Which Part of Your Data Analytics Dollar is Wasted?

Decision Analysis as Guidance for Data Analysis

Robert D. Brown III

Endeavor

Who should care about the conversation today and why?

- <u>Data analysts</u> who want to ensure the relevancy of their contribution and improve the odds that their Big Data Analytics (BDA) initiatives produce value

- <u>Decision analysts</u> who want to extend their practice into a domain that promises value but still needs appropriate guidance to reach maturity
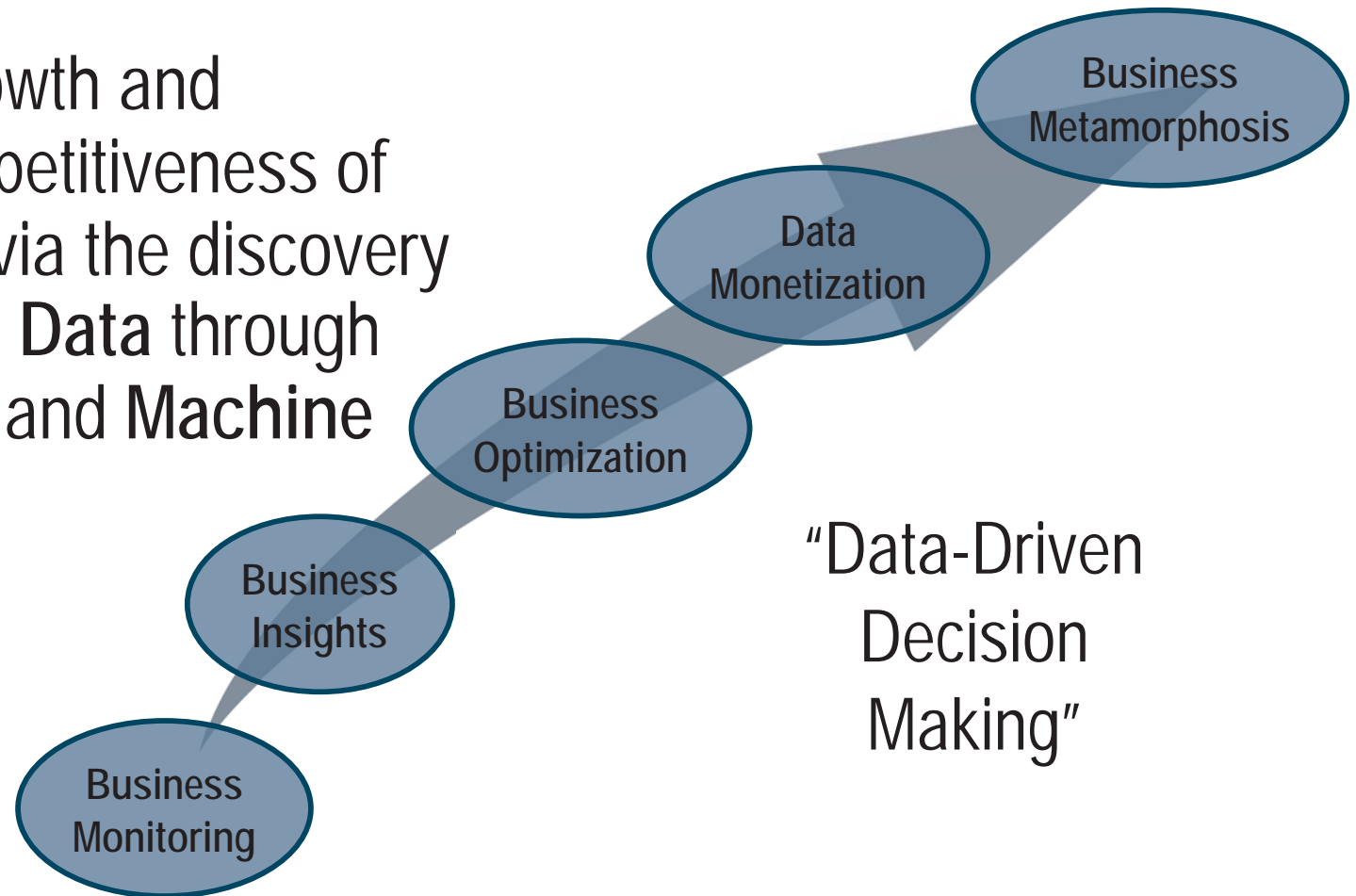
Poll

Which of the following descriptions best characterize your current role?

