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Modern medicine and the Pharmaceutical industry have made tremendous breakthroughs over the past few centuries. From the discovery of penicillin to gene editing, Life Sciences and Pharma have helped treat and prevent many life-threatening diseases.

At the same time, human ingenuity has always sought to not only save lives but also improve the standard of living for the growing global population. Great scientific minds invented the steam engine that launched the first Industrial Revolution in the 18th century or discovered electricity, which revolutionized the lives and industries of the early 20th century. Today, with the invention of the World Wide Web and the subsequent digitalization, we live in the Fourth Industrial Revolution where data, data exchange and cognitive computing are transforming all industries and services, including Life Sciences and Pharma.

Now Pharma companies face a dual challenge: to find novel treatments for diseases that are still incurable and to do so in a world where structured and unstructured data from all kinds of disparate sources is generated by the second. It is even more complicated because often the proprietary information generated in-house needs to be complemented with a vast amount of valuable open data. As a result, enormous volumes of data from various clinical trials and dynamically-changing scientific literature need to be parsed and analyzed on a daily basis.

To stay up to date with all the novelties in their fields and to gain knowledge and insights from the huge and disparate data sources, Pharma companies are one of the first ones to turn to intelligent data management solutions.

## The Value of Artificial Intelligence for Pharma R&D

For humans, the processing of huge amounts of data from government regulatory agencies, clinical trials, scientific literature, etc. and making sense of it is a formidable task. Here, according to a recent analysis by Frost & Sullivan, AI-based platforms and solutions have the potential to open new paths for therapeutic development, thanks to the technology's ability to crunch multi-source data:

> Pharmaceutical companies are increasingly recognizing the value of deploying Artificial Intelligence (AI)-based platforms that can leverage data regarding gene

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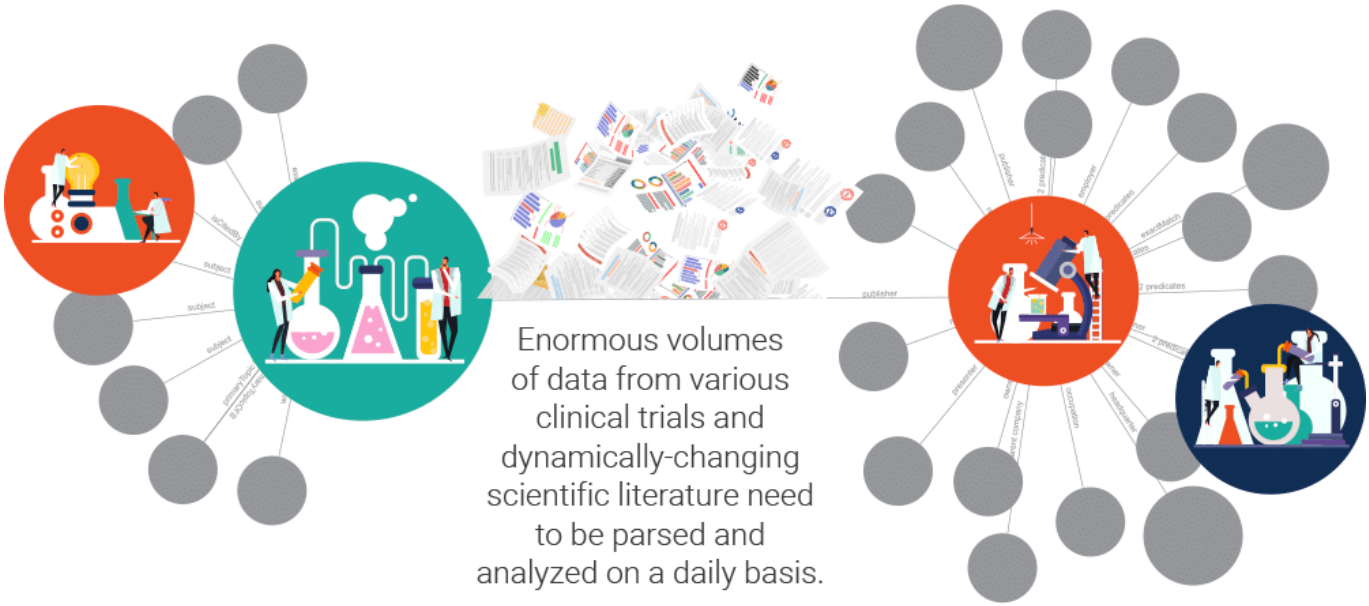
> mutations, protein targets, signaling pathways, disease events, and clinical trials to find hidden drug-disease correlations, Cecilia Van Cauwenberghe, Associate Fellow and TechVision Senior Industry Analyst at Frost & Sullivan, said, commenting on the analysis.

She also added that such technology would enable scientists to derive knowledge from structured and unstructured data from multiple sources as never before, which would help large Pharma companies address new therapeutic areas.




As both data sources and data volumes grow exponentially, so do the challenges of managing and obtaining insights from siloed structured and unstructured data. According to a survey published in Accenture's Life Science Tech Vision 2018, 99% of Life Sciences executives expect the volume of data exchanged with their ecosystem partners to increase significantly over the next two years.

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# The Contribution of Artificial Intelligence to Healthcare Services

Governments have also started to recognize that the ability of AI-based platforms to process vast amounts of disparate data can transform public health and patient care.

In the UK, the government announced in November 2018 that five centers across the country would use AI medical advances to develop a more intelligent analysis of medical imaging in patient triaging, thus assisting case prioritization and freeing time of more staff for direct patient care in the NHS.

In the United States, the Department of Energy (DOE) said in May 2019 that DOE scientists, in partnership with researchers from the National Cancer Institute (NCI), are building AI tools aimed at improving the screening process for new cancer drugs and helping match patients to the best treatments available.

While governments aim to support AI-based patient screening care, one of the main goals of

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the corporate pharmaceutical sector is to shorten the path from initial document research to actual drug research and development.

In order to go through gazillions of documents and data, Pharma companies employ smart semantic solutions that help them seamlessly navigate data and information coming from various structured and unstructured datasets. Semantically-enriched searches not only optimize search accuracy but enable highly contextual and richly personalized results. Most important, combining information from various resources and building analytical dashboards leads to much deeper insights and testing of new hypotheses.

## Ontotext's Smart Pharma Search Solution

As a semantic technology provider with years of experience in Life Sciences and Pharma, Ontotext has developed a smart semantic search solution that has been optimized for this industry sector. It merges structured and unstructured data into a Knowledge Graph that is capable of revealing relationships and implicit knowledge inferred from explicit facts.

Ontotext's intelligent solution provides intuitive semantic search based on auto-suggest of concepts from the knowledge graph, multidimensional semantic filtering, semantic vectors based similarity search and much more. Share on X It enables users to easily find relevant information across huge volumes of siloed structured and unstructured data-sources and get better knowledge insights from more efficient data management and discovery. The solution also provides provenance for each extracted fact and traces it back to the source document. The information can be sliced and diced using analytical dashboards and interactively explored navigating through the knowledge graph.

Read our case study to see how we developed a smart search solution for a top 10 pharmaceutical company or discuss your particular use case with us.

Book a Discovery Call

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