

# The Case for the Chief Data Officer

Peter Aiken, Ph.D.

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## Peter Aiken, Ph.D.

- 30+ years in data management
- Repeated international recognition
- Founder, Data Blueprint ([datablueprint.com](http://datablueprint.com))
- Associate Professor of IS ([vcu.edu](http://vcu.edu))
- DAMA International ([dama.org](http://dama.org))
- 9 books and dozens of articles
- Experienced w/ 500+ data management practices
- Multi-year immersions:
  - US DoD (DISA/Army/Marines/DLA)
  - Nokia
  - Deutsche Bank
  - Wells Fargo
  - Walmart
  - ...



## CIOs aren't ...

- 88 pages, 16,000 words
- Not written for you
- It is for your boss' boss
- Must make fundamental changes to the c-suite for data (especially big data) to succeed
- Amazon Best Sellers Rank: #767,842 in Books (See Top 100 in Books)
- #312 in Books > Business & Money > Management & Leadership > Industrial
- #702 in Books > Computers & Technology > Databases & Big Data > Data Processing
- #1025 in Books > Textbooks > Computer Science > Database Storage & Design



**EXPERIENCE: Succeeding at Data Management—BigCo Attempts to Leverage Data**

Full Text:  PDF

Author: [Peter Aiken Virginia Commonwealth University/Data Blueprint](#)

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Journal of Data and Information Quality (JDIQ) - Challenge Papers, Regular Papers and Experience Paper [JDIQ Homepage](#) archive  
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Article No. 8  
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[table of contents](#) doi>[10.1145/2893482](#)

 2016 Article

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- Refereed

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<http://tinyurl.com/PeterStudy>

# WHY JOHNNY CAN'T READ, WRITE, OR DO 'RITHMETIC EVEN WITH A COLLEGE DEGREE

AN ACCOUNT OF THE FRAUD  
OF HIGHER EDUCATION



PROFESSOR DOOM

YOU As A Responsible Parent Should Know ...


# WHY JOHNNY CAN'T *Data*

## AND WHAT YOU CAN DO ABOUT IT

"Will shock many a U.S. parent  
and educator." — TIME MAGAZINE

11 Printings Of The \$3.00 Edition  
Have Been Sold

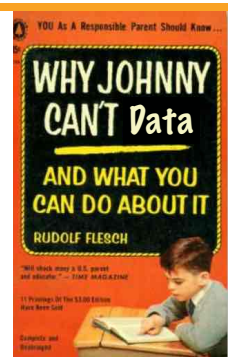
Complete and  
Reprinted



# The Case for the Chief Data Officer

Why Johnny Can't Data ...

- As-Is/Cause for Concern
  - Disclaimer/Bad Data Decisions Spiral
    - Data Management Practices Hierarchy Structure
    - Cost of the Lack of Architecture/Engineering Capabilities
    - Self Assessment/Root Cause Analysis
- To-Be/Necessary (but insufficient) CDO Prerequisites
  1. Dedicated solely to Data Asset Leveraging
  2. Unconstrained by an IT project Mindset
  3. Reporting directly to the Business



## CIOs/Organizational IT



- Have accomplished astounding technological feats
- Have developed excellent organizational skill sets
- Have delivered phenomenal business value

# Old Beer Accounting



This records a purchase of "best" beer from a brewer, c. 2050 BC from the Sumerian city of Umma in Ancient Iraq  
[http://en.wikipedia.org/wiki/File:Alulu\\_Beer\\_Receipt.jpg](http://en.wikipedia.org/wiki/File:Alulu_Beer_Receipt.jpg)



*The Hymn to Ninkasi, inscribed on a sixteenth-century BC tablet, contains a recipe for Sumerian beer*

The first references to beer dates to as early as 6,000 BC. The very first recipe for beer is found on a 4,000-year-old Sumerian tablet containing the Hymn to Ninkasi, a prayer to the goddess of brewing.  
<http://www.neatorama.com/2009/02/18/neatolicious-fun-facts-beer/#!kN0hf>

# Accounting for Beer Sales



# Bills of Mortality by Captain John Graunt



## Natural and Political OBSERVATIONS

Mentioned in a following INDEX,  
and made upon the

## Bills of Mortality.

BY

Capt. JOHN GRAUNT,  
Fellow of the Royal Society.

With reference to the Government, Religion, Trade, Growth, Air, Diseases, and the several Changes of the said CITY.

— *Non, me ac miretur Terra, labors,  
Contentus paucis Lelluribus.* —

The Fifth Edition, much Enlarged,


LONDON,

Printed by John Martyn, Printer to the  
Royal Society, at the Sign of the Bell in St. Paul's  
Church-yard, MDCLXXVI.

