Natural Language Processing (NLP) is used by machines to process human language to extract specific information from documents, to generate text from voice (or vice versa), to understand meaning, etc. Today, machines can accurately carry out simple requests, ease web searches, summarize documents or translate languages. NLP is one of the key enabling technologies behind chatbots and spam email detection. While NLP is almost 70 years old, it has tremendously progressed over the last decade by adopting machine learning techniques instead of solely trying to automate grammar rules typically full of exceptions. Apple Siri released in 2010 and Amazon Echo (i.e. Alexa) released in 2015 are two examples demonstrating this technological breakthrough, which are now part of the daily routines of many people across the globe and can manage many different languages. Looking beyond these "simple" use cases, NLP can offer many opportunities to Pharmaceutical Companies.

- NLP can be leveraged to "*extract the names of drugs, diseases, patients, and pharma companies using rule-based or statistical method*"[12] in order to support Pharmacovigilance activities as a vast amount of information about Adverse Events (AEs) reside in unstructured narratives. Similar methodologies could be applied to identify potential AEs from comments captured in EDC, eCOA or other systems which is currently labor intensive and subject to human errors.

- NLP could also automate data extraction from documents (including from legacy Clinical Study Reports of compounds acquired from other companies or even Monitoring Visit Reports) and load them into structured databases. NLP has the potential to ultimately replace traditional Extract Transform and Load (ETL) technologies and provide capabilities never seen before.

- Finally, some industries are using NLP to support regulatory compliance. Organizations are extracting key concepts from regulations and verifying that those concepts are reflected in contracts and Standard Operating Procedures. NLP can also be used to review large volumes of documents and search for potential liabilities which could prevent issues in the context of Mergers and Acquisitions.