

IS YOUR
INTUITION
DROWNING
IN MATH?



**THE EVOLVING — AND CONTROVERSIAL —
ROLE OF MATH-BASED BUSINESS DECISIONS
IN THE INFORMATION AGE**

By Jason Raguso



When it comes to math and data science, we live in remarkable times. Computing power, boundless data and advanced statistical techniques have never been more accessible. The combination of these three has yielded unbelievable progress in the areas of life science, particle physics and predictive modeling. Why then— if we are so capable of mapping our DNA, splitting atoms and detecting fraud—are executives and analysts more frustrated than ever when it comes to making great business decisions?

Despite the sophistication of information technology systems in top global corporations, executive decision-makers often characterize their organizations as “data rich and information poor.” While executives and consumers both use emotion to make choices, analytics teams employ rational data-driven approaches to make sense of these choices. The growing information at our disposal is fueling even more contradiction, and decision-making just feels harder. Time and time again, strong executive intuition says one thing while math says another.

The promise of math advancing decision-making makes fundamental sense. We can solve incredibly complex problems using mathematics, so it’s natural to want to apply math’s explanatory ability to business. However, in adopting the technologies to accommodate new forms of data and advanced math, we’ve unconsciously skipped over the steps required to make analysis meaningful. Somehow we’ve gotten ahead of ourselves, and our intuition needs to catch up.

THE GOLDEN AGE OF DECISION SUPPORT

Information technology in the 1970s and ’80s was heavily focused on automating essential routine business functions such as billing, labor and materials management. Most technology lived in a centralized data store and “dumb terminals” that allowed for basic read/edit functionality. These green screens, though, were horribly inflexible. Enter the

1990s, where localized computing got easier. The personal computer enabled a department-level business executive outside of the IT group, to “grab data and play with it.”

Throughout the next decade, a golden age of empowerment ensued. Department-level skills for analyzing data became both sophisticated and personalized. Analysts accessed cuts of data from centralized systems and developed new tools within Excel and PowerPoint. These were glorious times for enabling decisions. Competitive advantages for business units hinged on having a good relationship with IT and a couple of team members who were “good at Excel.” When customized to suit executive needs, data was incredibly effective. But suddenly, everyone was second guessing the veracity of their data. We began hearing “We need a single version of the truth” or “Which system did you pull that from?” Fifteen minutes of every meeting was spent discussing why the data was valid. Like Adam and Eve in the Garden of Eden, we woke up and realized we were naked.

For the most part, information was still moving at a glacial pace. Large refreshes of data occurred in batch processes overnight or during the weekend, and IT departments could help keep data versions under control to keep everyone aligned. Processes needed to be centralized and standardized. Stricter data governance initiatives were enacted and battle lines were drawn to prevent rogue access databases

from being built. During this centralization, business executives ceded control of information to technologists. And in the blink of an eye, the first golden age of decision support was over.

THE DAWN OF REAL-TIME DATA

Meetings were no longer filled with queries about the validity of data. Instead, we heard questions about new forms data such as, “Can we include our media spend by campaign to this analysis?” and “What is the value of a Facebook ‘like?’” We began feeling like we were missing something—a nagging sense that either the content or latency was inadequate. Naturally, our reaction was to recalibrate systems to capture, assimilate and analyze new forms of data in hopes of answering these new questions. The potential of data to empower and transform our decision-making was all too compelling.

The nature of the data changed, as well as our ability to capture structured and unstructured data in real time. The era we are currently in should more accurately be referred to as “all sorts of data in real-time.” It is the variety of data, the unknown value, and the zero-latency nature of it that confounds us—not the volume of the data files. Big Data is, however, a metaphor for disruption as it has largely disrupted corporate decision-making.

Yet no one wants to miss the boat, so we’ve launched headlong into defining value in the era of “all sorts of data in real-time.” Corporations are filling their ranks with folks from academic-intensive, non-traditional math and computer science backgrounds. Technologists, data scientists, mathematicians and support vendors—people who naturally find comfort in all this data—are now at the helm of these initiatives.

The mid-1990s was the first time business executives were involved across the board: Manipulating, analyzing and personalizing new streams of data to suit their needs. Today, decision-makers suffer differently for three reasons. First, executives are drowning in data, and their brains aren’t able to process any faster. Second, they are working through the IT and data science groups in the name of expertise and efficiency. Finally, executives are further removed from the data, and from letting their intuition help shape the process.

