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BIG DATA

## Making Big Data Think Bigger

By Steve Lohr

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Big-data management promises a significant shift in the way decisions are made across the economy. Abundant new sources of data from the web, sensors and smartphones, mined for patterns and insights by smart software, will mean that more and more decisions will be based on data and analysis rather than experience and intuition.

Logic would suggest that decision-making based more on science and less on hunch would have a big payoff in productivity and innovation. But so far the academic research and the industry's track record suggest gains of 1 percent to 5 percent from data-driven decision-making. Those seemingly modest gains tend to be in efficiency, cost savings and productivity.

In some industries, small percentages can mean a competitive edge and big savings. In the commercial airline industry, for example, a 1 percent gain in fuel efficiency would save roughly \$3 billion a year worldwide. Jeffrey R. Immelt, the chief executive of General Electric, speaks of "the power of 1 percent."

Tools like artificial intelligence and machine learning will someday help executives peer into the future to guide major strategic decisions like what products to bet on, what markets to enter and what companies to buy. But, said David B. Yoffie, a professor at the Harvard Business School, "the leap from the tools to the insight is the weak link."

Computer scientists and management experts are working to strengthen that link. One promising area of research is called computational enterprise analytics, and it was chosen this week as one of the central fields in the research agenda of a new

nonprofit organization, the Center for Global Enterprise.

Computational enterprise analytics, according to Peter C. Evans, the center's vice president for strategic analysis and trends, is a collaboration between computing and management science that seeks to describe complex business ecosystems. The research uses tailored software that automatically pores over sources of information like news releases on product announcements, research investments and partnership deals, analysts' reports, patent filings and CrunchBase, the online database of start-ups and venture financing.

The information is scored by significance and relevance, then translated into graphics showing links, nodes and types of activity among the actors in a business ecosystem — the mobile phone industry, for example. The visualization tools planned by the center would ideally be interactive, allowing users to zoom in and out to examine the underlying data.

“We're seeking a scientific understanding of organizations,” said Rahul C. Basole, an associate professor at the Georgia Tech School of Interactive Computing, who is working with the center. “And the tools we'll be developing are visual analytics for the c-suite,” he said, referring to executive offices.

An analysis using such tools, Mr. Evans said, might provide early signals — based on patent filings, partnerships and start-up activity — about where a company's competitors are investing in innovation. “It is taking data-analysis tools out of the engineering realm, with its focus on optimization and efficiency, and putting it into the strategic management realm,” he said.

Computational enterprise analytics is one of the four research programs being developed by the Center for Global Enterprise, each a collaboration that will rely heavily on academic partners. The other three programs are Business Models for Speed and Scale, Measuring Organizational Capital and the Emerging Platform Economy.

The center was founded by Samuel J. Palmisano, the former chief executive of IBM, as a forum for executives and academics to develop management skills for coping with globalization and rapid technological change.

It has already held invitation-only gatherings at Peking University and Stanford University, and others are planned. The meetings, said Christopher G. Caine, president of the center, are intended to foster “peer-to-peer learning among chief executives” as part of the organization’s role of working as “a catalyst for applied learning.”

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