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# WEBINARS

KEY LEARNING SUMMARY

## **Big Data at Work** DISPELLING THE MYTHS, UNCOVERING THE OPPORTUNITIES

*featuring* **Thomas Davenport**

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# Big Data at Work

## DISPELLING THE MYTHS, UNCOVERING THE OPPORTUNITIES

### OVERVIEW

Many organizations use analytics, but big data is a different animal. It requires new technologies and new management approaches to facilitate fast, continuous decision making. Well-known companies in many industry sectors are experimenting with big data to optimize their operations and support development of new products and services.

As businesses strive to attain “Analytics 3.0,” the world of fast, pervasive analytics at scale, they may want to use Professor Davenport’s DELTTA framework to build big data capabilities. They must also be cognizant of organizational barriers to big data, such as resistance from key stakeholders and a lack of experience with analytics.

### CONTEXT

Professor Davenport defined big data and discussed how it can have a positive impact on businesses.

### KEY LEARNINGS

#### **Big data has several characteristics that distinguish it from analytics.**

Research suggests that by 2014 the volume of data stored worldwide will reach 7,000 exabytes. Yet, only about 0.5% of this data is analyzed in any way.

The vastness of big data differentiates it from business information that has traditionally been used for analytics. Big data is too voluminous for a single server, too unstructured for relational databases, and too fast-moving to fit in data warehouses. Several new technologies exist to manage this information, but typically organizations need data scientists to manipulate big data. Big data demands new approaches to management and decision making that are evidence-based, fast, and support continuous decisions.

#### **Availability of information and willingness to use it both influence how industries and functions leverage big data.**

Some industries and functions tend to use big data more than others to support decision making and new product development. Professor Davenport described four categories of big data usage:

### CONTRIBUTORS

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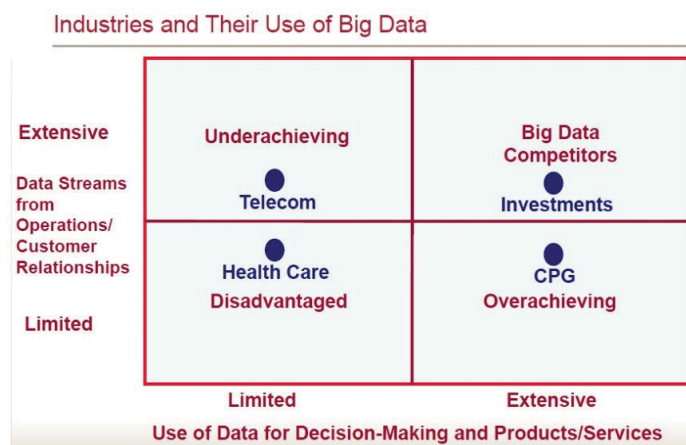
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1. **Big data competitors.** These are organizations that have access to extensive information from operations or customer relationships, and use that data intensively. Examples include investment firms and functions such as marketing.
2. **Overachievers.** These are organizations that have limited access to data, but are committed to using it as much as possible to inform decisions. Examples include consumer packaged goods companies and operations departments.
3. **Underachievers.** These are organizations that have access to extensive information, but fail to take advantage of it. Examples include telecom companies, and finance and sales departments.
4. **Disadvantaged.** These are organizations with limited access to data that rarely use information to support the business. Examples include healthcare and human resources.

Figure 1: The Four Categories of Big Data Usage



**Big data can support many business applications, but organizations must develop a prospecting plan.**

There are several ways big data can be used to enhance a business, such as:

- **Saving money by leveraging big data technologies.** For example, Citi uses free open source software (Hadoop) and inexpensive commodity servers to support big data analytics.
- **Making routine business decisions faster.** Caesars uses real-time interventions to provide gamblers with coupons that increase customer retention. UPS uses big data to support real-time routing, which has saved the company around 85 million gallons of fuel.

“Big data is good for optimizing recurrent, small decisions like pricing, fuel stops, or routing. Each decision may seem small, but they add up to considerable savings.”

—THOMAS DAVENPORT

- **Supporting new types of decisions.** United Healthcare has started analyzing call center conversations to identify signs of customer dissatisfaction that might lead to attrition. Schneider uses sensors in its trucks to indicate when and where refueling should occur, as well as to predict hazardous driving behaviors.
- **Developing new products and services.** One of the most exciting applications for big data is new product development. Examples include the Nest thermostat and Monsanto's predictive planting service which is based on weather data analysis.

As companies consider how to prospect for big data projects, they may wonder whether to first analyze their data or evaluate their customer needs. Professor Davenport suggests doing both simultaneously. Organizations must understand the business context, as well as their information assets.

It is a good idea to divide big data prospecting into two phases: discovery and production. A discovery platform helps businesses identify which information assets have the greatest value and should be used in production projects. Different teams will be involved in each phase, based on the type of big data application that is under consideration.