- Data analyst/scientist
- Decision analyst
- Manager of analysts
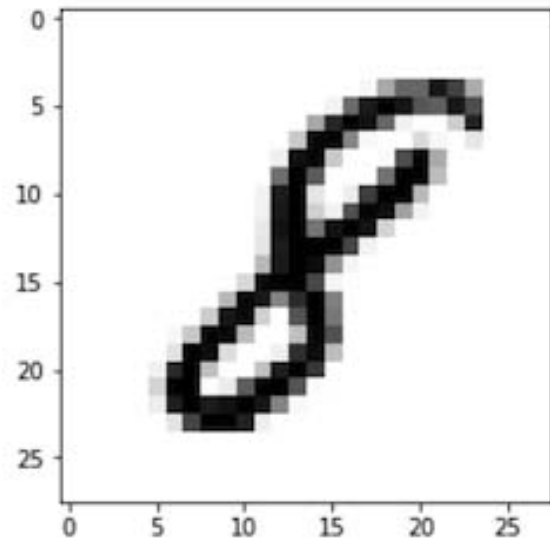- Curious onlooker
- None of the above

What we mean by Big Data Analytics (BDA)

Enable the growth and improved competitiveness of organizations via the discovery of value in **Big Data** through **Data Science** and **Machine Learning**.
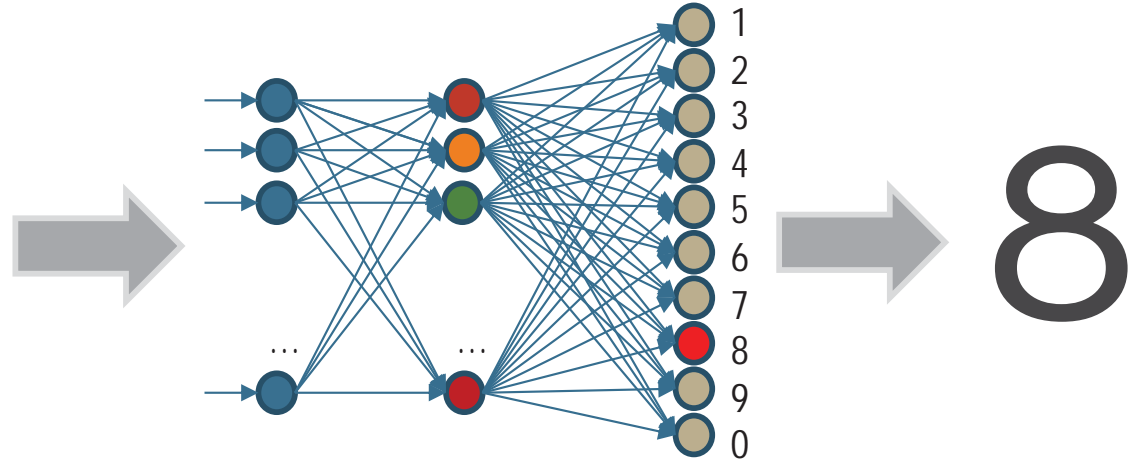
Business Metamorphosis

Data Monetization

Business Optimization

Business Insights

Business Monitoring

"Data-Driven Decision Making"

What we <u>don't</u> mean by Big Data Analytics

"Simple" machine learning exercises on MBs of data

http://yann.lecun.com/exdb/mnist/

Machine Learning algorithm

The commercial applications are numerous

Retail & Consumer

Health & Life Sciences

Finance & Fraud Service

Telecommunications

Web & Digital Media

Ecommerce & Customer Service

Your recently viewed items and featured recommendations

Inspired by your browsing history

American Kingpin: The Epic Hunt for the...
› Nick Bilton
★★★★☆ 434
Hardcover
$14.77 ✓prime

Warlight: A novel
› Michael Ondaatje
★★★★☆ 376
Hardcover
$18.32 ✓prime

Python Machine Learning: Machine Learning and...
› Sebastian Raschka
★★★★☆ 43
Paperback
$35.99 ✓prime

Data Visualisation: A Handbook for Data...
› Andy Kirk
★★★★☆ 12
Paperback
$28.42

Example: Amazon's successful recommender engine suggests similar items that may interest me based on similar buying patterns of millions of users.

"There's gold in them thar hills!"

Prospectors in an American data rush mine for data they can exploit.
Ebenezer finds a golden nugget of data.
(Photo: public domain, 9 July 1850)

- Dig for monetizable information contained and hidden in data
- Intended to address the problem of human bias in decision making
- Witnessed a rapid proliferation and democratization of tools
- Now in full hype cycle

Poll

What level of commitment has your organization made to an implementation of Big Data Analytics?

- None

- We have discussed it formally but have no plans yet

- We have a plan but have not committed resources

- We have 1-5 resources committed with a short term budget

- We have >5 resources and a commitment to a growing budget

Despite the significant investments in advanced analytics, Gartner forecasted in 2015 that 60% of big data projects would fail through 2017.

Photo of young girl expressing surprise

"…through 2017, 60% of Big Data projects will fail to go beyond piloting and experimentation and will be abandoned."
"Three promises and perils of Big Data", April 08, 2015, Bain Brief, Eric Almquist, John Senior and Tom Springer

What explains this failure rate?

- Inexperienced talent pool?

- Low quality and irrelevant data?

- Over-engineered solutions?

- Project mismanagement?

- Oversold hype?

