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Use of Predictive Analytics in Government and Commercial Enterprises

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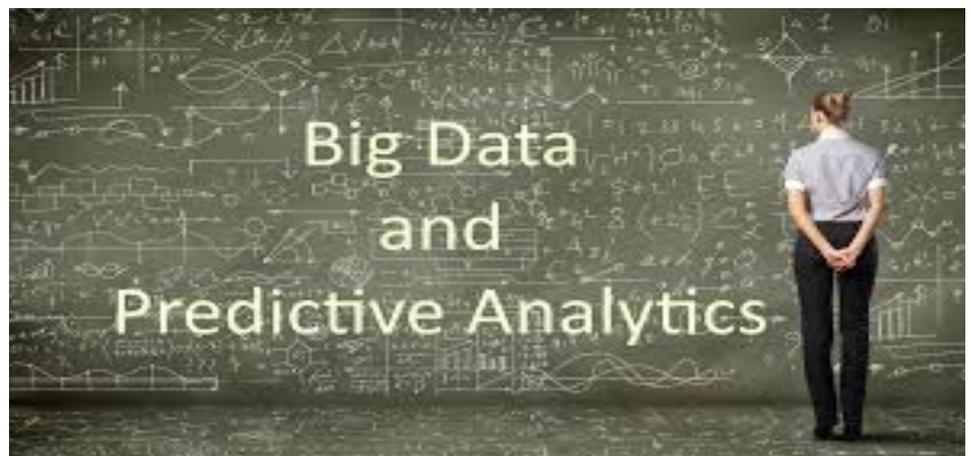
A few weeks back I published a post titled "5 Types of Analytics Every Organization Must Implement" in which I discussed the 5 different types of analytics - Discovery, Descriptive, Predictive, Diagnostic, and Prescriptive that organizations should implement. In this post, I will provide examples of how predictive analytics is being used within various industry verticals. Predictive analytics is applicable to a host of scenarios - to ascertain or predict what will happen, based on current and historical data. Predictive modeling is a process used in predictive analytics to create a statistical model of future behavior and trends, based on patterns within the data.

According to The Data Warehouse Institute (TDWI) Research, the top five reasons why companies want to use predictive analytics are (1) to *predict trends, (2) understand customers, (3) improve business performance, (4) drive strategic decision-making, and (5) predict behavior.*

Some examples of predictive analytics solutions in use in the Healthcare, Retail, Manufacturing, Government, Telecommunications, Financial Services and Intelligence verticals are provided below:

- **Healthcare**: At Johns Hopkins, data analysts have developed models to predict patients' length of stay and who is likely to be readmitted after discharge, two factors that are tied very closely to the health system's profitability. They also track quality of care metrics to ensure that the organization isn't spending too much on unnecessary or even non-recommended care.

- **Manufacturing**: A product manufacturer is using predictive analytics to determine which raw materials it needs in its inventory and the system also makes recommendations on when those raw materials should be ordered, based on orders and past production cycle times.

- **Telecommunications**: Cox Communications uses predictive analytics to identify business drivers for growth and then pinpoint existing and prospective customers to cultivate new offerings. They were able to answer difficult questions like why customers chose them instead of their competitors and what type of customer is likely to buy a specific product. With the predictive analytics tools in place, the company was able to put more campaigns into the field, as well as measure the effectiveness of different offers and marketing techniques to different customer segments. Recent campaigns have generated an 18 percent increase in customers responding to the promotion.

- **Government**: The data analytics team in New York City government has taken to detecting financial fraud and other crimes. According to its leader Mike Flowers, applying predictive data analytics toward "preemptive government" in New York City has resulted in - (1) A five-fold return on the time of building inspectors looking for illegal apartments, (2) an increase in the rate of detection for dangerous buildings that are highly likely to result in firefighter injury or death, (3) more than doubling the hit rate for discovering stores selling bootlegged cigarettes, (4) a five-fold increase in the detection of business licenses being flipped and (5) fighting the prescription drug epidemic through detection of the 21 pharmacies (out of an estimated total of 2,150 in NYC) that accounted for more than 60% of total Medicaid reimbursements for Oxycodone in the city.

- **Intelligence**: The Early Model-Based Event Recognition using Surrogates (EMBERS) project team working out of Virginia Tech has been successful in forecasting civil unrest in Latin America for the past two years, with an average lead time of around 7 days. They combined human expertise from subject matter experts (SMEs)—to devise and seed models—with computational power and natural language processing— to cope with the sheer enormity of examining open source big text. It uses big data and text analytics to do its forecasting. The program digests nearly 20GB of open source data a day from over 19,000 blog and news feeds, tweets, economic indicators, opinion polls, and even some non-traditional data sources, like parking lot imagery and online restaurant reservations. More than half of forecasts depend on unstructured data.

- **Financial Services:** Financial services institutions use predictive analytics to segment customers and predict which ones will react well to cross-selling promotions. Since it is widely reported that it costs credit card issuers, for example, up to $200 to attract each new customer, banks are eager to recoup their costs early in customers' lifecycles. Cross selling is a popular strategy for doing so. Predictive analytics can also be used to predict and segment quickly which customers are most creditworthy. Likewise it can forecast commercial property values for properties in investment portfolios, and those held

as collateral. And, in the unfortunate event of default, the application can forecast the best methods of managing the process, potentially reducing losses.

- **Retail**: An apparel retailer has spent years investing in paid search, but only recently began investing in social media advertising. The cost per acquisition in this new channel is higher than for paid search - and if they relied just on their historical customer lifetime value (CLV), they would pull out of the channel altogether for not delivering a strong return. But using predictive analytics, they are able to determine the lifetime value of the new "social" customers within just a couple of weeks, and they may realize that these new customers were much more valuable than their paid search shoppers. Ultimately, this convinces them that social media is a profitable new acquisition channel for them despite the higher upfront cost. Also, retailers need to be able to predict gaps in supply chain efficiency, supplier stability, customer churn and the causes of attrition, to minimize risk. A predictive analytics solution can examine unusual patterns to recognize anomalies and pinpoint where there are issues, all in real time. Allowing retailers to better control their losses and remain competitive.

In the next White Paper in this series, I will discuss the implementation aspects and a list of tools that can be used to develop predictive analytics solutions.

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