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How Big Data Is Changing the Whole Equation for Business

By STEVEN ROSENBUSH AND MICHAEL TOTTY

There's a ton of information out there. And businesses are figuring out how to put it to work.

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The experts call this state of affairs big data. The definition is squishy, but it usually boils down to this: Companies have access to vastly more information than they used to, it comes from many more different sources than before, and they can get it almost as soon as it's generated.

Big data often gets linked to companies that *already* deal in information, like [Google](#), [Facebook](#) and [Amazon](#). But businesses in a slew of industries are putting it front and center in more and more parts of their operations. They're gathering huge amounts of information, often meshing traditional measures like sales with things like comments on social-media sites and location information from mobile devices. And they're scrutinizing it to figure out how to improve their products, cut costs and

keep customers coming back.

Shippers are using sensors on trucks to find ways to speed up deliveries. Manufacturers can trawl through thousands of forum posts to figure out if customers will like a new feature on their product. Hiring managers study how candidates answer questions to see if they'd be a good match.

Lots of obstacles remain. Some are technical, but business as usual also can stand in the way. In most companies, decisions are still based on HIPPO—the highest paid person's opinion—and persuading an executive that data trumps intuition can be a hard sell.

What follows are several ways that companies are tapping the power of data to transform their businesses.

HUMAN RESOURCES

Employee benefits—health care in particular—can be expensive. Some companies are using big data to get a better handle on it.

[Caesars Entertainment Corp.](#), for one, analyzes health-insurance claim data for its 65,000 employees and their covered family members. Managers can track thousands of variables about how employees use medical services, such as the number of emergency-room visits and whether they choose a generic or brand-name drug.



Getty Images

"This is about shining a light on what was a very opaque and acceptable cost of business that an HR leader or a property team wouldn't have thought they had any control over," says Emily Gaines, Caesars' senior vice president of compensation, benefits and HR effectiveness.

For instance, data in 2010 showed that at a company property, Harrah's, in Philadelphia only about 11% of emergencies were being treated at less-expensive urgent-care facilities, versus 34% across all of Caesars. The Harrah's team launched a campaign to remind employees of the high cost of ER visits and provided a list of alternative facilities. Two years later, 17% of emergencies were going to urgent care, and the percentage of individuals making multiple ER visits fell to 30% from 40%.

Overall, since Caesars began tracking ER visits in 2009, 10,000 emergencies companywide have been shifted to less-expensive alternatives, for a total savings of \$4.5 million.

Big data is also changing hiring. Take Catalyst IT Services, a Baltimore-based technology outsourcing company that assembles teams for programming jobs. This year, the company will screen more than 10,000 candidates. Not only is traditional

recruiting too slow and cumbersome, the company says, but also the subjective choices of hiring managers too often result in new employees who aren't the best fit.

"You need to be able to build models that help you take that subjective view away," says Michael Rosenbaum, Catalyst's founder and chief executive.



So, Catalyst asks candidates to fill out an online assessment—a move that many companies are making these days, most famously Google. Catalyst uses it to collect thousands of bits of information about each applicant; in fact, it gets more data from *how* they answer than *what* they answer.

For instance, the assessment might give a problem requiring calculus to an applicant who isn't expected to know it. How the applicant reacts—laboring over an answer; answering quickly and then returning later; or skipping it entirely—provides lots of data about how someone will deal with challenges.

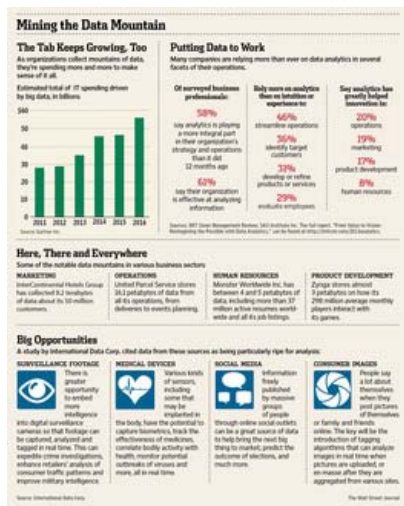
Someone who labors over a difficult question might fit an assignment that requires a methodical approach to problem solving, while an applicant who takes a more aggressive approach might be better in another setting.