- FOMO or FOBLB?

Photo of man looking intently at his computer

The rates and reasons for failures of IT initiatives are well known

State	13 Yr. Avg. (1994-2015)
Failed: The project is cancelled before completion or never implemented.	23%
Challenged: The project is completed and operational, but over budget, late, and with fewer features and functions than originally specified.	48%
Successful: The project is completed on-time and on-budget, with all features and functions originally specified.	29%

Thanks to Eric Torkia with Technology Partnerz for compiling the information in the chart from the Chaos Report.

"Half the money I spend on advertising is wasted."

"The trouble is, I don't know which half."
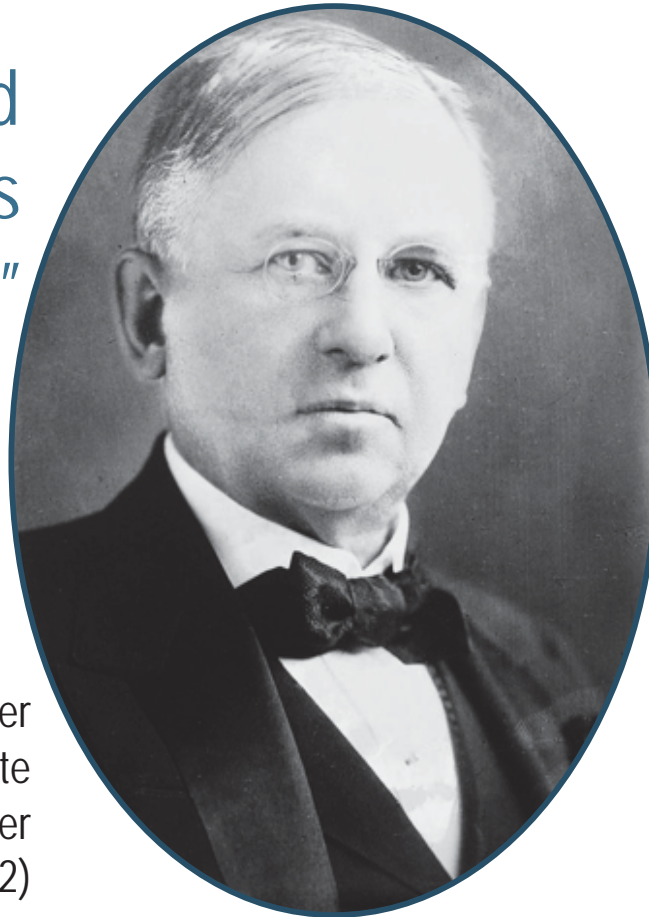
John Wanamaker
Department store magnate
and marketing pioneer
(1838-1922)

https://commons.wikimedia.org/wiki/File:John_Wanamaker.jpg

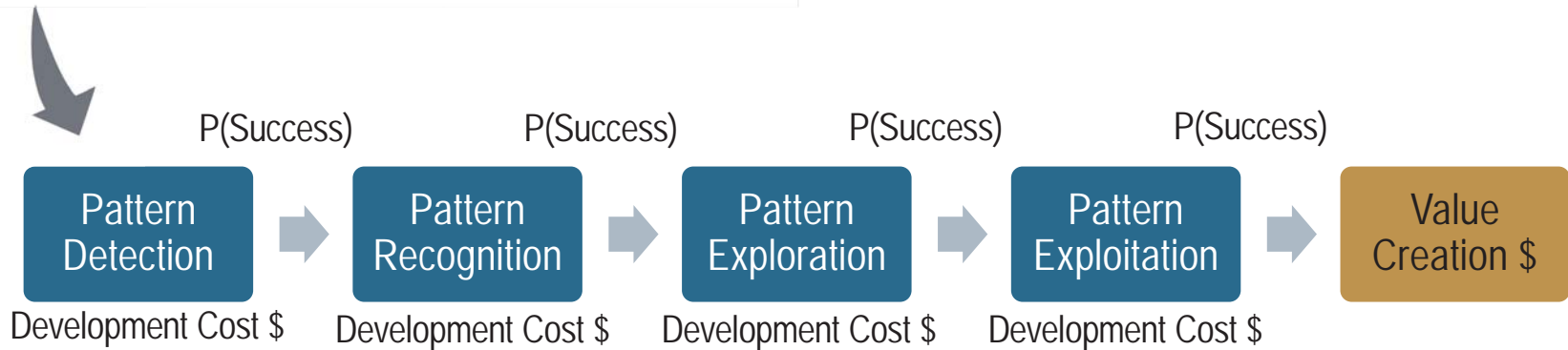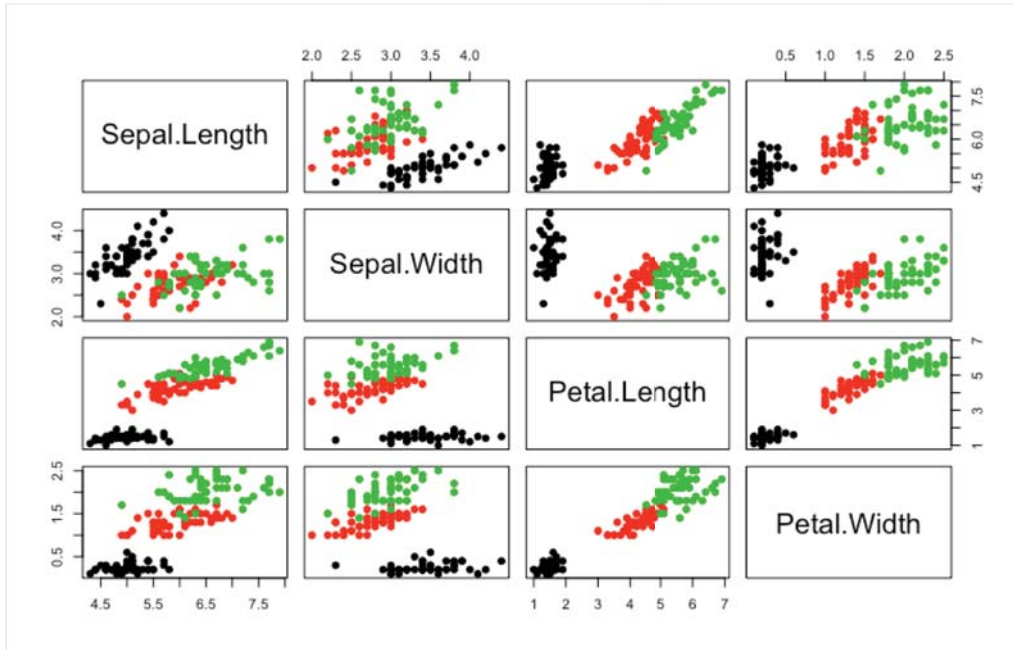# The situation was actually worse than anticipated

