

A woman's profile is shown in silhouette, looking upwards. Inside her head, a glowing blue cityscape is visible, with several bright blue circular nodes connected by white curved lines, representing a network or data flow. The background is a gradient of white and black, with a red horizontal line.

FROM AI TO BI:

Misunderstood Applications of
Business Intelligence

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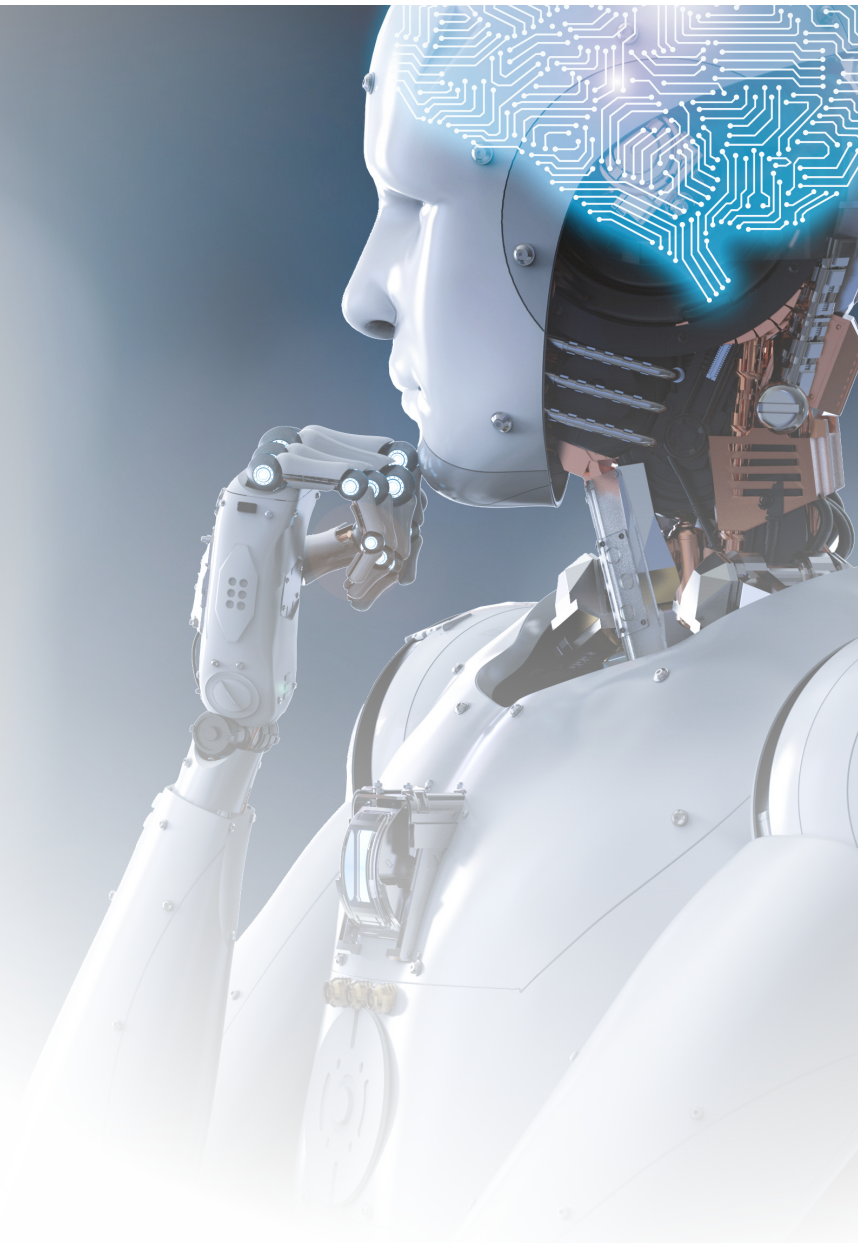
Misunderstood Applications of Business Intelligence

When you think of Artificial Intelligence (AI), what comes to mind? The dystopian nightmare of The Matrix? The Skynet singularity of The Terminator? While the recent rise of AI is far less terrifying, it stands to be as revolutionary a force in the world as computing grows more powerful and increasing amounts of data are collected for AI to analyze and learn from.

