Optimizing costs for healthcare supply chain with predictive analytics

Technology helps reduce spending and increase revenues by providing visibility into global spend while creating automated processes to classify spend data and identify opportunities for savings. Algoscale practiced big data analytics and predictive intelligence to bring transparency in supply chain management making healthcare system more affordable and efficient. This enables hospitals and suppliers to effectively manage their daily supply chain operations and generate revenues.

The Client

Provider of a cloud-based SaaS purchasing platform designed to reduce costs and deliver better patient outcomes. The company's cloud-based SaaS purchasing platform uses the latest data science and software technology to bring maximum transparency to both ends of the supply chain – for benefit of both, and at expense of neither.

The Challenge

The client wanted to bring hospitals and suppliers on a single platform, enabling seamless collaboration and commerce between hospitals and suppliers. Hospitals use the solution to manage their daily supply chain operations and suppliers leverage the platform to generate revenues and collaborate with hospitals. In healthcare supply chain, lack of business intelligence can lead to increased costs and poor patient outcomes for hospitals, and loss of business opportunities and new customers for suppliers.

Project was aimed at moving manual work model to an automated system for better visualization of insights on company's expenditure over the time and various categories using their spend and consumption data. One of the challenge was handling enormous size of data in an unstructured format for over a decade (2007 – 2017). This valuable data set existed in spreadsheets and has been there over the years but has never been looked into for gaining business insights.

Vital information had to be extracted from the 160,000 invoices in Spanish language containing products/services with their attributes and prices had many uneven marks and noise. Besides, the client required an e-commerce portal for medical equipment to eliminate intermediaries from supply chain in order to bring down the healthcare cost.

The Solution

Algoscale built a solution for the entire healthcare supply chain for the client. The team began with building a global database for creating a product master to handle an enormous size of data of over three years and standardize it across all regions. Information on product catalogs from major healthcare equipment industries was extracted by crawling across sources. Collection and cleaning of a large volume of data were undertaken followed by designing the taxonomy and data management to build most enriched database for visualizing the insights. An enormous data warehouse equipped to handle 2 million x 300 data points and an ETL pipeline equipped to process 10 million + row items/cycle was modeled.

Purchase and consumption data was augmented with cleaned product master and then spend analysis was done using a customized software application to leverage fine insights and power of machine learning. For better visualization of data, a dashboard with custom filters based on user profiles was implemented.

Some of the purchase data was not cleaned and was present in form of scanned images of physical purchase invoices. Hence, additionally, an in-house OCR (optical character recognition) solution, that converts images of text into machine-encoded text, was developed to extract data from the supplier invoices by using google tessaract engine. Image was pre-processed and the information was extracted via pytessaract tool. Further, the team developed an end-to-end e-commerce platform inclusive of features like Live Chat, Automated email generation, etc. for the Indian market in healthcare sector. Building recommendation engine based on past order data simplified the inventory replenishment process for customers.

Benefits

Algoscale built a platform to find opportunities for savings and generating new revenues for the client. A web application depicting spend and consumption (supply chain) analysis with over 80 thousand products and more than 10 thousand suppliers was made. Cost saving opportunities was achieved to the tune of 15% of spend. The client now had a clear view on total spend by them.

Technology Stack

Python, MySQL, ElasticSearch, Angular, NodeJs, JavaScript, Tessaract OCR & OpenCV