Photo of young girl covering her eyes

Turns out, the humans are still involved.

"A year ago, Gartner estimated that 60% of big data projects fail. As bad as that sounds, the reality is actually worse. According to Gartner analyst Nick Heudecker this week, Gartner was 'too conservative' with its 60% estimate. The real failure rate? '[C]loser to 85 percent.'"

"Gartner says that one of the main reasons big data projects have failed to come together is a lack of proper management, combined with lots of trial and error from companies that just throw systems together willy-nilly."

BDA initiatives are just like any other project

P(Success)   P(Success)   P(Success)   P(Success)

Pattern Detection	→	Pattern Recognition	→	Pattern Exploration	→	Pattern Exploitation	→	Value Creation $
Development Cost $		Development Cost $		Development Cost $		Development Cost $		

A "**Data-driven**" attitude deflects us from considering why we make decisions in the first place

- Our **values** drive us to make decisions as individuals and organizations to increase the chances of being happier.

- Good data (clean, unbiased, pedigreed, and relevant) contributes to making fine distinctions that help us choose wisely.

- **Values-driven & data supported** decision making is what we should be pursuing.

- **Decision Quality** provides a means to tie these ideas together.

Photo of happy, smiling children

We make decisions to increase the chances of being happier in one state versus the known alternatives

