

Data science has been considered the domain of a few highly skilled experts, and organizations have struggled with a scarcity of talent. But advancements in analytics software are democratizing data science, empowering employees at all levels of the organization.

How Organizations Can Bridge the Gap Between Data Science and Business Outcomes

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Introduction

The idea of being more data driven in decision making has permeated enterprises across industries worldwide. IDC's research has shown that becoming data driven provides organizations with benefits such as improvements in financial metrics, customer retention, and employee satisfaction as well as the ability to respond quickly to changing market dynamics.

Enterprises have spent decades investing in building their data assets, systems of record, applications, data warehouses, data lakes, analytics applications, and business intelligence tools, and yet they are not able to provide decision makers with access to the right data, at the right time, and in the right context. The problem is not that organizations do not have enough data; rather, they often have too much data and not enough people who can analyze it.

IDC's research has shown that 50% of respondents across industries are overwhelmed with the information that is available to them for decision making and that they do not have sufficient technical and analytic skills for analyzing the data. Another gap in organizations is that the culture of making data-driven decisions is not pervasive across all levels of the organization. IDC research has shown that 83% of CEOs want to be more data driven, but only 30% of frontline workers said that their actions are driven by data.

What do business users have to do to be able to analyze the data they have to glean insights from it and to operationalize the synthesis of information at scale? Sometimes they can turn to their data science colleagues for support.

Data scientists have a mix of skills in two or more of the following disciplines: advanced analytics, statistics, machine learning, and computer science. Data scientists are experts at preparing large amounts of diverse data for analysis as well as developing new analytic models and testing them to arrive at usable predictive models.

AT A GLANCE

KEY STATS

According to IDC research:

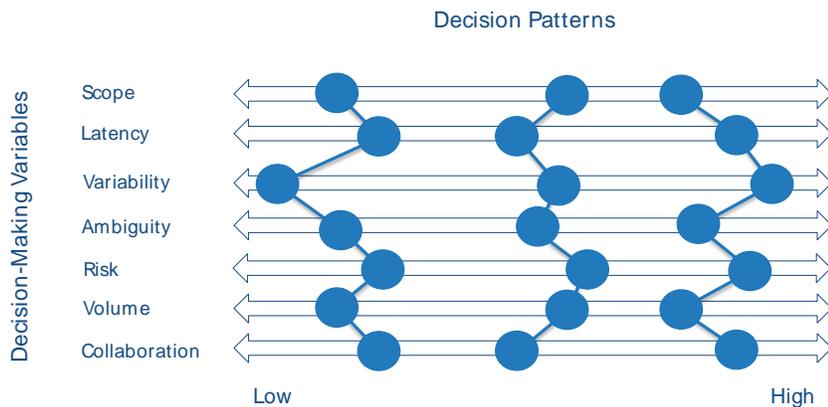
- » 50% of organizations are overwhelmed with the information available to them for decision making and lack the skills for analyzing the data.
- » 83% of CEOs want to be more data driven, but only 30% of frontline workers said that their actions are driven by data.

However, only a small fraction of business problems and opportunities that require data analysis are supported by data scientists. The reality is that most organizations cannot hire enough data scientists to address all their analytic needs. According to data from job sites such as LinkedIn, Indeed.com, and Quanthub.com, there were approximately 250,000 fewer qualified data scientists than advanced analytics jobs in the market in 2020. Organizations continue to have the most difficulty finding appropriate skill sets for the data science technology area, second only to cybersecurity.

Therefore, there is an opportunity (and a need) to ensure that business analysts — and, more broadly, any business knowledge worker who relies on data — can benefit from advanced analytics without having to have deep expertise in data science with a mix of statistics, machine learning, and computer science skills or coding. The answer to achieving this goal lies in aligning various analytic and decisioning requirements with appropriate analytics skills, processes, and tools. After all, not every analytics and decision-making process requires an analyst who has a combination of advanced degrees in statistics, machine learning, and computer science.

The framework for aligning analytic and decisioning requirements is shown in Figure 1. IDC's Decision Patterns Framework depicts key variables of decision making and helps identify types of analytic methods and skills needed to address them. Some of these needs will clearly continue to rely on dedicated data science teams, but others can benefit from availability of more advanced analytics in the hands of business users.

