The AI Advantage

Life sciences can't afford not to take advantage of intelligent web and social listening technology. It is the only way they can hope to cut through the online noise and become truly vigilant about post-marketing patient safety in an always-on digital world. And they could pick up a lot of other valuable insights along the way if they teach systems what to look for, say Christopher Rudolf of Volv Partners and Adam Sherlock of ProductLife Group.

Making safety a differentiator, being seen to be more customer-centric, reducing risk, and staying on the right side of regulators are among the many drivers causing life sciences to take a long, hard look at web and social media listening.

It is no longer acceptable to be on the back foot in adverse-event and patient experience monitoring and reporting once drugs are on the market. Good pharmacovigilance practice demands that manufacturers go further – and become more proactive – in keeping patients safe. Meanwhile, brands seeking to differentiate themselves on how seriously they take their responsibility for that (i.e., their willingness to exceed regulators' expectations) cannot practically achieve it as long as their vigilance is slowed by voluminous data feeds – feeds that are coming in faster than even the best-equipped teams can process. As long as market monitoring is mired in laborious manual processes, companies will never become able to get on top of what's happening out in the real world.

The situation is becoming only more challenging all the time, as digital channels evolve and multiply. When companies first started talking about social listening a number of years ago, they primarily meant the tracking of Twitter and public Facebook posts. In 2017, and in the context of life sciences, being vigilant about safety monitoring also means taking in web-based patient forums and special interest groups; blog articles and comments published through platforms like WordPress; complaints and feedback submitted via e-mail or web formats; scientific literature, including downloadable pdf attachments; and formats that depend less on the written word, such as YouTube and Pinterest. Some of this is mandatory, but all of it is recommended to build up the complete picture. A further complication is that relevant content could come in any language, from anywhere in the world.

Monitoring all of the above adds up to a gargantuan task for even the best-resourced teams. Big data is every industry's double-edged sword. If it can be consolidated, filtered, analysed, and harnessed both efficiently and effectively, then detailed insights can be very powerful. If it cannot, it can weigh companies down. And that's what's been happening in life sciences. Every minute of every day, patients or professionals somewhere can be found discussing, reporting, or asking questions about drugs online – across any number of the channels mentioned above. But getting to the mentions that matter – those that could indicate a real problem or could save a life or could inspire a new product direction or dosage regime – feels impossible to achieve. Even if responsible teams could process all of the available sources in the time available, they would be expensively inefficient and could easily miss something important.

Improving Safety Rates

Estimates suggest that 10 to 17% of adverse events go undetected today because companies are not "listening" to social media and other web channels other than those currently mandated by regulators. Those other channels could be in the forms of digital media beyond their own websites and communities, published scientific literature, and individual case safety reports.

The life sciences industry is well aware of this, but hasn't as yet found a practical way forward. Although the majority of pharmaceutical companies are thinking – and in many cases, seriously worrying – about web and social monitoring and how on earth they can do it in a way that's compliant, efficient, and effective, only a handful have made real progress. That's because the main options available to companies have been either to buy into very expensive proprietary turnkey analytics solutions like IBM Watson Analytics or to cobble something together from a series of tools designed for other purposes – like mainstream social listening. But what's suitable for trawling Twitter is going to differ greatly from tools capable of scanning scientific literature or capturing the sentiment and context of online discussion forums, opinionated blog posts, or photo or video posts whose potential signals are visual rather than text-based.

Monitoring every channel, format, or country and language separately creates more work and makes it harder to spot patterns. Unless monitoring efforts deliver something meaningful that can be relied on, companies will be wasting their time and budgets. With so many channels to keep track of, life sciences firms need a more consolidated, intelligent, and focused approach.

AI: The Smart Way to Sift Through Big Data

This is where artificial intelligence (AI) comes in by offering to take the strain from human teams so they can focus their time and budgets more productively. As optimised solutions for life sciences become available, AI is beginning to have a positively disruptive effect on companies' ability to efficiently and reliably monitor any number of digital channels to distil the insights that count. That in turn is transforming what pharmacovigilance and safety teams can do—not to mention what other parts of the business can do too.