*See Reg. Lond.*

## Bills of Mortality

*The Diseases and Mortalities this Week,*



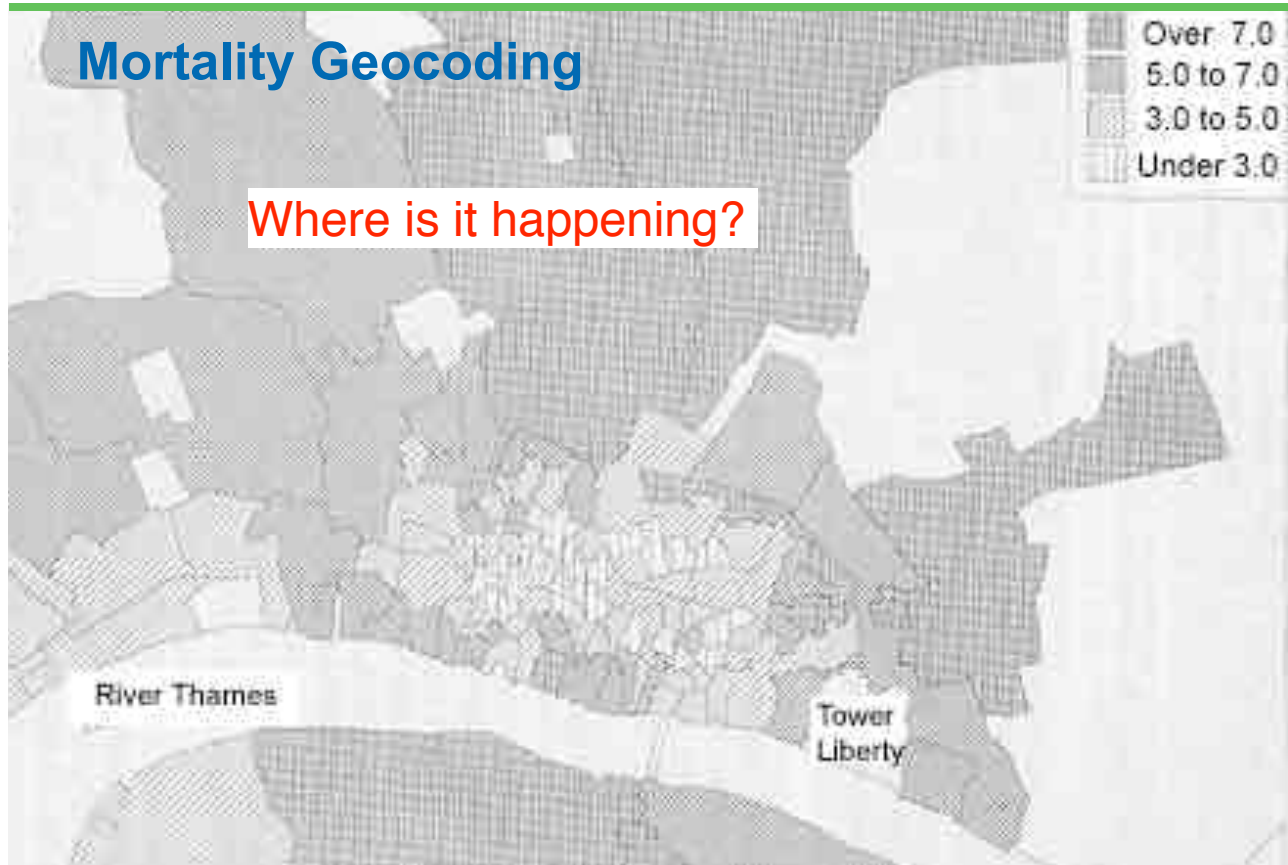
London 40		From the 17 of September to the 20, 1665.	
	Deaths	Deaths	Deaths
Above mentioned	123	123	123
Small Pox	123	123	123
Measles	123	123	123
Scarlet Fever	123	123	123
Whooping Cough	123	123	123
Consumption	123	123	123
Colic	123	123	123
Diarrhoea	123	123	123
Stomachic	123	123	123
Strangury	123	123	123
Scurvy	123	123	123
Spleen	123	123	123
Sporred Fleaver	123	123	123
Silbora	123	123	123
Serous	123	123	123
<u>Swelling of the Stomach</u>	123	123	123
Suddenly	123	123	123
Surfeit	123	123	123
Teeth	123	123	123
Thrush	123	123	123
Timpany	123	123	123
Tifick	123	123	123
Vomiting	123	123	123
Winde	123	123	123
<u>Wormes</u>	123	123	123

Males — 852      Males — 451 }  
 Christianes Females — 875      Buried Females — 422 } Plague — 718  
 In all — 1727      In all — 873 }  
 Increased in the Buriall this Week — 607  
 Particulars of the Plague — 4      Particulars Infected — 128

*The Alliance of Bread set forth by Order of the Lord Mayor and Council of Aldermen  
A penny Wheaten Loaf to contain Nine Ounces and a half, and three*

# Mortality Geocoding

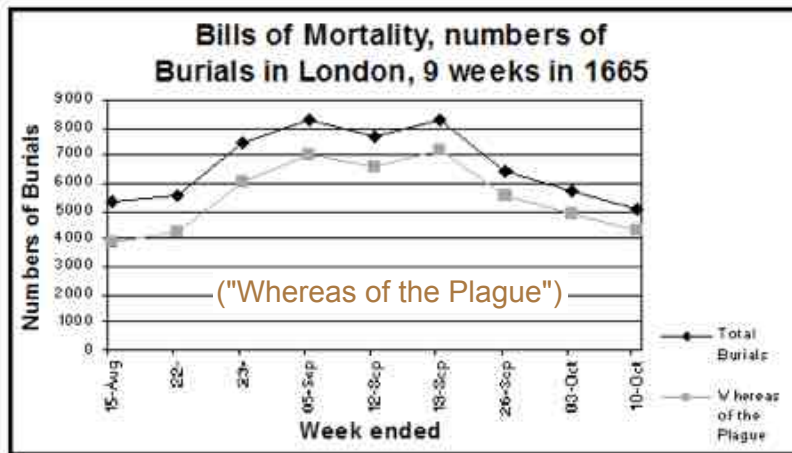
Where is it happening?



