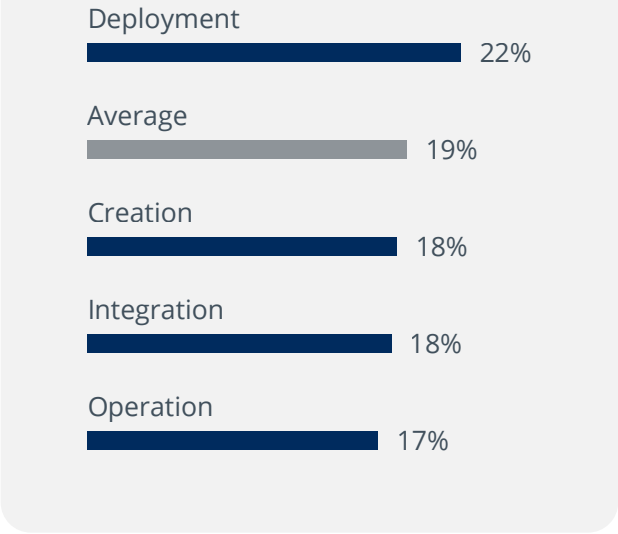
Open interfaces are currently one of the most important characteristics of modern analytics and BI tools. They allow the integration of tools and therefore the **reuse of analytics assets** in an efficient and secure manner. This works either by granting **access to internal data stores** or even the metadata layer and facilitating the embedding of reports and models by relying on established standards. This **openness is key** to combining vertically integrated products without reducing efficiency. On top of that, one can often find lightweight **data catalogs** that index all available data and analytics assets.

04 Better usability and tight integration propel effectiveness, speed and efficiency

Satisfaction with results is higher than with creation – tool support must consider that



How satisfied are you with the following aspects of created assets? (only "very satisfied", n=315)



How satisfied are you with the effort required for asset creation and maintenance? (only "very satisfied", n=313)

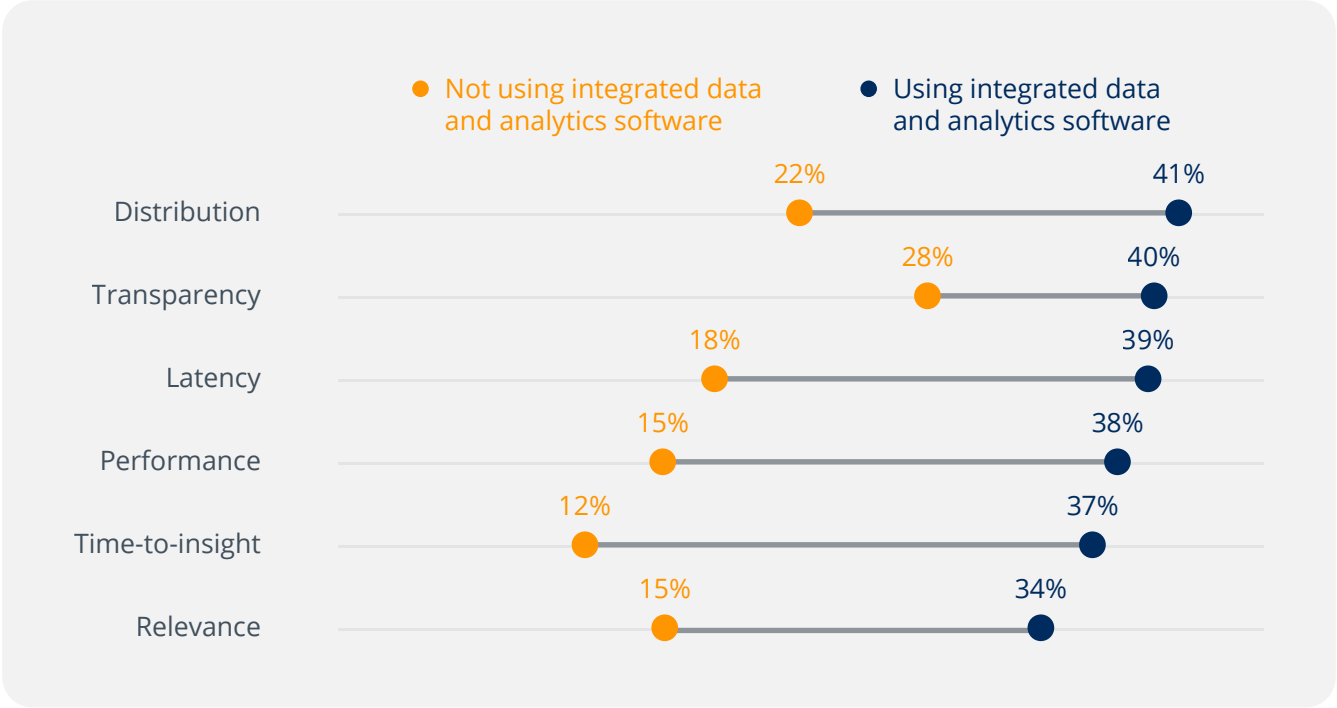
The satisfaction of users with their analytics and BI tools reveals invaluable insights. In general, we see that the **satisfaction** with the **results produced** is quite high with an average of 76 percent. Yet of those 76 percent, only 27 percent are "**very satisfied**".

