Delivering Value from Data

Accelerating the path from data to decision

Data has never been so abundantly available to aid business decision-making. For enterprises, the challenge is ensuring that the sheer volume of data doesn't become a barrier to insight. Effective data management can accelerate the collection, processing, and analysis of available data to fast-track the return on investment in data and analytics.

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Key Findings

- Data-driven decision-making has become a business imperative amid the fourth industrial revolution as data-driven pioneers have shown that the effective use of data can be leveraged to drive new opportunities, disrupt existing markets, and create competitive advantage.
- Prior investments in data and analytics have helped organizations cope with the impact of the COVID-19 pandemic, which appears to be exacerbating the divide between those that are investing to grow their data and analytics initiatives, and those that risk being left behind.
- Being data-driven is easier said than done. It involves cultural and organizational change, and the adoption of new products and services, as well as investments in data literacy, and programs to reduce data silos, facilitate access to data, and improve data governance.
- There are multiple challenges associated with successful utilization of data, including the rising volume of data and the increased variety of data sources, as well as the time taken to find and prepare data for analysis, configure and deploy infrastructure, design and deploy data analytics pipelines, and create and test analytics models.
- Reducing the time taken to generate insights from data could deliver meaningful benefits, including increased sales, improved business agility, enhanced customer service and engagement, and more empowered and aligned internal decision-makers.
- Improving data culture in an organization involves the democratization of data to ensure that staff across the whole organization have the skills, tools and access they require to read, analyze, understand, and communicate with data.
- Data management is an enabler of improving insight from data that can play an important role in overcoming the challenges to successful data utilization and facilitate the delivery of value from overall investment in data and analytics.
- Data marketplaces can facilitate decision-makers to unlock the value in enterprise data in combination with third-party data, by providing access to prepared data sets, as well as natural language query capabilities, and the underlying data processing functionality, that help accelerate the time to actionable insight.

Executive Summary

Introduction

Data and analytics have been an integral part of organizational decision-making for thousands of years: there is archaeological evidence that humans were counting — and recording quantities by etching notches in sticks and bones — some 45,000 years ago.

The use of data is therefore not new: over the generations data has had an integral role in all the key advances in human innovation, from building the pyramids, through mapping the known world, to powering exploration beyond our solar system.

Today, data and analytics are at the heart of the fourth industrial revolution. Together with sensors and robotics, they are delivering automation and artificial intelligence to drive operational efficiency improvements, as well as the development of new products and business models.

As recognition of its importance continues to grow, data has never been as important to enterprise decision-making. In this new data age, the companies that stand to gain the most are those that maximize their investments in data analytics to facilitate quicker and more insightful business decision-making by leaders and knowledge workers.

Data-driven pioneers — such as Netflix and Spotify — have shown that the effective use of data can be leveraged to drive new opportunities, disrupt existing markets, and create competitive advantage. Data — both internally and externally generated — is increasingly seen as an asset, and one that has the potential to separate the winners from the losers in any given market.

In recent years the increased realization of the potentially differentiating power of data caused something of a 'data rush' as enterprises hoping to gain an advantage over their rivals set out to accumulate ever-larger quantities of data from an ever-growing variety of sources.

More recently it has also become clear, however, that a large volume of data is not the be-all and end-all. Arguably, in fact, the greater the volume of data, the harder it is for enterprises to identify truly meaningful trends that require action.

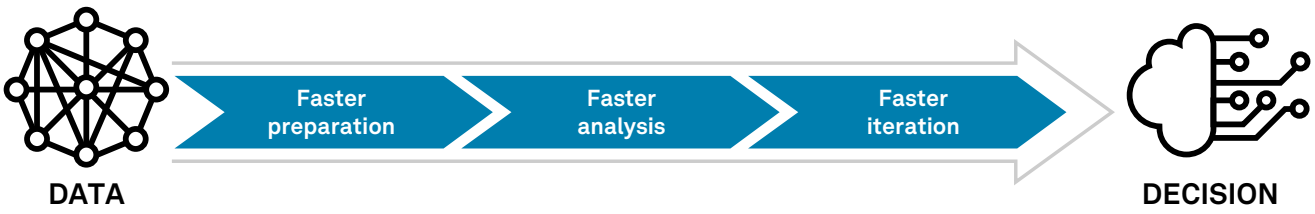
Today the mantra has evolved from 'more data' to 'faster insight' as enterprises seek to ensure that they are generating value from all the data they are collecting, storing, and processing. In particular, the new pace of business demands a faster path from data to decision to ensure that data and analytic plans are aligned with — and central to — business transformation initiatives.

The speed of data processing has always been a key consideration in data and analytics — 451 Research Voice of the Enterprise survey respondents consistently score performance as a top five consideration when selecting vendors for both data platforms and data management and analytics.

However, enterprises are increasingly considering time to insight not just in terms of data processing and query performance, but also the time taken to configure and deploy analytics infrastructure and analytics pipelines, as well as the speed at which they can iterate in response to changing data sources and business requirements.

Together, it is these three considerations that will enable enterprises to accelerate the path from data to decision and deliver faster value from data.

Fig 1: Accelerating the path from data to decision



Source: 451 Research

The ever-increasing value of data

As recognition of its importance continues to grow, data has never been as important to enterprise decision-making.

More than three quarters (81%) of respondents to 451 Research's Voice of the Enterprise: Data & Analytics, Data Platforms 2021 survey indicated that data will be more important to their organization in the next twelve months. In fact, we have seen similar numbers of respondents citing the increasing importance of data to their organization since we began our surveys in late 2018.

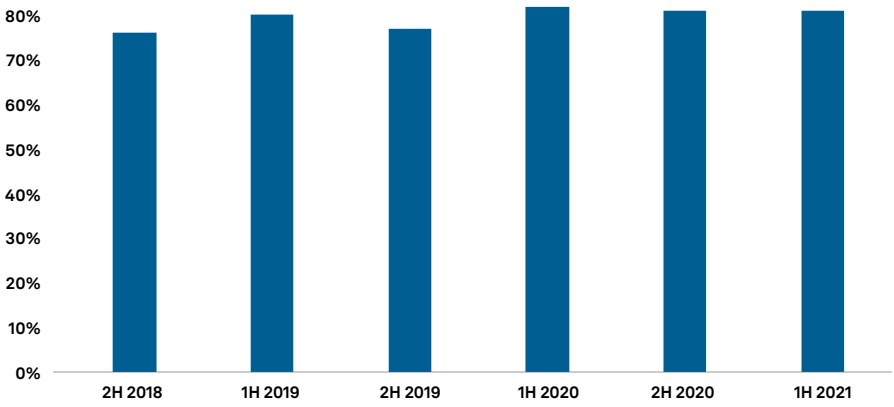
It is also clear why data is increasingly growing in importance to enterprise decision-makers. Data-driven decision-making has become a business imperative, enabling enterprises to derive new business value, improve operational efficiency, increase competitive advantage, and respond to competitive threats.

