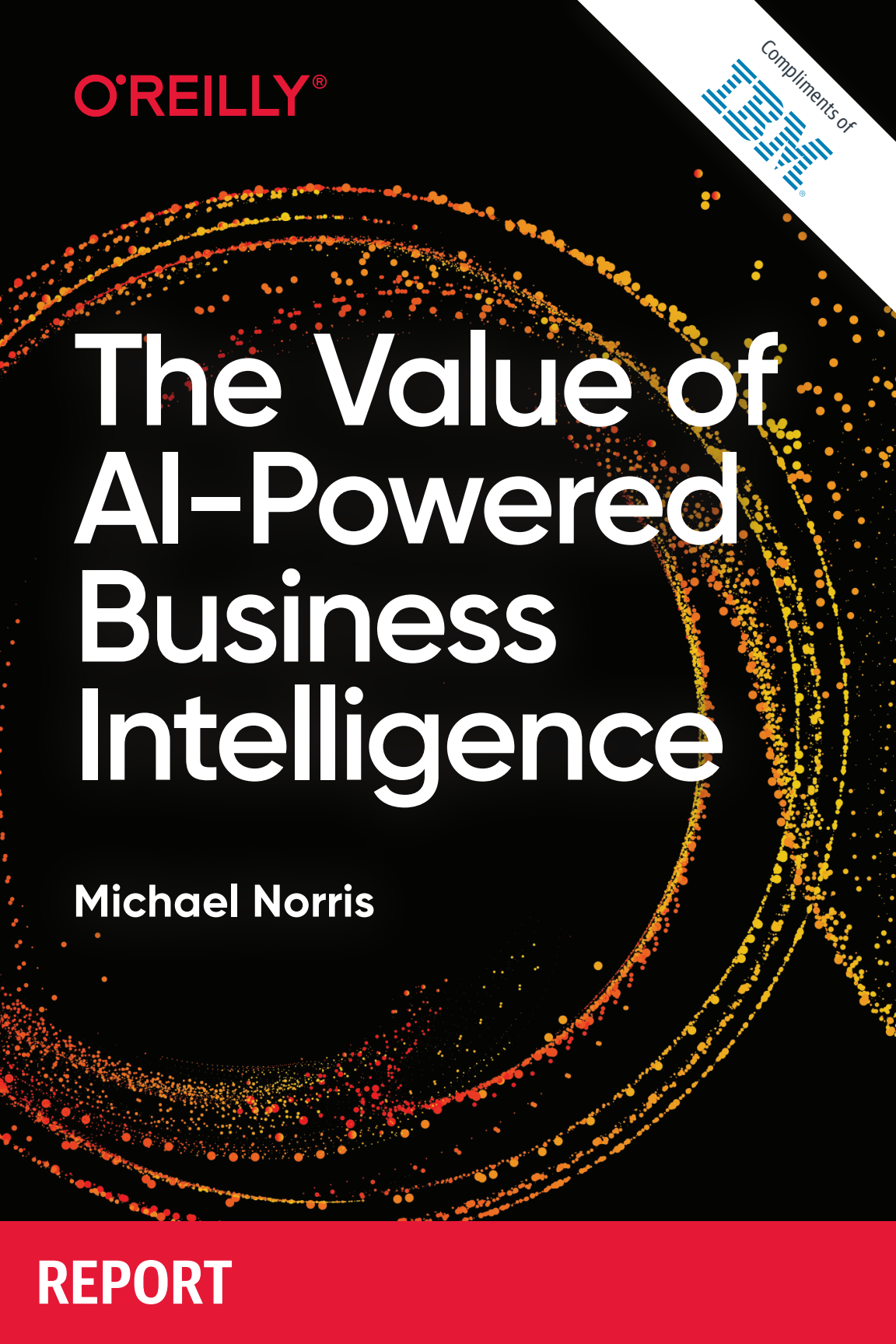
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The Value of AI-Powered Business Intelligence
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REPORT

The Value of AI-Powered Business Intelligence

Michael Norris

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by Michael Norris

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The Value of AI-Powered Business Intelligence

What does it mean to infuse artificial intelligence (AI) into business intelligence (BI)? What are the benefits of AI in BI? Let's begin by defining our terms:

Artificial intelligence
: Refers to simulating human intelligence within computer systems. Some call it *augmented intelligence* because the underlying technology is augmenting, rather than replacing, human intelligence. AI is currently capable of performing tasks such as visual perception, speech recognition, decision making, and translation between languages.

Business intelligence
: Refers to a range of technology solutions that help businesses analyze, visualize, communicate, and share their information.