Many agree that they know where data is coming from and how it is manipulated. The **transparency** of analytics assets, a precondition for trusting the results presented, is relatively high. The **satisfaction with** the **effort required** to create **relevant** insights in time is generally lower. On average, 67 percent are satisfied with only 19 percent claiming to be "**very satisfied**".

The relatively low satisfaction with **time-to-insight** is a sign of the high effort and technical difficulties involved in **creating and deploying** new assets. So, if the **effort** is too high because more tools and parties than necessary are involved, time-to-insight increases and, in turn, relevance decreases. There is not much that you should avoid as strictly as spending time on creating and operating assets that are not – or no longer – relevant. The clear antidote is to introduce **vertical integration** in analytics where fewer tools are involved and a uniform and easy-to-use interface enables power users to **do more with data** without requiring them to resort to developers often situated in different departments, or even more time consuming: external consultants.

04 Better usability and tight integration propel effectiveness, speed and efficiency

There is a lot to gain if the right moves are made – or how you can improve your analytics



How satisfied are you with the following aspects of created assets? (only "very satisfied", by using an integrated software, n=315)

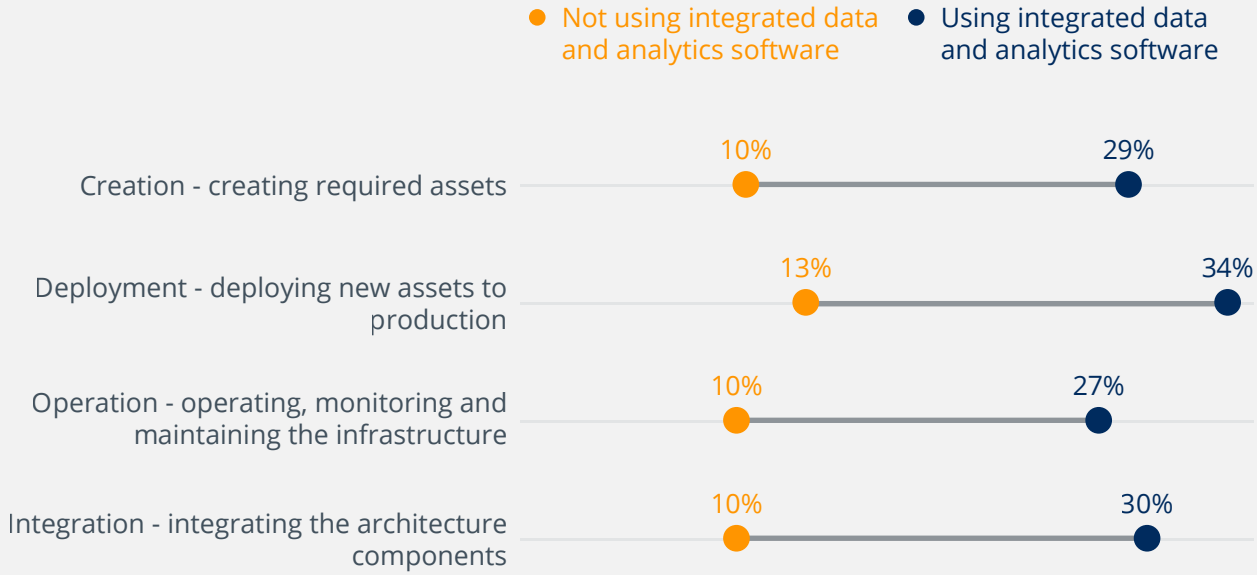
To truly see the **advantages** of deploying integrated data and analytics software, we compare companies that already use it with those that do not. A quick look at the graph shows the stark contrast in **satisfaction**. Vertically integrated software is no magic wand. However, satisfaction ratings on average are **doubled** if it is being used properly.