But for all the opportunity, AI is still widely misunderstood in the business world—and when it comes to the applications business leaders are looking for from AI such as advanced analytics, reporting, and data visualization, there's actually a different letter of the alphabet to focus on. That's not to say that AI doesn't have a place in business—certainly, as the technology develops, there will be increasing opportunity to apply machine learning in enterprise environments.



Without understanding exactly what AI is and the limited use cases in business, enterprises are resigned to failing to reap the benefits of solutions that exist in the market and can be applied today.





A Brief History of Artificial Intelligence

Since the computer was invented, humans have been trying to get them to mimic the behavior of the human brain. The 1956 Dartmouth Conference was where the vision for Artificial Intelligence first crystallized, asserting that “every aspect of learning or any other feature of intelligence can be so precisely described that a machine can be made to simulate it.” This would be achieved through the development of applications that could reason, process language, learn, and move and manipulate objects.

The era between 1956 and 1974 is widely regarded as the golden age for artificial intelligence. During this time, machines were taught to speak English, solve algebra problems, and prove theorems in geometry; these applications would lay the foundation for future AI applications. AI researchers during this era were buoyed by the rate of advancement and made bold predictions about the opportunity for AI applications, including the famous prediction that within ten years, a digital computer would be the world’s chess champion.

This optimism ultimately led to a cooling down in AI development, a period referred to as the first AI winter, lasting from 1974 to the early 1980s. This cooling down occurred because AI development could not keep pace with expectations and the limited power of computers of the era hampered abilities to develop further. Important applications

of AI also required significant amounts of data about the world—at the time, there was no database large enough to contain the vast amount of information a machine would require to start with the base level of ‘knowledge’ necessary to reason (how far we’ve come!)

The 1980s saw the first true commercial application of AI with the proliferation of expert systems. Expert systems were programs designed to solve complex problems (such as budget analysis or computer component allotment) by applying logical rules to a broad, preconfigured base of knowledge. This, however, wasn’t necessarily ‘true’ AI—expert systems lacked the ability to learn autonomously and incorporate external data. The 1980s also saw the development of the famed *Deep Thought* (later *Deep Blue*) chess computer—though the computer failed to defeat chess master Garry Kasparov in their initial 1989 match, and wouldn’t find success until nearly a decade later in 1997—39 years after the initial decade prediction.

1974-1980

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From 1993-2011, as the computing power necessary to drive significant advancements in AI became available for the first time, AI adoption throughout the technology industry became more widespread. Over this period, the AI industry also benefited from increased fragmentation, as different disciplines focused on overcoming roadblocks specific to them. However, despite these advancements, AI was still regarded with healthy skepticism, particularly within the business world.

From 2011 to today, AI has boomed—largely due to the unprecedented amount of data being generated and stored. There are 2.5 quintillion bytes of data produced every day currently—it's estimated that by 2020, there will be 1.7 megabytes of data produced **every second for every person on earth¹**. Consider that in the 1950s, when AI was first conceived, magnetic drum storage, the main unit of data storage at the time, had a maximum capacity of 10b kilobytes. Rapidly dwindling data storage costs and the always-on accessibility offered by cloud computing have also contributed to the AI boom—but in response to the skepticism of previous decades, businesses are now at risk of abandoning their tangible needs in pursuit of incorporating anything deemed 'AI' into business technology and process.

But when dealing with an emerging (and still misunderstood) technology such as Artificial Intelligence, skepticism is necessary. Businesses should be wary of investing in new technology in the absence of understanding exactly what benefits that technology can provide.



For more clarity, let's look at exactly what AI can bring to your business.



