Leveraging Natural Language Processing for Business Intelligence

Business intelligence (BI), a collection of strategies and tools used to analyze business information, is a strategic, competitive advantage for many organizations. It enables quick and insightful decisions based on internal and external data sources.

And with digital disruption, a trend creating massive amounts of data on a continuous basis, the demand for Business Intelligence tools and technologies to cope with rapidly expanding data sets is quickly growing. Software vendors ranging from Microsoft and Tableau to SAP, Oracle and IBM are all now integrating Artificial Intelligence capabilities such as Natural Language Processing (NLP) into their offerings.

By adding NLP technologies to Business Intelligence tools, data and analytics platforms can now interact with humans as if they were virtual assistants, without the need to manipulate sophisticated spreadsheets or manage complicated Business Intelligence and analytics systems.

Business Intelligence and NLP for Healthcare Analytics

As the healthcare industry and medical practitioners alike have fully adopted digital transformation, population-scale datasets generated as a result are just now offering the potential to surface insights to improve care quality and decrease costs.

Drivers for healthcare-specific NLP adoption include:

- Supporting the needs of value-based care (VBC)
- Population health management (PHM)
- Coding and analyzing encounters more effectively
- Decreasing physician workload and burnout

Exploring Census Datasets with NLP

Using Census Survey data from the Centers for Medicare & Medicaid Services (CMS), CORMAC developed a Proof of Concept (POC) that showcases NLP advantages when analyzing large data sets with Microsoft's PowerBI platform.

Natural Language Processing with Business Intelligence Key Benefits:

- Draw insights that may not have been surfaced with traditional BI tools
- Query large datasets through using common phrases and natural language
- Create continuously updated dashboard visualizations
- Columnar databases support tabular data
- Interactive geo-mapping
- Use machine learning and artificial intelligence enabling human communication combined with computer understanding
- Data Analysis Expressions (DAX) scripting for creating measures and columns

PowerBI lets you query a data set about how many active CMS contracts are in place. Simply use the "Ask a question" feature by typing "How many active contracts" using the PowerBI query tool and the results will be displayed in the dashboard as 312 contracts. (Figure 1)
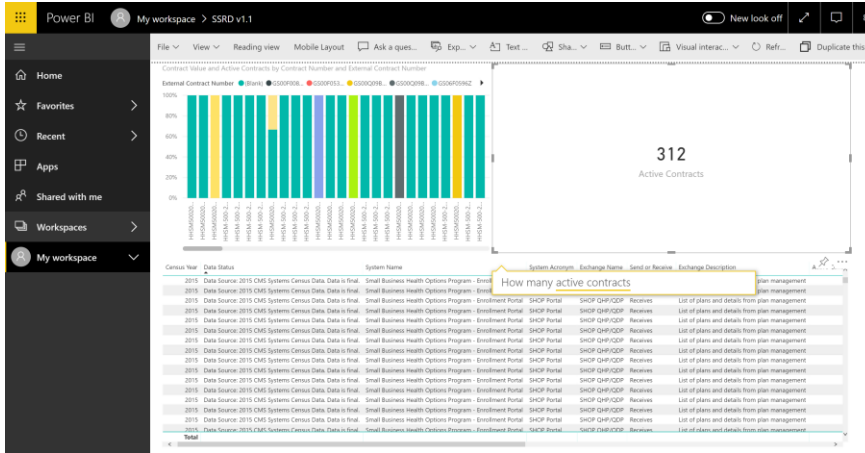

Figure 1

You also can ask follow-up questions by asking "What about 2015 active contracts" and the answer appears in the dashboard as 139 active contracts. (Figure 2)
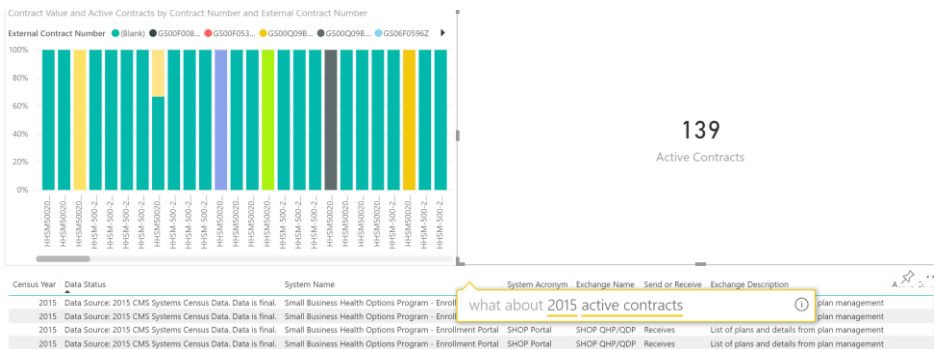

Figure 2

Conclusion

This contract data is only one simple example of how a business intelligence analyst can filter through a large dataset from CMS. By applying more sophisticated queries and combinations of datasets, business intelligence analysts can take advantage of NLP technology to build reports and surface insights that may not have been available with traditional business intelligence tools.