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# Plague Peak

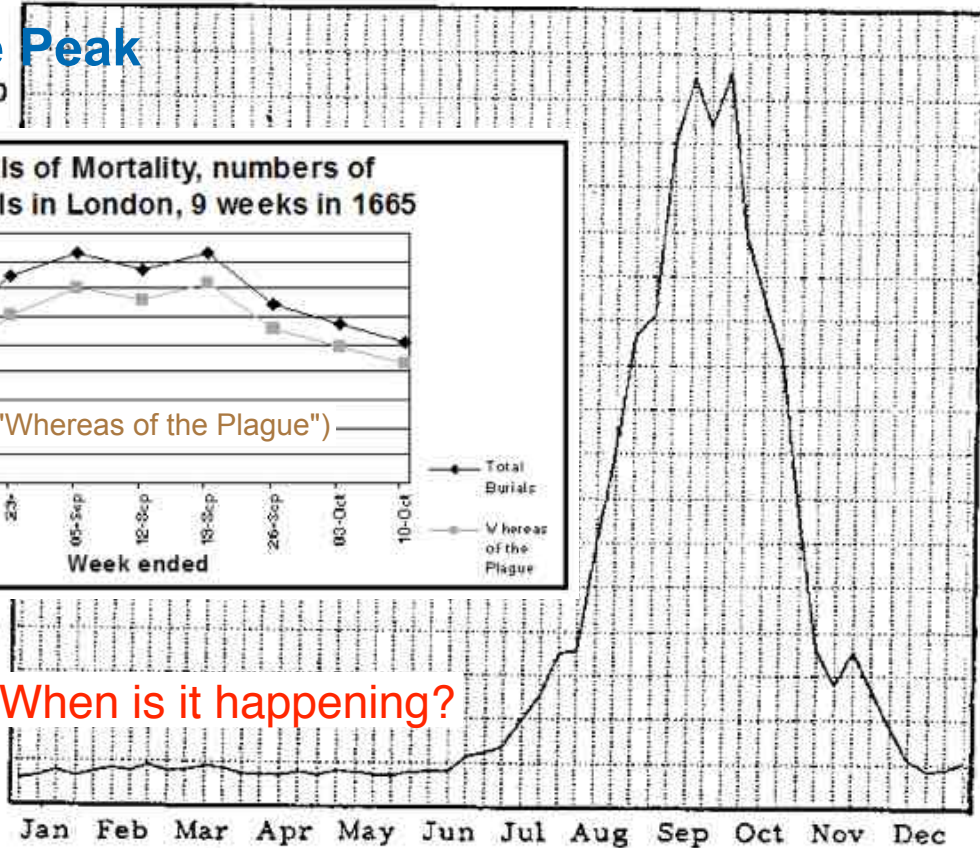
8000



2000

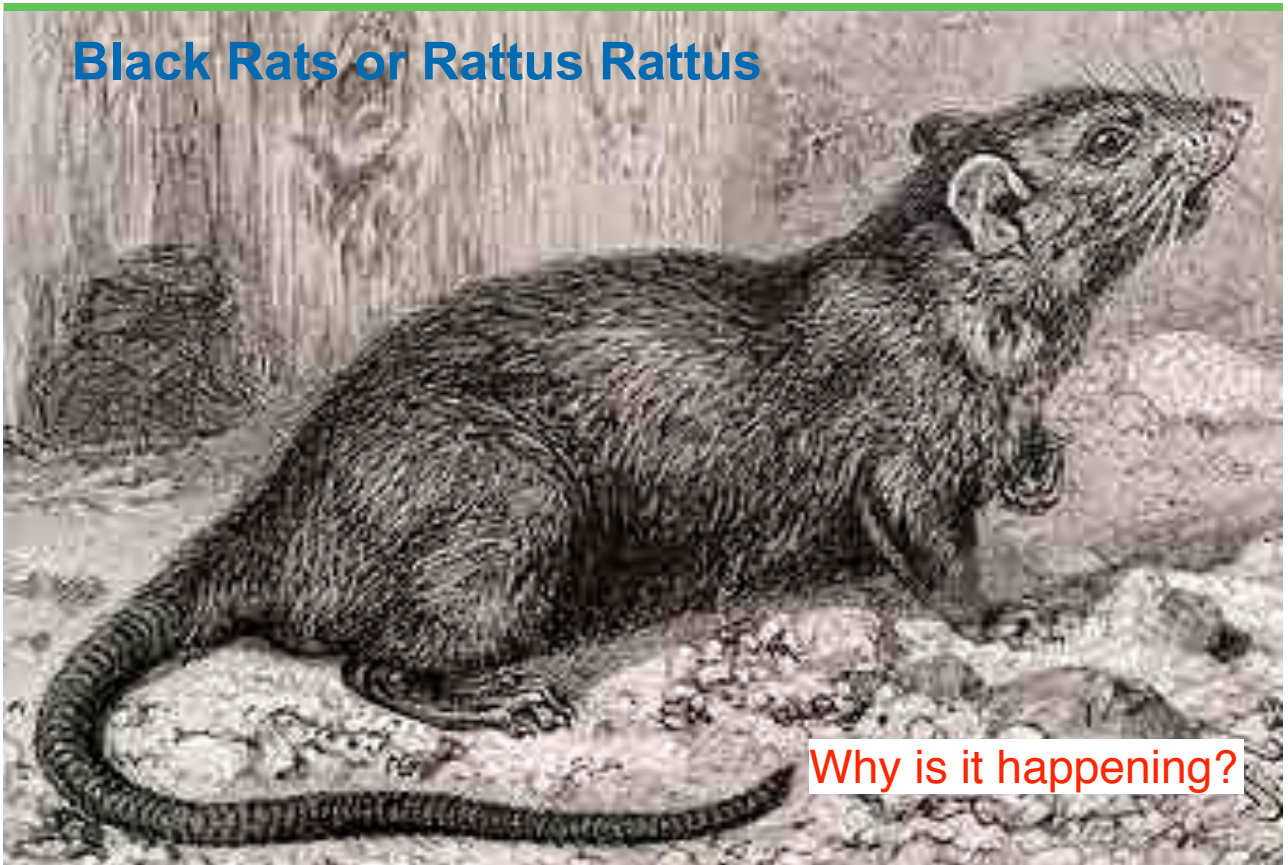
1000

When is it happening?



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# Black Rats or Rattus Rattus



Why is it happening?

What Will Happen?



What will happen?