AI is fast becoming a critical component of BI. Here are three key points worth highlighting:

- AI in BI is a game changer because it allows line-of-business (LOB) users to easily discover data-driven insights in their domain without requiring specialized, data science expertise. Working independently of IT, while remaining within an organization's secure and governed IT architecture, AI in BI empowers all users—not just IT specialists—to discover actionable, easy-to-understand insights.
- AI in BI takes advantage of the power of natural language and learns from users' interactions to customize and personalize

insights into their data. A *natural language interface* (NLI)—which consists of natural language processing (NLP) and natural language generation (NLG)—makes it possible for users to ask questions in plain language and get answers back in plain language. This allows them to gain deeper insight into their data, using intuitive exploration tools. Guided by user questions, the system then provides recommended visualizations, dashboards (more on this later), and other easy-to-comprehend metrics to present compelling, concise, and explainable data.

- AI in BI allows for automated data cleansing and preparation. The system does the tedious work of preparing data for analysis, freeing up IT analysts and LOB users to engage in more productive work.

This report expands on these three points and answers the following questions about AI in BI:

- Why is AI everywhere?
- How does AI improve BI?
- How do you drive AI adoption in your business?
- What is the future of AI in BI?

Let's dive in and discover how AI in BI is permanently affecting your way of doing business.

Why Is AI Everywhere?

AI represents a step in the evolution of technology that has been actively pursued since British mathematician and codebreaker Alan Turing envisioned a clear way forward in his groundbreaking 1950 paper, "Computing Machinery and Intelligence." At the time, computer technology couldn't keep up with Turing's ideas. But as computing has advanced, so has AI.

Most AI we see today is really artificial *narrow* intelligence (ANI), meaning that it can perform a narrowly defined task. Consider home-based NLIs like Apple's Siri and Amazon's Alexa. These systems can process basic human commands and questions using NLP and then use NLG to provide straightforward answers or execute commands, such as turning the lights on and off. But they can't think or reason for themselves, nor can they hold an intelligent

conversation with a human counterpart. A quick search on YouTube garners thousands of examples of users testing these limits by attempting to ask Siri and Alexa deep existential or philosophical questions to no avail.

Strong AI, though not yet a reality, is where many experts believe AI is heading in the near future. Strong AI is AI that can perform thoughtful, intelligent (read: human) tasks and improve itself. These tasks will range from learning, planning, and communicating well in natural language, to making jokes and even reprogramming itself.

A 2018 report by the Future of Humanity Institute out of Oxford University surveyed a panel of AI researchers on timelines for Strong AI. It found "a 50% chance of AI outperforming humans in all tasks in 45 years and of automating all human jobs in 120 years." However, AI will bring with it many opportunities for new job creation, as well. As many experts have pointed out, one of the great values of AI is its potential to remove the need to do tedious, repetitive tasks. Instead, users can focus on their core values and skills.

The application of technology in many industries has predominantly been aimed at reducing human error, shrinking labor costs, and subsequently increasing profit. This was true for the advances made during the Industrial Revolution on through to the birth of the computer, and it remains true for the rise of AI.

AI is a key driver—along with the internet of things (IoT), advanced robotics, blockchain, quantum computing, migration to cloud computing, and other emerging technologies—in a new digital era of human advancement. We are now experiencing this revolution in real time. The McKinsey Global Institute estimates that in just the manufacturing sector, emerging technologies that use AI will by 2025 add as much as $3.7 trillion in value. PwC calculates "that AI could contribute up to $15.7 trillion to the global economy in 2030, more than the current output of China and India combined. Of this," PwC estimates that "$6.6 trillion is likely to come from increased productivity, and $9.1 trillion is likely to come from consumption-side effects."

AI has advanced significantly in the past few years due to a number of factors, starting with an exponential increase in available computing power. An AI model that once took weeks to train now takes days, or even hours, using *machine learning* (more on this shortly).

Another factor is more widespread access to data. You might have heard that data is "the new oil," or something similar. But data must be processed with advanced tools such as analytics and machine learning algorithms to reveal meaningful information. This processing is where AI in BI becomes an invaluable tool.

Machine learning is the driver of AI systems. It strengthens AI models by analyzing complex datasets. The difference between machine learning and typical software development is that in typical programming, we receive an input and we write code that represents all the rules for producing the correct output.

Although this sounds straightforward, for many tasks it is difficult and time consuming to come up with all the rules required to produce the right output. For example, consider the task of writing a program to determine whether a picture shows a dog or a cat.

Think about the rules needed to perform this task. Coding the rules aside, simply imagining all of the required rules is mentally taxing. On the other hand, in machine learning, you begin with some input data and the correct output data, and the machine learning algorithm comes up with the rules for you.

If you think about it, it is much easier to build models this way (given you have adequate amounts of data), as the system is coming up with rules for you. Furthermore, it's possible that the algorithm will come up with rules you didn't know existed. These rules are captured in what we call the *machine learning model*.