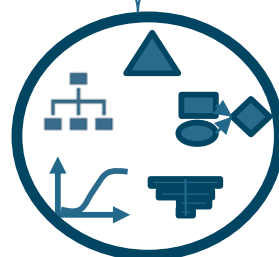# A **Decision Quality** framework provides a pathway to bring values back to the discussion
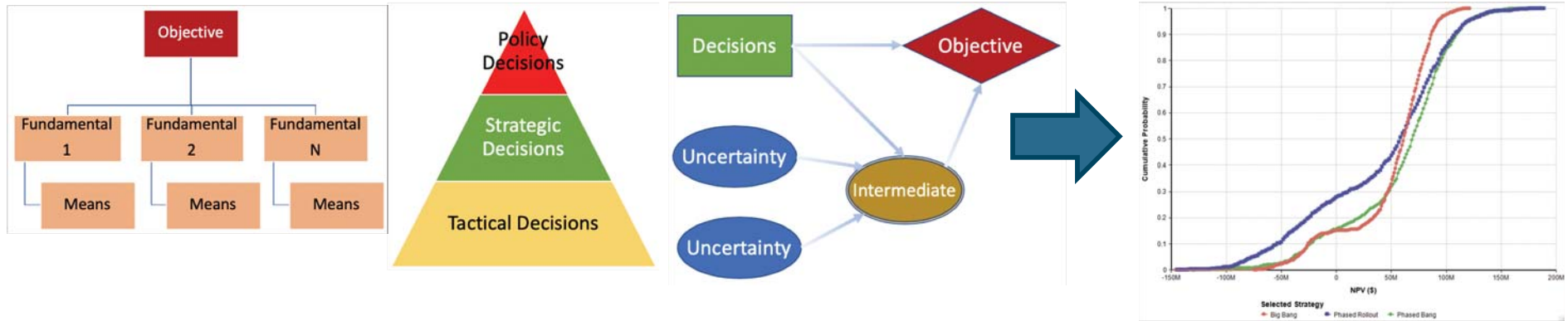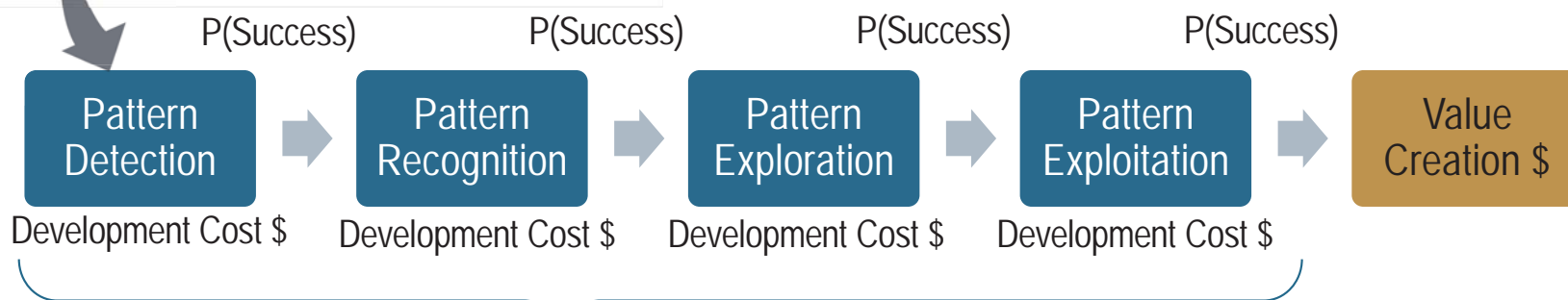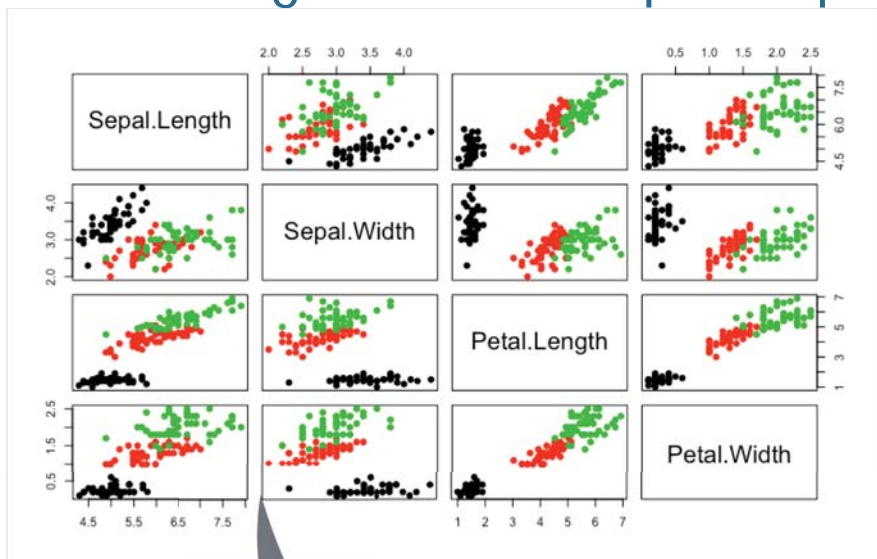

Frame the problem and then evaluate the business case value

- Clarify what we value and why
- Clarify what we can do now with decision strategies to achieve what we value
- Clarify how events outside our control (i.e., uncertainties) but conditional on the decisions we make can affect achieving the value we desire
- Create simulations to provide important insights and tradeoffs about opportunity cost among decision strategies

Decision Quality suggests that we should hypothesize why and how observed data patterns can be exploited to achieve value before committing to the development process

P(Success)   P(Success)   P(Success)   P(Success)

Pattern Detection → **Pattern Recognition** → **Pattern Exploration** → **Pattern Exploitation** → **Value Creation $**

