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Pharmaceutical Commerce
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Machine Learning Finds Purpose in Commercial Life Sciences

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In 2016, a stunning $8 to $12 billion was invested in artificial intelligence (AI), according to a new report by McKinsey.[1] The report also stated that healthcare is one of three industries seeing the greatest profit margin increases as a result of AI adoption, while Reuters reported that "the world's drug companies are turning to artificial intelligence to improve the hit-and-miss business of finding new medicines."[2]

AI, or machine learning, has arrived in life sciences – and this time, to stay.

Early business uses have proven successful in drug discovery, particularly in predicting molecule-target bonding, identifying new biomarkers, and uncovering new drug indications. Now machine learning is gaining broader traction in commercial operations, too, transforming the way the industry collects, synthesizes, and uses data. Two recent breakthroughs are accelerating adoption. First, new industry standards and development frameworks are making it easier and faster for software developers to build solutions for machine learning. Second, advanced computing hardware such as graphic processing units (GPUs) and chipsets are processing vast amounts of data faster than ever before – so much so that they are being characterized as bionic.[3]

These technological advancements will make smart devices immensely powerful computers right in the palm of your hand by processing many diverse sets of structured and unstructured data in real time, and then applying sophisticated learning algorithms to mine real-word insights. Actionable insights help brand managers, field reps, and medical science liaisons improve decision-making and take smarter actions to personalize their engagement with healthcare professionals and, ultimately, achieve greater commercial success.

As the industry progresses, life sciences organizations will find new and compelling ways to use machine learning across a broad range of commercial use cases. Here are five areas where machine learning will make a significant impact.

1. **Taking the Next Best Action with Customers**
   Perhaps the most mature use case of machine learning is the ability to leverage data science to drive more informed actions with customers. Today, applications can predict the next best channel, message, and timing for customer engagement.

   "More and more top life sciences companies are looking to embed machine learning into their sales and marketing processes," said Matthew Van Wingerden, head of machine learning services at Aktana. "And, they are seeing success. Machine learning optimizes field execution by predicting the best message, channel, and timing for each customer. These insights and tactical guidance integrate into existing workflows in the form of timely suggestions to reps. Likewise, marketers leverage the learnings of AI to refine their brand strategy and develop personalized experience journeys for individual HCPs," Wingerden continued.

2. **Dynamic Customer Segmentation for Improved Engagement**

   Customer segmentation still requires some level of manual, human involvement today. Consequently, segmentation is limited to the basic levels such as by therapeutic area. Machine learning enables much more complex segmentation – in fact, it allows for infinite levels of highly specific segmentation. Commercial teams are then able to personalize their engagement with greater specificity based on individual behaviors.

   The human brain is incapable of tracking all of the millions of individual variables required for this level of segmentation, but machine learning can do it. With machine learning, marketing segmentations will be more fluid and complex, and systems will be more predictive of customer behavior because it takes each individual customer into context. Sales and marketing teams will be empowered to serve up very individualized information in real time.

   Machine learning can also be used to optimize resources. For example, a sales rep could efficiently plan his week by segmenting targeted cardiologists clustered in a 40-mile radius who prefer visits on Thursdays after 3pm and are interested in new indications for the company's new drug. The rep not only maximizes his road trip but also connects with customers according to their preferences with information that they want to drive a better engagement experience.

3. **AI-Driven Planogram Solutions Improve Productivity of Field Reps**

   Machine learning will remove burdensome data entry and provide a virtual assistant for pharmacy planning – all through a reps' mobile device.

   Today, field reps manually take inventory of the products on the shelf in a pharmacy and transcribe this data into a CRM system. This takes time away from other activities and often introduces human error. AI image-recognition planogram solutions – some that are already at use at large retailers – automate tasks better suited to machines, eliminating human error and affording field teams more time to engage providers and pharmacists.

   Using image recognition, machine learning apps capture product shelf data for both the manufacturer and its competitors in real time on the device without a costly roundtrip to the cloud. In other words, data is instantly sent to the right software systems at headquarters to identify issues, such as planogram non-compliance, quickly. The system checks reality against what product should be available based on contracts to enable fast problem resolution.

4. **Automated Data Matching and Clean Up for Better Insights**

   Commercial organizations capture a high volume and variety of data that are typically siloed across hundreds of different sources. This creates a fragmented view of the stakeholder landscape, and makes it impossible to plan and execute across their complex ecosystem of stakeholders. Most important, it's difficult for companies to turn their data into information and make good use of it. Despite the uphill battle, life sciences teams spend a lot of energy trying to match and clean their data sets to make sense of it all. Machine learning, however, does this for companies instantly – and that's just the beginning.

Now, re-apply machine learning to clean data, and its value is multiplied because it derives richer, more accurate insights that people can act upon. The key to enabling this level of depth are large data sets that are clean, and formatted to be easily comparable. Once life sciences companies can compare apples to apples, they can employ even more sophisticated machine learning to look for patterns to improve commercial strategies.

5. **Industry Benchmarking to Improve Business Performance**
   Once a company has the right data and it's clean, machine learning informs commercial teams on how best to optimize their existing strategies. However, that's only a fraction of machine learning technology's power. The real advantage comes when teams find ways to optimize their strategies based on what the entire industry is doing but no single pharmaceutical company has this dataset.

   Right now, there is no access to reliable industry data to benchmark how one organization is performing compared to others. Companies are unable to apply data science to large volumes of data to make sense of it and use it to inform how the organization should change its strategies to compete relative to the industry. This is the next step. Soon, life sciences companies will be able to apply machine learning to benchmark themselves against the industry, and get closer to implementing the optimum personalized HCP-level launch plans and other successful commercial campaigns.

These are very exciting times, where scientists are *curing* diseases not just *treating* them. Similarly, we're on the cusp of incredible breakthroughs with machine learning. It has the power to allow every life sciences sales rep to be a top performer and every marketing campaign to be on target. It has the potential to cut through the tremendous complexity of today's commercial landscape to deliver clear suggestions that guide commercial teams for greater effectiveness. And, when these insights are directed into users' daily workflows, they become truly actionable, allowing organizations to fully realize the proceeds of their investments.

As AI and machine learning continue to mature, expect industrywide benchmarking opportunities that will inform decision-making and change how business gets done.

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