

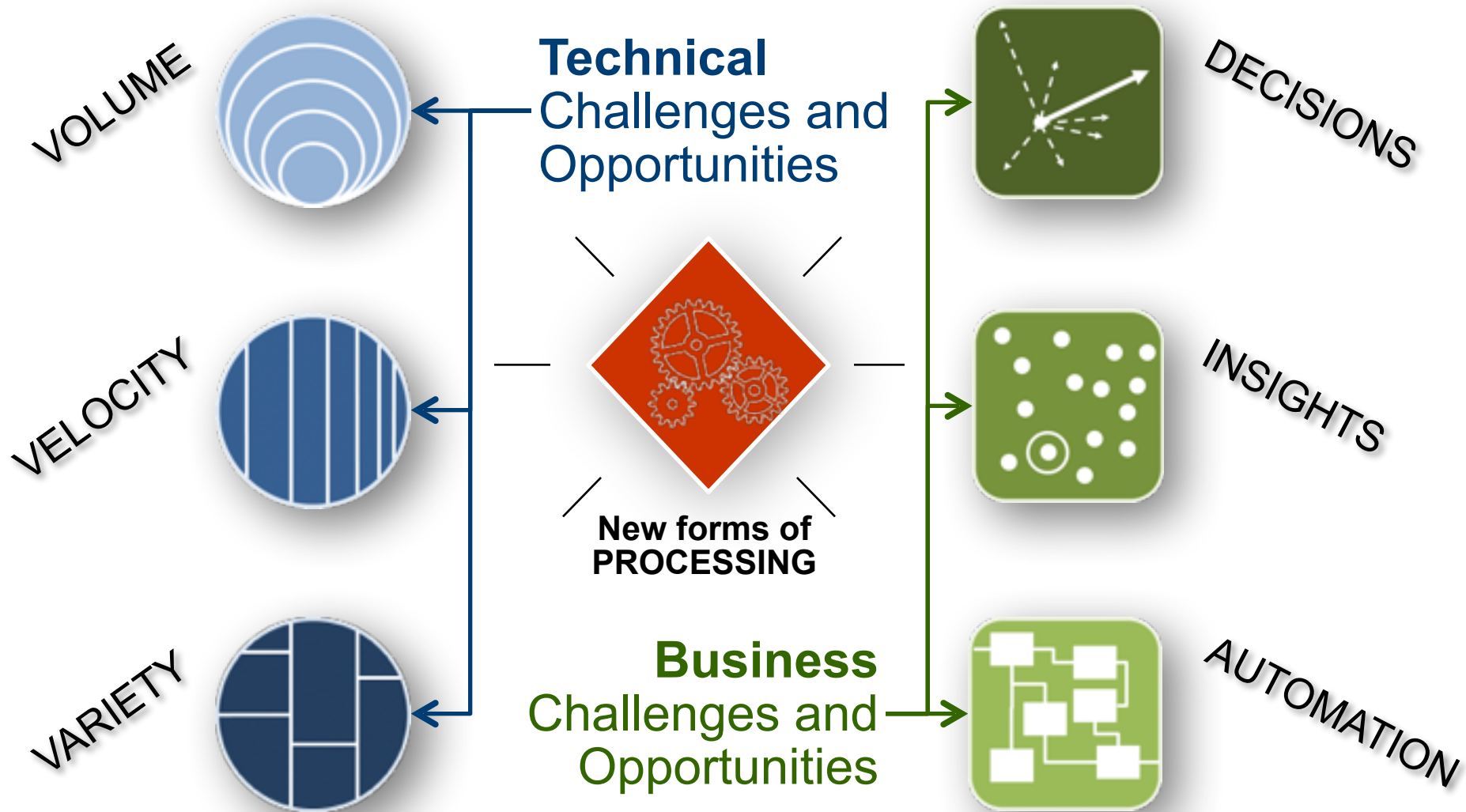
Big Data and Analytics Overview

Clay Miller
Executive Partner



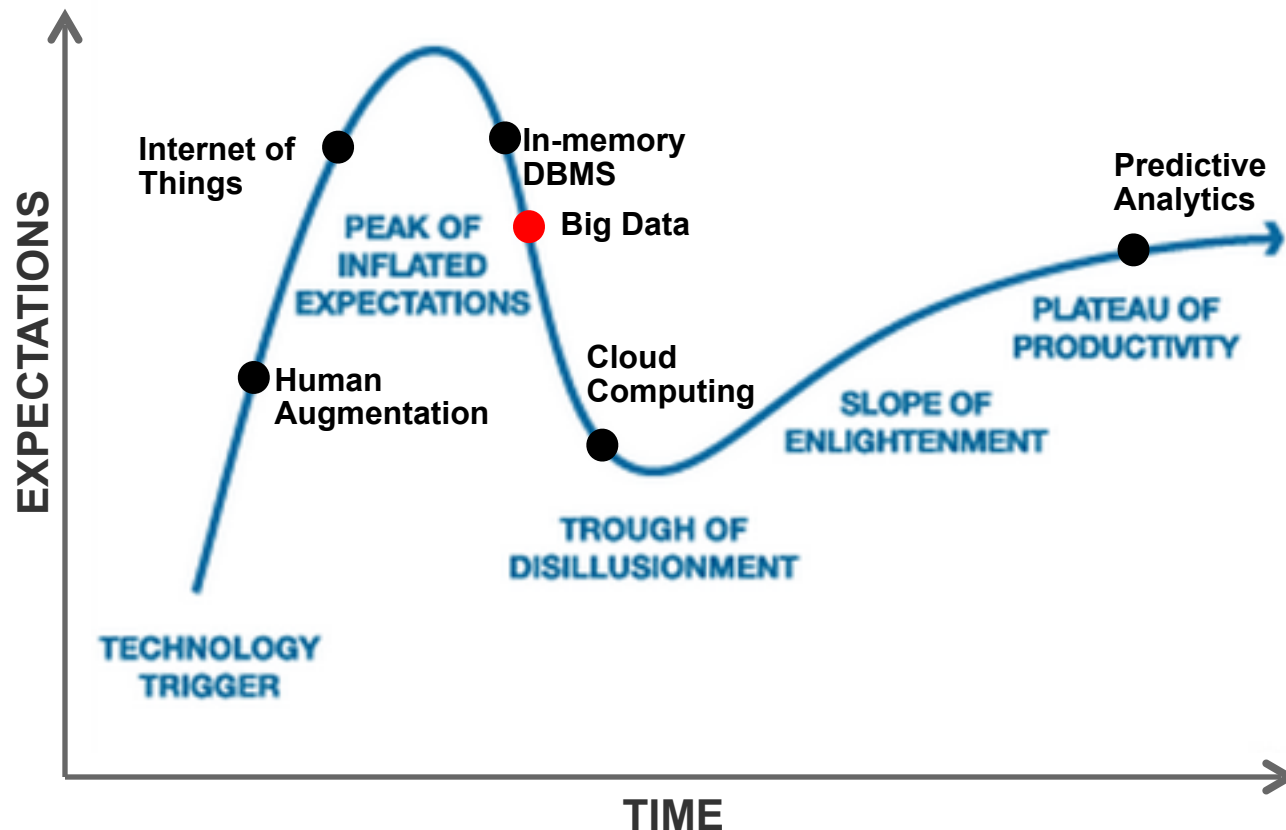
Big Data is #1

Big Data is Centered on Challenges and Opportunities



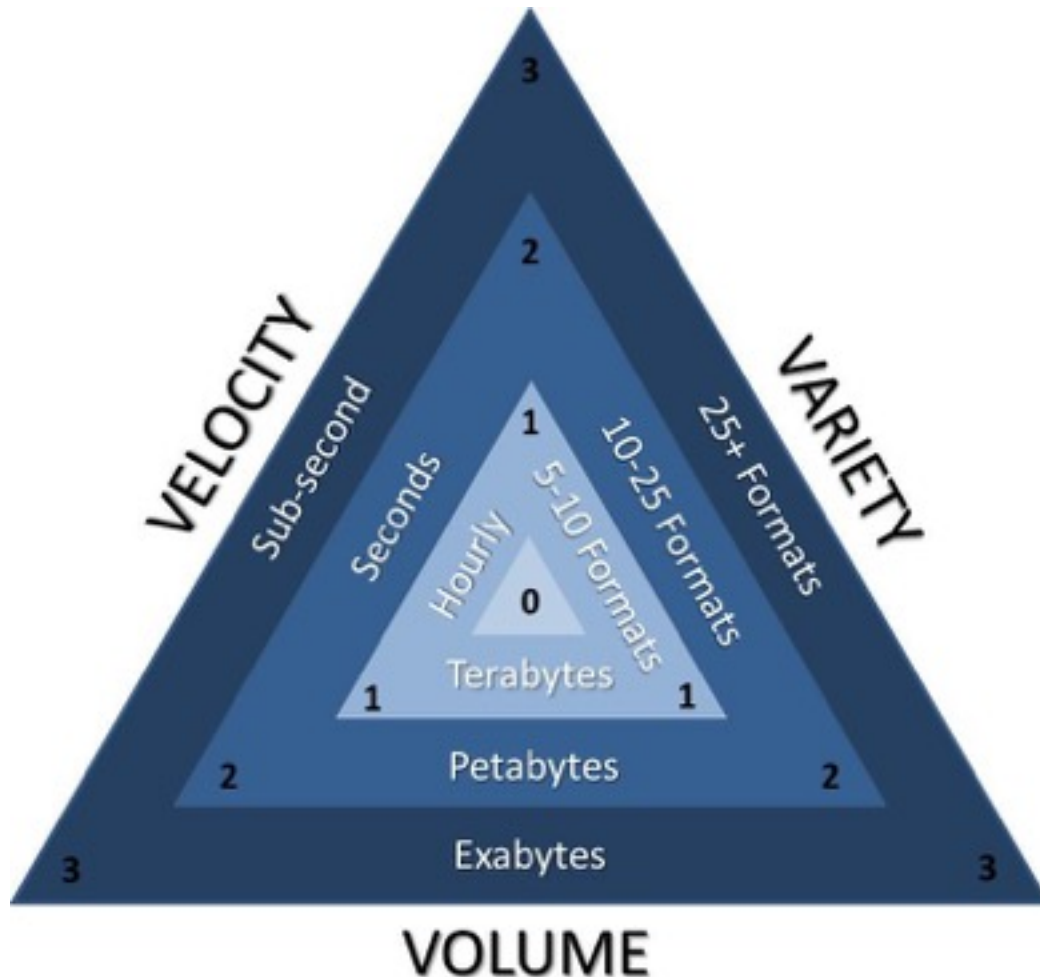
Big Data hype is peaking...and that's a good thing

Gartner Hype Cycle for Emerging Technologies
(Sample)



How Big is Big?

The Gartner Data Magnitude Index



Identify the scale of data you manage *and* process, for each dimension then sum them to determine your Data Magnitude Index (DMI).