First, using natural-language-processing algorithms and artificial intelligence, it's now possible to sift and clean data, thereby reducing the noise (irrelevant or red-herring content) by looking for the right signals that match teams' criteria. The ability to interpret natural human language and semantics means the technology isn't just following blind search rules but can identify mentions in context and can read into subtext to determine how relevant the mentions are.The parameters for the task might vary between parameters needed to analyse a short mention on Twitter and those required to interrogate longer posts on WordPress, but the technology is sophisticated enough to recognise and adapt to those differences.

Teams can adjust the noise settings to let more or less data through, and once a subset of high-quality data has been created, the findings can be fine-tuned and improved with input from the teams using the data. As teams interact with and classify data, machine-learning algorithms enable the software to observe and adapt to teams' preferences and to hone the next iterations of findings accordingly. An added opportunity at this point is that different teams, with their own individual tasks and interests, can train a system in their own priorities and preferences in order to support their own particular purposes. So, different task forces can derive their specific needs from the same master data without having to spend time looking through content that has no bearing on the work they're doing.

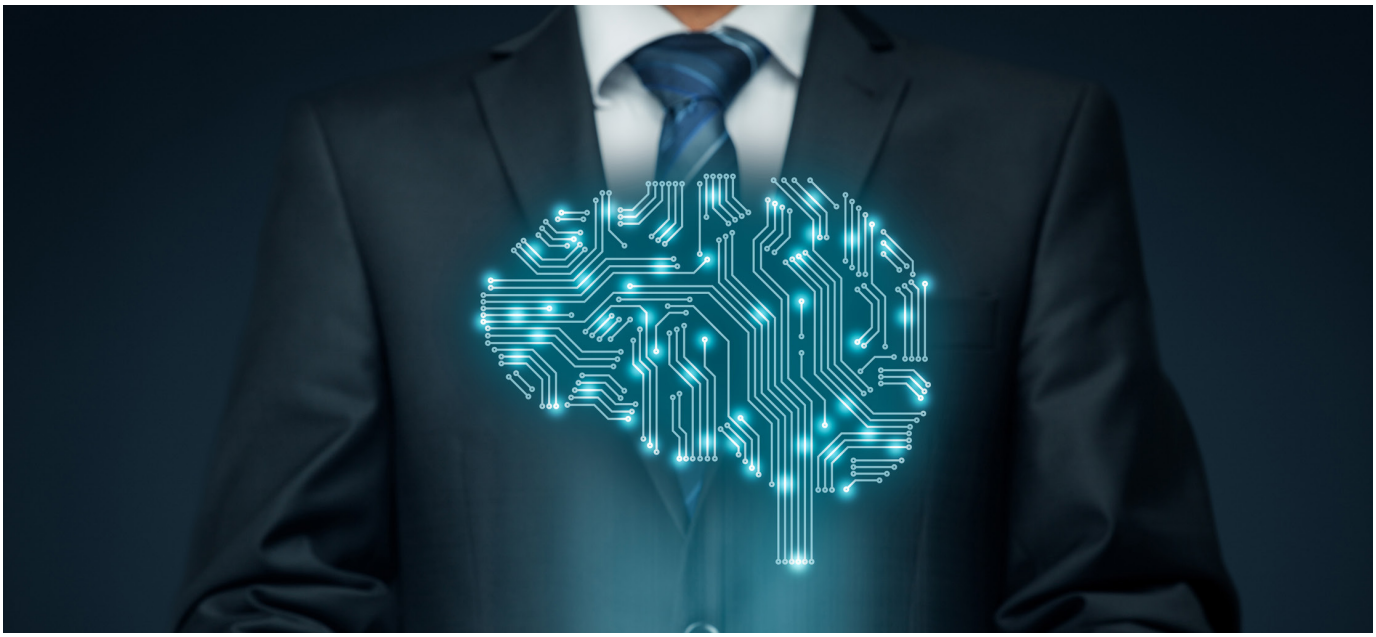
The clean, filtered data is served to users via the equivalent of an e-mail inbox, with an option to share findings with the team or feed important adverse-event findings into regulatory processes for urgent action. Incredibly, all of this can happen in near real time because the latest technology is capable of returning comprehensive but accurately filtered findings from entire global web and social media searches within just 90 seconds, and red-flag events can be moved through to supervisors just as quickly. Such speed of responsiveness to adverse events is unprecedented, and it is exactly what's needed to keep pace with new findings given the continual refreshment of digital content and round-the-clock social posting.