¹https://www.domo.com/learn/data-never-sleeps-5?aid=ogsm072517_1&sf100871281=1

What Artificial Intelligence Is

Despite being half a century old, the practical applications for Artificial Intelligence are still a source of confusion for business leaders—but that isn't stopping businesses from boarding the hype train in pursuit of unrealized benefits and profits. Bloomberg economist Michael McDonough has tracked companies mentioning 'Artificial Intelligence' on earnings calls since 2008 and has found that while the number of mentions has ballooned, **the actual applications have not²**.

We're at risk of entering another AI winter because of inflated expectations—so let's explore what AI can do.



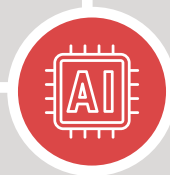
NATURAL LANGUAGE PROCESSING (NLP):

Natural language processing is focused on improving communication between humans and machines, by analyzing human language inputs (either via direct messages, online comments, or searches) and providing outputs (either analysis or generating a response). Think of voice assistants like Microsoft Cortana or Siri, or the voice technology underpinning voice-controlled devices like Amazon Alexa or Google Home—these services use NLP to analyze, parse, and react contextually to voice cues.



MACHINE LEARNING:

Machine learning, at its core, is the process of getting computers to learn and act like humans by responding to variable data inputs. Rather than explicitly programming computers to provide a specific answer, **algorithms** are applied to layers of data that map variable inputs to variable outputs and gives the computer the opportunity to learn progressively each time they execute a task.



VISION SYSTEMS:

Vision systems are capable of analyzing and interpreting visual images, such as aerial photographs, medical imaging, or product labels. Facebook's facial recognition photo tagging is an example of a vision system.



AI PLANNING AND SCHEDULING:

The planning and scheduling branch of artificial intelligence primarily applies to autonomous machines such as industrial machinery, autonomous cars, or robots. To successfully interact with the physical world, these devices must be able to observe the world through different types of sensors and perform actions based on those observations.

In each of these applications, the differentiator is that machines aren't simply reacting to data and providing a prescriptive output. They're continually learning, iterating, and adapting to new data inputs. But before you take on the enormous expense and overhead of AI configuration and deployment, you need to ask yourself—is this really what you're looking for?

²https://twitter.com/M_McDonough/status/836580294484451328

What Artificial Intelligence Isn't

AI frequently gets conflated with other business applications that don't necessarily require the ability for computers to simulate human thought. What are some of the applications that don't require AI to achieve your goals?



AUTOMATION:

Automation is simply the task of removing humans from the equation when it comes to executing repetitive tasks. Automation can be applied to internal processes, workflows, and tools, as well as customer interactions—but don't require the presence of AI to execute. **A Harvard Business Review report found that 46% of businesses were implementing AI for the purpose of process automation³**—but is AI really necessary for the majority of these?



DECISION-MAKING:

For all the advancements in AI, it's still no substitute for good old-fashioned brain power. Artificial intelligence can't automatically pilot your company or determine the viability of a new product offering or keep your employees engaged; with the right parameters, and the right programming, it can provide estimations and insight—but ultimately the decision-making should still reside with people (who are, of course, informed by data).



DATA AND ANALYTICS:

One of the most widely-held beliefs around AI is that it's required to provide insight into and analysis of business data. But as long as you're collecting the data, keeping it clean, warehousing it properly, and you know which insights you're trying to extract from it, you can do so with a simple SQL query (which we'll cover later).

³<https://hbr.org/2018/01/artificial-intelligence-for-the-real-world>

Artificial Intelligence vs. Business Intelligence: It All Starts with Data

With all the talk of emergent Artificial Intelligence, existing business applications are sometimes being overlooked in favor of shinier, AI-powered solutions. But sometimes the best solution is also the simplest. And with the uncertainty around the practical application of AI, as well as the additional cost and manpower required to execute, the question all businesses should be asking themselves before investing is: 'Is AI the solution to my business problems?' If you're asking, you're not alone—in a recent McKinsey survey of 3,000 business executives, 41% responded that they were uncertain of the benefits of AI⁴.