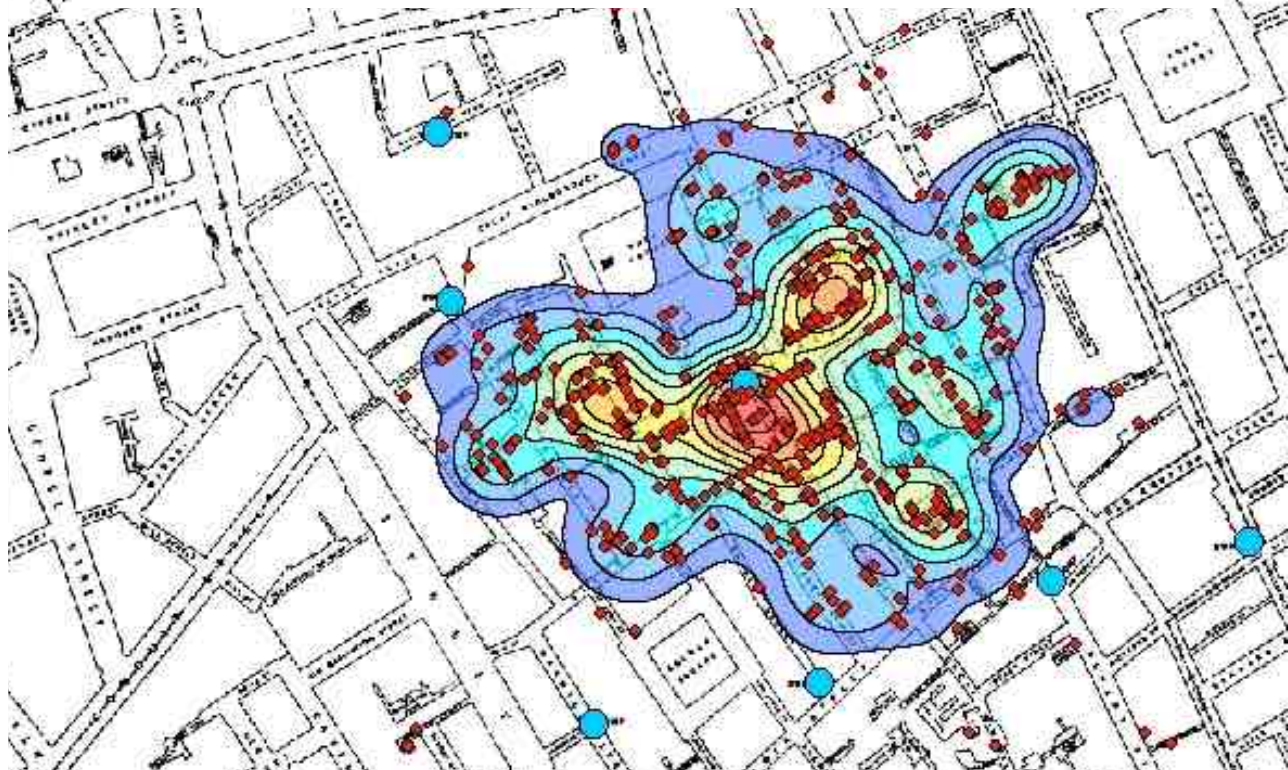


## Lord Francis Bacon, 1st Viscount St. Alban

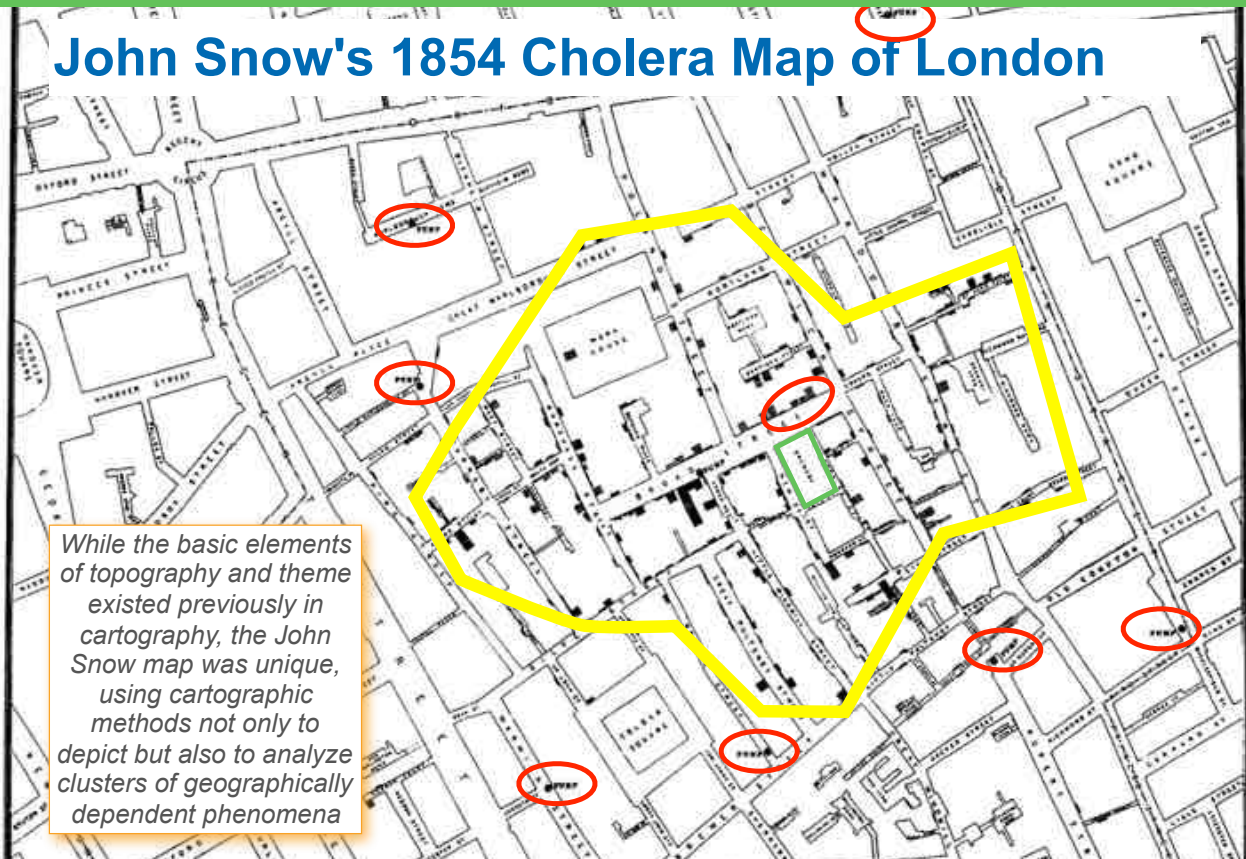
- Father of empiricism
- Popularized inductive methodologies for scientific inquiry
- Inspiration for the founding of the Royal Society in 1660



## John Snow's 1854 Cholera Map of London



# John Snow's 1854 Cholera Map of London



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## Formalizing Data Systems

- *Defend the Realm:*  
*The authorized history of MI5*  
by Christopher Andrew
- World War I
- 1914
- At war with much of Europe
- 14,000,000 Germans living in the United Kingdom
- How to efficiently and effectively manage information on that many individuals?
- Using index cards?



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# Hedy Lamarr

- Google celebrated her 101st Birthday on 11/8/2015
  - Tablets for fizzy drinks
  - Improved stop light design
- Invention of “frequency hopping” radio
  - By jumping from one radio frequency to another rapidly, only a receiver that shares the key can find the transmission
  - Prevent interference with the radio guidance controls of torpedoes
- U.S. Patent 2,292,387 (w/ George Antheil)
- Associated traffic analysis
  - Looking at other elements of a communication when you don't know the actual content
  - Time/duration of a message
  - Location of transmitters
  - Detect specific operator “fists”
  - Identify the operator and you could identify a specific ship or military unit, locate it with direction finding, and then track its activity over time

<https://theconversation.com/how-wwi-codebreakers-taught-your-gas-meter-to-snitch-on-you-29924>



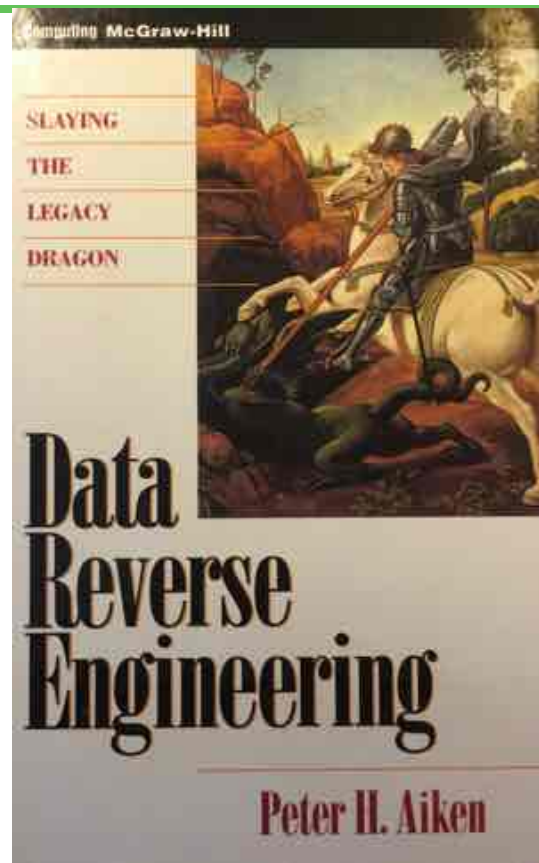
# US DoD Reverse Engineering Program Manager

- *"Your first project is to keep me from having to testify to a Congressional Hearing!"*
- Problem: 37 systems paid personnel within DoD
  - How many were needed?
  - How many potential losers?
- What do you mean by employee?
- Process modeling - inconclusive results
- Data reverse engineering - definitive
  - One legged engineer, working in waist deep waters, underneath rotating helicopter blades, on overtime



# Data Reverse Engineering

Amazon Best Sellers Rank:  
#1,841,642 in Books



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## THE WALL STREET JOURNAL. *These decisions have consequences!*

U.S. EDITION Wednesday, May 28, 2014 As of 1:58 PM EDT

Home World U.S. Business Tech Markets Market Data Your Money Opinion Life & Culture N.Y. Real Estate

May 28, 2014; 1:58 p.m. ET

### Target Shareholders Should Oust Directors, ISS Says

Article

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Text

By Paul Ziobro

A prominent proxy adviser took the unusual step of recommending that Target Corp. shareholders oust seven of the company's 10 directors, citing what it called the board's failure to manage risk and protect the retailer from a massive data breach.

