



TOPIC: SUPPLY CHAIN, ENGINEERING, STRATEGY & FINANCE, MARKETING & SALES, PRODUCT INNOVATION

## BEER IN THE ERA OF BIG DATA AND AI

🕒 10 min read

In all of the US academic research libraries combined, there are 2 petabytes of data; in comparison, the world generates 1,000 petabytes of digital data alone in one day!<sup>[i]</sup> Breweries may consider themselves masters of the same craft that began thousands of years ago. Still, today, a case can be made that the key to winning in the marketplace hinges on their ability to leverage data and information. While data is the foundation in this transformative digital age, no topic warrants as much attention as artificial intelligence or AI. Economists Ian Shepherdson and Oliver Allen at Pantheon Macroeconomics have recently forecasted that US economic growth today and, in the future, will be primarily driven by AI in both software and equipment purchases.<sup>[ii]</sup> Through this digital revolution and technological advancements in computer processing, storage, and algorithms, artificial intelligence has exploded onto the scene in our daily lives, in our smartphone and personal computer use, safety features in our cars, and in customer service and medical diagnostics, to name a few. While Big Data and AI are emerging to form a new definition of markets, supply chains, and consumers, there are risks for workers and companies alike; a recent International Monetary Fund analysis noted that AI would impact 40% of global employment in the near future.<sup>[iii]</sup> Big Data and AI will be much more strategic than creating and using near-unlimited information and replacing jobs and companies. Some beer companies have begun leveraging its benefits through data analytics in the manufacturing and supply chain and in data-driven marketing, but this is just the beginning. This article provides a primer for how brewing companies can avoid being left behind in creating an entirely new market for this product that has been enjoyed for thousands of years.

First, it's essential to understand that every industry, not just the brewing sector, must consider themselves in the business of data and information to win in the 21<sup>st</sup> century. This doesn't mean that Big Data and AI applications will eventually replace brewers and their craft. Instead, the brewing industry, like others, will be augmented and transformed through digital technologies. Given the brewmaster's history and expertise as the sole driver of innovations and new markets worldwide, this may be a difficult paradigm shift. This path using Big Data and AI has been inevitable since the middle of the 20<sup>th</sup> century when scientists thought of how computers could be used to automate, replicate, and supplement human intelligence. Today, there are advanced computer processing and storage capacities and algorithms for first generation AI applications that can perform tasks successfully in managing quality, brewing, packaging and engineering and some leading brewing companies today are already using Big Data and AI to improve their performance and drive innovation. For example, Big Data and AI are used to optimize production processes by identifying bottlenecks, reducing waste, and improving resource allocation leading to increased production efficiency and cost savings at breweries. This includes predictive maintenance for equipment, quality control in the production processes and automation of repetitive tasks. Another example is Big Data and AI being used in product development processes to analyze consumer feedback, market trends, and competitor data which can identify new product opportunities, optimize existing products, and make data-driven decisions throughout the innovation lifecycle. Big Data and AI are already offering favorable returns on investment, lowering operating costs, and increasing revenue and profit in these competitive local, regional, national, and global markets. Yet in the media, too much emphasis has been placed on the use of AI to supplement and replace human tasks, and not enough emphasis has been placed on having sufficient data, analytics and system integration and the right platform, each of which are prerequisites for AI. A software or equipment provider who proposes AI solutions without addressing these foundational needs can mislead a company into capital spending that doesn't achieve results. For breweries to compete in these changing markets through these technologies, a sufficient data and infrastructure platform must be a baseline for success. As a test to determine a brewery's readiness to be a player in this data and AI revolution that will change the industry, they must assess how much data they are creating and using today in their current state of business, and the quality of the data, as opposed to what will be expected to compete in the future. It may not be as sexy as a demo of an AI application, but it is the right place to start.

For those of us old enough to remember, there is a precedent for how companies have leaped toward new technologies before they had a business understanding to succeed in a new era. Twenty-three years ago, my first role at one of the largest breweries in the world was as the newly developed role of Director of e-Business. I believe that I was offered the job because I promised to eliminate this role that I was hired to perform in two years! After all, the goal wasn't to create a separate channel of how to conduct business in the beer industry, but rather how to integrate the Internet, and redefine our operations! When we did so, and we eliminated the department, we created new business strategies rather than creating separate ones, with a specific focus on the business, with the technology as an enabler.