The power of this approach is that it recognizes people bring varied skills to the table, and there's no one-size-fits-all person for a job. Analyzing millions of data points can show what attributes candidates have that fit in specific situations—something human bias can't do.

For one measure of success, employee turnover at Catalyst is only about 15% a year, compared with more than 30% for its U.S. competitors and more than 20% for similar companies overseas.

PRODUCT DEVELOPMENT

Big data can help capture customer preferences and put that information to work in designing new products. In this area, online companies are taking the lead.



Zynga Inc., the San Francisco game maker behind FarmVille, snares 25 terabytes a day from its games—enough to fill 1,000 Blu-ray discs. It uses that data for customer service, quality assurance and devising what features will show up in the next generation of games.

For instance, in the original version of FarmVille, animals were included mainly as decoration. But Zynga's game analysts found players were interacting with the animals far more than designers had expected, moving them around the farm and using in-game currency to buy them.

So, in FarmVille 2, animals were made much more central. If you want to make and sell a cake, for instance, you might need a cow for the milk and a chicken for the eggs.

Even Zynga's artists use data when designing new features. In traditional test marketing, a game designer might test different versions of, say, a polka-dot cow with a focus group. Zynga's artists can draw two different versions and put both in the game to see which is more popular with players.

Of course, real-world manufacturers are also using big data to gauge customer interest.

As Ford Motor Co. was designing the first subcompact model on its new global platform—a common set of components that would be on Ford cars and trucks around the world—it had to decide what features common in one region to make available in all regions.

One feature it considered was a "three blink" turn indicator that's been available on its cars in Europe for years. Unlike the signals on its vehicles in the U.S., this indicator flashes three times at the driver's touch and then shuts off.

A full-scale market-research test was seen as too costly and time consuming. So, Ford scoured auto-enthusiast websites and owner forums to see what drivers were saying about turn indicators. Using text-mining algorithms, researchers culled more than 10,000 mentions and summarized the most relevant comments.

The three-blink indicator was introduced on the new Fiesta in 2010 and is now available on most of Ford's products. While some online commenters have complained that they've had trouble getting used to the new feature, it also has lots of defenders.

"At first, it took some getting used to. Now I wouldn't have it any other way!!!" wrote one.

"The use of text-mining algorithms was critical in this endeavor and helped secure a complete picture that would not have been available using traditional market research," says Michael Cavaretta, Ford's technical leader for predictive analytics and data mining.

OPERATIONS

For years, companies have been using digital technology to make their operations more efficient. With the rise of big data, they can capture much more information from a wealth of new sources as it happens.

[United Parcel Service Inc.](#) has long relied on data to improve its operations. In 2009, it began installing sensors in its delivery vehicles that can, among other things, capture the truck's speed and location, the number of times it's placed in reverse and whether the driver's seat belt is buckled. Much of the information is uploaded at the end of the day to a UPS data center and analyzed overnight.

By combining GPS information and data from fuel-efficiency sensors installed on more than 46,000 vehicles, UPS in 2011 reduced fuel consumption by 8.4 million gallons and cut 85 million miles off its routes.

MARKETING

Marketers have long used data to understand their customers and target their pitches. Now a superabundance of data means marketers can aim for much more personalized messages.

Like many hoteliers, U.K.-based [InterContinental Hotels Group PLC](#) for years has gathered details about the 71 million members of its Priority Club rewards program, such as income levels and whether they prefer family-style or business-traveler accommodations.

Several years ago, the company consolidated all its customer-marketing information into a single data warehouse, which can pull in information from social-media sites and process queries much faster than ever before.

Using the system, it launched a new marketing campaign in January. Where previous campaigns might have on average seven to 15 customized marketing messages, the new campaign has 1,552, according to Atique Shah, IHG's vice president of global guest campaign marketing.

The messages are rolled out in stages to an initial core of 12 customer groups, each of which is defined by 4,000 attributes. One group, for instance, tends to stay on weekends, redeem reward points for gift cards and register through IHG marketing partners, according to Mr. Shah. So, those customers received a marketing message that lets them know about local events over the weekend.

The campaign has generated a 35% higher rate of customer conversions, or acceptances, than a similar campaign last summer, says Steve Sickel, IHG's senior vice president for distribution and relationship marketing.

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