FIGURE 1: *IDC's Decision Patterns Framework*



Source: IDC, 2021

The decision-making variables are defined as follows:

- » **Scope.** The breadth of the impact of a given decision. Does it impact a single customer or many or all customers; a single activity or one whole process or multiple processes?
- » **Latency.** The time window or time interval within which a decision needs to be made or an issue needs to be resolved. Some decisions need to be made in subseconds (e.g., real-time recommendations); others may have weeks or months of lead time (e.g., acquiring another company or entering a new market).

- » **Variability.** The extent to which the issue is predefined versus ad hoc. Is this a regularly or consistently recurring decision or a decision that needs to be made rarely?
- » **Ambiguity.** The extent to which the issue at hand is open ended. How open to interpretation is the data needed to make the decision?
- » **Risk.** The monetary value at risk. Decisions with narrower scope tend to have a lower level of risk; however, there is not a perfect correlation between risk and scope. For example, a planning process could be affecting a narrow part of the enterprise but have high risk associated with compliance.
- » **Volume.** The number of decisions made within a given time period.
- » **Collaboration.** The extent to which decision making requires collaboration among people.

Where Can Data Science Help Business Users?

Organizations have a set of decision patterns across departments, business groups, or other organizational constructs that define the types of analytics that need to be applied to data to derive information that leads to actionable insights. What is clear when looking at decisioning needs through the lens of these patterns is that some decisions require advanced analytics to help a person make the right decision. For example, in a pattern that includes a high volume of low-risk decisions that exhibit limited ambiguity and require low latency, there is an opportunity for data scientists to work with business subject matter experts to develop analytic models that are deployed in the context of operational applications. Operationalizing data science in this use case results in significant gains in efficiency and frees up the user from repeated tasks.

In a different case, such as a decision to acquire another company, the decision pattern could involve very broad scope and high risk, a high level of ambiguity, and a time frame (latency) of months, with no historical data available. In this case, data science may have limited or no value — what is more important is understanding the business context and having a framework for likely developments in the market over the next several years. No amount of data science can predict accurately what will happen three to five years from now.

A third pattern involves a range of operational decisions to optimize plans and mitigate risks. Analytics related to these decisions involve subject matter experts who can be broadly categorized as business analysts, but their actual titles can range widely across functional business departments and groups. The decision making supported or undertaken by these "business users" tends to be in the middle of the two endpoints depicted in Figure 1.

Often this type of data analysis involves techniques such as root cause analysis, key driver identification, or scenario or what-if analysis that happens regularly. This decision pattern neither lends itself to full automation nor requires deep, ad hoc data science projects involving new algorithms and analytical model development and testing. Instead, because the business context of this type of data analysis and the decisions it drives is well understood, a "toolbox" of previously developed and tested advanced analytics or data science models can be made available to these business subject matter experts within their existing business applications.

In other words, there is an opportunity (and a need) to ensure that business analysts — and, more broadly, any business knowledge worker who relies on data — can benefit from advanced analytics without having to have deep expertise in data science or coding. IDC finds that a portion of such workers has a sufficient level of data and analytics literacy to recognize when and where advanced analytics can benefit them. Our 2020 business analytics market research study showed that 47% of business analyst and business knowledge workers either have undergraduate degrees with some level of data science and statistics training or have taken courses in these topics from online training providers such as Coursera and Udacity. In other words, they are not data scientists with advanced degrees in math or machine learning, but they do have an appreciation for the value of advanced analytics. New tools make analytics more consumable by non-data scientists who are part of a broader population of users.

