

: *How do predictive analytics support decision making?*

by Dan Power

Editor, DSSResources.com

Predictive analytics is a general term for using simple and complex models to support anticipatory decision making. Analysis of historical data is used to build a predictive model to support a specific decision task. The decision task may be determining who to target in a marketing campaign, what products to stock, possibility of fraud, or who the "best" customers are for a firm. Using historical data, predictor variables are identified for building quantitative or business rule models. The model makes a prediction for a decision task.

Managers in consumer packaged goods, retail, banking, gambling, energy and healthcare industries are the most active users of predictive analytics. Predictive analytics are increasingly incorporated in day-to-day operations management tasks using real-time or near real-time systems. New projects can be implemented faster because software has improved for analysis and development, but the number of IT professionals skilled in using the many varied analytical techniques is inadequate to meet the demand for new capabilities.

Developing predictive analytics should involve both business and IT managers. This joint development process should help in understanding and in some cases automating business operations decisions. A meaningful technology analytics development partnership can facilitate improved and enhanced routine decision making. Analytics development can serve as a bridge between IT and business stakeholders.

Predictive analytics are increasingly important in large and medium sized organizations. Development and use of predictive analytics should be a core technology competency of many companies and managers should be reluctant to outsource or offshore the capability. Managers must realize that cost of each analytics project is an investment in building competency and it can also reduce operations costs and enhance operations. Certainly there is a learning curve associated with building predictive models and analyzing data, but consultants can reduce the curve. Managers should not however assume that programmers outside their firm can easily understand the peculiarities and needs of their business. As organizations capture more and more data, it will be important to analyze and use the data to enhance business results. Predictive analytics is **NOT** just another routine IT project.

All of the major software vendors market predictive analytics packages and development software packages. It is very important to pick the correct development environment for a specific decision

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task. For example, IBM advertizes "make better decision with business analytics." An IBM web page states "IBM Business Analytics Software takes the guesswork out of business decisions. So not only can you determine the right price for a boat, you can decide how many to buy, where to sell, and more. MarineMax®, the world's largest boat retailer, started using IBM Cognos software to inform their inventory decisions. As a result, their demand planning cycle dropped from 3 months to 3 weeks, leading to a 48% reduction in costs." MarineMax® may need different software for a different task and another company may need different software for making inventory decisions.

Predictive analytics is one type of tool in the broad field of analytics and decision support. Analytics is the science of analysis and discovery. Based on a number of sources and especially the IBM Analytics Quotient (AQ) quiz, the following responses to common questions are best practices for using information technology to implement analytics including predictive analytics.

1. What types of data sources should managers and staff analyze as part of decision making? In general, standard enterprise data sources across functions should be combined with data from text sources, point of sale, RFID, and social media.
2. How important is the quality of data used in analyses? **Very important.** An organization should have an enterprise data model. Common master data and metadata must exist and strong data governance practices must be in place.
3. Should managers document outcomes of analytics initiatives? **Yes.** Managers should initiate a documentation process to capture how the use of business analytics has changed business operations. Successful projects will lead to more projects.
4. How important is using predictive models? **Very important.** Integrated planning and predictive modeling can enable an organization to adjust policy and execution in response to shifting dynamics in the organization and business environment.
5. How should managers assess and manage risk? Risk metrics should be industry specific. Managers should share risk management assessment and mitigation processes across the organization, identify the most significant cross-departmental risks in an effort to reduce loss, and link risk reduction and specific risks to business objectives and improved performance.
6. Should managers centralize resources for performing and developing analytics? **Yes, but**

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analytics knowledge should be widespread throughout an organization. Using analytics should become part of the organizational culture. Managers should establish an analytics center of excellence and cross functional analytics teams similar to Six Sigma teams.

7. What general analytics solutions should be implemented in organizations? Solutions are in four categories: 1) Reporting and analytics; 2) Planning, budgeting and forecasting; 3) Predictive and advanced analytics; and 4) Governance, risk and compliance.

8. How should managers anticipate future events and results? It is important to use both qualitative and quantitative methods, including: 1) experience and intuition; 2) predictive analytics for priority needs; 3) "what if" scenarios, and 4) integrated planning and predictive models.

9. How often should managers adjust financial and operational plans to accommodate change? In general, **plans should be adjusted when significant changes occur.**

"Analytics: The Widening Divide" report, a joint MIT Sloan Management Review and IBM Institute of Business Value analytics research partnership, identified three core competencies organizations must master to achieve a competitive advantage with analytics. The first is information management, which focuses on standardized data practices. The second is analytics skills, which revolve on core discipline expertise built on robust tools. Finally, there's a data-oriented culture that sees analytics as a key asset to drive evidence-based management.

Davenport et al. (2005) note "Instead of competing on traditional factors, companies are beginning to employ statistical and quantitative analysis and predictive modeling as primary elements of competition. These firms have overcome the historical barriers to gathering and managing transaction data and some of the cultural resistance in organizations accustomed to 'gut-feel' decision making, and are using complex analysis and data-intensive decisions to change the way they manage themselves and compete in the marketplace."

Predictive analytics are important decision support tools that lead to fact-based decision making.

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Author: Daniel Power
Last update: 2012-07-30 09:35