

Data Visualization: Making Big Data Approachable and Valuable

A RESEARCH REPORT DETAILING HOW ORGANIZATIONS ARE USING DATA VISUALIZATION TO SUCCEED WITH BIG DATA

Enterprises today are beginning to realize the important role Big Data plays in achieving business goals. Concepts that used to be difficult for companies to comprehend—factors that influence a customer to make a purchase, behavior patterns that point to fraud or misuse, inefficiencies slowing down business processes—now can be understood and addressed by collecting and analyzing Big Data. The insight gained from such analysis helps organizations improve operations and identify new product and service opportunities that they may have otherwise missed. In essence, Big Data promises to deliver the advantages that companies need to drive revenue growth and gain a competitive edge.

However, getting to that Big Data payoff is proving a difficult challenge for many organizations. Big Data is often voluminous and tends to rapidly change and morph, making it challenging to get a handle on and difficult to access. The majority of tools available to work with Big Data are complex and hard to use, and most enterprises don't have the in-house expertise to perform the required data analysis and manipulation to draw out the answers that the business is seeking. In fact, in a recent survey conducted by IDG Research, when asked about analyzing Big Data, respondents cite lack of skills and difficulty in making Big Data available to users as two significant challenges.

"A lot of existing Big Data techniques require you to really get your hands dirty; I don't think that most Big

Data software is as mature as it needs to be in order to be accessible to business users at most enterprises," says Paul Kent, vice president of Big Data with SAS. "So if you're not Google or LinkedIn or Facebook, and you don't have thousands of engineers to work with Big Data, it can be difficult to find business answers in the information."

What enterprises need are tools to help them easily and effectively understand and analyze Big Data. Employees who aren't data scientists or analysts should be able to ask questions of the data based on their own business expertise and quickly and easily find patterns, spot inconsistencies, even get answers to questions they haven't yet thought to ask. Otherwise, the effort and expense that companies invest in collecting and mining Big Data may be challenged to yield significant actionable results. And companies run the risk of missing important



Big Data Challenges

Lack of skills/expertise needed to run analysis on all the data **57%**

Too difficult to access all data and make available to users for analysis **50%**

Not effectively using our most valuable data to drive decisions **45%**

Too difficult to analyze and understand all of the data **37%**

Too difficult to share information and insights with others **22%**

Running queries and reports **takes too long** **19%**

business opportunities if they can't find the answers that are likely stored in their own data.

» THE DEMOCRATIZATION OF DATA

Why are some companies able to use Big Data to their advantage, while others remain mired in reams of information, but gain little insight? In many cases, those companies that have found success with Big Data are using data visualization to help make sense of the information.

According to the IDG Research study, among the respondents who say their organizations are highly or somewhat effective at Big Data analysis, 58% have already implemented, or are in the process of implementing, a data visualization solution; another 40% expect to implement one. Put another way, of those who are most effective with Big Data, 98% have data visualization squarely in their sights. Of those with data visualization solutions in place, or plans to implement, 68% intend to use their data visualization solution to report and share information, and 60% plan to use the solution for discovery. Compared with those who say their

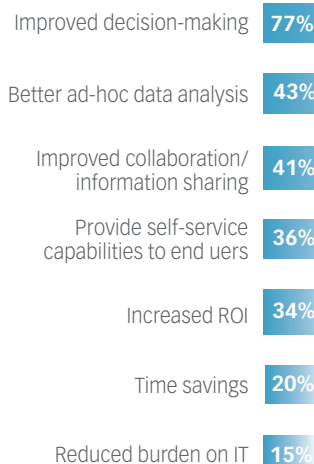
EMPLOYEES WHO AREN'T DATA SCIENTISTS OR ANALYSTS SHOULD BE ABLE TO ASK QUESTIONS OF THE DATA BASED ON THEIR OWN BUSINESS EXPERTISE AND QUICKLY AND EASILY FIND PATTERNS, SPOT INCONSISTENCIES, EVEN GET ANSWERS TO QUESTIONS THEY HAVEN'T YET THOUGHT TO ASK.

organizations are not very/not at all effective at Big Data analysis, only 16% of these respondents have implemented a data visualization solution. Almost one-third of these respondents have no plans to do so.

"A crucial element in minimizing the amount of time needed to understand data, visualization tools are imperative [to] realizing the value from a Big Data initiative," says Tammi Kay George, manager of R&D Program & Project Management at SAS. "When incorporated with approachable analytics capabilities from the onset, organizations are empowered with focus and the ability



Top Benefits of Data Visualization Tools



SOURCE: IDG RESEARCH SERVICES, AUGUST 2012

to reduce the time required to know where opportunities, issues, and risks reside in voluminous data."

When combined with analytics, data visualization does this by enabling business users to quickly and easily explore data. This means that employees don't have to be well-versed in analytics in order to work with Big Data; line-of-business users can rely on their own expertise such as marketing, finance, or supply-chain operations to ask informed, specific questions of the data, gain insight from the answers, and put those answers to use to improve the business.

Adding data visualization to a strong, successful core of analytics gives users the power to make the right business decisions. With visual analytics, business users can

Data Visualization: Visualization-based data discovery solutions that offer highly interactive and graphical user interfaces, are built on in-memory architectures, and are geared toward addressing business users' unmet ease-of-use and rapid deployment needs. These solutions typically enable users to explore data without much training, making them accessible by a wider range of employees than traditional business analysis tools.

HOPE FOR A COLLABORATIVE FUTURE

Companies that have deployed data visualization solutions to help derive value from Big Data are finding that there are behind-the-scenes benefits to using these tools. Not only does the combination of strong analytics and data visualization give users the power to make the right business decisions, it also facilitates the coming together of different disciplines within an enterprise to help solve a business problem.

