Predictive analytics enabling technologies marketing essay

This technology paper will describe predictive analytics and the application of the technology in today's business execution. Also, this technology paper will discuss the benefits and potential issues and lesson learned in the application of predictive analytics. Finally, this technology paper will discuss the future outlook of the predictive analytics technology along with actual trends observed by technology experts and users. This technology paper starts by defining predictive analytics to provide context and outlining applications that make use of this technology.

Predictive Analytics is generally considered to be a combination of statistical analysis, mathematical modeling and data mining. The online Gartner information technology glossary defines predictive analytics as an approach to data mining to include four basic attributes (2013). The basic predictive analytics attributes include: emphasis on prediction, rapid analysis measured in hours or days vices months, business relevance of resulting insights vices a rosy colored lens outlook, or ease of use to make predictive analytics tools accessible to business users. According Gartner, (2013) the term data mining encompasses, " the process of discovering meaningful correlations, patterns and trends by sifting through large amounts of data stored in repositories." The Gartner glossary goes on to reveal, " data mining employs pattern recognition technologies, as well as statistical and mathematical techniques." (2013)

The author Jan Matlis, in her October 6, 2009 article " QuickStudy: Predictive Analytics," defines predictive analytics as a component of data mining concerned with forecasting probabilities (2009). According to her article, predictive analytics includes technique variables to predict future behavior of

a person or other entities. Additionally, there are multiple predictors combined into a predictive model. A predictive modeling, according to Matlis (2009), is data collected to create a statistical model. These statistical models are used as a set of mathematical techniques applied to a data set to determine the probability some scenario is likely to happen or be true. According to Matlis, these techniques can be applied to many areas to include research, science, genetics and business to help forecast the future.

According to an Information Management Magazine article (Agosta, 2004), " The Future of Data Mining," predictive analytics is defined as " methods of directed and undirected knowledge discovery, relying on statistical algorithms, neural networks and optimization research to prescribe (recommend) and predict (future) actions based on discovering, verifying and applying patterns in data to predict the behavior of customers, products, services, market dynamics and other critical business transactions." The article further states predictive analytics employs"…methods to identify and relate independent and dependent variables – the independent variable being " responsible for" the dependent one and the way in which " relate," providing a pattern and a model for the behavior of the downstream variables…" (Agosta, 2004).

The predictive analytics according to the definition and description stated in Mathis' (2009) article can be applied to business and marketing. One benefit of predictive analytics in business is it can be used to answer questions about future customer behavior. From a management perspective, predictive analytics can be executed using business intelligence technology, for example Customer Relationship Management (CRM) and Supply Relationship

Management (SRM) applications. CRM technology can be used to allow management to focus valuable marketing and advertisement resources. According to Gartner's (2013) information technology glossary, business intelligence " is an umbrella term that includes the applications, infrastructure and tools, and best practices that enable access to and analysis of information to improve and optimize decisions and performance." Business intelligence applications like CRM can help decision makers determine whether a perspective customer may respond more favorable to certain types of advertising methods, bonuses and benefits. For example, CRM results may determine a specific customer may respond more positively to online advertisements versus telephone marketing or direct mail offers. Additionally, CRM results may indicate bonus programs like reward points, discount pricing or gift cards may entice newly acquired customers to become long term customers.

According to the article by Lou Agosta (2004), " The Future of Data Mining – Predictive," traditional methods such as data mining and data warehousing share a common goal with predictive analytics. They all attempt through technology to provide better understanding of customer behavior, forecast product demand and manage and build the company brand. Predictive analytics successfully supports customer recommendations and fraud detection while yielding product side success stories in demand planning, just in time inventory and market optimization. Agosta (2004) identifies 10 predictive analytics enabling technologies that make up the Technology Cycle

(see Figure 1)

Figure 1: Predictive Analytics Enabling Technologies

Potential issues with predictive analytics can be unfulfilled expectations created through the use of data mining. According to Agosta (2004), high profile data mining successes have resulted in mixed blessings. The results have created numerous imitators with claims, solutions and products that fall well short of expectations and promises. This according to Agosta (2004) results in the dilemma of confusing the vendors' messages and unfulfilled expectations from end-user enterprises.

Another issue facing predictive analytics is data privacy. Bose (2009) states that individual privacy disclosures occur when personally identifiable information is discovered during the process of analysis. According to Petersen (2012), the lack of a comprehensive privacy law in the United States is one of the reasons for data privacy concerns in analytics. He attests that many organizations are left to devise their own ethical frameworks based around the nation's many Fair Information Practices. Many organizations involved in predictive analytics are taking steps toward outlining a more standardized approach to ensuring data privacy concerns are met during analytics processing. Petersen (2012) recommends a holistic approach, in which data governance through classification, assigning roles and responsibilities, data policies, de-identification, and information systems security all be combined to provide data privacy protection.

According to author Ken Baur's article " Predictive Analytics: Data Mining with a Twist" (2005) the explosion of business data and changing market dynamics requires management to make critical decision in compressed

time frames. Predictive analytics provides an avenue for business leaders to rise to the challenge of pressure decision making. The trick of predictive analytics, according Bauer (2005), is to create a seamless environment where data collection through model development and deployment is self-directed, automated and untouched by human hands.

Organizations have embraced predictive analytics and forward thinking in order to remain completive in the market place, according to an article by Fern Halper (2011). According to Halper, companies desire to have a better understanding of customer tendencies and behavior to better predict infrastructure failures. Halper identifies five predictive analytics trends across four dimensions, "…vision, viability, validity and value." The five trends identified by Halper include: Providing solutions across the user spectrum, operationalizing models, supporting unstructured data analysis, big data, and open Source. According Halper, there has been a shift in the user spectrum from statistician to business analyst and consumers. Also, there is a trend in business to incorporate predictive analytics models into operational business processes. Next, companies gather greater volumes of structured and unstructured data in order to implement big data strategy solutions. Finally, companies are increasing support open source predictive analytics models to encourage innovation.

A Forbes online article by Jeanne Harris and Dave Rich (2010) declares predictive analytics as a real game changer. According to authors Harris and Rich, a tough global economy can make bad decisions very costly for companies. Rich and Harris believe predictive analytics gives management a disciplined approach to gather quantitative data for critical decision making.

According to Harris and Rich predictive analytics has emerged as a game changer because it helps executives answer " What's next? and What should we do about it?"

This technology paper defined predictive analytics and the application of the technology in today's business execution. Also, this technology paper discussed the benefits and identified potential issues in the application of predictive analytics. Finally, this technology paper discussed the future outlook of the predictive analytics technology along with trends observed by technology experts and users.