More than two-thirds (68%) of respondents to the same survey told us that most or nearly all of their strategic decisions are currently 'data-driven', meaning that they are determined by or dependent on the collection or analysis of data.

The benefits of being more data-driven are many and varied, but 451 Research's Voice of the Enterprise survey respondents cite increasing sales, enhancing customer service and engagement, and improved business agility as the top three, followed by lower costs and improved/automated business processes.

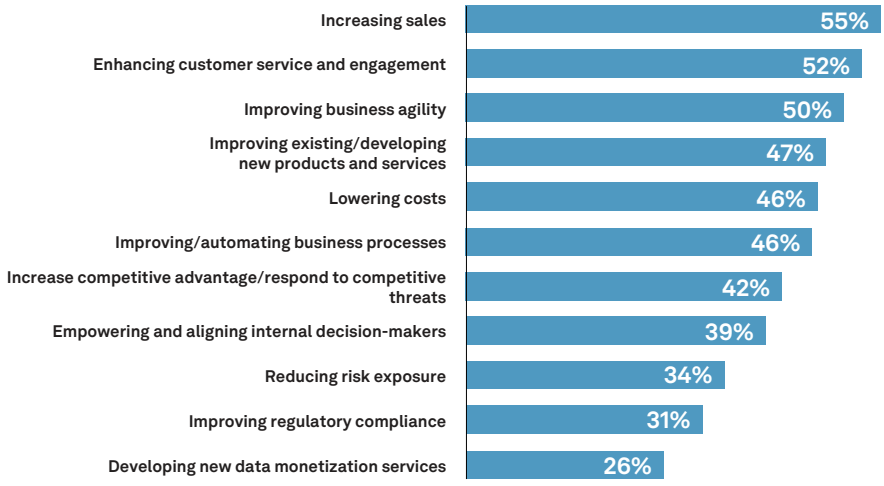
Fig 2: The continually increasing importance of data

Percent of respondents stating that data will be more important to their organization's decision-making 12 months from now



Source: 451 Research Voice of the Enterprise, Data Platforms & Analytics
Q. Looking ahead 12 months, do you think data will be more important to your organization's decision-making, less important, or will there be no change 12 months from now?

Fig 3: The benefits of being data-driven



Source: 451 Research Voice of the Enterprise, Data Platforms & Analytics, Data Platforms 2021
Q. What are the most significant benefits your organization would expect from being more data-driven? (n=654)

Many enterprises talk about being more data-driven, but being data-driven is easier said than done: 451 Research survey results show that being more data-driven involves cultural and organizational change, as well as the adoption of new products and services.

While almost every company is increasing its use of data and analysis, the most successful are baking data-driven decision-making into company culture through the adoption of new data management and analytics products and services, as well as investments in data literacy and programs to reduce data silos, facilitate access to data, and improve data governance.

Key habits of the most data-driven companies include collecting and processing a broader range of data sources, initiating a greater number of analytics projects, early adoption of emerging data platforms and services, and involving a broader sphere of influencers in technology selection decisions.

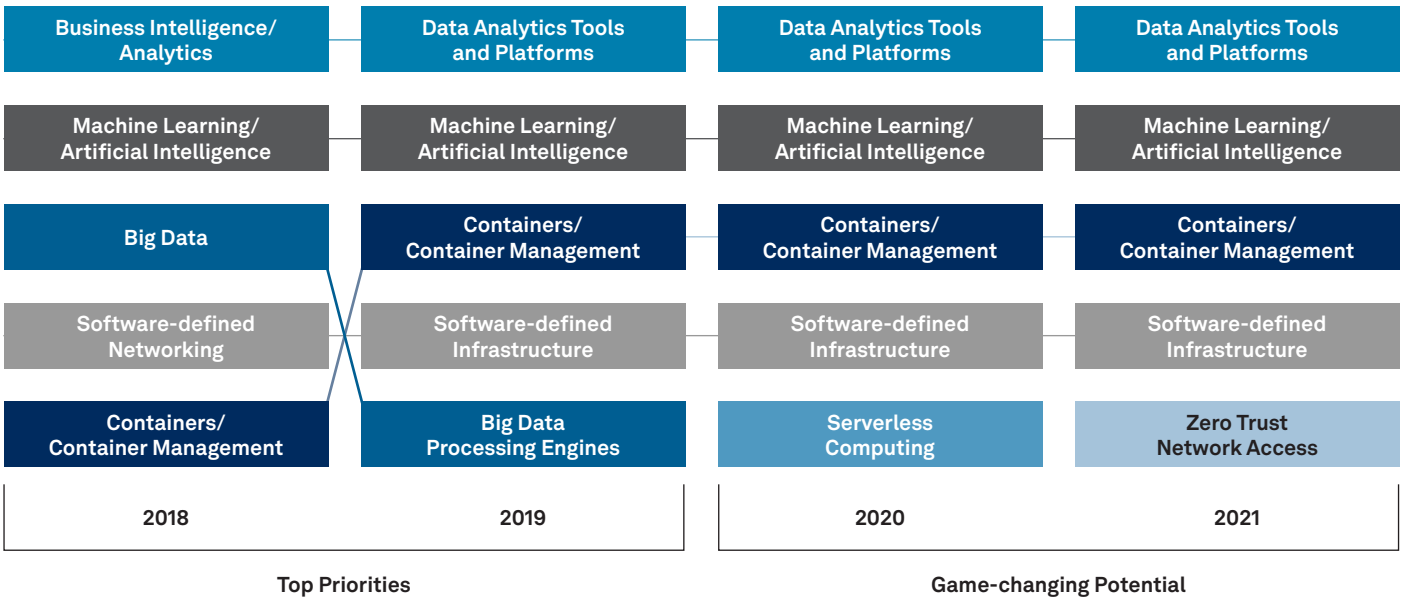
The most data-driven companies are also more focused on performance, rather than cost, when considering new technologies, and they have fewer concerns about lack of support from senior leadership or budget limitations.

Data from 451 Research's Voice of the Enterprise: Data Platforms & Analytics, Data Management & Analytics 2020 showed that those organizations with the highest proportion of successful analytics projects in recent years outscored their rivals in terms of all potential steps taken to improve data culture across their organization. These included investment in new products and services, investment in improving employee data literacy and skills, and the adoption of processes to facilitate access to data.

