

Empowering SmartTarget with a Multilevel Streaming Data Analytics Infrastructure for Predictive Analytics

Predictive Analytics for digital media processing is facing the challenge of handling an increasing volume, velocity and variety of big data and there has been an enormous drive lately in the area of streaming data analytics. We are rapidly moving towards the Internet of Things (IoT) where predictive analytics will need to analyze and integrate streaming data from many different devices and digital media sources including structured data from the traditional relational databases and unstructured data from the recent big data storage systems. Therefore, we need an infrastructure to enable long-term multilevel knowledge extraction where **1)** the 1st level analytics performed by a stream processing engine will identify important data components from multiple data streams and move them into a memory buffer. **2)** Then an in-memory data analytics engine will be used to perform the 2nd and the subsequent levels of analytics for knowledge extraction and integration with other big data sources. **3)** Finally, only the important data stream components and the extracted knowledge can be stored for future analytics into a big data store. We **propose to develop an infrastructure to facilitate complex multilevel predictive analytics and to streamline the process of knowledge extraction and integration for both streaming and non-streaming data.** A variety of open source stream processing engines exist today. However, none support such multilevel analytics. We will use open source streaming and in-memory data analytics engines and SOSCHIP's cloud and big memory systems. ***The infrastructure will be validated using a) streaming log data analytics for load and failure prediction and b) streaming stock and business news data analytics for predicting stock prices.*** It will contribute to Canada's economy by leveraging predictive analytics for decision support in areas such as cybersecurity, health and e-government.