The biggest incentive for change is dreadful **time-to-insight,** where satisfaction is more than **three times higher** when employing tools that were created to make an impact there. Lacking the proper tools therefore leads to low satisfaction with **relevance**. Inappropriately equipped companies are missing out on the key benefit of BI in principle, due to their **inefficient analytics processes**. But only changing tools won't do the trick . Different tools require different approaches too. Teams or even individual experts must be capable of preparing, analyzing and presenting data without requiring help from others.

Additionally, organizations without integrated platforms are struggling with common issues such as the query **performance** of analytics assets, a key driver known for its impact on user adoption of analytics and BI. If we equate 'very satisfied' with **successful realization**, many more early adopters are getting the insights into their business they need to inform their decisions and they are decisively ahead of hesitators.

04 Better usability and tight integration propel effectiveness, speed and efficiency

Continue treading water or jump the integration band-wagon



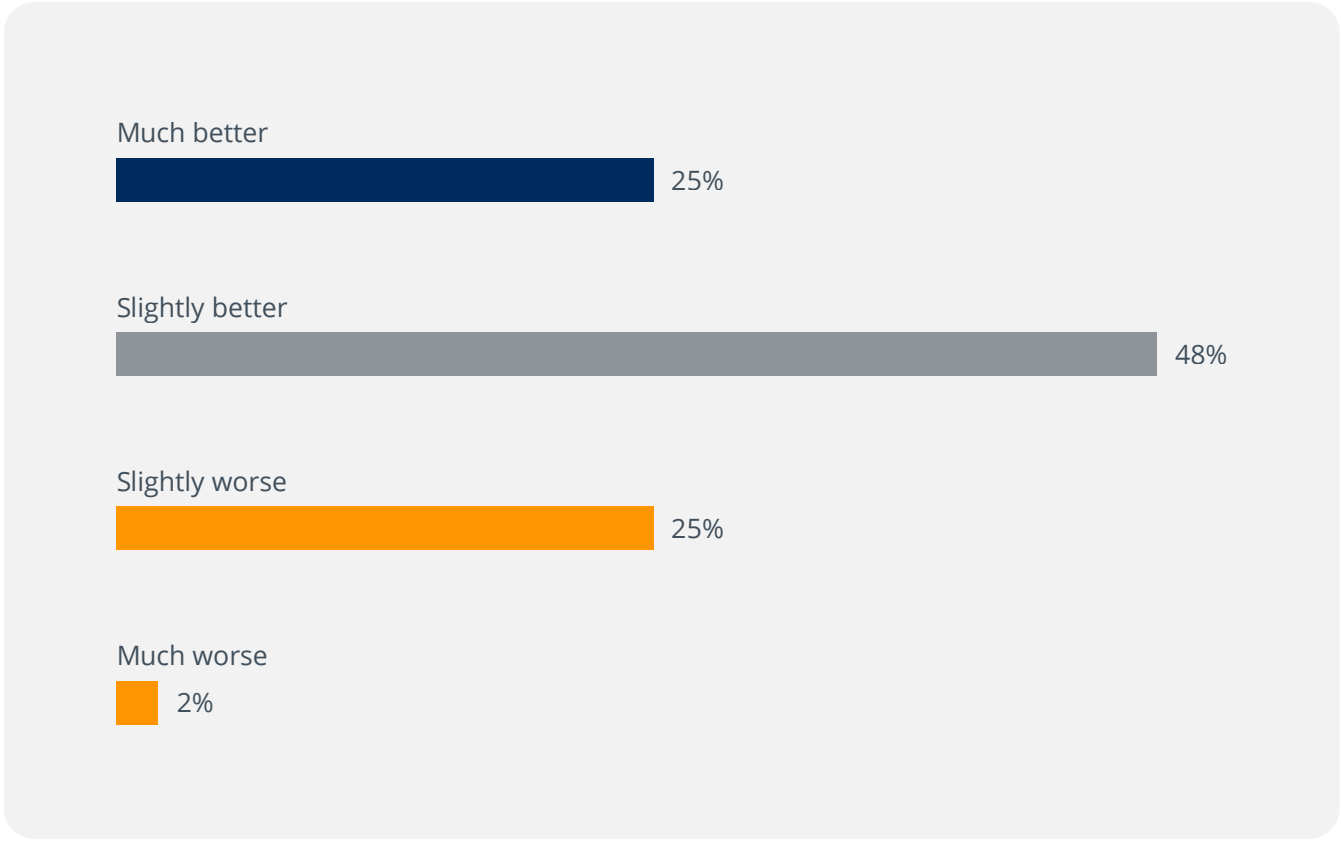
How satisfied are you with the effort required for asset creation and maintenance?
(only "very satisfied", by using an integrated software, n=313)

