Advanced Informatics for Business Intelligence 2.0

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Abstract

Business Intelligence (BI), a term coined in 1989, has gained much traction in the IT practitioner community and academia over the past two decades. According to Wikipedia, BI refers to the "skills, technologies, applications, and practices used to help a business acquire a better understanding of its commercial context" (http://en.wikipedia.org/wiki/Business_intelligence). Based on a survey of 1,400 CEOs, the Gartner Group projected BI revenue to reach $3 billion in 2009 (Gartner, 2006). Through BI initiatives, businesses are gaining insights from the growing volumes of transaction, product, inventory, customer, competitor, and industry data generated by enterprise-wide applications such as: Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), Supply-Chain Management (SCM), Knowledge Management, Collaborative Computing, Web Analytics, etc. The same Gartner survey also showed that BI has surpassed security as the top business IT priority in 2006 (Gartner, 2006).

Since about 2004, web intelligence, web analytics, web 2.0, and user-generated contents have begun to usher in a new and exciting era of Business Intelligence 2.0 (BI 2.0) research. An immense amount of company, industry, product, and customer information can be gathered from the web and organized and visualized through various knowledge mapping, web portal, and multilingual retrieval techniques. By analyzing customer clickstream data logs, web analytics tools such as Google Analytics provide a trail of the user's online activities and reveal the user's browsing and purchasing patterns. Web site design, product placement optimization, customer transactions analysis, and product recommendations can be easily accomplished through web analytics. More recently, the Web 2.0 phenomena have created an abundance of user-generated contents from various online social media such as: forums, online groups, web blogs, social networking sites, social multimedia sites (for photos and videos), and even virtual worlds. In addition to capturing entertainment-related contents and socio-political sentiments expressed in these media, Web 2.0 applications can efficiently gather a large volume of timely feedback and opinions from a diverse customer population for many different businesses (i.e., crowd-sourcing). Many believe social media analytics presents a unique opportunity for business researchers to treat the market as a "conversation" between businesses and customers instead of the traditional business-to-customer "marketing." Advanced information extraction, topic identification, opinion mining, and time-series analysis techniques can be applied to the traditional business information and the new BI 2.0 contents for various accounting, finance, and marketing applications, such as: enterprise risk assessment and management, credit rating and analysis, corporate event analysis, stock and portfolio performance prediction, viral marketing analysis, etc.

In this talk, I will review The University of Arizona Artificial Intelligence Lab's past, current and future research in security informatics and business intelligence. Coplink system supports large-scale public safety information sharing and crime data mining. Dark Web research encompasses scalable deep web collection and social media analytics for detecting and analyzing illicit contents and communities (that are hiding in the "dark" corner of the web). Selected techniques are currently being expanded to analyze stock performances, abnormal earnings, product sales, and market and political risks for high-impact finance, accounting, marketing, and economic applications in our BI 2.0 projects.