Illustrating the significance of data and analytics is the fact that in both 2020 and 2021, 451 Research Voice of the Enterprise: Digital Pulse survey respondents named data and analytics tools and platforms as the technology with the greatest game-changing potential for their organization in the next three years, followed by machine learning/artificial intelligence.

Digital Pulse survey respondents had previously rated business intelligence/analytics and data analytics tools and platforms as the highest technology priorities in 2018 and 2019, again ahead of machine learning/artificial intelligence, illustrating the consistent importance of data and analytics to delivering business innovation.

Fig 4: The Prioritization and Game-Changing Potential of Data and Analytics



Source: 451 Research, Voice of the Enterprise: Digital Pulse, Budgets and Outlook, 2021; Voice of the Enterprise: Digital Pulse, Budgets and Outlook, 2020
Q. Which of the following technologies — if any — have the greatest game-changing potential for your organization over the next three years? Please select all that apply.
Source: 451 Research, Voice of the Enterprise: Digital Pulse, Budgets and Outlook 2018
Q. Are any of the following items top IT priorities for your organization in 2019?
Source: 451 Research, Voice of the Enterprise: Digital Pulse, Budgets and Outlook 2017
Q. Are any of the following items top IT priorities for your organization in 2018? Please select up to 3.

The importance of data and analytics amid unprecedented change

The need for business agility and flexibility to adapt to changing market conditions and competitive challenges was emphasized during 2020 as the widespread and unexpected socioeconomic impact of COVID-19 highlighted more than ever the need for agile business decision-making.

Technology priorities driven by the C-suite amid COVID-19 include improving efficiency and cost-cutting, understanding evolving business processes, and accelerating digital transformation. All of these rely on data, along with agility and pragmatism, to make rapid decisions as socioeconomic conditions evolve.

The pandemic, and the way in which enterprises have responded to it, appears to be exacerbating the divide between those that are investing to grow their data and analytics initiatives, and those that risk being left behind.

More than three-quarters (78%) of enterprises agreed that prior investments in data and analytics helped their organization cope with the impact of the COVID-19 pandemic, according to 451 Research's Voice of the Enterprise: Data Platforms & Analytics, Data Platforms 2021. However, that figure rose to 90% amongst the most data-driven companies, and 86% amongst the companies that have been the most successful with their analytics projects in recent years.

While some enterprises are retrenching due to COVID-19, others have seized on the outbreak as an opportunity to accelerate transformational change. Perhaps not surprisingly, it is those that have already been most successful with analytics that are more likely to be accelerating ahead.

The results of 451 Research's Voice of the Enterprise: Data Platforms & Analytics, Data Management & Analytics 2020 showed that those enterprises with the highest success rates with analytics projects in recent years were more than twice as likely to have increased the number or scope of active analytics projects as a result of COVID-19, compared to those that had been the least successful.

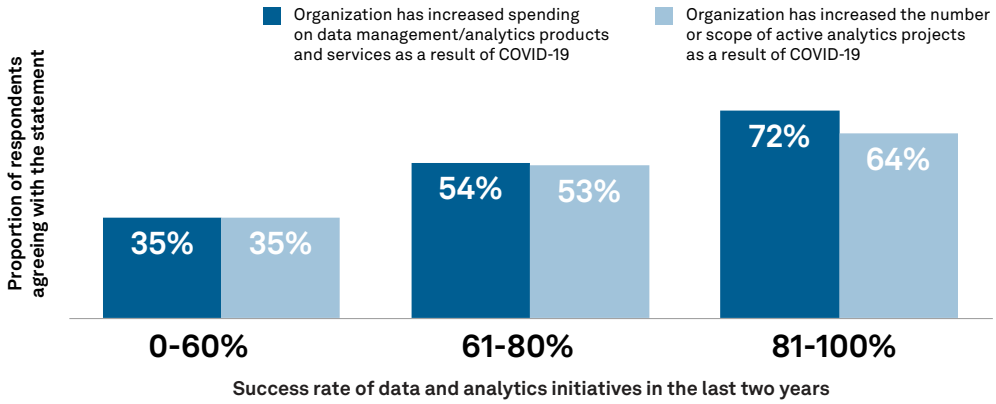
Those with higher success rates were also substantially more likely to have increased spending on data management and analytics products and services.

We have also seen increased and accelerated investment in cloud computing during the pandemic as enterprises have sought to take advantage of on-demand scaling to meet demand, accelerate changing business models, and aid remote working.

This has fast-tracked the ongoing trend of deploying new data processing and analytics workloads to the cloud, as well as migrating existing data workloads to the cloud or replacing them with cloud-native alternatives.

Nearly two thirds (60%) of respondents to 451 Research's Voice of the Enterprise: Data Platforms & Analytics, Data Platforms 2020 said they expect existing on-premises database workloads to move to the cloud (with or without modification) or be replaced with cloud-based versions. Meanwhile 66% of respondents said they expected to deploy new data platform workloads in cloud environments.

Fig 5: Analytics Success and Investment in Response to COVID-19



Source: 451 Research Voice of the Enterprise: Data & Analytics, Data Management & Analytics 2020
Q. What proportion of your organization's data and analytics initiatives conducted in the last two years would you characterize as having been successful?
Q. To what extent do you agree or disagree with each of the following statements?-"My organization has increased the number or scope of active analytics projects as a result of COVID-19."
Q. To what extent do you agree or disagree with each of the following statements?-"My organization has increased its spending on data management/analytics products and services as a result of COVID-19."

Challenges to successful data utilization

While the enterprises that have been more successful with data and analytics projects in recent years are more likely to be investing in new data and analytics products and services, being successful with data isn't something that enterprises can simply throw money at.