It comes as no surprise that the gap in satisfaction widens where end-to-end integration has the biggest impact: when creating assets to inform or automate decisions. The **satisfaction** of **early adopters** with the effort required for content creation is on average nearly **three times as high** as for other companies.

Automated **deployment** of reports or dashboards that are based on components built in various tools is often a challenge. While some integrated data and analytics tools still have shortcomings in this area, more companies succeed in orchestrating deployment with a **unified environment**. Similarly, tracing errors within a single environment with sophisticated data lineage or impact analysis is simple, especially when compared to error tracing across tool borders, which is more cumbersome and often involves multiple experts from various teams. A unified environment in essence makes both **operation** and content creation more efficient.

3x
higher satisfaction when using integrated data & analytics software.

Leaders vs. Laggards



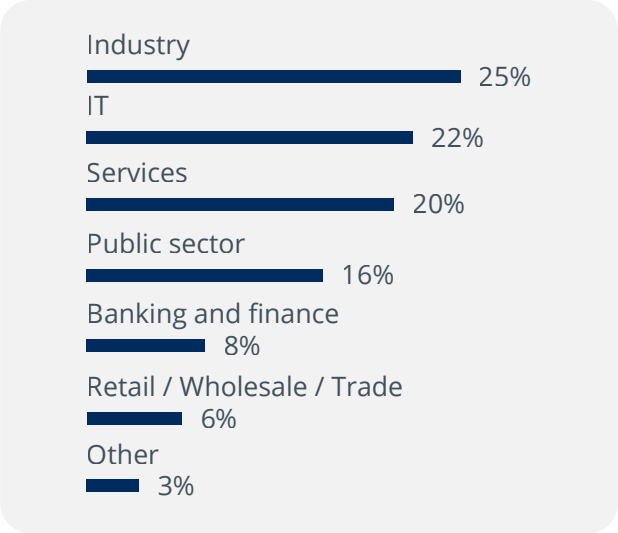
Is your company better or worse at leveraging data for decision support and decision automation than your competitors? (n=257)

We have divided the sample into “leading companies” and “laggard companies” in order to analyze differences in dealing with market dynamics. This differentiation was based on the question “Is your company better or worse at leveraging data for decision support and decision automation than your competitors?”. Companies that stated that they were much better at dealing with change than their competitors are referred to as “leaders” (25 percent), while those that stated that they were somewhat or much worse at dealing with change than their competitors are classified as “laggards” (27 percent).