NEARLY HALF OF IT PROFESSIONALS SAY THAT BOTH THE BUSINESS AND IT ORGANIZATIONS ARE DRIVING BUSINESS INTELLIGENCE AND/OR DATA ANALYTICS AT THEIR ENTERPRISE.

— IDG RESEARCH SURVEY OF 117 QUALIFIED IT PROFESSIONALS, AUGUST 2012

In a recent survey conducted by IDG Research—in which a majority of respondents say they have or plan to implement data visualization solutions for Big Data analysis—nearly half report that both the business and IT organizations are driving business intelligence and/or data analytics at their enterprise. Data visualization allows IT to enable line-of-business users to quickly and easily work with Big Data, so that the two disciplines are lending their own expertise to help address a business challenge.

“Sometimes IT really struggles to introduce new ideas to the business, like how to get a handle on big piles of data,” says Paul Kent, vice president of Big Data with SAS. “IT could take this opportunity to load data into a visualization tool and sit with the business and say ‘We’ve loaded the data, but we don’t know what it’s telling us. You know the data, what does this mean?’ That will help get the business users invested.”

drill down into data to confirm a hunch, spot patterns, understand trends, or figure out where a process went wrong. And because these tools convey results visually, they are significantly easier to work with and derive value from than traditional analysis tools. By making use of all the data that an organization collects, data visualization gives users new perspectives for data analysis, allowing them to look at more options and make more precise decisions. Combining the power of visualization and analytics with business users’ domain expertise gives enterprises innovative ways to improve the business, or even launch new business initiatives.

“The value of these tools is you can pull strands of insight out of a pile of data, which offers new ways of thinking,” says SAS’ Kent. “The very nature of showing users sets of Big Data in an interactive tool introduces them to new ways of thinking about something.”

In most organizations, IT staff is inundated with requests from business users and analysts for different sets of data, ad-hoc reports, and one-off requests for information. With solutions focused on providing visualization of Big Data, IT can give users access to more information and allow them to leverage data visualization to progress through Big Data analysis at their own pace. Thanks to in-memory technologies, IT can load data and make it available for multiple users, who can dynamically explore the information, create reports, and share information on their own. And IT staff is liberated to focus on other projects.

» TOOLS TO DEMYSTIFY BIG DATA

The combination of analytics and data visualization should be an integrated component of any business intelligence (BI) initiative to enable users to explore data, interact with it, apply analytics to understand or glean insights, and then share those insights in visually appealing ways, so actions can be taken quickly to improve the business. Key features of data visualization solutions include:

Big Data: Data that is of such volume, variety, and velocity (or the pace at which it is changing) that it puts an organization outside of its comfort zone to technically derive intelligence for effective decisions

"THE VERY NATURE OF SHOWING USERS SETS OF BIG DATA IN AN INTERACTIVE TOOL INTRODUCES THEM TO NEW WAYS OF THINKING ABOUT SOMETHING."

— PAUL KENT, SAS

» **Highly interactive graphics that incorporate data visualization best practices.** Solutions should automatically represent the data with the most appropriate visual for the type of data selected; provide geographical map views for a quick understanding of geospatial data; identify and explain the relationships between variables; and offer a variety of analytic visuals such as box plots, heat maps, and correlations.

» **Integrated, intuitive, approachable analytics capabilities.** Solutions should remove the complexity of data structures for nontechnical users so that they can explore and seek correlations on data sets; slice and dice multidimensional data by applying filters on any level of a hierarchy; drill up and down through hierarchies or expand and collapse entire levels; calculate new measures and add them to any view; and save views as report packages to share with others.

» **Easy report building.** Solutions should have a Web-based, interactive interface so that users can easily preview, filter, or sample data prior to creating visualizations or reports and leverage drill-down capabilities.

» **In-memory processing capabilities.** This is necessary for fast access to Big Data and to deliver answers to queries in seconds or minutes, instead of hours or days.

» **Ability to easily distribute answers and insight via mobile devices and Web portals.** This drives collaboration.

In addition, data visualization tools should be easy for IT staffs to deploy and manage in line with their existing practices, while maintaining control and security over the data. This means implementing enterprise-wide user authentication and information authorization policies in accordance with a company's data governance rules, supporting data provisioning to in-memory servers

based on volume and frequency of required updates and scalability requirements, and providing a Web-based interface for IT management tasks.

» REAPING THE BENEFITS

Making Big Data accessible to more users across the enterprise in a way that's easy and approachable isn't an end in itself. The real benefits come from the insight revealed by analysis of Big Data, and how an organization capitalizes on those answers. In the IDG Research survey, of those organizations that are considering using data visualization, 77% of respondents cite improved decision making as a top benefit, while 45% cite better ad-hoc data analysis and 44% cite improved collaboration.

"Inherently, business intelligence enables getting the right information to the right person at the right time and in the right format so that action can be taken. Data visualization backed by analytics enables your BI solution to empower better decisions faster," says SAS' George. "We live in a highly competitive world. If an organization can't easily see and act on an opportunity or risk quickly—or completely misses seeing it at all—that greatly impacts a company's competitive advantage. Loss in revenue, market share, shareholder value, and even legal implications can result from not seeing the relationships, the outliers, the hidden gems in data."

With analytics and data visualization, enterprises can begin tapping into the value of Big Data to boost overall effectiveness and realize a greater return on investment. And enterprises that use data visualization can be assured they are getting the best answers from the Big Data they collect, limiting missed business opportunities and helping them focus on strategic growth. ■

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