In other words, machine learning strengthens models by analyzing complex datasets through a set of self-defined, learned rules, as shown in Figure 1. A machine learning model learns from big data and from repetitive human interactions until it can provide information and answers that are relevant to the user's interests or goals. *Big data* refers to extremely large datasets that can be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions.

In the AI space, *deep learning* represents the next great leap forward in technology. As we've just touched upon, programmers write code that instructs the machine how to interpret a series of words, images, or commands to reach a decision and execute a command. The end user then provides input (data), while in-house engineers might define more specific rules to interpret and analyze that data.

Finally, the system provides output (analysis) based on the input and defined rules.

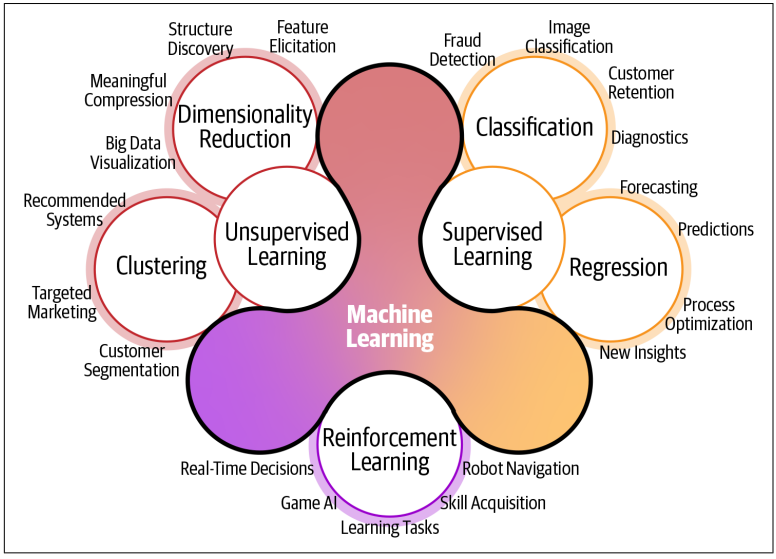

Figure 1. The machine learning model

In deep learning, however, a model can learn to identify something *on its own*. Deep learning systems don't need to be spoon-fed rules, as Figure 2 shows. Rather, the user provides structured or unstructured data, and the machine learning does the rest by running those datasets through increasingly complex models, building on its existing bank of learned behaviors, developed in part by interactions over time with the end user.

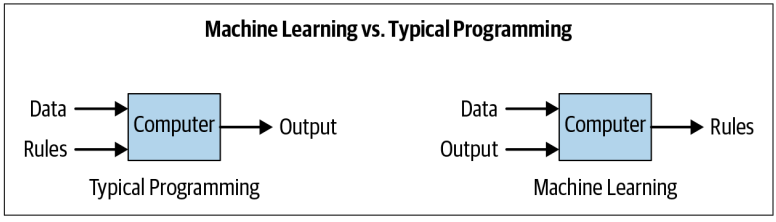

Figure 2. The machine learning programming model

But let's bring things back down to earth for a moment. The scenarios that AI can best solve today remain narrow by formal definition, but they are nonetheless truly powerful when applied to BI. These

scenarios include recognizing patterns in words, numbers, and images, as well as optimizing processes and expediting outcomes.

How Does AI Improve BI?

In this section, we begin to explore how AI in BI elevates and enhances the way an organization analyzes and interprets the lifeblood of its business: data.

Turning Business Users into Data Experts

Customarily, business analysts and IT administrators controlled access to and interpretation of data. Although those professions are still critical, they no longer exclusively hold the keys to the kingdom. With today's AI in BI tools, including NLIs, LOB users no longer need to rely on data science experts to analyze their data.

AI helps "democratize" data by allowing users to easily and directly obtain actionable answers. Put another way, it enables users to have a two-way conversation with their data and feel empowered to take action with reliable answers.

Here's an example of how AI in BI works in practice: an enterprise deploys a BI solution that uses an advanced NLI. Instead of waiting for system administrators or data scientists to analyze the data, a business unit manager accesses the BI solution directly. The manager makes data available via connection or upload and asks questions in plain language. The user then receives insightful answers to those questions along with a presentation-ready dashboard and visualizations to help communicate these answers.[1] The pretrained AI model can even target specific BI tasks like visualization recommendations, "what if" scenarios, and forecasting to help managers make important decisions for their business. Executives are amazed at the level of detail and insight in their presentation.

Helping You Explore Your Data

There is something inherently satisfying about exploring your data with the right AI-enabled BI tool. In minutes, you can go from

1 A BI *dashboard* is an information management tool used to track key performance indicators (KPIs), metrics, and other crucial data points relevant to a business, department, or specific process.

uploading datasets to uncovering hidden truths in your data and presenting those findings in compelling, beautiful visualizations.

