How Far Can AI Go in Life Sciences?

Artificial intelligence (AI) and machine learning are everywhere. Intelligent internet and content searches that adapt to user preferences, automated personal assistants like Alexa and Siri, and customer care channels such as web chat – AI is already a technology having a huge impact on our lives.

Machine learning is a subset of AI, where algorithms don't just make clever connections and spot trends in masses of data: they also become increasingly refined and efficient at this, in response to the conditions they are exposed to and the results they find. All of which adds to the speed of discovery, and the next actions this makes possible.

This can work for us in many ways, from accelerating scientific breakthrough and spotting previously elusive patterns in unwieldy global data masses, to enabling greater drug personalisation. But what is the ultimate potential of these technologies, and how far can they go?

The Power of Automation

Automation is undoubtedly a major attraction with AI. If machines can get to grips with routine knowledge work, and do it more rapidly than humans ever could, it makes sense to take the load, freeing up experts for value-added work – as long as humans continue to perform quality checks on what AI systems are doing.

In frontline healthcare, smart systems are already making headway in patient diagnostics. Just recently, UK researchers in Oxford announced the availability of AI technology that can diagnose heart disease and lung cancer at a much earlier stage, while connected devices are starting to be used to feed patients' data to those managing their care – monitoring their condition and enabling earlier interventions.

What powerful enabling or disruptive role could AI play in life sciences? Machine intelligence has substantial potential for enhancing R&D, through the ability to analyse large volumes of data leading to richer insights. To this end, applications, systems, and platforms have already been developed to transform clinical trial innovation.

This isn't just about distilling subtler patterns from once unmanageable volumes of disparate data either. It is also about modelling and extrapolating from such findings to arrive at bolder hypotheses and deeper and more targeted work, to accelerate discoveries and the development of treatments.

Understanding Patient Trends and Behaviours

AI technology also offers a way to track global patient trends, concerns, experiences, behaviours and needs, enabling the life sciences industry to understand what is happening in the real world – to a degree that hasn't been possible previously. This offers potential not only for more proactive and thorough monitoring of adverse events and other safety signals as drugs move into markets, but also for identifying emerging requirements, triggering new innovation.

Where the life sciences industry has traditionally been one step removed from patients, public internet forums and social networks offer an opportunity to understand evolving demands and engage with patients in new ways. AI is already proven for social media monitoring in other markets, whose best practices could be carried across to life sciences with a few adjustments.

AI Underpinning Life Science Innovation

For all the excitement around AI, though, life sciences as an industry is not known as an early adopter of new technology. So there are a number of things that need to happen if companies are to adapt to and exploit the potential ahead of them.

Once firms have accepted that change is coming, the next step is to prepare an IT and data environment which allows for new experimentation and insights – within the restrictions of regulatory control and privacy protection. This isn't just about developing 'big data' strategies, but rather preparing that data so it can be analysed efficiently, accurately and holistically using AI platforms – to spot emerging trends, anomalies, concerns and opportunities in a very efficient and granular way.

Alleviating Regulatory Pressures

For now, regulatory pressures are driving most data-related initiatives in life sciences. So this is a good place to start with AI – even if just for taking over some of the more repetitive or preparatory stages of submission creation, or content checking, to accelerate speed to market. (Using machine learning, systems could 'learn' how to produce better output, or the conditions most likely to result in a new marketing submission being accepted first time.)

If data preparation work has to be done to fulfil regulatory demands, why not exploit this – laying the foundations for future innovation, and testing just how powerful AI can be in transforming everyday processes?

The critical enabler for maximising the potential of data is the creation of a comprehensive master data model – one that also includes interdependencies between the data, in a way that can drive new efficiencies and increased impact through proactive process automation, boosted by AI/machine learning.

Every life sciences business aims to be more agile, responsive and patient-centric. But this relies on a strong sense of purpose and a foundation of rich, ready-to-exploit data. So if companies are going to start anywhere, it should be in developing both of these, and AI and machine learning can play a major role in bringing them to fruition.

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