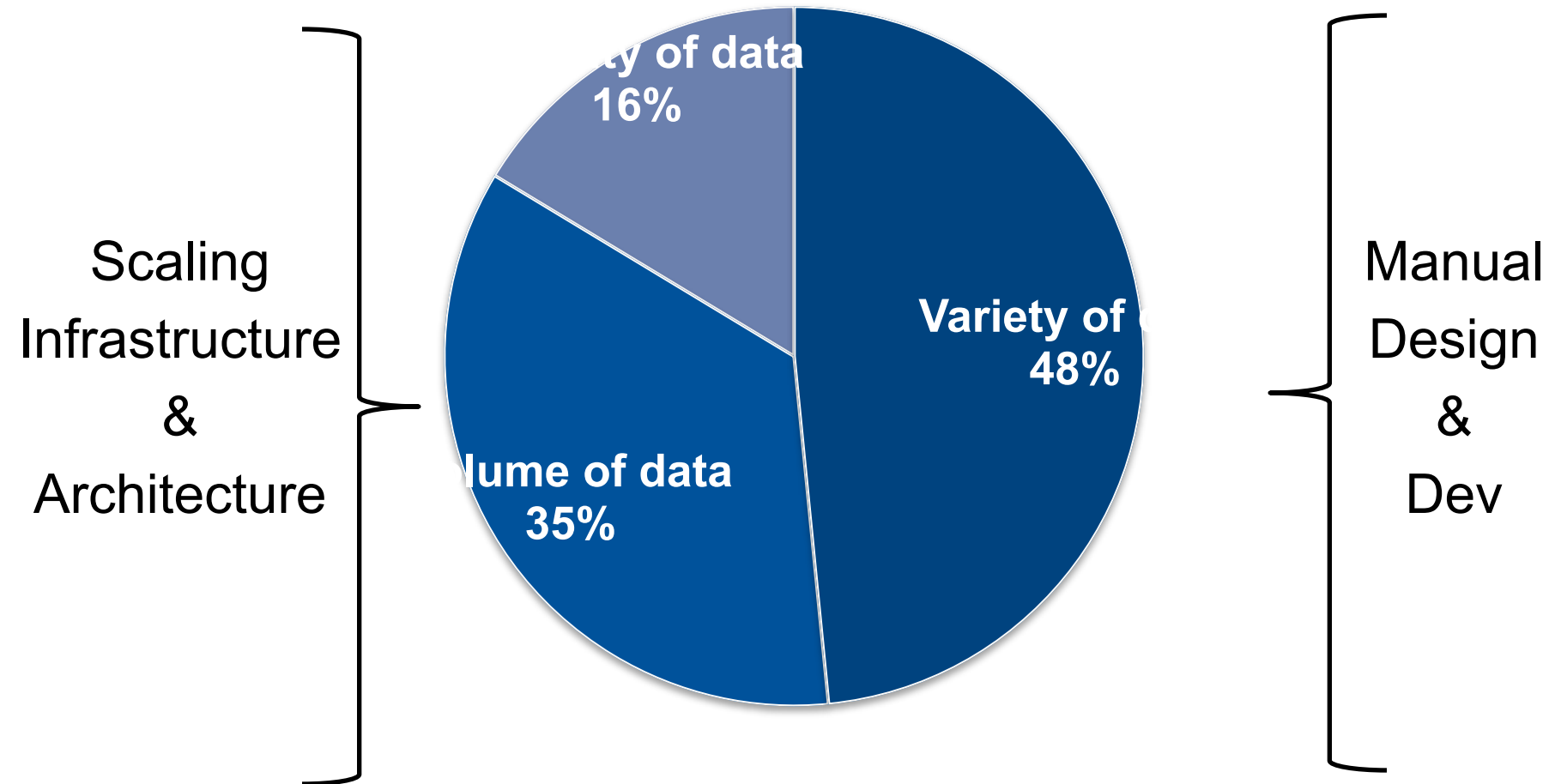
Technology Class:

DMI 1-3: Prior generation

DMI 4-6: State of the art

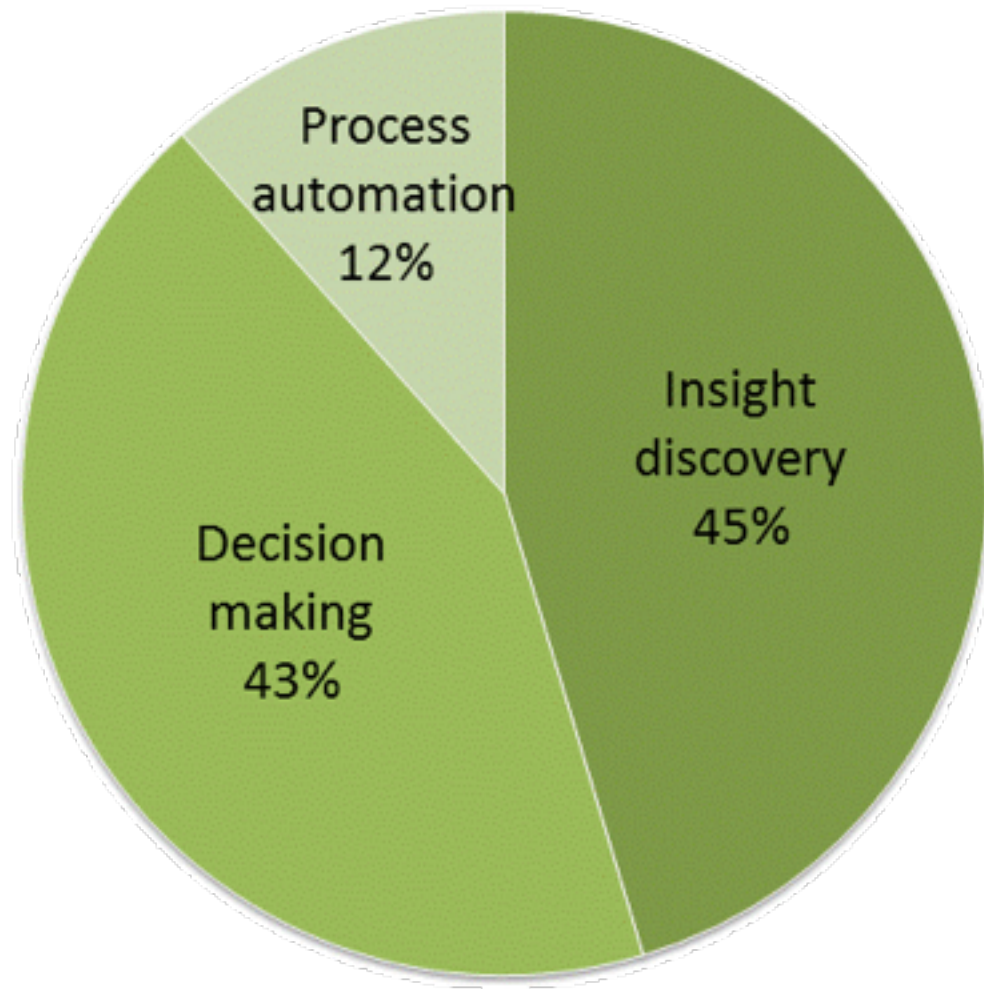
DMI 7-9: Next generation

Which Big Data characteristic is the biggest issue for your organization?