From the moment you make data available, the AI in BI system does the heavy lifting by automatically classifying columns, tagging them, and joining matching data across sets. The first step in data exploration for the user involves accessing the NLI. As Figure 3 shows, you don't even need to have a question in mind. The AI in BI tool will actually suggest questions that might be helpful if you're stuck.

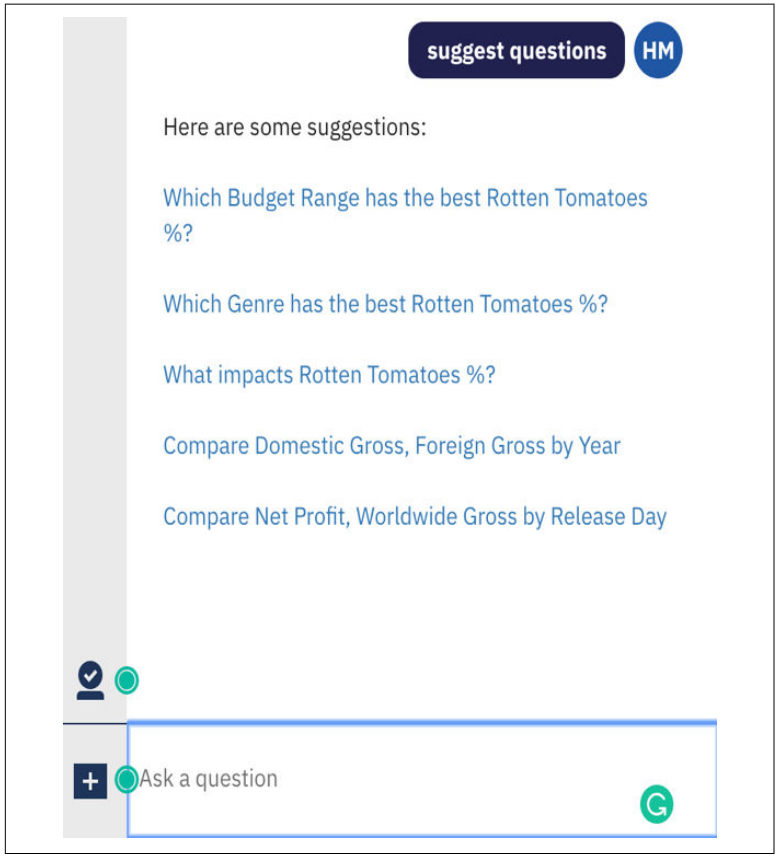

Figure 3. An NLI can assist in discovering data insights by providing the user with suggested questions

You can also start with the basics, such as "What is the performance of the retail store division over the X period?" The AI system will provide answers and also suggest ways to explore data for additional insights related to performance.

Exploration is exciting because you can continue to delve ever deeper into insights that only AI can make possible. What really captures users' imaginations is visualization. Visualizations are a key feature of all modern BI solutions, but with AI-enabled BI solutions, users receive suggested and automated visualizations that best fit the answers to their questions. Figure 4 shows an example visualization.

