: What is analytics?

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Analytics refers to quantitative and statistical analysis of data. Analytic capabilities are important in both data-driven and model-driven DSS. Analysis using quantitative and statistical tools is the focus of ad hoc and routine special studies. Various sources identify three categories of analytics: 1) reporting, 2) prescriptive, and 3) predictive. Reporting summarizes data using descriptive statistics. Prescriptive analysis uses data to inform a recommendation for action. Prediction involves causal or correlational analysis. Analytics involves a systematic process that often begins with data gathering or data retrieval. The goal of analytics is discovering actionable information that supports decision making.

Business analytics refers to the practices, processes, skills, and technologies used for exploration and investigation of historical business data, especially performance related data, to identify relationships and insight and improve business planning. The goal of business analytics is to turn large sets of raw data into meaningful and manageable information for business use.

There are three main types of business analytics (BA):

Descriptive analytics --> summarizes what has happened.

Predictive analytics ---> forecasts what might happen.

Prescriptive analytics --> suggests the best outcome among various choices, given the known parameters.

Prescriptive analytics is used to suggest decision options for how to take advantage of a future opportunity or mitigate a future risk, and illustrate the implications of each decision option. In practice, prescriptive analytics can continually and automatically process new data to improve the accuracy of predictions and provide better decision options.

Davenport and Harris (2007) define analytics as "extensive use of data, statistical and quantitative analysis, exploratory and predictive models, and fact-based management to drive decisions and actions. The analytics may be input for human decisions or drive fully automated decisions (p. 7)."

According to Anne Robinson in an interview with Anna Brown (2012), "INFORMS has defined analytics as 'the scientific process of transforming data into insight for making better decisions.' However, practically we describe it as descriptive, predictive and prescriptive. Descriptive is the 'what's happened?' part of analytics, predictive is 'what could happen?' and prescriptive is 'What's the best outcome given a set of circumstances?'" Robinson is the Director of Supply Chain Strategy and Analytics at Verizon Wireless and President-elect of INFORMS, the Institute for Operations Research and the Management Sciences.

An IDC Market Analysis Report (2011) notes, "For the past decade, IDC has defined the business analytics software market as the combination of the data warehouse (DW) platform software with performance management and analytic applications and business intelligence (BI) and analytic tools.... the business analytics software market has three primary segments: performance management and analytic applications, business intelligence and analytic tools, and data warehouse platform software." Analytics software helps access, analyze and model data to support fact-based decision-making. IDC identified the five leading analytics vendors for 2011 as Oracle, SAP, IBM, Microsoft, and SAS. Teradata advertises that it is "the leading analytic data solutions company".

Henry Morris, Senior Vice President for IDC's Worldwide Software and Services research groups, claims he coined the term “analytic applications” in 1997. In an article titled “Trends in Analytic Applications”, Morris argued an analytic application must meet each of the following three conditions: 1) provide process support, it structures and automates a group of tasks pertaining to the review and optimization of business operations or the discovery and development of new business; 2) independent of transactional applications, “yet it can be dependent on such applications for data and might send results back to these applications”; and 3) use time-oriented, integrated data from multiple sources.

According to Morris, three major types of analytic applications meet the above criteria: 1) Financial/Business Performance Management, 2) Operations/Production, and 3) Customer Relationship Management (CRM). Morris notes, “Analytic applications will co-exist with business intelligence tools.” He also claims “Analytic applications are specialized, supporting a structured business process, while business intelligence tools are generic, supporting ad hoc user inquiries.”

Analytics refers to a broad set of information systems and capabilities that are generally decision support applications. In Morris' taxonomy decision support that emphasizes unplanned or ad hoc user inquiries are not analytic applications, but rather BI applications.

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Analytics software encompasses three main technologies: 1) database management, 2) mathematical and statistical analysis and models, and 3) data visualization and display. Reporting analytics focuses on generating reports and visualizations from organizational data stores. That task is the main purpose of business intelligence (BI) software. Some sources consider analytics a subset of business intelligence, while others consider reporting analytics as another name for BI. In general, data-driven DSS and BI are considered reporting or data analytic applications. Prescriptive analytics manipulate large data sets to make recommendations. Predictive analytics are based upon quantitative and statistical models and this category of analytics includes model-driven DSS. Analytics includes a broad spectrum of computer-based analyses used to support fact-based decisions.

Analysis refers to using data to draw conclusions and support decision-making. Analysis should precede action and in cases of routine action it is possible to prescribe routine analyses. Routine analyses need to be periodically reviewed to determine if the information provided remains appropriate and relevant to prescribe and inform action taking.

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