But if not AI, what scalable solutions exist for the enterprise? And how can today's business leaders determine what's best for them?

Regardless of where you're landing regarding Artificial Intelligence and Business Intelligence, one thing is true: **you'll need to have data to feed both**. Without data to act upon, there's no 'intelligence' in AI or BI. There's nothing to analyze or apply a learning algorithm to—when it comes to any intelligence solution, data is the foundation upon which it must be built.

Thankfully, with the widespread adoption of cloud computing and the Internet of Things, data has never been more readily available in today's business world. But the vast reams of data generated on a daily basis are presenting a new problem for businesses—what data matters? How should data be tagged, sorted, grouped, and analyzed? Which problems do disparate data points speak to? And how can the data collected across multiple touchpoints, from retail locations to the supply chain to the factory be easily integrated?

Enter data warehousing. Data warehouses are a means of taking data points from disparate touchpoints (such as point-of-sale, CRM, inventory, and warehouse management systems), standardizing the data collected, structuring it to extract necessary insights, and running analysis. Enterprise businesses cannot survive without robust data warehousing—data silos can rapidly devour money and resources, and any business still trying to make sense and compile 'business intelligence' from multiple reports and inconsistent data is rapidly going to lose ground to those businesses with integrated data and reporting.

The optimized data warehouse isn't simply a number of relational databases cobbled together, however—it's built on modern data storage structures such as

the Online Analytical Processing (or OLAP) cubes. Cubes are multi-dimensional datasets that are optimized for analytical processing applications such as AI or BI solutions. Cubes are superior to tables in that they can link and sort data by multiple dimensions, allowing for non-technical users to choose from any number of role-specific and highly contextual data points to uncover new insights and adjust tactics and decisions on the fly. Chances are good that your average non-technical sales agent or purchasing representative will have difficulty joining multiple tables together with a standard report, but with Business Intelligence cubes, all that is required drag and drop the metrics and dimensions that matter to them into their own personalized dashboard.

So how is the data extracted? By using Structured Query Language, or SQL, the language used to manipulate and extract data stored in cubes. SQL was developed as a standard language to communicate with databases, regardless of exactly which type of database was being used and is ultimately the means by which data in a table is extracted, retrieved, deleted, updated and managed.

When many of today's business leaders are looking to implement AI, what they really mean is they want more actionable insight into their data. Data warehousing, SQL, and OLAP cubes help address that—but how else can modern Business Intelligence solutions provide the necessary insight into business data, with or without the involvement of AI?