RATIONALITY AND INTUITION: FRENEMIES

High-performing teams are largely based on their ability to agree on courses of action. The following approaches—intuition and rationality—are common frenemies in the decision-making process.

RATIONAL APPROACH: Decisions and the ideal decision-making process in most corporations are highly objective and rational. Conscious reasoning and deliberative analytical thought are its hallmarks. In a world where everyone agrees on cause-and-effect relationships, has equal access to information and consensus on its meaning, rational decision-making is unquestionably effective. A well-orchestrated planning process systemically prevents emotion and bias from influencing how decisions are made.

INTUITIVE APPROACH: Senior leaders frequently set course based on their feel for what is around the corner. During times of great change, intuition is an effective executive’s greatest asset. By definition, intuition is the capacity for understanding without an apparent intrusion of rational thought. Without intuition, Steve Jobs would have been rendered significantly less potent in his relentless pursuit of design and a better user experience. In groups, shared intuition is even more powerful. Highly effective teams sense clarity that doesn’t come from spreadsheets.

Intuition and rationality in equal measure propel teams to greatness.



WHILE **MATH** IS DETERMINISTIC,
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THE NEXT ERA: BRINGING RATIONALITY AND INTUITION INTO BALANCE

Most senior decision-makers are uncomfortable with the complexity of advanced applied mathematics. They've got no feel for it. Conversely, most analysts and technologists are trained to showcase math's deterministic power. Yet math is not deterministic when it comes to explaining random or rare occurrences. We're relying heavily on math at a time when executives are struggling to keep up, and analysts are ill-prepared to present data in a manner that speaks to business acumen.

We find ourselves facing a paradox yet again. So how do we break the cycle?

In the coming decade, a natural migration of math talent upward into organizations will address some of these issues. Senior leaders will inevitably develop a feel for the math behind the analysis. Analysts will become more exposed to storytelling. Until we close this gap, three approaches stand to elevate analytics to becoming a definitive source for heightened intuition: transparency, learning before solving, and multidisciplinary approaches.

1 Transparency: While math is deterministic, it cannot explain the irrational or random events that fill our everyday lives. Models are inherently unstable when pushed beyond the bounds of the data used to create them. However, this won't prevent an executive from asking a question beyond the scope of the data. An analyst, and the overall organization, would be better served settling on "we can't know for sure" than banking on a misleading projection. It is important to create a culture of vulnerability as we work through the experiments required to learn.

2 Learning before solving: Whether executives are expected to decipher math or analysts are required to present a business case, we need to give both parties permission to ask questions and iterate. Without this heuristic iterative approach, we hinder our implicit learning processes and validation sequences. Defining a set of objectives around learning would help set best practices and create consensus on cause-and-effect relationships. Trying to score consumer experience before both sides understand the definition and drivers undermines the very nature of how we inform intuition—via trial and error.

3 Multidisciplinary: "Never once do I get a deck that says, 'This is what I would do if I were you.'" This quote from the CMO of a major insurance company captures the dysfunction of many analytics teams. Decision-makers and analysts need to be on the same team working through these challenges together to develop an appreciation for each other's vantage points. More often than not, the analyst perceives their role as problem-solving as opposed to helping others make decisions. Teams can account for these differing points of view by adopting the following guidelines:

- **Build teams of experts and generalists:** People tend to stick close to their natural center of gravity. To compensate for this, develop teams with complementary skill sets. An ideal mix would include the following professionals: businessperson (MBA), technologist (DBA), statistician (B.A., math) and storyteller (marketer). This may feel a little inefficient but will be highly effective.
- **Train in the business:** Newly recruited data scientists will likely not have had business, marketing, psychology and communication courses in their curriculum. Supplement this by developing programs that allow them to gain valuable exposure to the nuances of your business. Welcome them into sales calls or to observe how staffing plans are generated. Understanding your business is key, and there's no better way than to immerse them early on.
- **Know your audience:** What speaks volumes to one person can frequently say nothing to someone else. Have clear and direct dialogues about the optimal ways to communicate findings for comprehension. Explore different representations of data with a diversified team to see what resonates.

Overall, these guidelines can mitigate contradictions that compromise institutional intuition. As a result, executives and analysts will begin to develop mutual appreciation for learning, making choices and driving confident decisions in our complex world. Just as we evolved from green screens to empowerment, the next generation of decision-making promises alignment between the numbers and the stories they tell. ■■

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