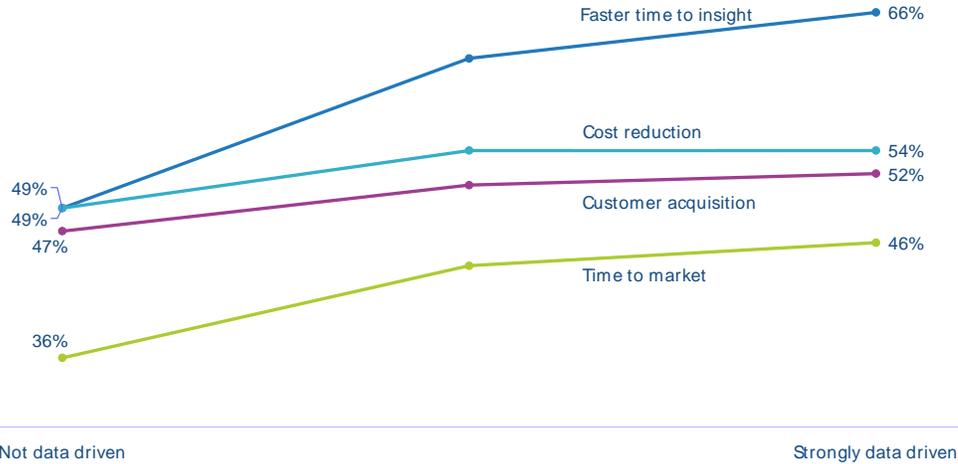
It is critical that enterprises provide the tools that empower business workers by making advanced analytics available to them within the context of their expertise level. Again, the key to addressing this broader advanced analytics opportunity is to identify decision patterns that exist in the middle of IDC's Decision Patterns Framework — your organization has plenty of them — and to ensure that the technical capabilities are presented in "business-friendly" language and within analytics workflows that help guide these non-data scientists in their efforts to use advanced analytics.

Benefits

When business users leverage data science, it opens new horizons to what is possible. For example, where users may have been able to find correlations in data, they may now be able to find causation. They can go from understanding what happened in the past to being able to predict what is most likely to happen in the future. Where they may have relied on intuition, they can now use their experience in conjunction with data and data science to drive decisions and action. When enterprises empower all their workers with access to timely, accurate, and contextual data and related data science capabilities, they see improvement in several business outcomes.

Democratizing data and analytics can offer tangible business benefits, but empowering business workers with analytics and data science often results in many intangible benefits such as improved employee satisfaction, higher retention of skilled data scientists, upskilling of workers, and better data empathy and collaboration. When measuring the return on investment of the value of data science, enterprises should consider both tangible and intangible business improvements (see Figure 2).

It is critical that enterprises provide the tools to enable everyone to maximize the use of advanced analytics within the context of their expertise level.

FIGURE 2: **Benefits of Democratization of Analytics and Data Science****Q What business outcomes improved because of data-driven decision making?**

n = 310

Source: IDC's Business Intelligence End-User Survey, 2020

Considerations

IDC's interactions with customers have shown that there are still many challenges to making data science accessible — from both a technical standpoint and a skills and understanding standpoint — across all levels of the organization but particularly in frontline or tactical roles. Common challenges cited by business users include:

- » Lack of understanding of the value of data science and analytics
- » Lack of trust in the results of data analysis and data science
- » Insufficient training on the meaning of data and the tools for working with data
- » Inability to synthesize data into actionable information

Many of these challenges require a mindset shift and evangelization of the value of analytics and data science. Organizations that have been successful in building a strong data-driven culture cultivate data champions from different areas of the business who truly understand the value of analytics and can demonstrate how using data science can materially improve their job functions. Identifying opportunities for embedding data science and showing measurable value is a critical first step to get buy-in from business users.

Conclusion

There continues to be a gap in analytic skills between highly training data scientists and business domain experts, who often lack sufficient support for advanced analytics from scarce data science experts. This gap can be filled by either hiring more data scientists or introducing new tools and data literacy programs to enable business workers to benefit from advanced analytics through business intelligence tools already familiar to them. The former approach is proving to be increasingly impossible due to the lack of qualified data scientists.

IDC recommends that organizations looking to provide their business knowledge workers with the ability to improve or maximize the value of data available to them consider the following opportunities:

- » Assess decision-making processes and the analytics and data required to support them. IDC's Decision Patterns Framework can help in identifying decision-making patterns that are the primary domain of business knowledge workers and can benefit substantially from the application of more advanced analytics to identify anomalies, trends, key drivers, and next best actions.
- » Look for software tools that are already familiar to business knowledge workers and also incorporate a set of tested, well-understood, and trusted advanced analytics models. This functionality will enable those who appreciate the value of advanced analytics and data science to apply appropriate analytic models to their data without having to develop new models — a process that is the domain of specialized data science teams.
- » Encourage all business users to develop higher levels of data and analytics literacy by investing in formal training and informal knowledge sharing. It is not enough to hope that more business users will start using and benefiting from advanced analytics. Intentional programs and associated investments in developing staff will ensure that such new business-friendly data science functionality will deliver on its promise.

About the Analysts



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To learn more about Business Science, visit <https://www.tableau.com/about/blog/2021/3/what-is-tableau-business-science>.



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