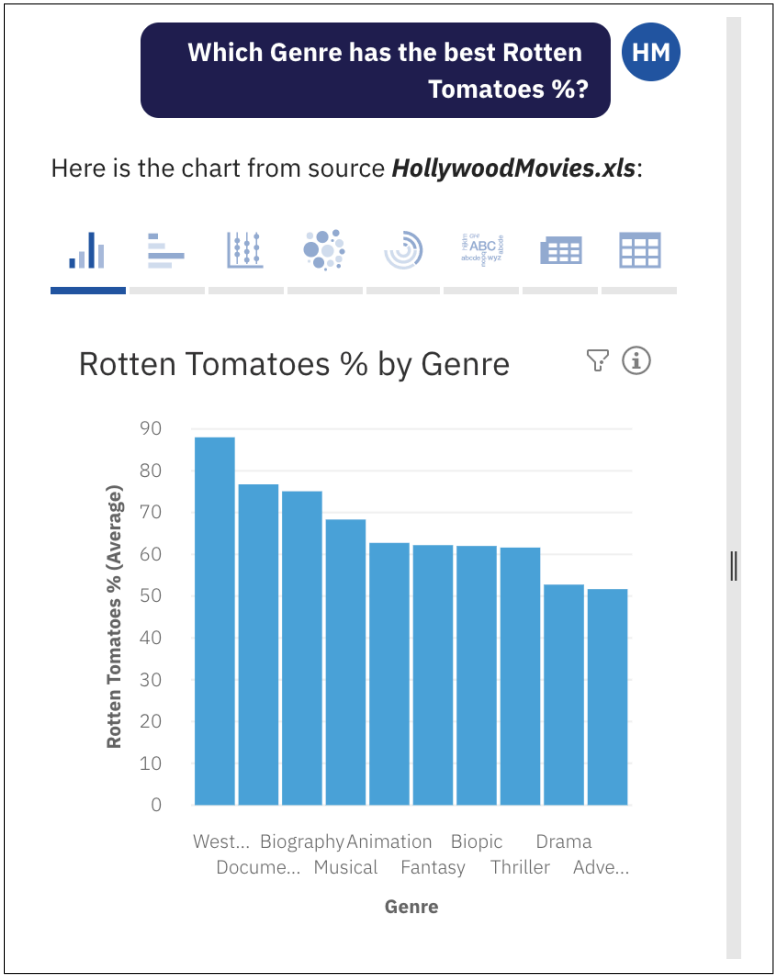

Figure 4. A visualization based on a user's query regarding the best Rottentomatoes.com score based on genre

Learning from the End User

Leading AI in BI systems customize and improve over time through machine learning, which catalogs and learns from the user's typical behaviors and questions. The more a user interacts with a BI tool, the better the AI becomes at knowing what that user wants in their analysis and presentation.

If a user typically uses data for forecasting, as depicted in Figure 5, the system will begin to prepare and present the data in a forecasting model via dashboards.

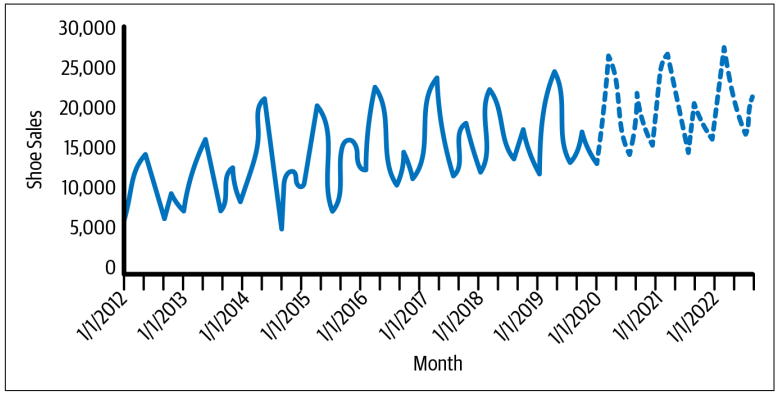

Figure 5. Forecasting monthly sales using an AI in BI tool

Figure 5 uses the example of shoe sales to show the power of forecasting. With historic data for monthly shoe sales, machine learning provides powerful forecasting data—differentiated using a dotted line, shown on the righthand side of the figure. The insights are immediately apparent to the user, who avoids having to burrow down into the data using NLP questions; instead, they are presented with presentation-ready material with minimal effort. If the user decides to delve deeper into forecasting, they can simply use the NLP interface to ask questions, examine the data, and even introduce new datasets to discover alternative forecasting scenarios.

Automatically Cleansing and Prepping Data

For you to successfully interpret it, your data needs to be structured in a way that is standardized and searchable. As any business knows all too well, multiple datasets bring multiple headaches. What if names are formatted as first name/last name in one spreadsheet, and

last name/first name in another? What if there are duplicate records? What if there are records in one dataset and not the other? What if the data in one set is daily, and the other is monthly?

AI in BI makes the process of data cleansing and preparation seamless and delivers a giant-sized aspirin for those headaches. With automated data preparation (one of AI in BI's biggest time-savers), you can go from making data available to working with it in minutes, rather than hours or days. Future AI in BI functionality will allow users to input both structured and unstructured data without skipping a beat; a significant change given that the majority of data generated today—such as photos, video, and audio—is unstructured. Removing barriers to effective analysis is just one way that an advanced AI in BI tool helps users who are not data scientists access and interpret their data.

Gaining Competitive Advantage

AI is now a critical differentiator between businesses that are positioned to succeed and those that will soon be left behind. Gartner "predicts that by 2021, 75% of prebuilt reports"—such as those used for data extraction—"will be replaced or augmented with automated insights." Powerful AI in BI tools also offer improved accuracy for critical operational usage reporting. If they're not already doing so, data and analytics leaders should plan to immediately adopt augmented (AI) analytics in their businesses as platform capabilities mature.

At a recent conference Gartner Research Vice President Rita Sallam cautioned "that data and analytics leaders must examine the potential business impact of" an increased dependence on forecasting using augmented and automated insights "and adjust business models and operations accordingly, or risk losing competitive advantage to those who do."