Institutional Shareholder Services, which advises big shareholders like mutual funds how to vote on corporate issues, focused on directors who serve on Target's audit and corporate-responsibility committees. Those committees are tasked with overseeing and managing risk, and the data breach showed the company was inadequately prepared for the threats posed by hackers.

"It appears that failure of the committees to ensure appropriate management of these risks set the stage for the data breach, which has resulted in significant losses to the company and its shareholders," ISS wrote.

### Target's CEO is out in wake of big security breach

- Beth Jacobs abruptly resigned in March



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# Managing Data with Guidance?



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Life is Short. Have an Affair.®



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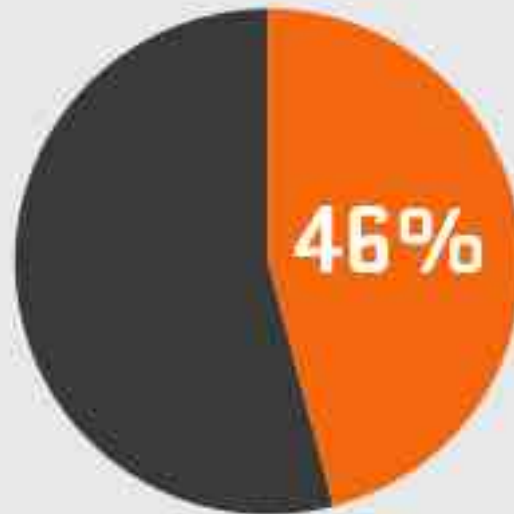
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## NEWS FLASH!

46% of companies report they made an inaccurate business decision based on bad or outdated data. Bad data leads to bad business decisions. Companies need to be careful that their data is sound – especially when dealing with investors.

Like Comment Share

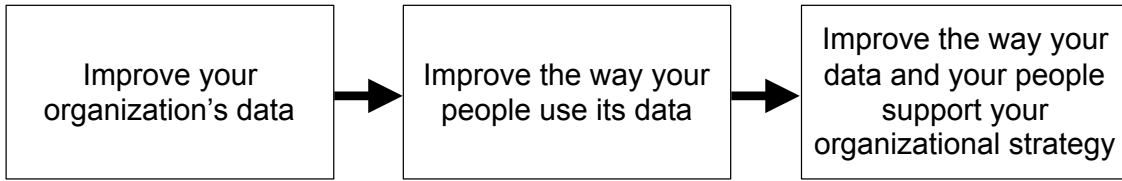


## Data Strategy Motivation

- Put simply, organizations:
  - Have little idea what data they have
  - do not know where it is (and)
  - do not know what their knowledge workers are doing with it



# Reasons for a Data Strategy



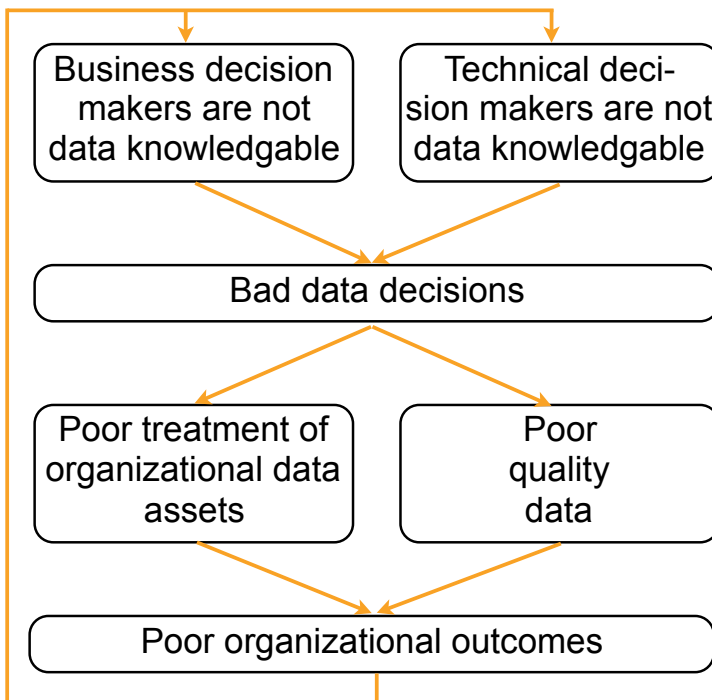
- Because data points to where valuable things are located
- Because data has intrinsic value by itself
- Because data has inherent combinatorial value
- Valuing Data
  - Use data to measure change
  - Use data to manage change
  - Use data to motivate change
- Creating a competitive advantage with data



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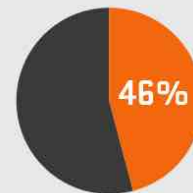
## Bad Data Decisions Spiral



### NEWS FLASH!

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## the Data Doctrine



We are uncovering better ways of developing IT systems by doing it and helping others do it.

Through this work we have come to value:

**Data programmes** preceding software development

**Stable data structures** preceding stable code

**Shared data** preceding completed software

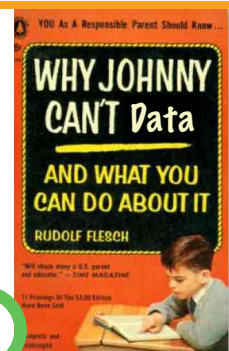
**Data reuse** preceding reusable code

That is, while there is value in the items on the right, we value the items on the left more.