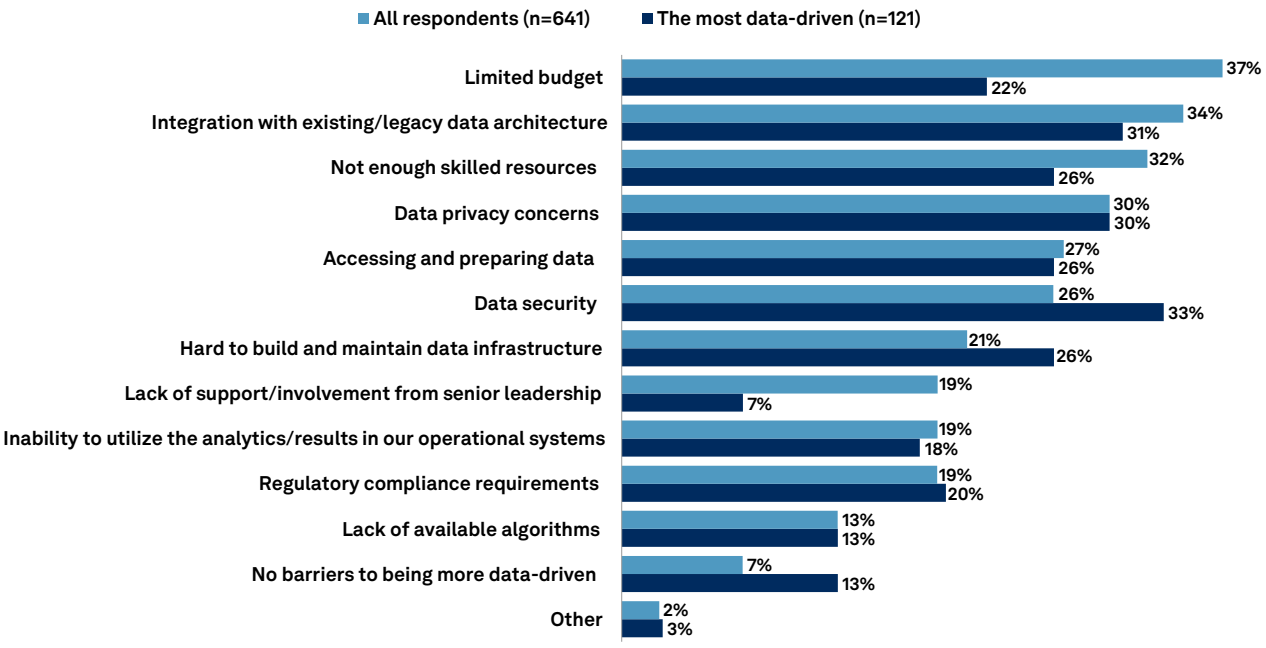
Indeed, there are multiple challenges associated with successful utilization of data, which can actually increase in significance the more an organization attempts to take advantage of data. This was highlighted by the results of 451 Research's Voice of the Enterprise: Data Platforms & Analytics, Data Platforms 2021, which indicated that the most data-driven companies are more adversely impacted by data security challenges, as well as building and maintaining data infrastructure, and regulatory compliance requirements.

However, the most data-driven companies are significantly less concerned about limited budgets, a lack of skilled resources, and a lack of support or involvement from senior leadership.

A key challenge enterprises face in attempting to be more data-driven is the rising volume of data. The volume of data under management at the median company was expected to grow by 29% to reach 821TB this year, according to respondents to 451 Research's Voice of the Enterprise: Data & Analytics. The median volume of data being used for analytics was expected to grow even faster, by 91% to reach 595TB today.

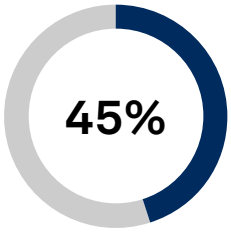
Although the proportion of enterprise data being used for analytics is increasing, a substantial proportion of data generated by businesses remains 'dark data' — data that it is not currently used to generate insights via analytics projects, and is therefore effectively hidden from enterprise decision-makers.

Fig 6: Barriers Faced in Attempting to be More Data-Driven



Source: 451 Research Voice of the Enterprise: Data & Analytics, Data Platforms, 2021
Q. What are the most significant barriers your organization faces in attempting to be more data-driven?

Respondents to 451 Research's Voice of the Enterprise: Data & Analytics, Data Platforms 2021 told us that on average, 45% of data currently under management could be described as 'dark data'. This means that a substantial proportion of data that is being generated and stored by enterprises (often at great cost) is not being used to generate business insight, leading potentially to lost opportunities to innovate, differentiate, and operate more efficiently.



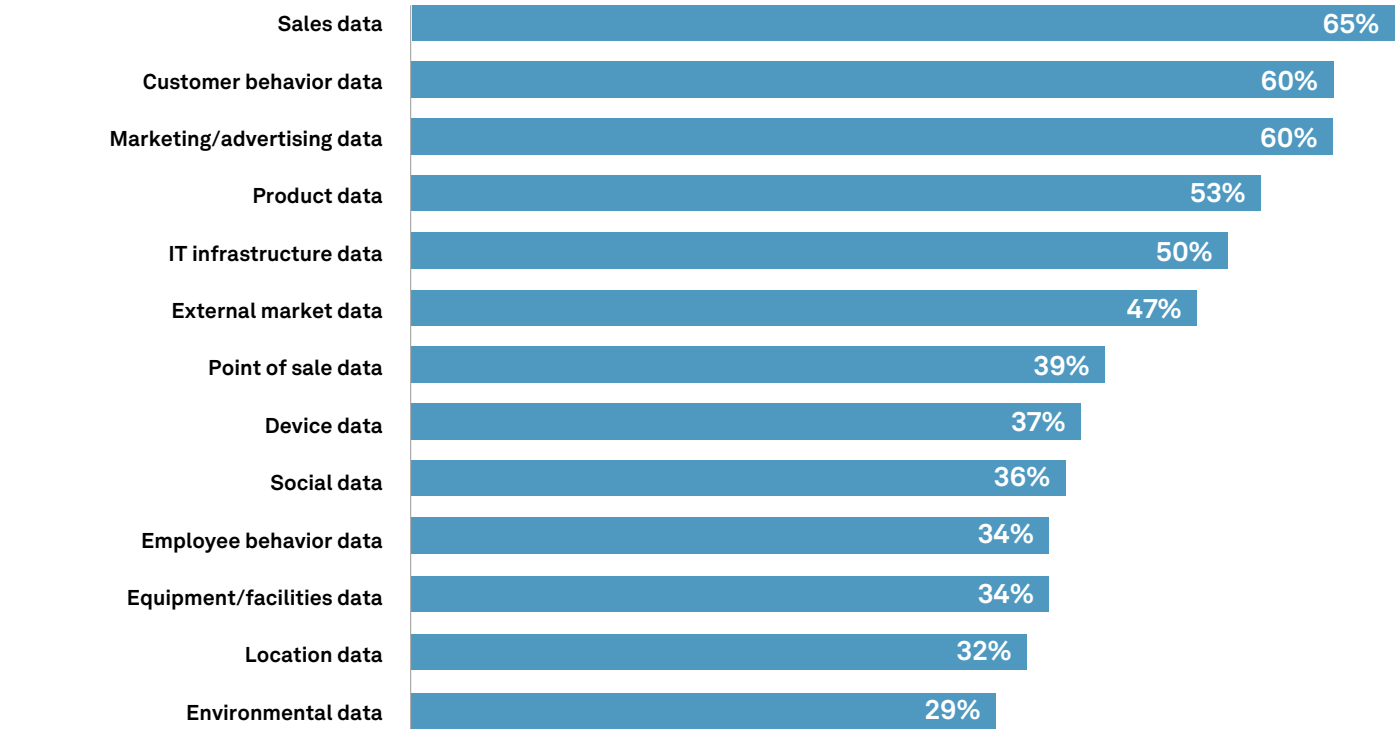
On average, 45% of enterprise data is dark data unused for analytics initiatives.