Source: [Getting Value from Big Data](#), Gartner Webinar

Which is the biggest opportunity for Big Data in your organization?



Source: [Getting Value from Big Data](#), Gartner Webinar

Recognizing Big Data initiatives are unique



Traditional DW & BI



Big Data & Analytics

Requirements-based

Pragmatic design

Data warehouses and marts

Structured data

Our data

Integration / reuse

Competence centers

Better decisions

Enterprise

Opportunity-oriented

Continuous experimentation

Data lakes, logical DWs, sandboxes

Unstructured data

Their data

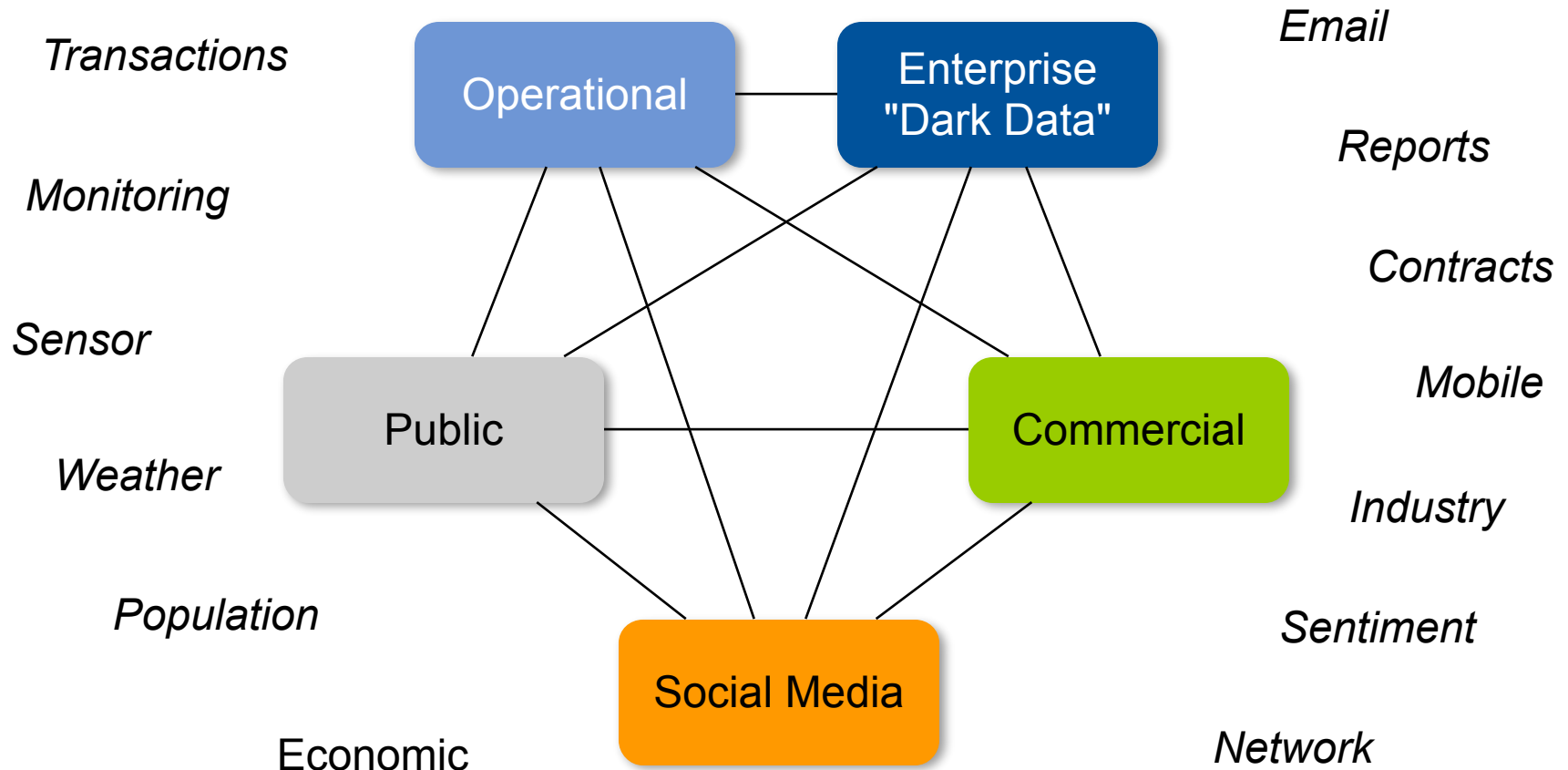
Immediate use / throwaway

Hackathons

Business innovation

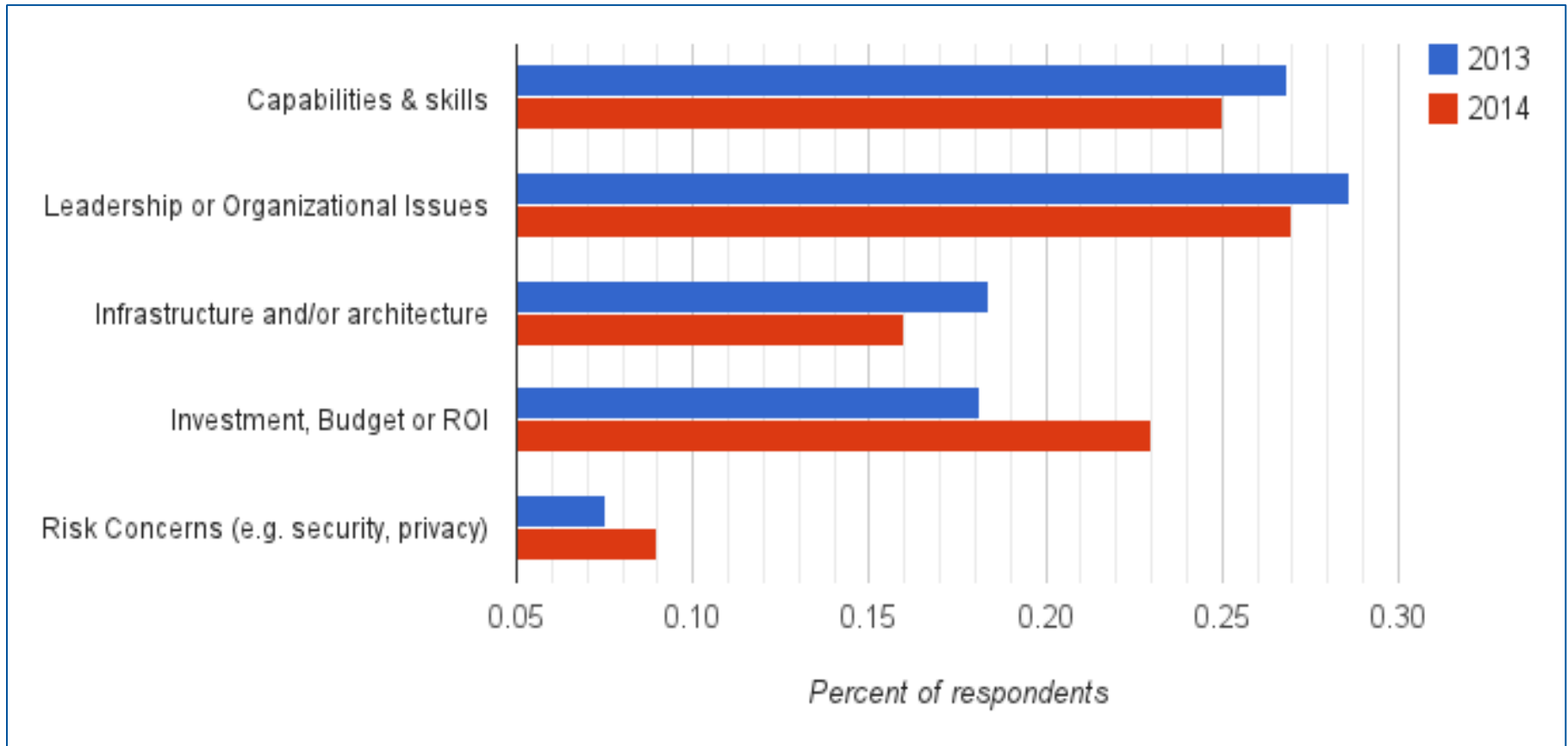
Functional

Big Data is About More Than Just Transaction Data



Correlations and patterns from disparate, linked data sources yield the greatest insights and transformative opportunities

What is your organization's biggest inhibitor to benefiting from Big Data?