## The Case for the Chief Data Officer

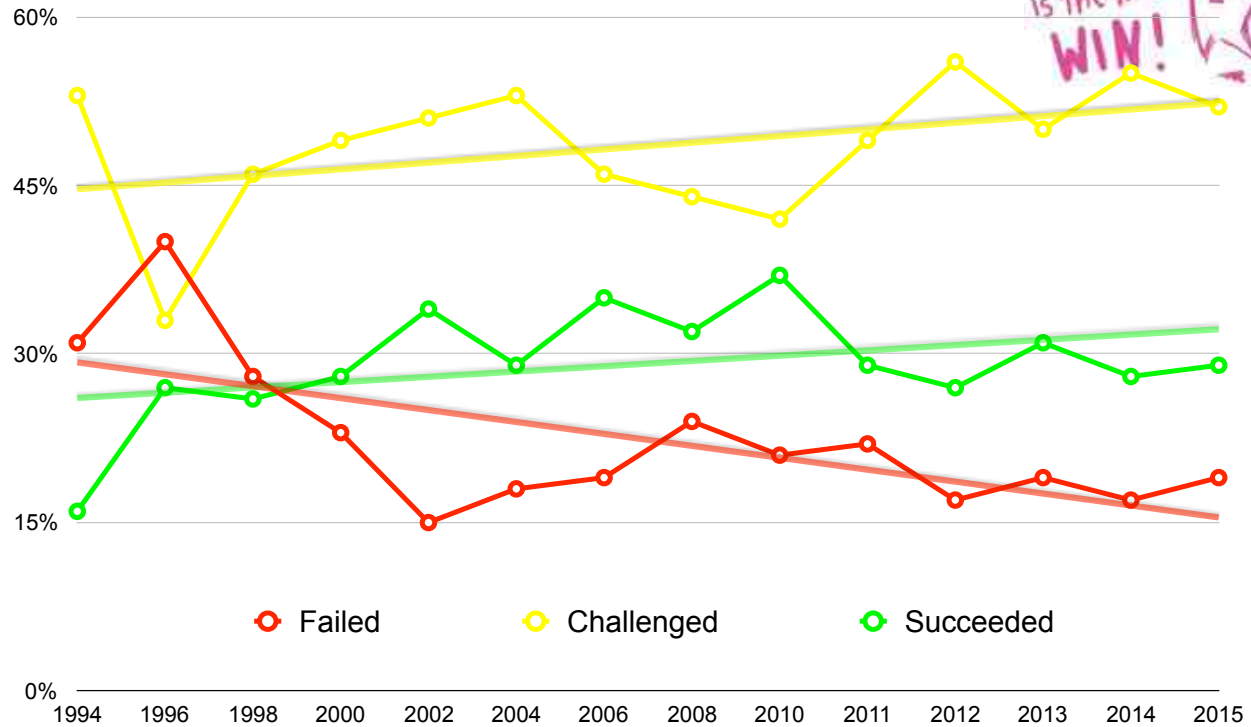
Why Johnny Can't Data ...

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  - Data Management Practices Hierarchy Structure
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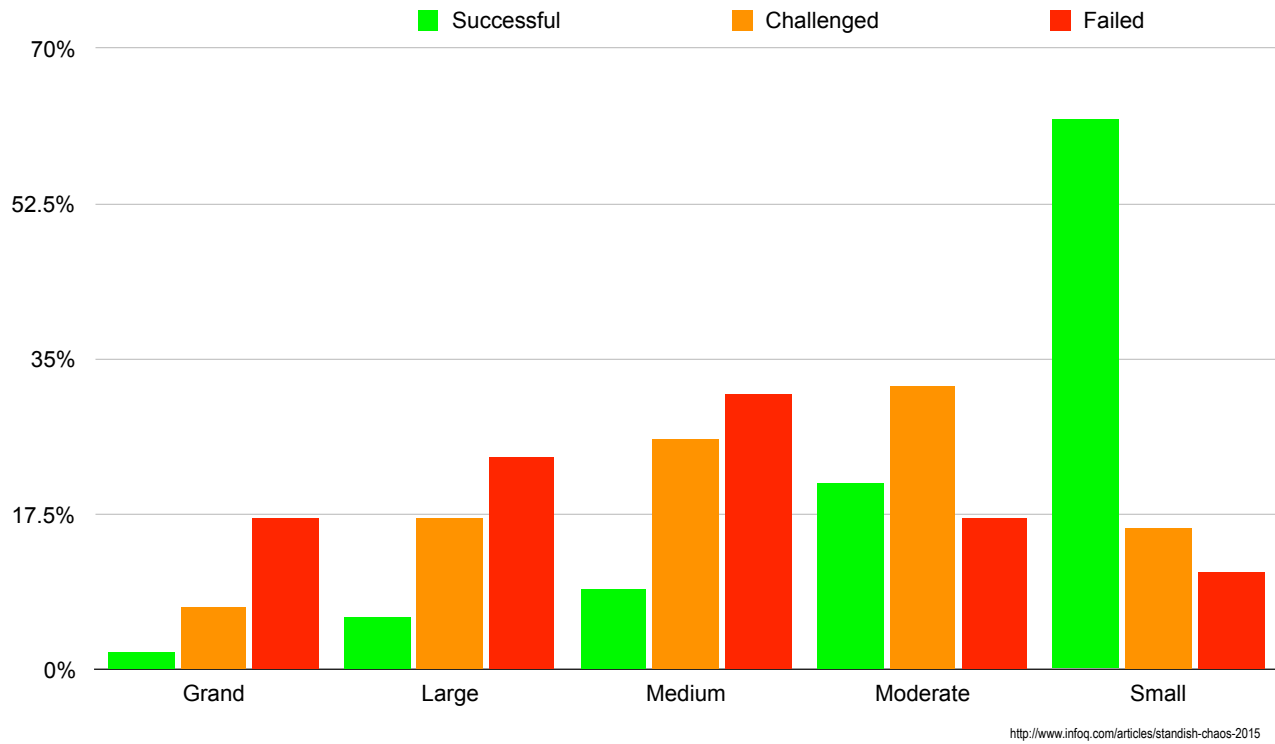




# IT Project Failure Rates (1994-2015)



## Chaos Resolution by Project Size (2011-2015)



## What do we teach knowledge workers about data?

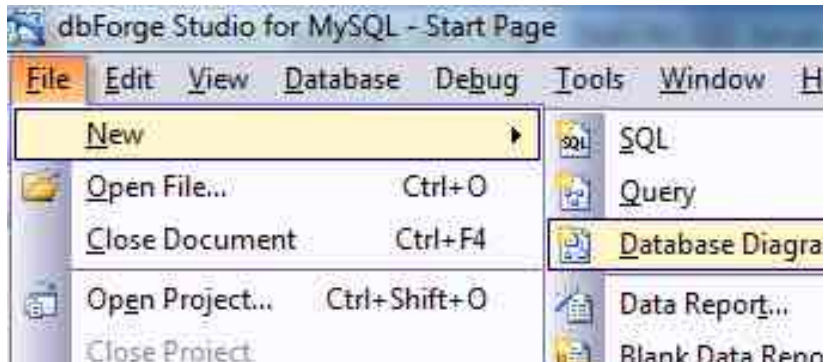


What percentage of the deal with it daily?