AI in BI solutions are already delivering today, and those companies that embrace the technology are positioned for success far more securely than those that don't. By detecting trends and correlations in data, and suggesting ways to interpret results in natural language along with providing the best format to display those results, AI in BI saves time and provides actionable insights to increase profitability and head off potential issues before they arise.

How Do You Drive AI Adoption in Your Business?

AI adopters at the enterprise level need one thing above all others: C-suite buy-in. Having support from the top down to fuel the adoption of AI technologies is crucial. Turning leaders into AI enthusiasts means that more departments will get the funding and personnel needed to purchase AI in BI solutions and deploy them. The same principle applies to small businesses, as well. Gartner predicts that beginning in 2020, "augmented analytics will be a dominant driver of new purchases of analytics and BI as well as data science and machine learning platforms."

AI's growing influence on enterprises was foreshadowed in a 2017 McKinsey paper in which a fifth of C-suite executives in 10 countries and a variety of industries described AI as "a core part of their businesses." They acknowledged that AI would continue to create an ever-larger footprint in their organizations—and this has indeed been how BI tools have evolved.

At the operational level, AI in BI has practical efficiencies, as well. In marketing alone, it turns out that 12.5% of a person's work week (roughly 11 days per year) is sucked into data collection. Imagine the benefit to a business if those 11 days were spent actually using data to create actionable insights that improve performance?

AI in BI augments manual tasks to decrease labor hours otherwise devoted to data collection, preparation, and analysis. AI in BI makes that possible by automating, analyzing, and highlighting explainable data insights to better equip leaders to take immediate action with confidence. The insights gained allow cross-functional teams to diagnose systemic issues and deliver a reliable experience across channels—because new or potential problems can be identified at lightning speed before they negatively affect business outcomes.

Example: Using Sales and Weather Data

Imagine you are responsible for business analytics for a mid-size retail clothing chain. You manage thousands of SKUs—inventory, seasonality, sales, and so on—across 100 stores in the US. You launch your NLP-equipped BI solution and ask, "What is the best-selling item in the Pacific Northwest this quarter?"

In a moment, it answers, "SKU 584697—Women's Rain Boots." AI has deciphered several gray areas in your question. For instance, it has determined that by "Pacific Northwest" you mean a region of the US. The system has also accurately pinpointed the current quarter and identified the SKU that has sold more than any other product. You're off to a good start.

Selling a lot of rain boots in the Pacific Northwest makes sense—it's a rainy region. But it's not the only rainy place in the US. You then ask, "What are sales of that SKU in New Orleans, Houston, and San Francisco in the same quarter?" You are surprised to discover that the SKU is not performing nearly as well in those notoriously soggy cities.

At this point, you have fed the BI system questions via the NLP interface. In a fully AI-integrated BI solution, the AI should be starting to figure out the answers you are seeking and then discover new relationships between data joins. The system pulls in weather data and suddenly gives you your "aha!" moment: people tend to buy boots most frequently on the day a storm *is predicted* in the weather forecast. Your AI in BI tool discovered this insight by pulling in weather data by location, made the connection between datasets, and showed you this correlation using a full-color graph visualization in dashboards. The system described what it discovered using NLG: "There is a correlation between sales of this SKU on days when the weather report predicts a storm in New Orleans and Houston."

There have not been any recent storms in those cities. Hence, sales are low. You present this data-driven insight to your team. Marketing then initiates a digital campaign to target customers in these select regions ahead of likely storm activity. AI in BI discovered a hidden connection across datasets, enabling you to identify a business opportunity.

AI then goes a step farther, actively comparing changes in weather in each of your business regions to see whether it correlates to increases or decreases in all SKUs across the business. These new insights generate a flurry of new ideas for marketing and sales.

You have just had a meet-and-greet with your data. Your AI-infused BI system was able to seamlessly analyze a combination of confidential enterprise (sales) and open source (weather) data and work with it to show you previously hidden connections. Beyond just answer-

ing questions, then, AI in BI also builds a repository of learned knowledge about your data and how it drives your business.

Securing Your Data and Your Company

Most enterprises and small businesses now operate in cloud computing environments. *Cloud computing* is defined as a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources. These resources, such as networks, servers, storage, applications, and services, can be rapidly provisioned and released with minimal management effort or service provider interaction.

Most companies have adopted a hybrid approach to a *multicloud environment*: a mix of *public* clouds to quickly develop and deploy applications, *private* clouds to maintain the highest levels of security and availability for business-critical data and processes, and, in some cases, traditional on-premises servers for the most secure data. According to market intelligence firm IDC, by 2024 90% of enterprises will embrace integrated hybrid cloud tools and strategies to support different applications and use cases.