Source: Gartner Big Data Webinars, March 2013 & 2014

Build business leadership belief in data



Communicating Analytic Insights



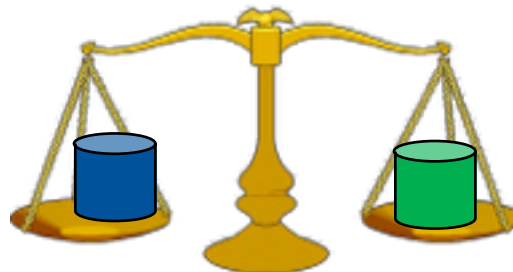
Executive Education in Analytics



Chief Data Officer



Aggressive Recruiting



Data Quality

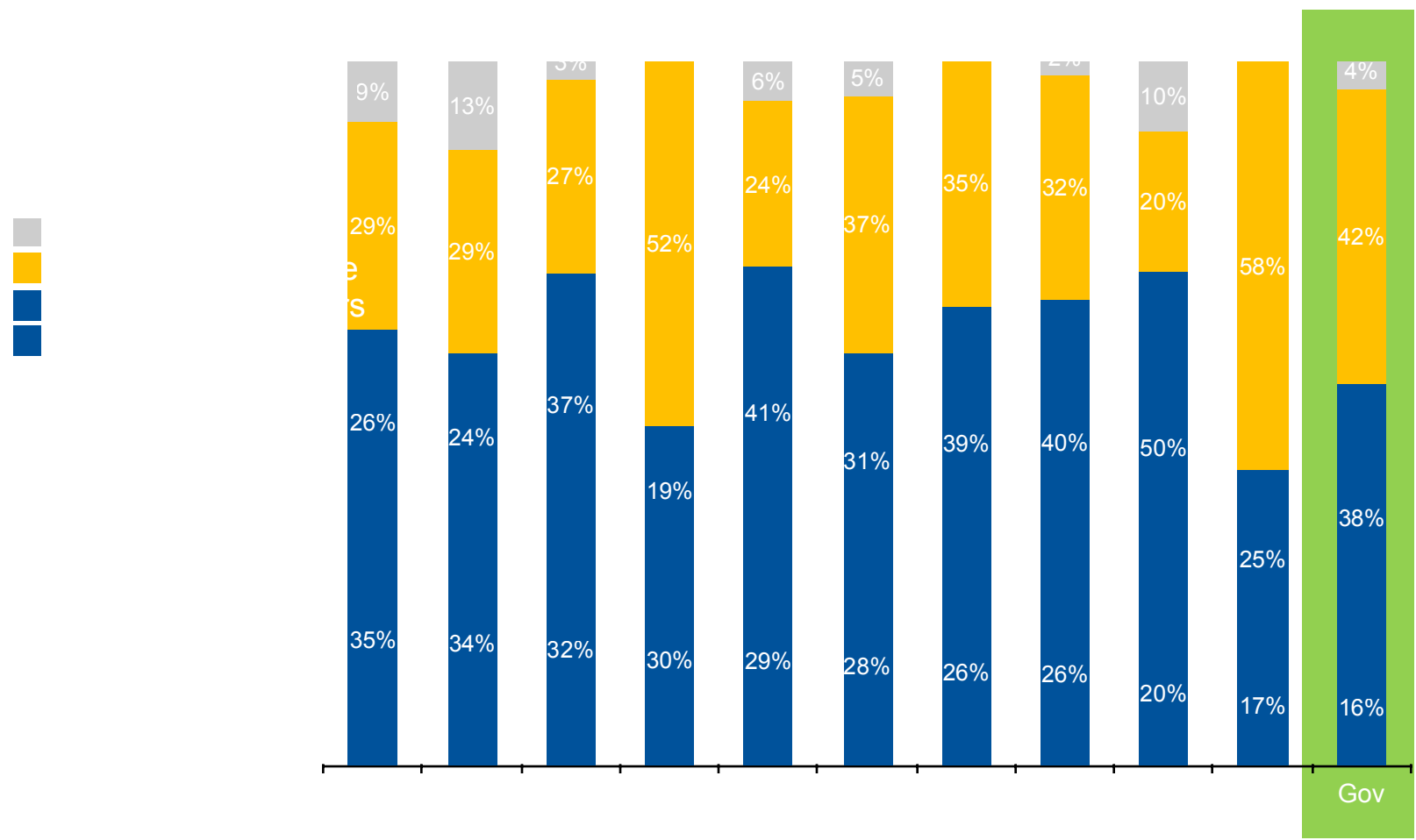