Many forecasters predict that AI will have an even more significant impact on business than the Internet did some twenty years ago. This is likely true since a concept such as *generative artificial intelligence* can redefine this balance between humans and machines in an almost unlimited capacity. However, just as was the case in the early 21<sup>st</sup> century, some companies will choose to place technology at the forefront of the strategy without an appreciation of the role of business strategy, business process, and the foundational data and integration structure necessary in place for innovation. The transformation will not be the technology, but rather a reimagining of the future of malting, brewing, packaging, supply chain, distribution, and marketing means to grow sales and profits with our consumers. Another example of how some leading breweries are using AI today includes through demand forecasting and supply chain optimization. Using AI algorithms to analyze historical sales data, market trends, and even external factors like weather patterns to forecast demand for their products accurately. This helps breweries forecast demand accurately, adjust production levels accordingly, and optimize inventory management. Big Data and AI is also being employed to optimize supply chains by analyzing data on production, distribution, and logistics. This includes route optimization for delivery trucks, inventory management across warehouses, and identifying opportunities for cost savings and efficiency improvements. Those who consider technology as the solution and those who refuse to consider it will both not succeed, as is testament from what happened with the Internet twenty years ago. It is time for breweries to start with the foundational platform required for AI in data, integration, standardization, and infrastructure.

Data is the key to success. Asking yourself, what data does your company currently have? Asking questions to your data to get better answers and enhancing your decision making capabilities. One of the leading indicators for a company's success in the current state market, and especially in the future, will be its data strategy. Artificial intelligence is a data hog because it relies on extensive data sets for a learning process to develop entities, relationships, and clusters within diverse sources, formats, and business processes.[iv] Once a brewery has a successful data platform and infrastructure, it must project forward a data governance approach across the company and with its partners. Like the public Internet, these partnerships will form their own novel and transformative manners to conduct their business from this foundational platform. From this, the brewery can contract consultants as well as data scientists and AI developers to build new company strategies. A team of business subject matter experts (SMEs), data scientists, and AI developers can create a roadmap for the future of a brewery to succeed in the 21<sup>st</sup> century. This can include strategic work, such as new markets, products, beer styles, retail and consumer strategies, individualized marketing, and even concepts AI can develop that one cannot imagine. Some leading breweries are already using Big Data and AI to create personalized marketing campaigns and promotions. By analyzing customer data, preferences, and behavior, they can target specific segments with tailored offers, increasing engagement, loyalty and sales. AI applications can be developed for monitoring and managing quality from ingredients to brewing to consumer, laboratory testing, managing and improving yields, packaging run strategies, production to inventory management effectiveness, supplier management and relationships, and others. Some leading brewing companies are using Big Data and AI to manage inventory levels efficiently by predicting demand, identifying slow-moving products, and optimizing stock replenishment cycles. This ensures that breweries maintain optimal inventory levels while minimizing carrying costs and stockouts. All in all, brewers should not wait until they can conceive the potential of Big Data and AI in the brewing industry because that will be too difficult. Instead, they must build the platform and integrate outward to suppliers, partners and consumers that will enable future strategies.

Artificial intelligence will neither take over the production of beer from humans nor be limited to a minor role in the future of the business. Professionals in the brewing industry do not need to understand how the technology operates, just as they don't understand the technical aspects of the Internet. However, brewing companies need to consider how a data platform, not the AI tool itself, can lead to better decision-making, and offer generative intelligence in even the brewing of beer that one person on their own cannot provide. Beer recipes will change, as will brewing ingredients and packaging materials. production processes and plans, and consumer behavior and retail strategies. It is inevitable that Big Data and AI will change the nature of workers and consumers alike.

Our advice to breweries is neither to *wait and see*, or *rush into AI*, but rather to focus on building a data analytics platform that is the key to success in today's alcohol sector. It's about going down the journey with a team of partners so you can collaborate and try some data uses cases. There is significant evidence that companies who understand the importance of creating and utilizing data are winning market share in comparison to those who do not. There will be a time when AI transforms the beer industry much differently than we can even conceive, but that won't happen today. A brewery can move forward rationally by understanding their company's data strategy, existing infrastructure, and integration with partners/suppliers. Then, exciting opportunities can be created by realizing new business models in what will undoubtedly create a new beer market. We can certainly expect that ten years from now, the beer market will be dramatically different from how it looks today, and yet it is hard to conceive what that means. The future of beer won't be some dystopian model where AI controls a craft that has been perfected by humans for thousands of years, but it will be a partner alongside the industry to make it even more exciting in the years to come!

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[i] Kevin Bartley. (2023). "Big Data Statistics: How Much Data is in the World." *Rivery*. August 27. <https://rivery.io/blog/big-data-statistics-how-much-data-is-there-in-the-world/>

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