The growing volume of data being managed and analyzed is just one challenge associated with attempting to be more data-driven, however. Another is the variety of data sources that need to be integrated before they can be used to generate actionable insight.

The average enterprise is using 5.78 different categories of data for analysis, according to 451 Research's Voice of the Enterprise: Data & Analytics, Data Platforms 2021 survey. That figure rises to 6.27 among companies that have been successful with more than 80% of their recent analytics projects, and 6.54 among the most data-driven companies.

In addition to traditional sources of data (such as sales data, customer data, and product data) enterprises are increasingly looking to take advantage of new sources of data, including social media, devices/sensors, and external data marketplaces.

Fig 7: Sources of enterprise data

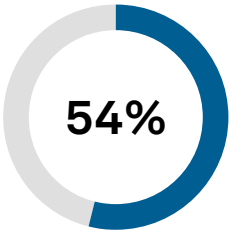


Source: 451 Research Voice of the Enterprise, Data Platforms & Analytics, Data Platforms 2021
Q. Which of the following types of data does your organization analyze? Please select all that apply (n=611)

Finding the needle of insight in the data haystack

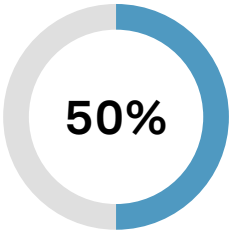
The growth in data volumes, combined with a growing variety of data sources, can be both a blessing and a curse. The more data you have, and the more used for analytics projects, the greater the chances of uncovering that key data point that could revolutionize your business — and the more likely it is that trying to find that key data point is like searching for a needle in a haystack.

Finding and accessing data is a perennial challenge for enterprises that is exacerbated by the growing data volumes and variety of data sources. On average, data analysts spend 54% of their working hours finding and preparing data for analysis, according to respondents to 451 Research's Voice of the Enterprise: Data & Analytics, Data Platforms 2021. With the average data analyst salary currently at $74,000 per annum, according to Indeed.com, that equates to $40,000 per year, per analyst being spent on finding and preparing data.



On average, 54% of a data analyst's time is spent finding and preparing data for analysis.

The situation is slightly better for data scientists. On average they spend 50% of their working hours finding and preparing data for analysis, according to respondents to the same survey. However, given that data scientists have an average base salary of $122,000 per year, according to Indeed.com, that equates to $61,000 per year — per data scientist — being spent on finding and preparing data.



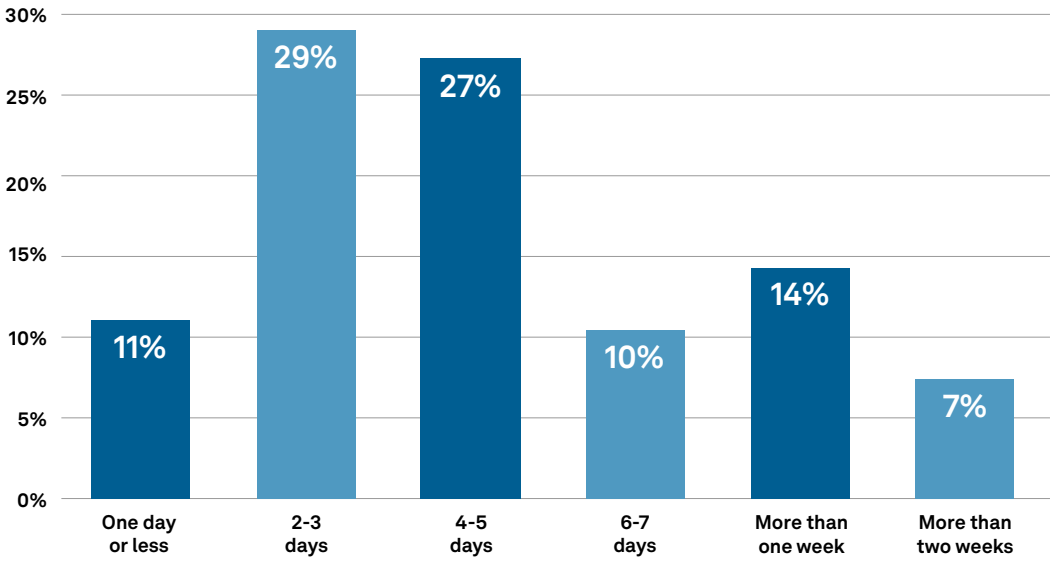
On average, 50% of a data scientist's time is spent finding and preparing data for analysis.

Time spent finding and preparing data for analysis is just one of the potential delays to insight, however. Other challenges include the time spent configuring and deploying associated infrastructure and analytics software, as well as designing and deploying data analytics pipelines, and creating and testing models, including backtesting using historical data.

Finally, there is the time taken by data scientists, data analysts, and decision-makers to actually study the results of the analysis, and then take appropriate action.

More than a fifth (21%) of respondents to 451 Research's Voice of the Enterprise: Data & Analytics, Data Platforms 2021 told us that it takes their organization more than a week to generate insight from raw data when creating new analytics reporting or dashboard environments, while 10% take 6-7 days, 27% 4-5 days, 29% 2-3 days, and only 11% one day or less.