and Governance



Data Scientists

Big Data investment – *by industry*

Has your organization already invested in technology specifically designed to address the big data challenge?

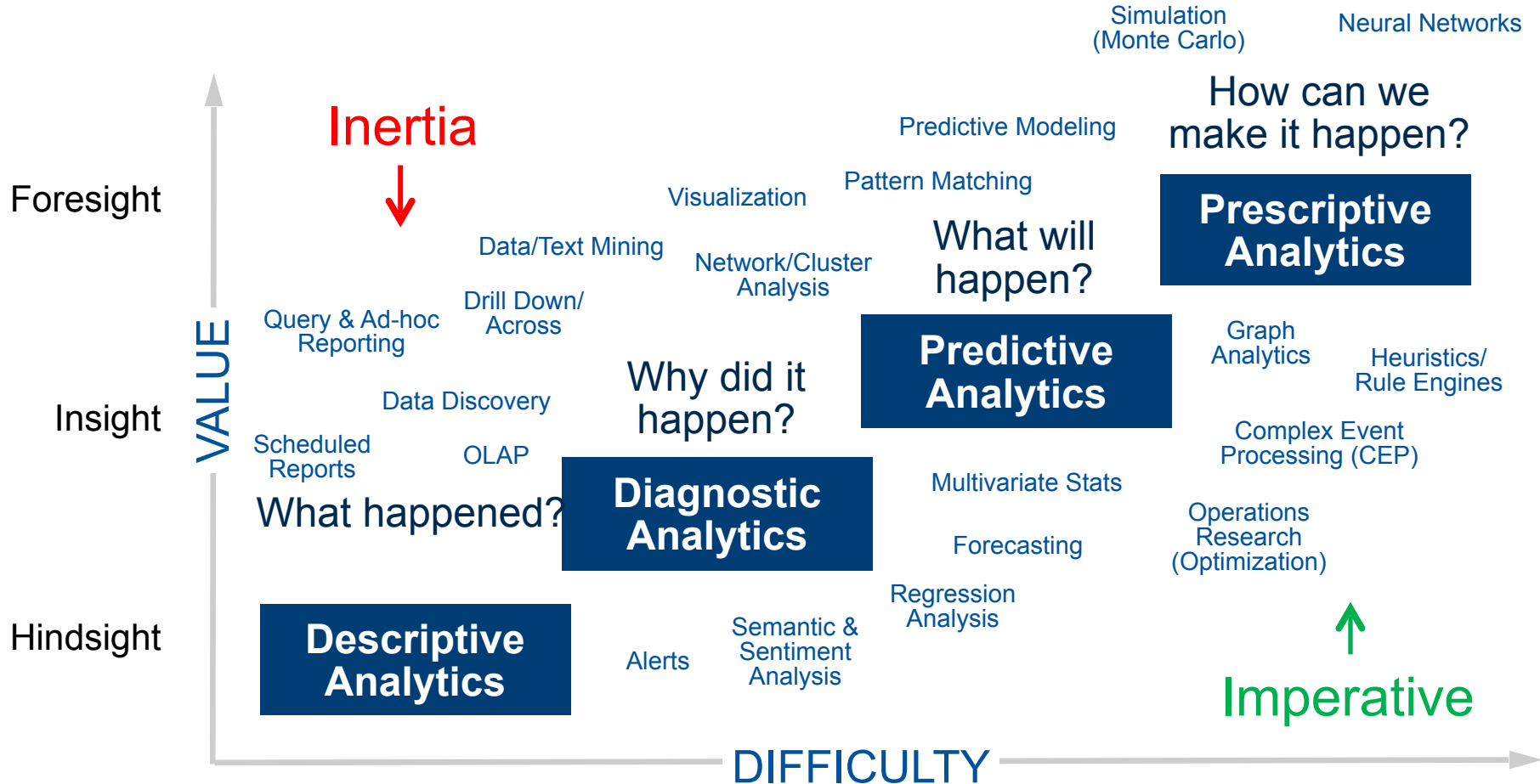


Best Practices in Analytics

"I need to get
my
organization
out of the
report
writing
business."