Most analysts expect that this hybrid approach—and the flexibility in running multiple clouds—will accelerate within major companies over the next decade. Although most companies have moved only about 20% of their data to the cloud today, this shift is now rapidly accelerating.

How does all this connect to AI in BI? The critical shift to multicloud environments requires companies to adopt strong data governance policies, a critical concern for BI and analysis. Businesses are often either required to or prefer to keep regulated or highly proprietary data inside their own firewall. Security is paramount.

The appropriate AI in BI tool offers secure gateways to access data across clouds—whether private, hybrid, or public—as well as strong governance tools. This allows users to confidently explore and interact with these datasets, regardless of the security frameworks in place.

Security goes beyond protecting data from hackers. It extends to the surrounding environment that builds and sustains the AI environment and its point of connection to your data. With BI and analysis,

it is historically human error, not cybercrime, that represents the biggest threat to data integrity.

AI in BI helps employees avoid making unsafe choices that can jeopardize the integrity of the data they are exploring, while strong data governance means LOB users cannot corrupt datasets. Today's modern AI in BI tools deploy within a company's governed IT architecture to allow for role-based access, which prevents many human errors that would otherwise have been cause for concern.

Essentially, data governance is centered around the different facets involved in ensuring that data is intact, protected, and secure.

Practicing Data Governance

Data governance is the practice of ensuring the availability, usability, integrity, and security of your data. Good data governance can drive better business results as you explore your data in BI with the assistance of AI. Data governance has a few different components:

Data security
: Includes data loss prevention. Although you might normally associate data loss with large enterprises, it can have a devastating effect on smaller businesses, as well.

Data integrity
: Ensures that you are working with only the most accurate data that is consistent across the business.

Data integration
: This is the bread and butter of BI because it deals with the way data moves across your business and changes shape. That is exactly what you want to happen in BI, and AI can pull from any data source made available to it. It's vital to ensure that moving and using data doesn't change its underlying structure and content. You want repeatable, objective results in BI, so you must carefully maintain that data.

Data lineage
: Refers to leaving a quantifiable "paper trail" that can be followed backward and that explicitly details any changes in your data.

Data completeness
: Means having complete and up-to-date data to feed into your AI. Data completeness is of utmost importance in getting insights you can trust.

Essentially, data governance ensures that your data is intact, protected, and on point. One of the best ways to ensure governance is by employing role-based access to various features in your BI tool of choice. As part of data security, you should also consider employing single sign-on (SSO) to create a secure environment in which good governance can take place. Governance is an enabler for alignment and business agility.

Using AI in BI for Businesses of All Sizes

The infusion of AI into BI tools allows not only large enterprise employees to analyze data. AI in BI can also help small businesses get a leg up on their competition.

In fact, small businesses are particularly vulnerable to the vicissitudes of the hyperlocal market. Before the digital age, the general consensus was that a successful small business owner just had a "good head for business." What that really meant was that they could spot which way the business wind was blowing and get ahead of it in time.

Twenty percent of small businesses fail within the first year, and fifty percent fail within the first five years. How can AI in BI help more small businesses succeed? It can start by giving a small business access to the one thing it has historically lacked: data.

Small business owners might update their spreadsheets regularly, but spreadsheets alone are subject to several limitations:

- Finding the time required to review them
- Bias in looking at the data objectively
- Misunderstanding what the data means
- Not knowing what to do about the data

For example, coffee shop owners know coffee, pastries, and ambiance—but likely not advanced data analysis. Yet the right AI-infused BI solution can turn a coffee shop owner into a data guru. Suddenly, they have the power to upload datasets into their BI tool,

ask important questions, and get the answers they need delivered to them in visualizations they can easily understand.

What's more annoying than visiting a coffee shop and waiting forever for service when all you want is a latte to go? A forgiving customer might go back to such a place a couple of times if the coffee is great, but most won't give it a second chance. Using AI and NLG tools, the owners can query the data and correlate staffing schedules to handle the busiest hours, when most transactions occur. From there, it's relatively simple to staff according to demand and thereby increase customer satisfaction. The same holds true for ensuring that coffee and pastries are always appropriately stocked at different locations, thus avoiding spoilage. Another way to avoid spoilage is to pair near-expired food items with popular drinks in combo deals at optimal times—something for which an AI in BI tool is well-equipped to lend assistance.

Using AI in BI in the Cloud

As more AI in BI products introduce and improve their cloud Software as a Service (SaaS) offerings, anyone can access the power of AI in BI. You do not need to be the biggest business on the block nor the most digitally advanced to take advantage of the benefits. In fact, thanks to the heavy lifting of early AI adopters, AI in BI is now accessible and relevant to countless industries.

Even without access to big sets of proprietary data—customer and other domain-specific data that enterprises protect with the most secure safeguards—huge swathes of open source datasets are publicly available that can be helpful to industry, small businesses, and citizen users.