Development Cost $ Development Cost $ Development Cost $ Development Cost $

Decision Quality framework ensures relevance and feasibility of continued development
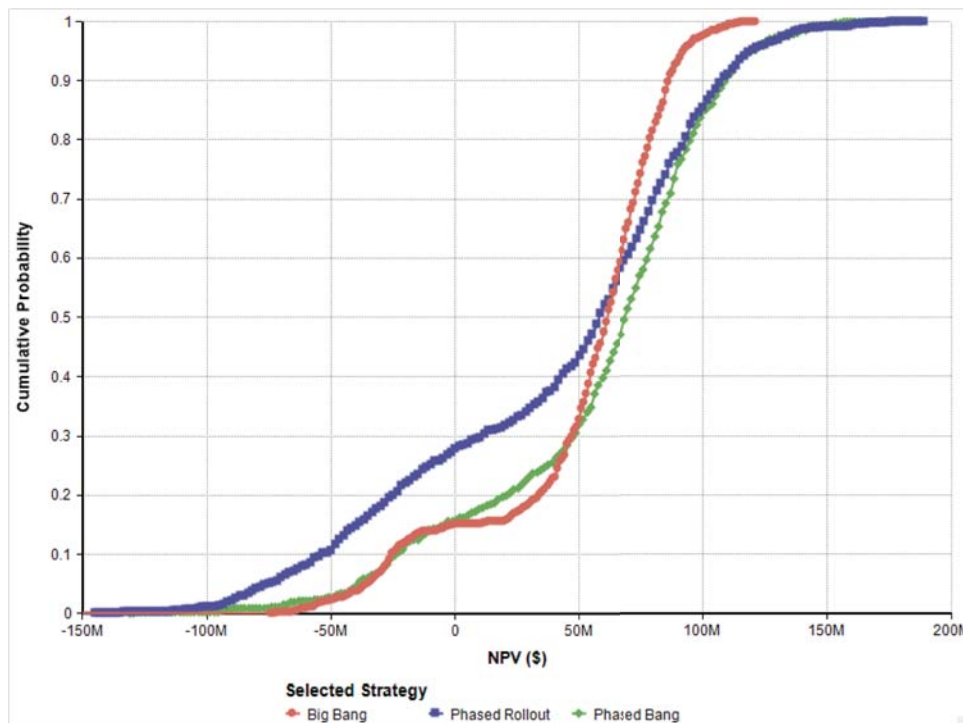
# Example: A data set reveals an interesting pattern about customer churn
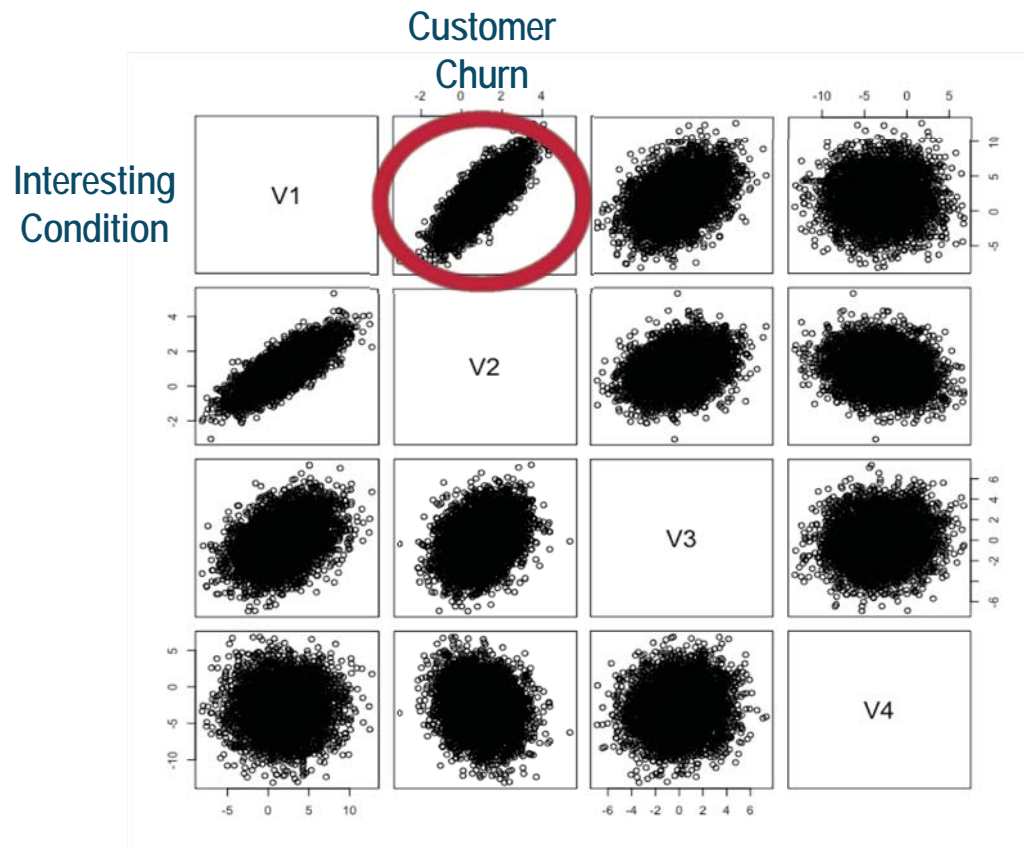
- Is the correlation real?
- Can you establish causality?
- Is it worth doing something about?
- How do you know?

Value of Information (VOI) can help data scientists use research budgets to optimize the data exploitation process


- How much would you be willing to pay to know with certainty that you should choose one strategy over the others due to the effect of, say, Churn Rate (or any other uncertainty)?