The Gartner Analytic Continuum



The data science skillset

Data Management

Analytics Modeling

Business Analysis

Understand Data

- Integrate and Manipulate
- Structured, Content, and Hybrid Data
- Quality Assurance
- Big Data

Know Analytics

- Appropriate Techniques and Platforms
- Interpret Data and Diagnose Models
- Meet Business Requirements

Focus on the Business

- Goals
- Constraints
- Decisions
- Change Management
- Communication of Results

Soft

Communication

Teamwork

Creativity

Collaboration

Passion

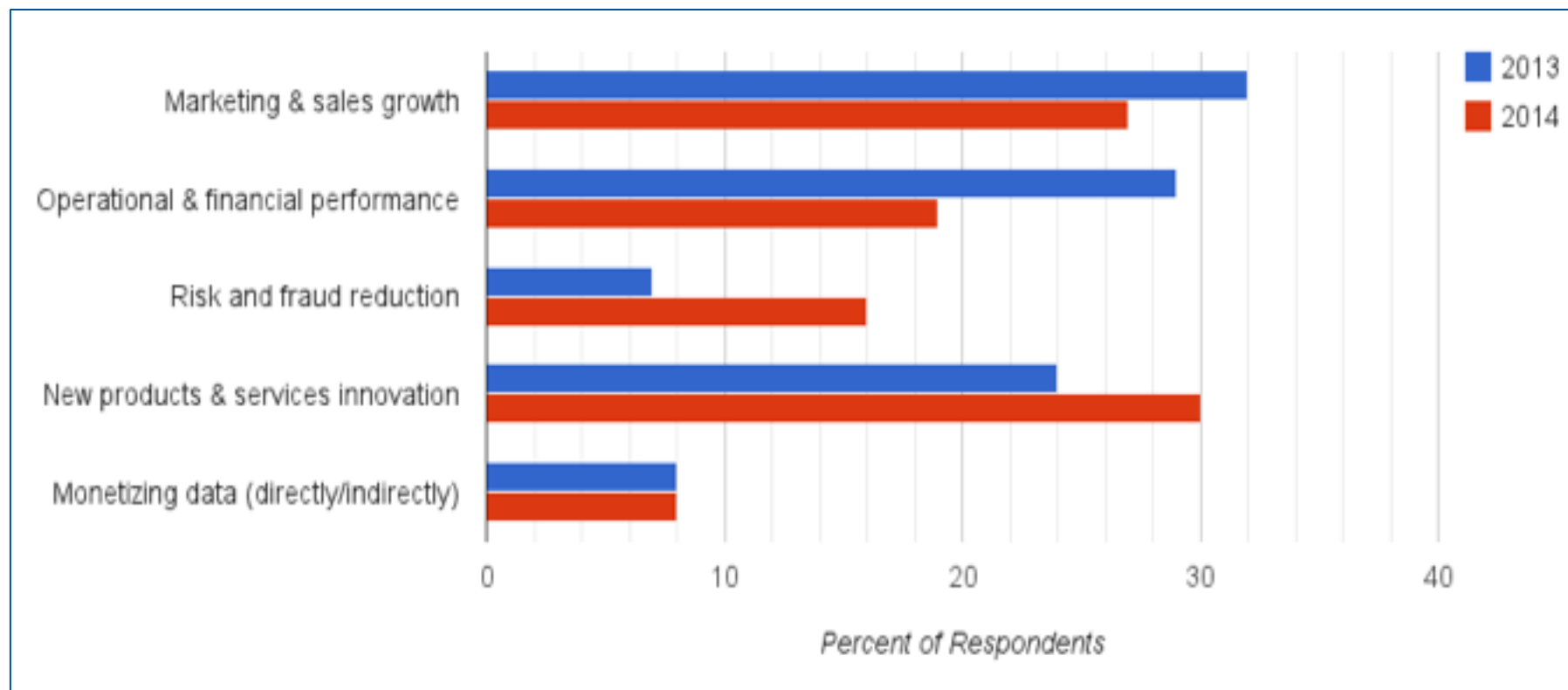
Discipline

Skills

Big Data & Analytics

Real World Examples

Which is the biggest opportunity for Big Data?



Source: Gartner Big Data Webinars, March 2013 & 2014

Betting the Farm on Information

- Opportunity
 - Improved farming productivity, growth and margins
- Data and Analytics
 - Soil tested with electrical charges and mapped for precise fertilizer dosages applied automatically
 - Drones equipped with infrared cameras survey for flood, irrigation and crop stress
 - Combines take continuous readings, analyzing data in real time data on moisture, yields, etc. via iPads
- Results
 - Ability to farm 20,000 acres, up from 700 acres in the 1970s, with only 25 employees
 - ROI growth from 14% to 21%, despite 8x increase in cost of sensor-loaded combines
 - Eliminated need for crops diversification to hedge against weather, disease and market conditions



A Fire Hose of Big Data

- Opportunity
 - Limit the instance and spread of forest fires
- Data and Analytics
 - The WIFIRE system combines local sensor data including temperature, wind, humidity, along with topography and other satellite imagery, and fuel conter..
 - Analyzed in UCSD's Supercomputer Center to generate dynamic, real-time wildfire modeling
- Results (TBD)
 - Identify potential hotspots and better determine firefighting strategies
 - Save lives, property, forests and water
 - Operational trial starting in Jan 2015



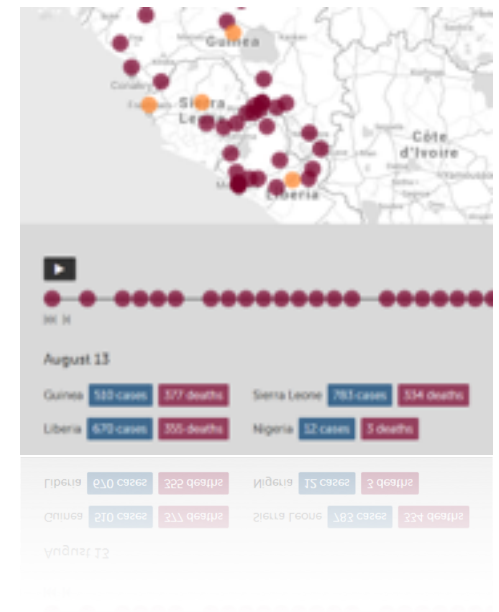
South Australia Water taps into demand and forecasting

- Opportunity
 - Provide reliable forecasts for demand, movement and supply of clean water.
- Data and Analytics
 - Imports weather data and historical customer usage data to analyze potential demand for all water data collection every 15 minutes
 - Amulet Predictive Analytics creates 'what if' scenarios in 30 minutes, replacing 2-3 weeks of analysis
- Results
 - Actual versus predictive forecasts of water demand, levels, and best routes by zone.
 - Amulet calculates daily water demand up to 2 years into the future.