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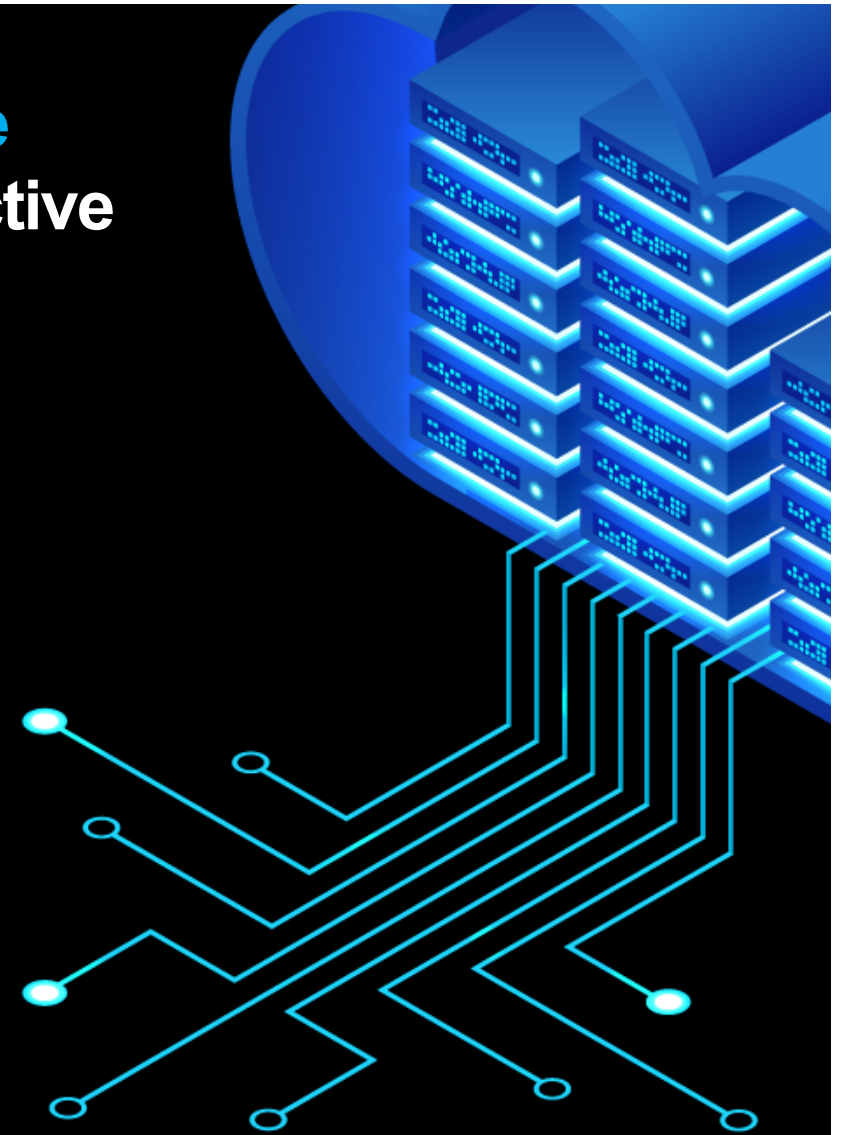


⁴<https://www.mckinsey.com/~media/mckinsey/industries/advanced%20electronics/our%20insights/how%20artificial%20intelligence%20can%20deliver%20real%20value%20to%20companies/mgi-artificial-intelligence-discussion-paper.ashx>

Did you know that **data warehouse automation** is a fast and cost-effective delivery solution to simplify data warehouse design, development, and deployment?

Find out more in this white paper:
Avoid 3 Common Mistakes That Cause Business Intelligence Project Failure

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Core Components of a Modern Business Intelligence Solution

The ultimate objective of Artificial Intelligence is to create computers that can simulate human thought—which is a noble objective, to be sure, but less valuable to an enterprise than a school of technology specifically devoted to helping businesses analyze performance, understand the past, and predict the future. Business Intelligence, by definition, “includes the applications, infrastructure and tools, and best practices that enable access to and analysis of information to improve and optimize decisions and performance” in a business environment.

Beyond data warehousing and OLAP cubes, which provide the technical foundation of BI, there are a number of additional components that can help enterprise businesses address their data requirements:

Data Modelling: Data modeling is a method of mapping out individual data sources across an enterprise and determining how they need to interact with one another to extract the most valuable business insights. Data modeling can be performed at the conceptual (high-level, related to business objectives), logical (mapping to each business function), and physical (how the actual dimensions, measures, and hierarchies are related within a data cube).

Analytics and Reporting: Capturing, structuring, and storing data is good—but being able to analyze and report on it is the ultimate goal. Business intelligence solutions are capable of providing simple, accessible analytics and reporting functions for end users, empowering them to find the actionable insights they need with little technical expertise (or formal data science training.) This also helps business functions avoid unnecessary data logjams and gives instant access to the data businesses so desperately require.

Data Visualization and Dashboards: Analytics and reports are a crucial component of business intelligence, but if you’ve ever spent hours poring over a table of values trying to decipher exactly what the data is saying, you’re not alone. With data visualization tools, critical insights are displayed in rich graphical representations that are vastly easier for the human brain to interpret.