- Data analysis applied to refining information to gain a higher sense of confidence about the best course of action is wasted if it exceeds the VOI for the current level of information.

Organizations often have more good project opportunities than budget to execute them

NPV of Proposed Projects
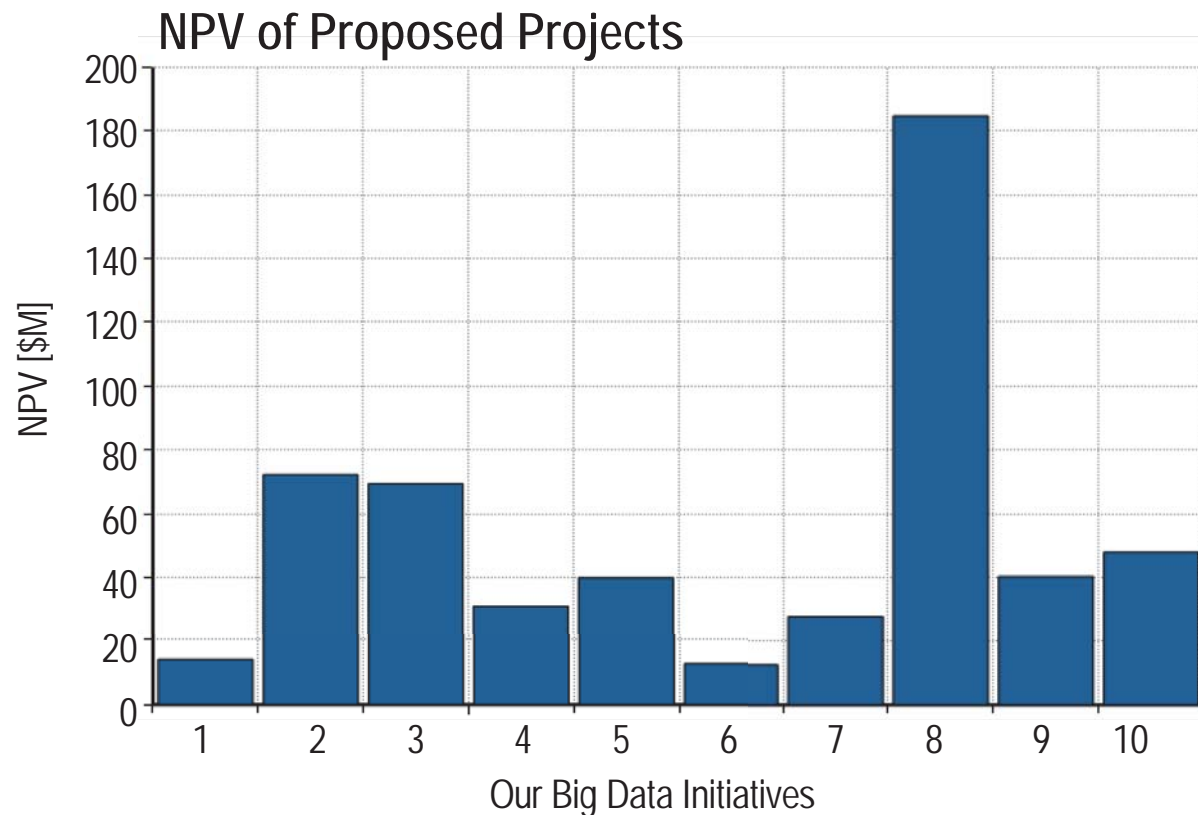
If you had to prune or defer a project, how would you make that choice?

Portfolio analysis guides us to select BDA projects that generate value at the highest rate

Marginal Project Value Contribution
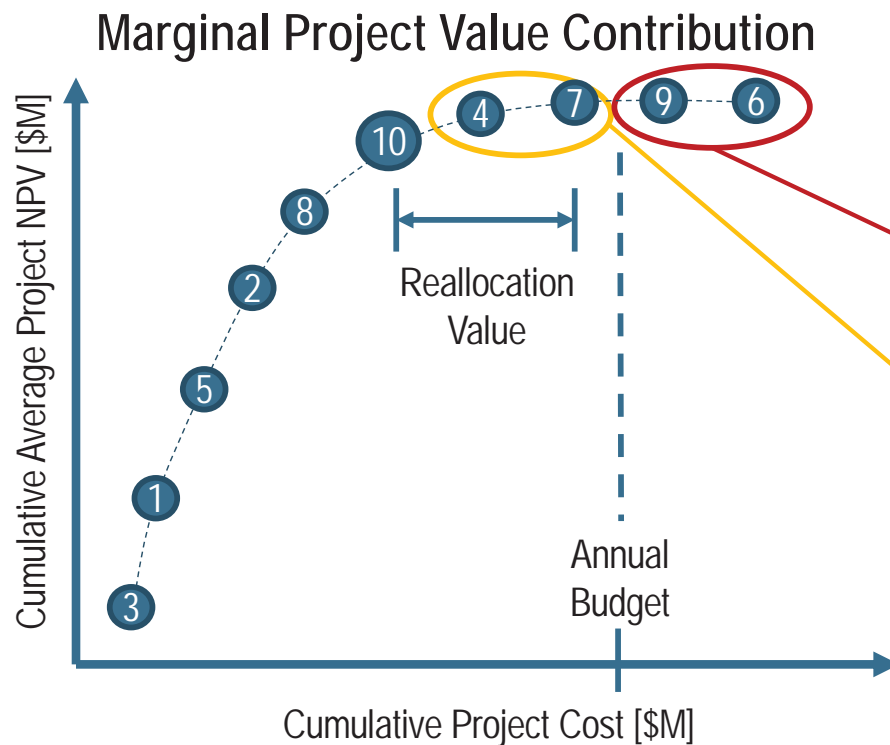
- Prioritize the value of BDA initiatives on the basis of Productivity Index
  - $PI = E(NPV_i) / Cost_i$
- Remove projects that fall outside annual budget
- Remove projects with little marginal contribution of value; reallocate value to other valuable uses