Demographics

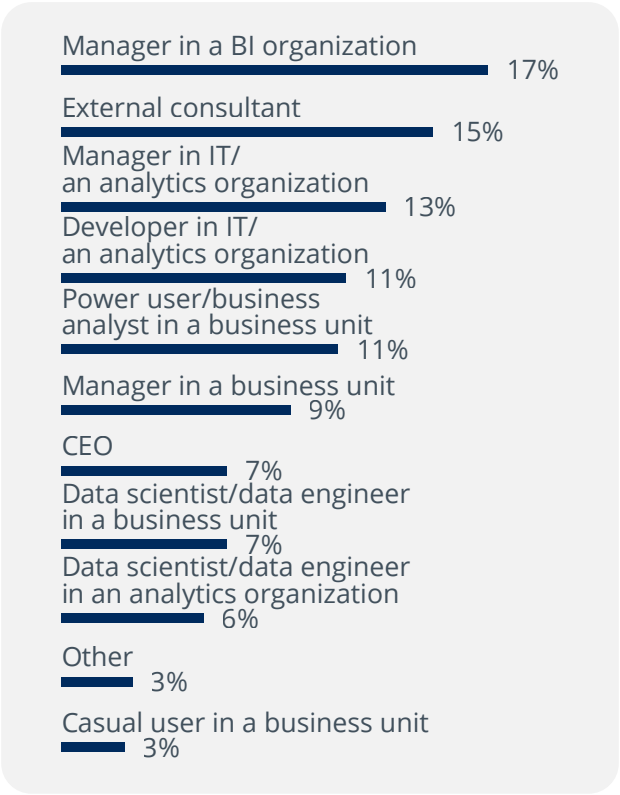
This worldwide online study was conducted from January to February 2021. It was promoted within the BARC panel, via websites and newsletter distribution lists. A total of 319 people took part, representing a variety of different roles, industries and sizes. Due to rounding, totals may not add up precisely. The selection of the answer option "Don't know" is not taken into account in the sample size stated below each chart and is also hidden in the charts.

INDUSTRY SECTOR



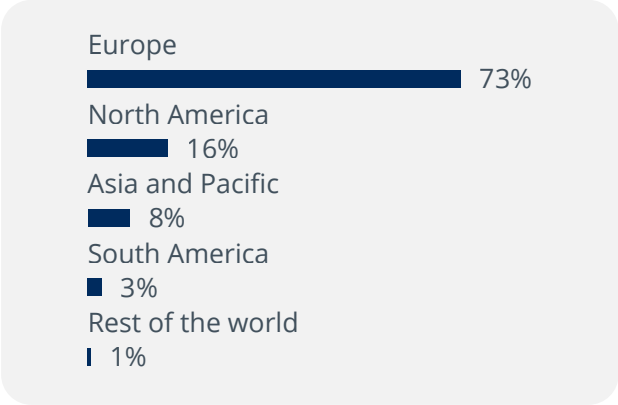
Which of the following best describes your organization's industry sector? (n=319)

ROLE



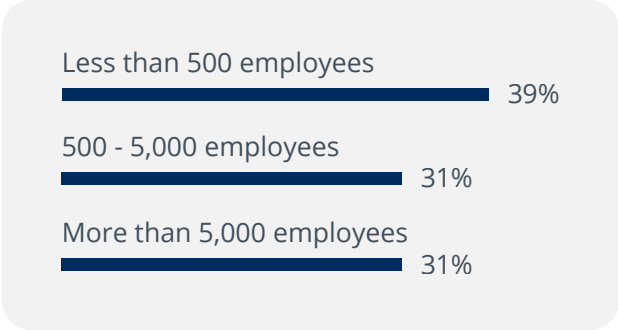
What is your role in the company? (n=319)