Figure 2: The Two Phases of Big Data Prospecting

#### Who's in Charge?

	Discovery	Production
Cost savings	IT innovation	IT operations
Faster decisions	Analytics group	Business unit/function
New decisions	Analytics group	Business unit/function
Products/services	R&D/product devt	Product devt/mgt

#### When building big data capabilities, companies may want to use the DELTTA framework.

As organizations build out their big data capabilities, it can be helpful to apply a model to the initiative. Professor Davenport has developed the DELTTA framework:

- **Data.** Big data is diverse and combines many different types of information, such as data from internal and external sources, as well as structured and unstructured data.
- **Enterprise.** A big data initiative should be unified across the entire organization. That means integrated analytics for both big and small data, one analytics leader such as a chief analytics officer, and one support group.

“Discovery platforms are like big data refineries. They help organizations understand which of their information assets are most valuable.”

—THOMAS DAVENPORT

- **Leadership.** People leading big data initiatives should be passionate and committed to the cause. They should not be afraid to experiment and make informed investments.
- **Targets.** It is important to find specific targets where big data can make a difference to the business.
- **Technology.** New architectures and options have emerged to support big data initiatives. For example, Hadoop, Pig, and Hive are useful to spread big data processing across massively parallel servers. In-memory processing and in-database analytics can speed analytics. For rapid model generation and testing, organizations may want to consider machine learning. Other relevant technologies include natural language processing and visual analytics software. Big data may be stored on premise or in the cloud.
- **Analytics.** Deriving meaningful analytics from big data usually requires intervention by data scientists. In large companies, data scientists may have different roles and work in different functional areas, but everyone should be working toward the same goals.

#### Today's big data adopters tend to be small startups and big firms.

Professor Davenport has found that companies working extensively with big data today tend to fall into two categories:

1. **Small startups.** These businesses are often in the online, media, or healthcare sectors. They tend to leverage big data for new products and services.
2. **Big firms.** These organizations may be either traditional or online businesses and span a variety of industries. They are engaged in both big and small data analytics and need a new management model to manage the two realms.

#### Attaining fast, pervasive analytics at scale is an evolutionary process.

To achieve fast analytics at scale, organizations must seamlessly blend big data with traditional analytics. Reaching this level of sophistication is the result of a three-stage evolution:

1. **Analytics 1.0.** Traditional analytics are primarily descriptive analytics and reporting. They are internally sourced, based on relatively small collections of structured data, and focused on internal decision support. A drawback of Analytics 1.0 is slow models and slow decision making.
2. **Analytics 2.0.** The "Big Data Era" emerged in the early 2000s. Companies hired data scientists to apply new analytical and computational capabilities to complex, large, unstructured customer data. Online firms created data-based products and services and online data started to be tracked.

3. **Analytics 3.0.** In this stage, analytics are seen as integral to the business and a focus of everyone's job. The infrastructure exists to support rapid, agile insights and model delivery. Analytics are available to support decisions at speed, as well as development of new products and services.

Many well-established companies, as well as relative newcomers, have achieved Analytics 3.0. However, Professor Davenport noted that to succeed, organizations must overcome obstacles in two areas:

- **Resistance from inside and outside the organization.** Often, frontline workers don't want analytics and big data to dictate how they do their jobs. Similarly, managers may not like "black box" decisions. External stakeholders like customers and partners may think they own the data.
- **Lack of experience with analytics.** Internal managers and customers may not understand analytics. In addition, product managers may not be comfortable developing and launching data products.

In today's business world, big data has the potential to widen the gap between market leaders and laggards. The key is understanding what information is available in organizations and determining how it can be leveraged for decisions and innovation. Utilizing big data is often an incremental process, but it can deliver major benefits once it becomes an integral part of everyday business operations.

## BIOGRAPHIES

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Voted the third leading business-strategy analyst (just behind Peter Drucker and Tom Friedman) in *Optimize Magazine*, Thomas Davenport is a world-renowned thought leader who has helped hundreds of companies revitalize their management practices. He combines his interests in business, research, and academia as the President's Distinguished Professor in Management and Information Technology at Babson College. Tom earned a PhD from Harvard University in social science and has taught at the Harvard Business School, the University of Chicago, Dartmouth's Tuck School of Business, and the University of Texas at Austin. He has also directed research centers at Accenture, McKinsey & Company, Ernst & Young, and CSC.

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Angelia Herrin is Editor for Research and Special Projects at *Harvard Business Review*. At *Harvard Business Review*, Herrin oversaw the re-launch of the management newsletter line and established the conference and virtual seminar division for *Harvard Business Review*. More recently, she created a new series to deliver customized programs and products to organizations and associations.

Prior to coming to *Harvard Business Review*, Herrin was the vice president for content at womenConnect.com, a website focused on women business owners and executives.

Herrin's journalism experience spans twenty years, primarily with Knight-Ridder newspapers and USA Today. At Knight-Ridder, she covered Congress, as well as the 1988 presidential elections. At USA Today, she worked as Washington editor, heading the 1996 election coverage. She won the John S. Knight Fellowship in Professional Journalism at Stanford University in 1989–90.

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