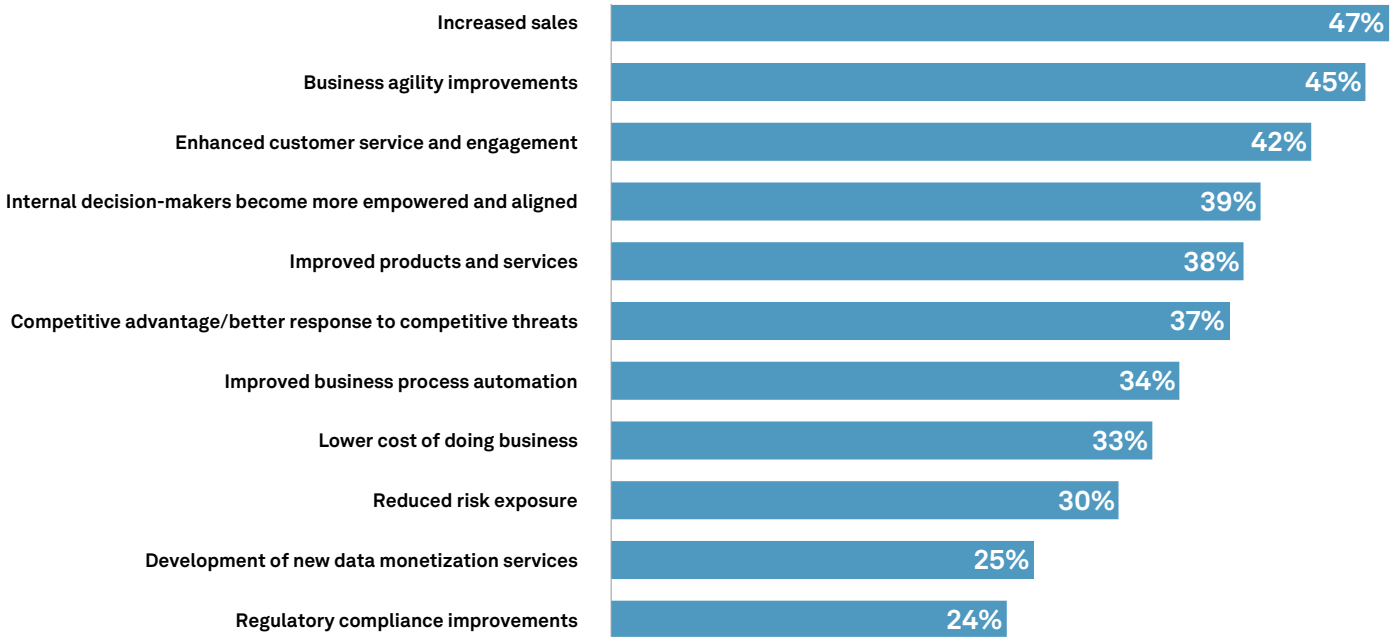
Fig 8: Time taken to generate insight from raw data



Source: 451 Research Voice of the Enterprise, Data Platforms & Analytics, Data Platforms 2021
Q. When creating new analytics reporting or dashboard environments, approximately how long does it take to first generate insight from raw data? (n=467)

Reducing the time taken to generate insights from data could deliver meaningful results. Respondents to the same survey cited numerous potential benefits, including empowered and aligned internal decision makers (39%), enhanced customer service and engagement (42%), and improved business agility (45%). Increased sales topped the list, however, cited by 47% of all respondents.

Fig 9. Anticipated benefits of reducing time to insight from data



Source: 451 Research Voice of the Enterprise, Data Platforms & Analytics, Data Platforms 2021
Q. If your organization could generate insights from data more quickly, which of the following benefits would you expect to achieve as a result? Please select all that apply. (n=492)

Identifying and measuring ROI from data, AI and analytics

While identifying the potential benefits of accelerating analytics initiatives is not difficult, measuring the value delivered by investments in data, AI and analytics in terms of return on investment (ROI) can be more problematic.

One of the issues is that any strategic data processing and analytics initiative involves a long-term investment in products and services, as well as people and skills and infrastructure, that can be punctuated by multiple short-term projects. Identifying the outlay on data, AI and analytics in relation to each of these projects as a proportion of the overall investment may not be straightforward.

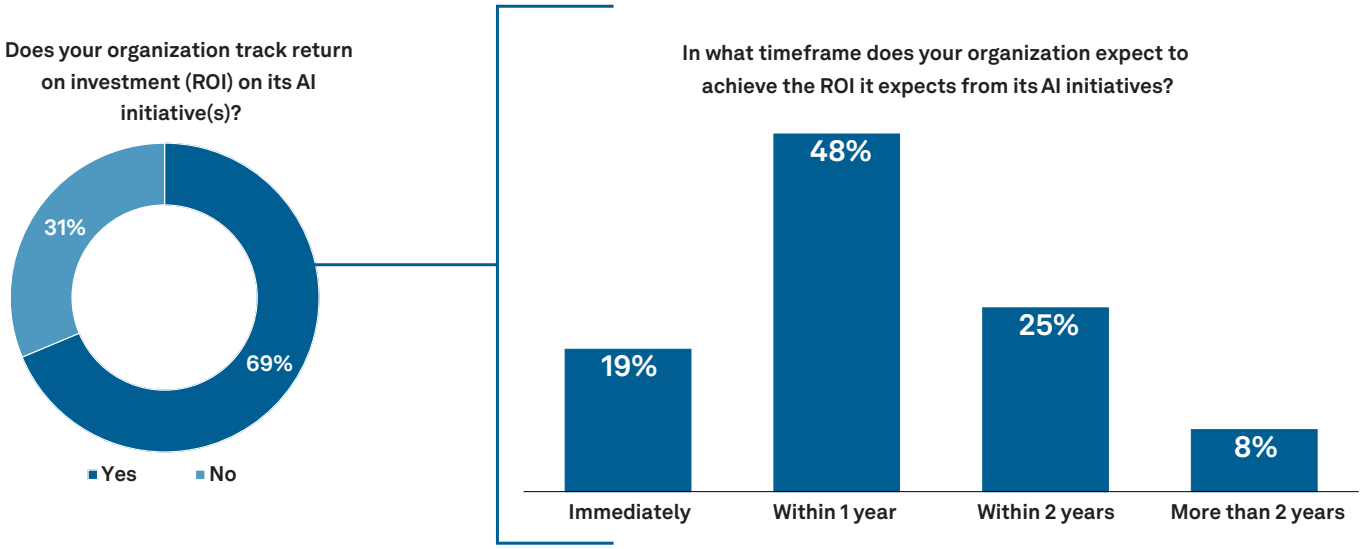
Even if investment in new products and services, as well as people and skills could be clearly allocated to a specific project, attributing outcomes directly to a specific investment in tools and platforms may not be simple. Could a business confidently state that an increase in sales is directly attributed to the use of a new business intelligence dashboard, for example, rather than the quality of the product, a new marketing initiative, the skills of the sales team, or an external factor (such as a change in the competitive environment)?

That is not to say that calculating the ROI from data, AI and analytics is impossible. Just over two-thirds of respondents to 451 Research's Voice of the Enterprise: AI & Machine Learning, Use Cases 2021 told us that their organization is currently tracking ROI on its AI initiatives, for example, with 67% of those that are tracking ROI expecting their AI initiatives to deliver anticipated ROI immediately or within one year.

With respect to data, AI and analytics tools and platforms, an ROI model needs to be focused on the measurable impact of tools and platforms on business decision-making. Potential measurable factors associated with business intelligence tools would include the time taken to find data, the accuracy and trustworthiness of data, and the time taken to reach a decision or communicate insights to others.