Repeating the process from year to year adds accelerating benefits to your organization

Portfolio Value over Time
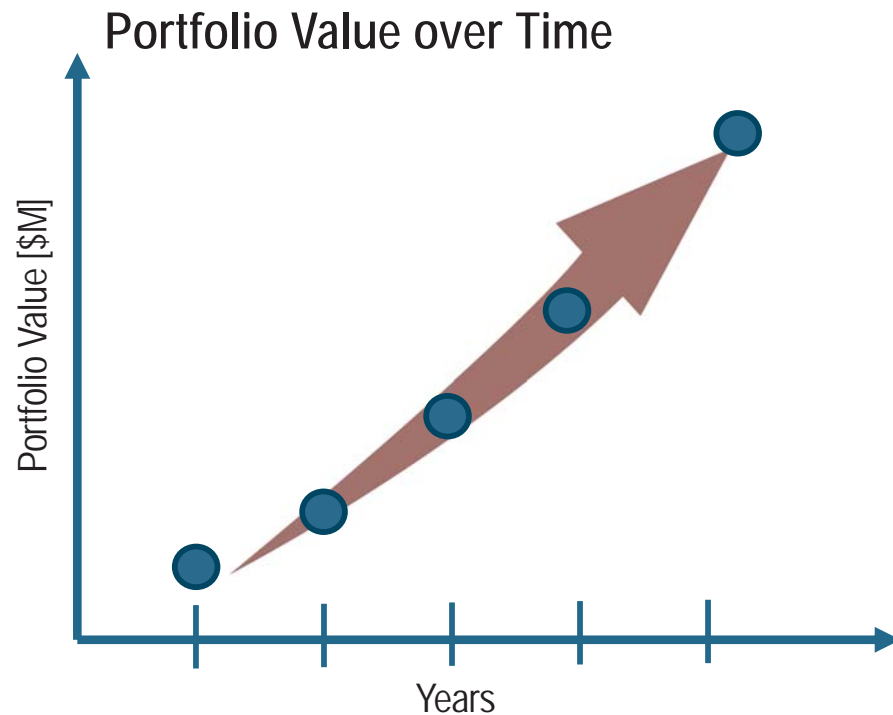
- Improves your ability to recognize valuable opportunities and problems-to-be-solved

- Increases cross functional collaboration to ensure each project addresses relevant stakeholder concerns

- Accelerates the efficient use of capital resources

BDA certainly presents opportunities for organizations to create new sources of value

Without a guiding Decision Quality framework, BDA faces

- Failing due, at least, to lack of relevance

- Becoming another expensive business fad

Photo of someone making notes in an business notebook

For BDA to avoid the failure of relevance…

- Ensure that a BDA initiative addresses a real problem or opportunity and frame it at the right scope and context.

- Demonstrate that there is a clear value proposition for initiating a Big Data exploitation project.

- Understand what potential value creators and risk factors to your organization might be for each initiative.

- Use Value of Information to guide and budget the refinement of the understanding of those risks to maximize the likelihood of success.

- Treat the BDA initiatives as a portfolio. Prioritize your initiatives accordingly.

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Endeavor

950 Echo Lane, Suite 200
Houston, TX 77024
+800 846-4051
info@endeavormgmt.com

www.endeavormgmt.com

Endeavor Management is a management consulting firm that leads clients to achieve real value from their strategic transformational initiatives. We serve as a catalyst by providing the energy to maintain the dual perspective of running the business while changing the business through the application of key leadership principles and business strategy.

In 2012, Gelb Consulting became an Endeavor Management Company. Our combined experience (Gelb founded in 1965) offers clients unique capabilities to focus their strategic initiatives with a thorough understanding of customer needs to drive marketing strategies, build trusted brands, deliver exceptional customer experiences and launch new products. Our experienced consultants and analysts use advanced marketing research techniques to identify customer needs and spot high potential market opportunities.

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