

# Artificial Intelligence in Life Sciences – How Far Can it Go?

AI, or artificial intelligence, is one of the most hyped terms to emerge in technology over the past decade. Despite that hype, though, it does possess the potential to truly transform ways of working and it is starting to become widely-used in a number of industries. But how is AI being deployed within life sciences and how far can it really go? Industry expert, Peter Brandstetter of PwC, outlines the short-term and long-term potential.

It's not uncommon for emerging technologies to become over-hyped. It happened with the cloud and with mobile, and it is currently happening with both artificial intelligence (AI) and the internet of things (IoT). But it is important to not let that technology's potential become overlooked because of the hype. AI is rich with potential and can be used to help address any number of challenges faced by life sciences firms.

We are approaching the inflection point when AI (and related technologies such as IOT, analytics and big data) is moving beyond the hype into business reality. I delivered a presentation at the AMPLEXOR BE THE EXPERT Conference earlier in 2018, and cited some IBM research that had a statistic revealing that between 20% and 30% of pharmaceutical companies have already started with projects using AI technology. Throughout the conference (and indeed a number of other conferences since) there were some of the most highly-respected influencers within the industry talking about AI, how it can be used and sharing real-world examples of organisations actually doing so.

### Machine Learning and Natural-language Processing

For some, it can be easy to get carried away with all of the potential opportunities AI offers to life sciences firms, including machine learning, natural-language processing and cognitive image processing. And it's with good reason. As in the broader medical field, AI offers to cut to the chase and deliver new discoveries in a fraction of the time that human capabilities could match, for instance.

This is due to the scope for mining vast vaults of data spanning case notes and academic archives from across the world, and spanning decades – aided by intensely powerful processing capacity. Intelligent systems don't just present a chance to scour that data for interesting correlations that would be invisible to the human eye; they can also quickly hone their efforts as they learn what to look out for – true machine learning in action.

For AI to have maximum impact, though, it is important for companies to have a plan for what they hope to get out of the technology. They need to ground their vision in tangible projects, and work back to a practical starting point – such as how they might optimise current systems, and rethink processes to take advantage of the best and most immediate opportunities.

### The Here and Now of AI in Life Sciences

What's especially interesting about AI in life sciences right now is that rethinking of processes is exactly what is starting to happen. One powerful example is a patient data box that IBM is developing

in the pharmacovigilance space. It makes the whole process easier when a person with a reaction comes in, as it makes assessing it much faster – a pharmaceutical company needs to react to this within fifteen days. They need to analyse what the event was, what was the cause of it, was it something that could be repeated? They need to put a lot of things together. This is known as a literature research, which is supported by what's called patient safety, a natural language processing artificial intelligence technology.

Rather than several people reading hundreds of documents, the user simply presses a button and they get the results much faster. Then the person must go and deep dive, but this AI computing at the literature research phase can be invaluable.

AI can also play a major role in generating fresh insight from existing data. One example is around one muscular skeletal disease, with data that's been around for twenty years, and has been used by many researchers and many pharma companies already. By applying machine learning, after working just three or four weeks, new insight was uncovered.

Machine learning is particularly potent when you have thousands of parameters that you need to combine and you need to look and to find patterns. Machine learning is a deep neural network and this is something that a human with traditional statistical methods cannot do as fast.

### The AI Challenges

It is also true that AI in life sciences is not without its challenges. Life sciences is an industry in which organisations are not known for their rapid adoption of emerging technologies. It's a highly regulated industry, so every technology that is innovative also needs to prove that it's really working.

This is especially so when you use AI, but it is also harder, as we can't use the traditional approaches where you put in A and B comes out. Because in AI you train the system similarly to how you would a human being, so it's not that obvious what is really coming out.

But I am confident that such challenges will not be a true barrier to AI adoption and for it to reach its true potential. AI is already a reality for many in the industry, while others are still in the pilot phase. But as soon as the early adopters can demonstrate strong ROI and tangible results, then others will embark on their own AI projects too.

### Peter Brandstetter

Peter Brandstetter is a Senior Manager at PwC. Peter has experience across the fields of IT in the life sciences industry, in particular the pharmaceutical sector. His areas of specialisation are quality management and quality assurance in manufacturing and R&D (SAP QM, LIMS, ELN), enterprise content management and R&D (clinical data management, pre-clinical, R&D Lab, R&D collaboration and project management) and computer validation.