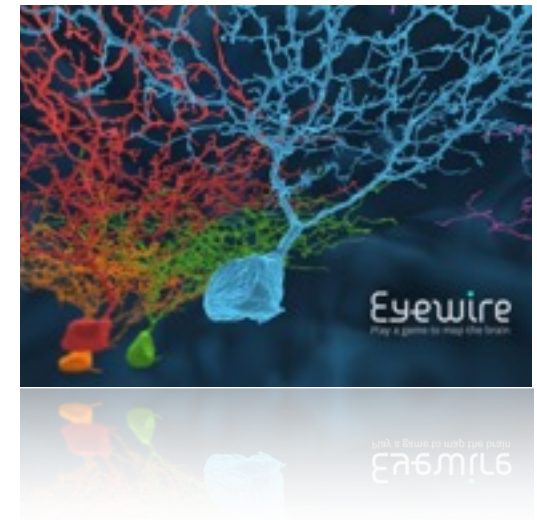
Outperforming Traditional Outbreak Monitoring

- Opportunity
 - Early identification of disease outbreaks
- Data and Analytics
 - Automatically sifts through millions of posts on dozens of social media sites, local news reports, medical workers' social networks and government websites to track instances of disease
 - Sophisticated filtering algorithm to reduce “noise”
 - Continually plots disease hotspots on a map
- Results
 - Identified a cluster of “mystery hemorrhagic fever” in Guinea over a week before the Ministry of Health of Guinea notified the World Health Organization (WHO), that a day later confirmed the Ebola outbreak
 - Assist the cash-strapped WHO



The Eyes Have It: 100,000 Amateur Neuroscientists Gamers

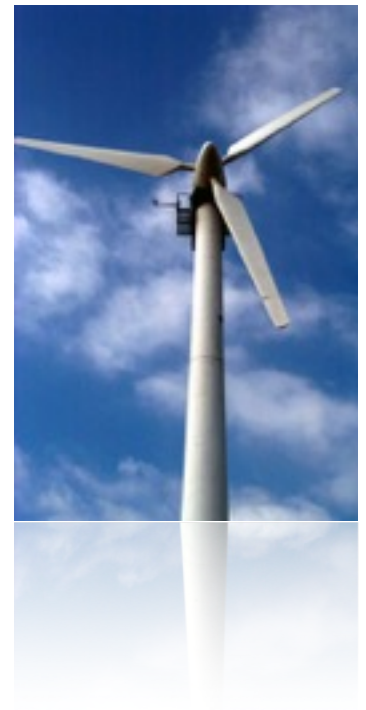
- Opportunity
 - Understand the hyper-complex tangle of connections among neurons in the brain
- Data and Analytics
 - Researcher Sebastian Seung at MIT created the online game *EyeWire* for players to color connections between retina and 3-D slices of the brain
 - Artificial intelligence app is learning how humans map the cells
- Results
 - 140,000 players from 120 countries have charted 50 entire cells as of May 2014
 - AI app provides increasing levels of assistance to players; ultimately it will be able to perform this task alone



Blowing Away Previous Modeling Capabilities

- Opportunity
 - Precise placement of wind turbines affects performance and useful life and energy costs
- Data and Analytics
 - 10x increase in breadth (178 parameters) and history (18-24 *petabytes*) of weather data , including temperature, barometric pressure, humidity, precipitation, wind direction & velocity from 0-300 feet altitude
 - Supercomputing-based analytics from IBM enables 10 sq meter grids vs 27 sq km grids previously modeled
- Results
 - Reduced wind forecast modeling by 97% (3 weeks to 15 minutes) to pinpoint optimal placement of each turbine
 - One month faster turbine site development (one turbine installed every three hours)
 - Reduced energy costs to utilities and consumers

Vestas



Gartner

Data mining for riskless farming

- Opportunity
 - Former Google employees offer crop insurance to underserved parts of the world
- Data and Analytics
 - Continually gathering weather measurements from 500K locations; 30 trillion simulation data points
 - Actuarial analytics to predict weather-related risks for specific crops in specific locations
 - Hadoop, Lisp, Clojure, Amazon Web Services; 1000s of concurrent instances of map-reduce
- Results
 - Out-compete insurers that can't assess granular risk; automatic claim payments based on weather
 - Enable farmers in Asia and Africa to take on risk



Gartner Information & Analytics Predictions

Sample Strategic Planning Assumptions

- By 2017, over 30% of enterprise access to broadly-based big data will be via intermediary **data broker services**, serving context to business decisions.
- By 2020, information will be used to **reinvent, digitalize** or eliminate 80% of business processes and products from a decade earlier.
- By 2020, 30% of data will be prescribed **provenance**, business, security and value metadata at the time of its creation.
- By 2017, 80% of **chief data officers** will strive to maximize the value of information while they continue working to minimize its risks.
- Through 2017, 50% of organizations will not have an information strategy that addresses the emerging role of **information citizen**.
- By 2017, most business users and analysts in organizations will have access to **self-service** tools to prepare data for analysis.
- Through 2016, less than 10% of self-service BI initiatives will be **governed** sufficiently to prevent inconsistencies that adversely affect the business.
- Through 2017, fewer than half of lagging organizations will have made **cultural or business model adjustments** sufficient to benefit from big data.

Key Government Strategic Planning Assumptions

- By 2018, more than 30% of local government agencies will depend on data supplied by the internet-of-things to support at least 50% of their mission-critical programs.
- By 2018, 20% of smart cities worldwide will have key initiatives that address medical/healthcare and aging population issues to improve the quality of life.

Conclusion

Action Plan for Information Management and Business Leaders

Monday Morning:

- *Catalog* relevant internal and external data sources available
- *Institute* or enhance innovation workgroup to focus on big data and analytic opportunities

Next 90 Days:

- *Establish* data science team to consult proactively with businesses on big data and advanced analytics opportunities
- *Identify* at least one analytic idea from outside your industry to adopt and adapt

Next 12 Months:

- *Refocus* investments and resources away from hindsight reporting and toward diagnostic, predictive, and prescriptive analytics
- *Launch* a new capability or service using big data