It is clear that any ROI model for data, AI and analytics needs to consider the impact of other factors beyond the tools themselves, however. As such, the factors used to assess the ROI of investment in analytics should be tied closely to wider business goals — whether it is increasing sales, improving staff efficiency, or lowering costs.

Fig 10: Anticipated ROI from AI initiatives



Source: 451 Research Voice of the Enterprise: AI & Machine Learning, Use Cases 2021
Q. Does your organization track return on investment (ROI) on its AI initiative(s)? (n=1,000)
Q. In what timeframe does your organization expect to achieve the ROI it expects from its AI initiatives?
Base: Organization tracks ROI on AI initiatives (n=687)

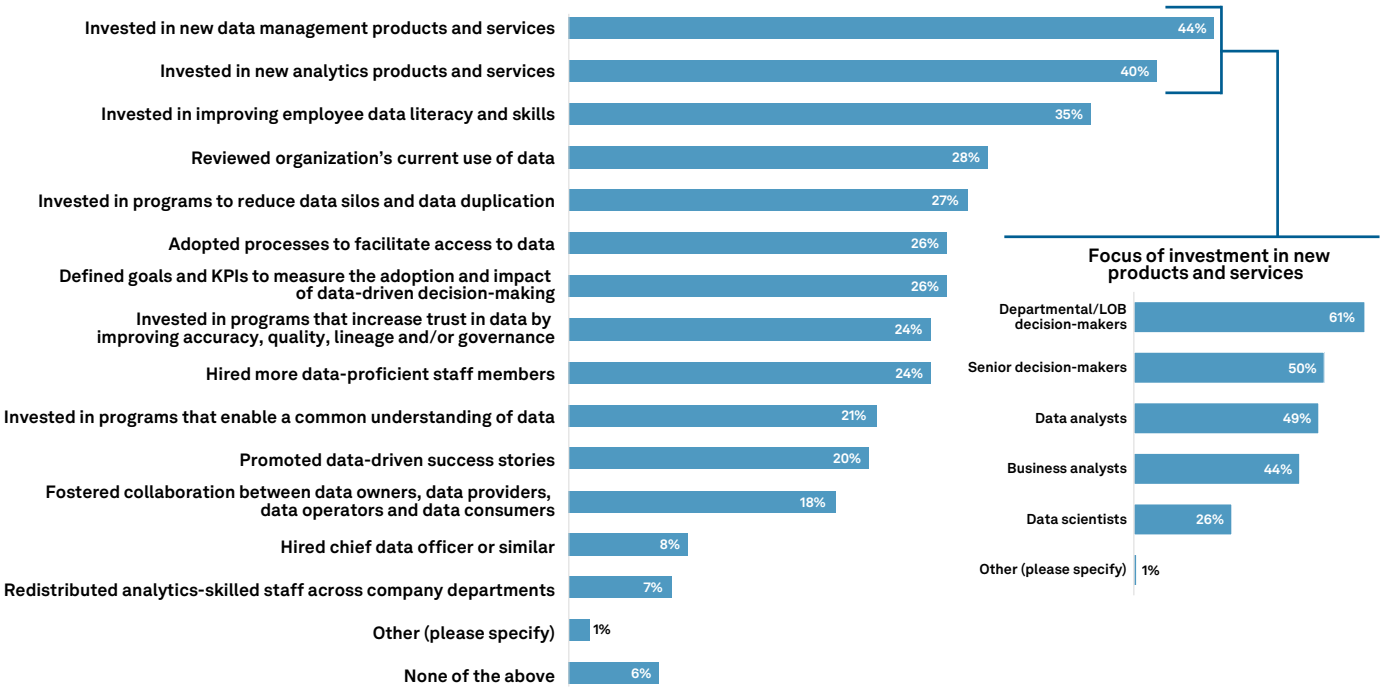
Data management and data marketplaces as facilitators to data decision-making

In addition to direct investment in analytics and AI tools and platforms, data management is an enabler of improving insight from data that can play an important role in overcoming the challenges to successful data utilization and facilitate the delivery of value from overall investment in data and analytics.

The importance of data management to delivering value from analytics initiatives was highlighted by 451 Research's Voice of the Enterprise, Data & Analytics, Data Management and Analytics 2020. When respondents were asked what steps their organization had taken to improve data culture, the most popular response was investment in data management products and services, cited by 44% of respondents.

The fact that investment in new data management products and services ranked higher than investment in new analytics products and services highlights the key role data management has to play in delivering value from analytics initiatives. Additionally, the fact that the top two responses both involved investment in products and services indicates that many enterprises have a product-centric approach to improving data culture.

Fig 11: Steps taken to improve data culture



Source: 451 Research, Voice of the Enterprise, Data & Analytics, Data Management & Analytics, 2020
Q. What steps has your organization taken to improve its data culture? Please select all that apply. (n=360)
Q. Which of the following employee roles have been the focus of your organization's investment in improving employee literacy and skills? Please select all that apply. (n=139)

The survey results also showed that, rather than data and business analysts, departmental and LOB decision-makers have been the most popular focus of this investment in products and services, ahead of senior decision-makers.

The same survey also showed that senior decision-makers have also most often been the beneficiaries of investment in improving employee literacy and skills (followed by departmental and LOB decision-makers), while departmental and LOB decision-makers have most often been the beneficiaries of the adoption of processes to facilitate access to data (followed by senior decision-makers).