A novice can begin learning how to use BI products in seconds. Think of weather data, or historical stock market numbers. When a user sets the output parameters for an AI model, machine learning can ingest these datasets to become smarter, more integrated, and more reliable in reaching an informed outcome. This reliability becomes critical as AI models are increasingly used for forecasting.

Combating Misperceptions

Widespread adoption of AI is still fraught with misperception and suspicion. In a Pegasystems Inc. study, more than 70% of respondents said that they understand AI. However, the study also revealed

that nearly half of respondents did not understand that AI solutions enable machines to learn new things, and even fewer understood AI can solve problems or understand speech.

Another challenge of AI adoption is the need for *explainability* within many industries. In other words, decision makers need to know not just what hidden insights are being discovered through data analysis and exploration, but how to unpack the AI "black box" of algorithms and outcomes. This challenge is particularly true for areas that require high explainability such as medicine and law. Overcoming such a challenge requires that businesses adopt an "all-in" approach to AI, which includes investing in in-house data scientists and AI-competency training throughout an organization.

Regardless, businesses that want to succeed in the twenty-first century should adopt new technologies like AI in BI, which puts an entire user experience into a collaborative team environment. NLP allows users to request additional information on areas of interest and gain deeper, immediate insights to make confident business decisions.

Consider these things when evaluating BI tools, and choose a solution with a strong track record, enterprise-level buy-in, and end-to-end IT governance integration. This way, you can better ensure that you protect your data while accurately discovering the story your data is telling you about your business or field of interest.

What Is the Future of AI in BI?

Right now, leading AI in BI solutions are working to deliver *domain-specific models* as part of the product in the near term. What does that mean? Take medical services as an example. Right now, an AI in BI natural language interface would have a difficult time deciphering many medical terms without significant time and resources dedicated to training the machine learning model. This would be deeply time consuming and frustrating for new users of the product.

However, in the near future, leading BI solutions will begin delivering strategic BI knowledge that is domain specific. For example, one large enterprise is now integrating its health care–focused NLI tools to its AI in BI product, so that the interface will be able to understand and interact using complex medical terms. These integrated domains will become the norm in the near future of AI in BI.

Another cutting-edge integration of AI in BI will be *social analytics*, commonly used by companies to track online conversations and sentiment about their products and reputation. Look for BI solutions that offer these features in future updates to their products.

Retention of institutional knowledge is another long-term benefit of AI in BI. Managers know the difficulties of losing an employee with years of working experience. That person has organizational or institutional knowledge that might seem irreplaceable, and passing on such knowledge in an efficient way is difficult.

But an AI system remembers, through machine learning, all of the departing employee's previous queries, searches, visualizations, and reports. Essentially, AI in BI allows the system to act as a repository of institutional knowledge in an organization. This repository will serve two major benefits in the future:

It becomes a historical archive for data
: Thanks to the NLI and machine learning, key data can be discovered with minimal querying.

It makes onboarding more efficient
: New hires will be able to familiarize themselves with previous reports and trends and dive into forecasting as it relates to their business unit's data, all through the NLI of the AI in BI system. Everyone approaches questioning their data in a different way, but an AI-infused BI tool will be able to learn from new users and quickly provide meaningful answers, while the user benefits from a minimal learning curve.

Of course, all the data in the world is useless unless its value can be demonstrated. Future capabilities of AI in BI include cleansing and preparation of not just structured data, but unstructured data from multiple sources. This incredible time-saving tool has the power to democratize data analysis across business sectors.

Augmented and automated analytics—such as visualizations, storytelling, and reporting—will also play an increasingly important role in business operations. Insight-rich reports guided by user query and AI assistance will also become the norm.

As more businesses embrace the power of AI in BI, the system will be better able to answer the "why" in your data and explain "how" it came to a recommendation. These are the key questions that will be

front of mind for decision makers, and leading BI tools must meet these expectations in an increasingly AI-driven environment.

The future in software engineering is deep learning, which includes the incredible power of AI in BI. It will be everywhere in everything we use in the next decade. In some ways, that future is already here. The only question is: Are you embracing it, or are you being left behind?

About the Author

Michael Norris is the Director of Offering Management for Business Analytics within IBM's Data and AI organization. Mike helps clients grow their business analytics acumen with 20 years of expertise focusing on user experience, needs, and adoption while maintaining the ability to scale and provide governance in balance. He has helped transform offerings like IBM Cognos BI and IBM Watson Analytics into a future-proofed modern BI platform to meet the needs of the most demanding clients. When not engaged with clients and the Data and AI team, Mike spends time with his four kids, who all participate in team sports, and takes in the occasional NBA game from his couch when time allows.