REGION



In which region are you located? (n=319)

COMPANY SIZE



How many employees does your company have? (n=319)

BARC – Making Digital Leaders

BARC – BUSINESS APPLICATION RESEARCH CENTER

BARC (Business Application Research Center) is one of Europe's leading analyst firms for business software, focusing on the areas of data, business intelligence (BI) and analytics, enterprise content management (ECM), customer relationship management (CRM) and enterprise resource planning (ERP).

Our passion is to help organizations become a digital company of tomorrow. We do this by using technology to rethink the world, trusting data-based decisions and optimizing and digitalizing processes. It's about finding the right tools and using them in a way that gives your company the best possible advantage.

This unique blend of knowledge, exchange of information and independence distinguishes our services in the areas of research, events and consulting.

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Our BARC studies are based on internal market research, software tests and analyst comments, giving you the security to make the right decisions. Our independent research brings market developments into clear focus, puts software and vendors through their paces and gives users a place to express their opinions.

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Decision-makers and IT industry leaders come together at BARC events. BARC seminars in small groups, online webinars and conferences with more than 1,000 participants annually all offer inspiration and interactivity. Through exchange with peers and an overview of current trends and market developments, you will receive new impetus to drive your business forward.

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In confidential expert workshops, coaching and in-house consultations, we transform the needs of your company into future-proof decisions. We provide you with successful, holistic concepts that enable you to use the right information correctly. Our project support covers all stages of the successful use of software.

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Sponsor profile Board

ABOUT BOARD

Board is the #1 decision-making platform. Founded in 1994, Board International has enabled people from more than 3,000 companies worldwide to have a transformative impact on their business by rapidly deploying Business Intelligence, Integrated Business Planning, and Predictive Analytics applications on a single unified platform.

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Sponsor profile ONE LOGIC

ABOUT ONE LOGIC

As the leading AI company in Germany, we have been driven by one overarching goal since 2013: to turn large volumes of data into new value for our customers. Our approach is based on a combination of data science and our innovative Data Product Platform ONE DATA. The 160 employees at ONE LOGIC are based in three locations: Passau, Munich and Frankfurt/Main.

Creating data products in an agile way and using them to maximum effect – this is our approach to every project. The focus is on practical results rather than consulting and theoretical concepts alone. The process as a whole ranges from data engineering to identifying use cases to the finished solution going live on our Data Product Platform ONE DATA.

Our way of working is based on close cooperation: after all, data science is teamwork. And of course, our customers are part of this, and work with us in a virtual laboratory. We also collaborate with companies and universities. We are at the forefront of research in this field, work to speed up digitalization within companies, and pave the way for all areas of society to embrace long-term solutions based on data science.

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Sponsor profile Pyramid

ABOUT PYRAMID

Pyramid Analytics is a global analytics leader, offering a trusted business intelligence platform that enables individuals—from power users to knowledge workers to decision makers—to transform their organization into a data-driven business. With over 175 employees, Pyramid is headquartered in the Netherlands, with offices in the United States, Israel, the United Kingdom, and the United Arab Emirates. Pyramid delivers best-in-class analytic functionality for enterprise organizations with sophisticated data requirements. It was designed to bridge the gap between self-service and IT-driven analytics, providing agility for decentralized business users while retaining centralized monitoring and control.

Pyramid is a complete analytics application that supports the full data and analytics workflow, including data preparation, visual analysis, dashboards, machine learning, advanced analysis, and reporting into a single enterprise analytics platform. Pyramid is a server-based platform securely accessed through a browser. Its open architecture means the software can be deployed in different environments: cloud, hybrid, or on-premises. Furthermore, it supports REST API to support embedding and automation. Pyramid's analytics engine drives both querying and analytic calculations across different data sources using ANSI SQL or MDX--which enables fast in-place analytics on large data sets, including in-memory, big data, and unstructured data sources.