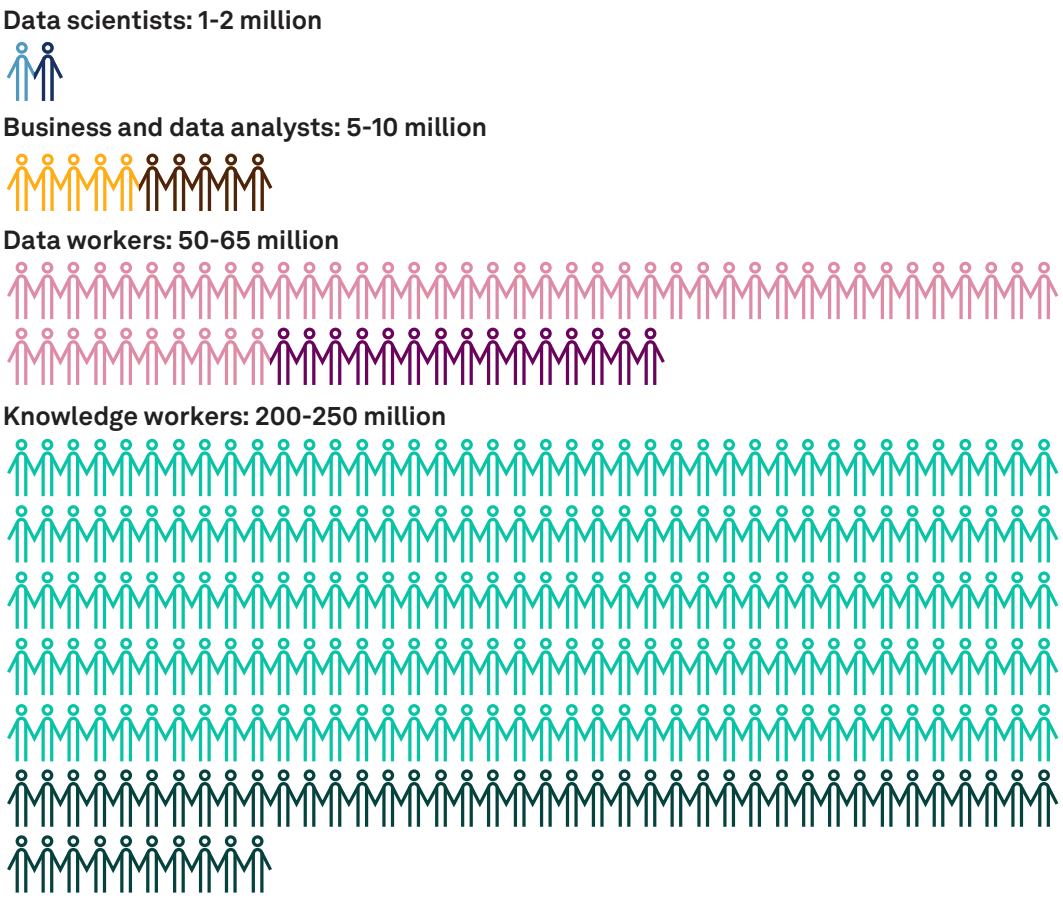
This reflects the fact that improving data culture in an organization involves the democratization of data to ensure that staff across the whole organization have the skills, tools and access they require to read, analyze, understand, and communicate with data.

It is not difficult to appreciate the motivation for this increased investment in data-related skills, tools and access for decision-makers. While business analysts, data analysts, and data scientists have historically been the primary focus of investment in data and analytics, these roles account for a tiny proportion of the overall workforce.

451 Research estimates that there are currently between one and two million data scientists in the world and roughly 5-10 million data and business analysts — those that regularly use business intelligence tools and dashboards.

In comparison, 451 Research believes that there are in the region of 50-65 million 'data workers' in the world (those that engage with business intelligence tools and dashboards on a more irregular basis), and some 200-250 million 'knowledge workers', who may not engage with analytics tools but do make use of data and information in the course of their duties.

Fig 12: The population of potential data users



Source: 451 Research

Facilitating access to data

According to 451 Research's Voice of the Enterprise: Workforce Productivity & Collaboration, Employee Engagement 2020 survey, the features that employees desire most from potential investment in workforce productivity tools is to make the information they need easier to find.

While senior, departmental and LOB decision-makers account for a tiny proportion of the number of data workers (estimated to be perhaps in the hundreds of thousands), their influence over purchasing decisions is such that they are surprisingly underserved by current data and analytics products and services.

Senior and departmental decision-makers are likely to be occasional consumers of the output of business intelligence products but are more likely to engage with enterprise applications and corporate performance management (CPM) tools in the process of making business decisions.

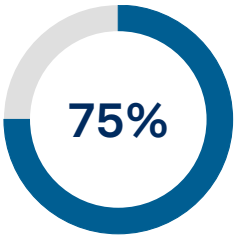
One of the ways in which enterprises are facilitating access to data for senior and LOB decision makers is through providing access to data in both internal and external marketplaces in the form of data feeds or APIs.

Data marketplaces can aid decision-makers to unlock the value in enterprise data, increasingly in combination with third-party data, with external data marketplaces providing access to prepared data sets, as well as natural language query capabilities, and the underlying data processing functionality, that help accelerate the time to actionable insight.

These data marketplaces help data and knowledge workers to find data sources that are relevant to their domains and incorporate them into their decision-making processes, either as part of, or complementary to, specific business intelligence and analytics initiatives.

More than one fifth (21%) of enterprises currently enable senior and departmental/LOB decision-makers to access data in data marketplaces as part of their decision-making processes, according to respondents to 451 Research's Voice of the Enterprise: Data & Analytics, Data Management & Analytics 2020. The use of data marketplaces by senior and departmental/LOB decision makers is expected to climb to more than a quarter (27%) of respondents two years from now.

Meanwhile, almost three quarters (75%) of respondents to 451 Research's Voice of the Enterprise: Data & Analytics, Data Platforms 2021 indicate that data marketplaces will be in their organization's top five strategic priorities in the next three years. That figure rises to 79% among companies that have been successful with more than 80% of their recent analytics projects, and 84% among the most data-driven companies.



75% of enterprises expect data marketplaces to be a top five strategic priority in the next three years.

Fig 13: Usage and importance of data marketplaces

Use of data marketplaces by departmental/LOB decision-makers.

Source: 451 Research Voice of the Enterprise: Data & Analytics, Data Management & Analytics 2020
Q. What products are currently used by senior and departmental/LOB decision makers in your organization to make decisions based on data? (n=350)
Q. Two years from now, what products do you anticipate will be used by senior and departmental/LOB decision makers in your organization to make decisions based on data? (n=322)
Source: 451 Research Voice of the Enterprise: Data & Analytics, Data Platforms 2021
Q. To what extent do you agree or disagree with each of the following statements? — Data marketplaces will be in my organization's top five strategic priorities in the next three years. (n=273)

Conclusion

While data has never been as important to enterprise decision-making as it is today, the continuing rise in the recognition of the importance of data means that data may never be considered this inconsequential again.

Driven by the fourth industrial revolution and associated investment in sensors, robotics, and automation, data, AI and analytics are at the heart of modern enterprise strategies to drive operational efficiency, improve competitiveness, and develop new products and services.

While becoming more data-driven is an enterprise imperative, it is also more easily said than done and involves cultural and organizational change, as well as investment in new products and services, employee skills and data literacy.

Data management is an enabler of accelerated insight from data, while data marketplaces can help decision-makers to unlock the value of enterprise data and third-party data by providing access to prepared data sets, as well as natural language query capabilities.

Facilitating access to data and reducing the time taken to generate insights from data has the potential to deliver meaningful benefits, including increased sales, improved business agility, enhanced customer service and engagement, and more empowered and aligned internal decision-makers.

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