Making the Impossible Possible

Many industries are concerned about AI's undermining of people's jobs, but in a skilled and resource-pressed environment as found in the areas of life sciences quality, safety, and regulatory affairs, *time* is what is crucial; and AI's role is to enable teams to focus on what's important. Given that the web never sleeps and that people are posting around the clock and across different time zones, another advantage of AI-based web and social monitoring is that it keeps working out of office hours, refreshing results minute by minute. No time is lost, and there is much less danger of falling behind. What was an insurmountable task for humans has now become viable.

AI-based web and social listening can also significantly improve the accuracy and reliability of human-directed monitoring, thereby ensuring that nothing critical passes under the radar and no cross-references get missed. When systems have been built specifically for life sciences and are supplied with preloaded algorithms, levels of accuracy start high—above 80%—even before the software has been trained in what's of interest to a particular company and business function. That's a substantial advantage in winning the big data war—and in sharpening a manufacturer's safety credentials.

Without AI, this kind of progress is unthinkable. Firms would have to hire more and more people to trawl Google, look through individual websites and forums, capture reports, highlight what's of interest, enter findings into a database manually, and pass anything important on to decision makers. In that scenario, it could take days to find something of value, and in the meantime, much more could be missed. And because that cycle is so long, teams are perpetually playing catch-up yet falling further and further behind.



To maximise the impact of AI-based web and social monitoring, life sciences companies should be tracking everything holistically rather than in silos, where social channels get monitored separately from, for example, scientific studies. There also has to be efficient workflow that feeds straight into established systems and processes, such as existing pharmacovigilance systems and recognised regulatory procedures. Such a workflow requires an integrated, joined-up approach as part of broader pharmacovigilance and safety management, rather than making it a special separate activity.

Staying Compliant, Spotting Opportunities

Another very important capability that an AI-based approach brings to the table is the ability to adhere to strict rules designed to protect patient privacy—rules that can differ across international markets. The technology can, for instance, monitor for when relevant social media or web forum posts get subsequently deleted by the poster and can flag that event in the pharmacovigilance database, so that compliant processes around patients' data privacy can be applied. Staying on the right side of regulators is essential in managing risk and maintaining public confidence.

Once companies have seen the potential of AI-based web and social monitoring in safety management, the scope for additional applications comes into focus. With consent, firms have an opportunity to become more proactive in monitoring groups of patient users who have diseases firms are interested in—for example, discussions about hay fever—to get a clearer picture of where they stand in the market and where needs are not being met. Feedback could also help design more-well-rounded clinical trials, which supplement clinical data points, biomarkers, and reported outcomes and offer feedback from patients about how they're feeling and measurements from connected devices that track key health statistics. Once companies can monitor and cross-analyse all of those signals, they can start to predict adverse events in an individual before events happen and then can intervene pre-emptively.

This is the kind of development pharma companies are very interested in at the moment, and it's already technically possible. AI-based data monitoring and analytics for life sciences are becoming increasingly accessible and affordable too, thanks to the emergence of open-source solutions that can be run in the cloud and even operated as a managed service on companies' behalf.

Even if preventive safety action is a little way in the future, intelligent web and social monitoring can add plenty of other value today—for example, by helping companies keep track of regulatory changes and revisions to timelines, which can be hard to stay on top of globally. Commercially, the ability to gauge both (1) how a brand and product are perceived in the market and (2) how a product's safety profile measures up to the competition, offers invaluable mass-scale insights that could be fed back to product development and marketing teams.

Certainly there is a wealth of executable intelligence out there if companies can find efficient ways to extract and harness it. Discussions at the recent DIA EuroMeeting in Glasgow left no doubt that developing that kind of capability is high on life sciences organisations' agendas—and not just as a means of regulatory adherence.

We've only scratched the surface of AI's potential to transform companies' market knowledge and market responsiveness: the best is yet to come.

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