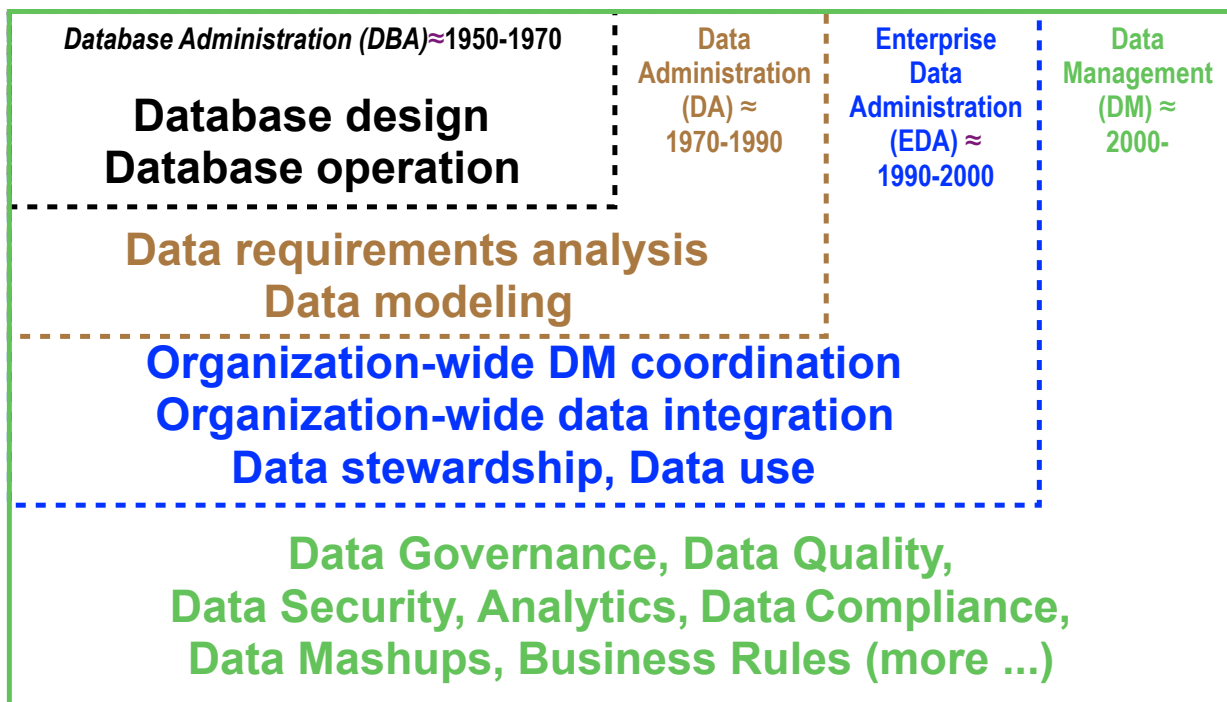
100%

# What do we teach IT professionals about data?

- 1 course
  - How to build a new database
- What impressions do IT professionals get from this education?
  - Data is a technical skill that is needed when developing new databases
- If we are migrating databases, we are not creating new databases and we don't need organizational data management knowledge, skills, and abilities (KSAs).
- If we are implementing a new software package, we are not creating a new database and therefore we do not need data management KSAs.
- If we are installing an enterprise resource package (ERP), we are not creating a new database and therefore we do not need data management KSAs.



# Expanding Data Management Scope

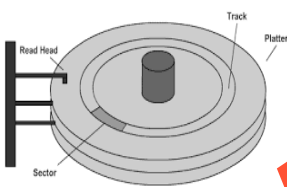


# Example

Calculate the access time for a disk with 512 byte/sector and 12 ms advertised seek time. The disk rotates at 5400 RPM and transfers data at a rate of 4MB/s. The controller overhead is 1 ms. Assume that the queue is idle (so no service time).

## Answer:

$$\begin{aligned}
 \text{Disk Access Time} &= \text{Seek time} + \text{Rotational Latency} + \text{Transfer time} \\
 &\quad + \text{Controller Time} + \text{Queuing Delay} \\
 &= 12 \text{ ms} + 0.5 / 5400 \text{ RPM} + 0.5 \text{ KB} / 4 \text{ MB/s} + 1 \text{ ms} + 0 \\
 &= 12 \text{ ms} + 0.5 / 90 \text{ RPS} + 0.125 / 1024 \text{ s} + 1 \text{ ms} + 0 \\
 &= 12 \text{ ms} + 5.5 \text{ ms} + 0.1 \text{ ms} + 1 \text{ ms} + 0 \text{ ms} \\
 &= 18.6 \text{ ms}
 \end{aligned}$$



The disks no longer rotate!

If all seeks are 1/3 the advertised seeks, disk access time would be 10.6 ms, with rotation delay contributing 50% of the access time!

## How CEOs Recognize Data as a Corporate Asset



33%

We measure the benefits that each type of information asset generates for us



24%

We quantify the financial value of our information assets, as if they were a balance sheet asset



22%

Our information assets are well-cataloged (inventoried) and defined



11%

We do not regard information as a kind of asset



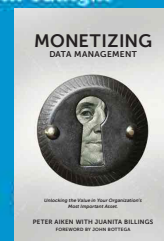
10%

We directly monetize information assets by bartering with them or selling them outright

n = 410 CEOs and Senior Business Executives

[gartner.com/SmarterWithGartner](http://gartner.com/SmarterWithGartner)

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# We believe ...

**Asset:** A resource controlled by the organization as a result of past events or transactions and from which future economic benefits are expected to flow [Wikipedia]

- Today, data is the most powerful, yet underutilized and poorly managed organizational asset
- Data is your
  - Sole
  - Non-depletable
  - Non-degrading
  - Durable
  - Strategic
- Asset
  - Data is the new oil!
  - Data is the new (s)oil!
  - Data is the new bacon!
- Our mission is to unlock business value by
  - Strengthening your data management capabilities
  - Providing tailored solutions, and
  - Building lasting partnerships

	Data Assets	Financial Assets	Real Estate Assets	Inventory Assets
Non-depletable	Available for subsequent use	Can be used up		Can be used up
Non-degrading	✓	✓	Can degrade over time	Can degrade over time
Durable	Non-taxed		✓	✓
Strategic Asset	✓	✓	✓	✓