According to a study by Aberdeen Group, organizations using data visualization tools are 28 percent more likely to find timely information than those who rely solely on managed reporting; the same study also found that 48 percent of business intelligence users at companies with visual data discovery can find the information they need without the help of IT staff. Dashboards can easily assemble visualizations and reports into customizable displays by end-user or business unit, giving individuals instant insight into KPIs that help drive better business performance from the bottom up.

Security, simplicity, speed—these are the three major benefits Business Intelligence solutions help to drive, and three critical measures of success in the enterprise business. While Artificial Intelligence remains focused on helping computers glean insight entirely on their own, Business Intelligence is enabling entire organizations to gain access to the data they need to make rapid, informed decisions, and the importance of that in today’s quickly shifting business landscape simply can’t be overstated. **In a survey of 2,600 Business Intelligence end users, 91% responded that BI gave them faster reporting, analysis or planning; 84% said it enabled them to make better business decisions, and 79% said it improved employee satisfaction⁵.**

⁵<https://bi-survey.com/benefits-business-intelligence>

Not sure where to start?

Find out what business intelligence features are important for success and how to evaluate Business Intelligence and reporting solutions for Microsoft Dynamics.

[DOWNLOAD WHITE PAPER](#)

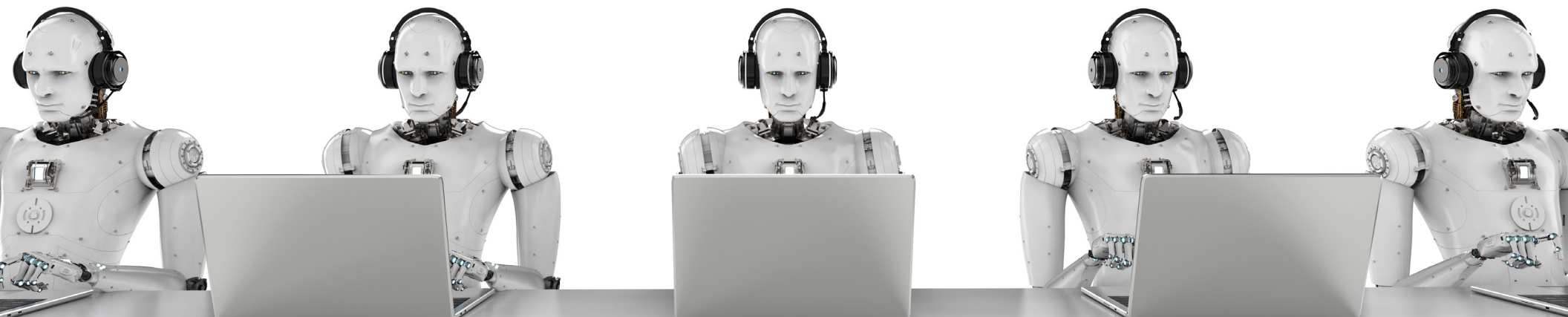


Artificial Intelligence or Business Intelligence: **Which is Right for You?**

While the discipline of AI continues to advance and the staggering amount of data we've already generated continues to increase, the opportunities to find synergy between AI and BI applications will only continue to grow. Imagine a world where AI solutions fulfill the role of data scientist within your organization, generating the necessary data models and building your data cubes with informed precision, or where NLP-powered chatbots will be able to provide responses to BI questions across your organization. Every day, AI is getting incrementally better at analyzing complex data to extract insights and identify trends—and these abilities will continue to improve over time.

In order to leverage this incredible opportunity, your organization will want to have a BI foundation implemented sooner rather than later—or run the risk of losing ground (or market share) to businesses with a strategic view of how these technologies can intersect. AI will always require data to have any kind of meaningful impact—and BI solutions provide the ideal framework to collect the data and prepare it for eventual analysis by our computer overlords.

And if your company chooses to delay? Don't worry—we're only a few years away from Skynet.



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