Pyramid can deliver world-class BI for organizations using SAP data warehouse technologies to support analytics and decision-making. It features SAP Certifications for SAP BW 7.5 and SAP BW 4/HANA, as well as SAP HANA via SQL. Pyramid is also cloud-ready, featuring a robust, containerized version to automate deployment on AWS. In addition, Pyramid features built-in support deeper for Kubernetes to support all customers' cloud and multi-cloud ABI implementations. Lastly, Pyramid threads AI-driven "smart" capabilities (NLQ Chatbot, Smart Insights, Smart Model, Smart Discover, and more) throughout the platform to help drive user adoption across the organizations. For AI and machine learning, the vendor offers sophisticated R, Python, MLib, Weka, and TensorFlow integrations.

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Sponsor profile Suadeo

ABOUT SUADEO

Suadeo, The Self BI platform.

Since its inception in 2004, Suadeo has pursued the same objective and that is to provide a BI Service platform which:

- Ensures an optimal responsiveness and a real user autonomy for their data usage
- Gives the users an upper hand on leveraging their business acumen in constructing multidimensional data analysis, building dashboards and reports.
- Enables the users to run successful data analytics to obtain a clear picture of where the business is, where it has been and where it should go.

Because Dashboarding and reporting tools alone are not enough to offer the freedom users require to run analysis as a support for strategic decision making. Suadeo Designer®, the Suadeo BI Service platform combines Data Governance and DataViz, to free up non-IT users in their data analysis production, their data flows exchange, their Cataloging as well as their Restitution, while being 100% integrable into any information system.

- A real users' hands on, easy to test data preparation and treatment for analysis, according to their business usages and rules (calculation rules, axes of analysis, etc.).
- Users' freedom and autonomy at any level of the data life cycle treatment, to carry out, publish and share analyzes.
- A real time data governance with full data lineage, traceability, and auditability capabilities.
- An end-to-end security at every level of the data life cycle (data flows preparation and transformation).
- A real Big Data oriented architecture (Billions of lines treated within Suadeo).
- Access to the full spectrum of BI tools (Dashboard, Report, Usage Data, Data Catalog, ETL) via direct access or Web.
- A rapid data exposure by the IT department.

Headquartered in Ivry sur Seine in France, with a presence in Switzerland and Dubai. Suadeo services a large portfolio of clients from the public sector and across divers industries in the private sector both in France and overseas.

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Sponsor profile Tableau

ABOUT TABLEAU

Tableau (NYSE: DATA) helps people and organizations become more data-driven as the trusted leader in analytics. The Tableau platform provides the breadth and depth of capabilities to serve the needs of even the largest global enterprises in a seamless, integrated experience. Tableau is designed to fit, not dictate your data strategy, and adapts to your environment with unmatched flexibility and choice, while meeting the toughest governance and security requirements. People love using Tableau because it is both powerful and intuitive - and offers a fundamentally different user experience by empowering people of all skill levels to explore and analyze data using visuals and natural language. Tableau has become the standard language of analytics for modern business users and continues to lead the industry with the most passionate and engaged user community in analytics, a customer base with millions of users at more than 86,000 organizations, and a deep commitment to customer-focused innovation.

Designed for the individual, scaled for the enterprise

Tableau is the most powerful, secure, and flexible end-to-end analytics platform. Equip your people with smart, visual, and direct access to their data for every step of the analytics journey. Our flexible architecture means it will work in your environment and with your data.

Only Tableau combines a laser focus on how people see and understand data with the kind of robust, scalable platform needed to run the world's largest organizations.

See and understand your data

When you pair smart and curious people with trustworthy data, data comes to life and becomes your competitive edge.

Equip teams with powerful visual analytics from Tableau. Fuel unlimited exploration with interactive visualizations and dashboards that reveal actionable insights. Share securely and watch "a-ha moments" transform your business.

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