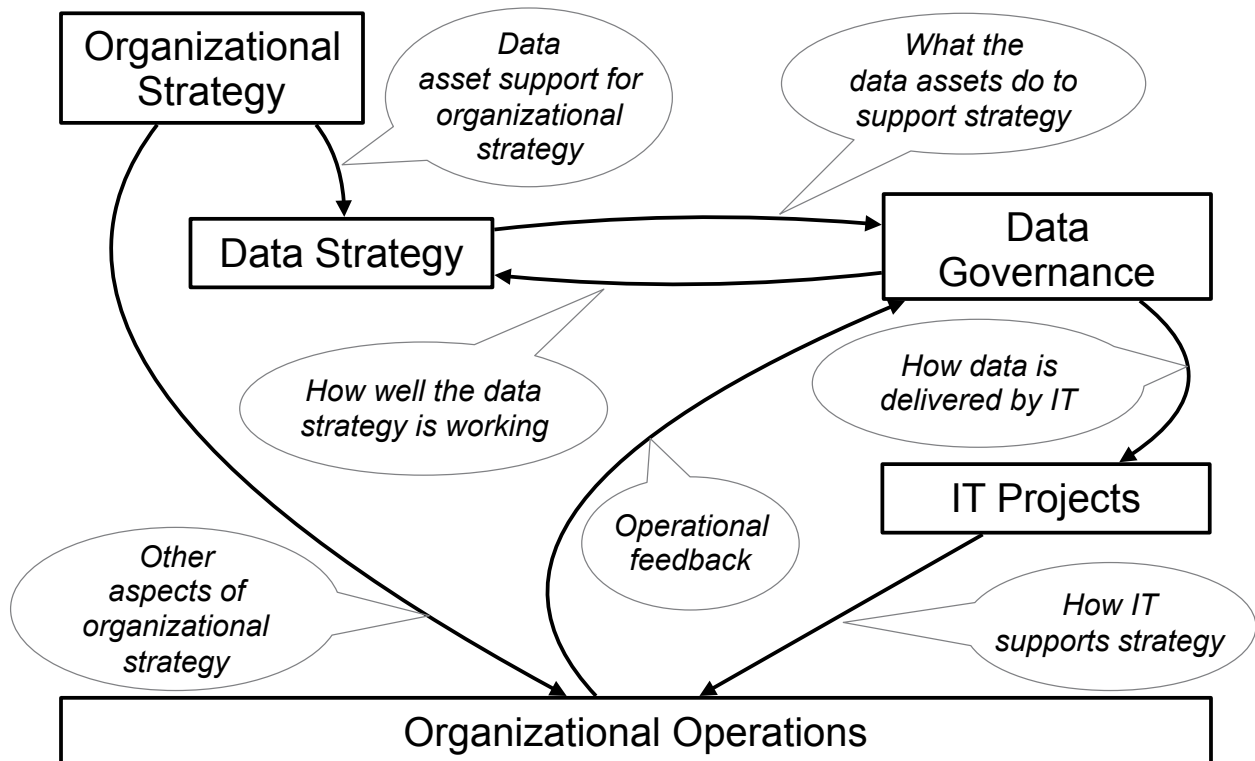
## Data Assets Win!



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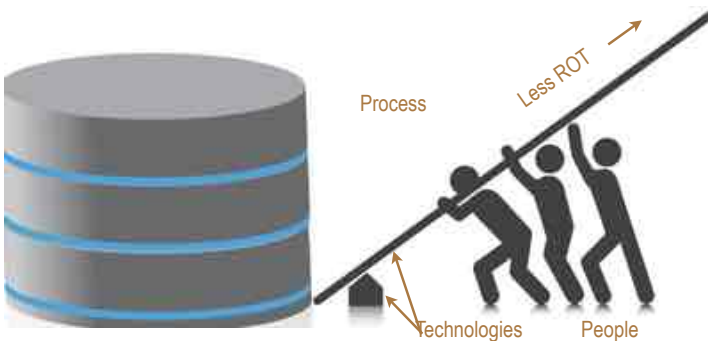
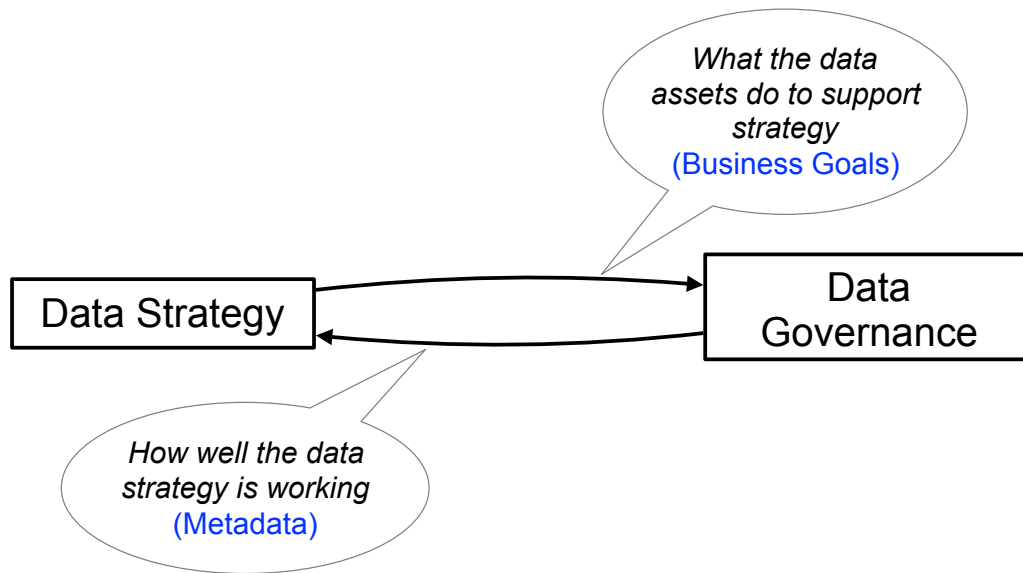
# Data Strategy and Data Governance in Context



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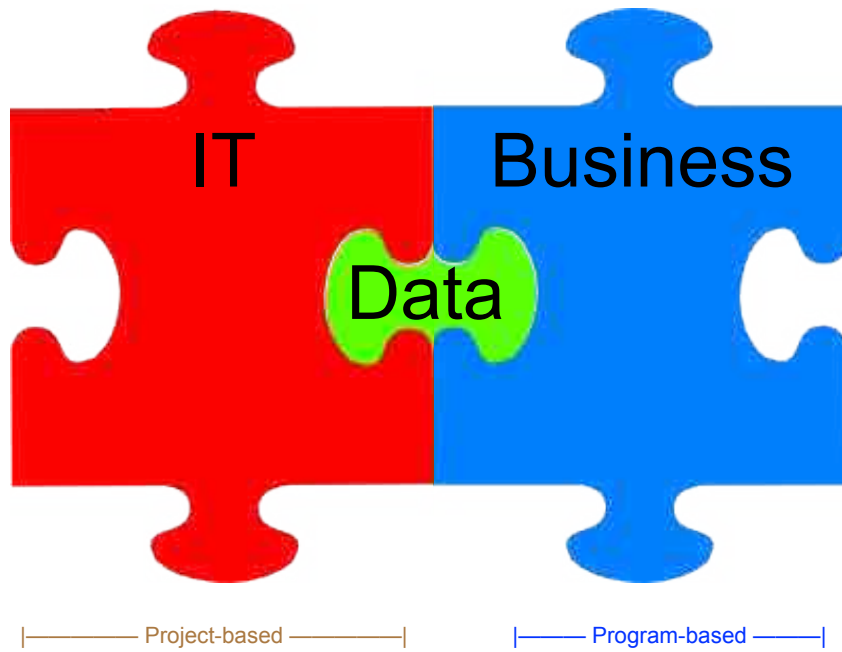
# Data Strategy & Data Governance



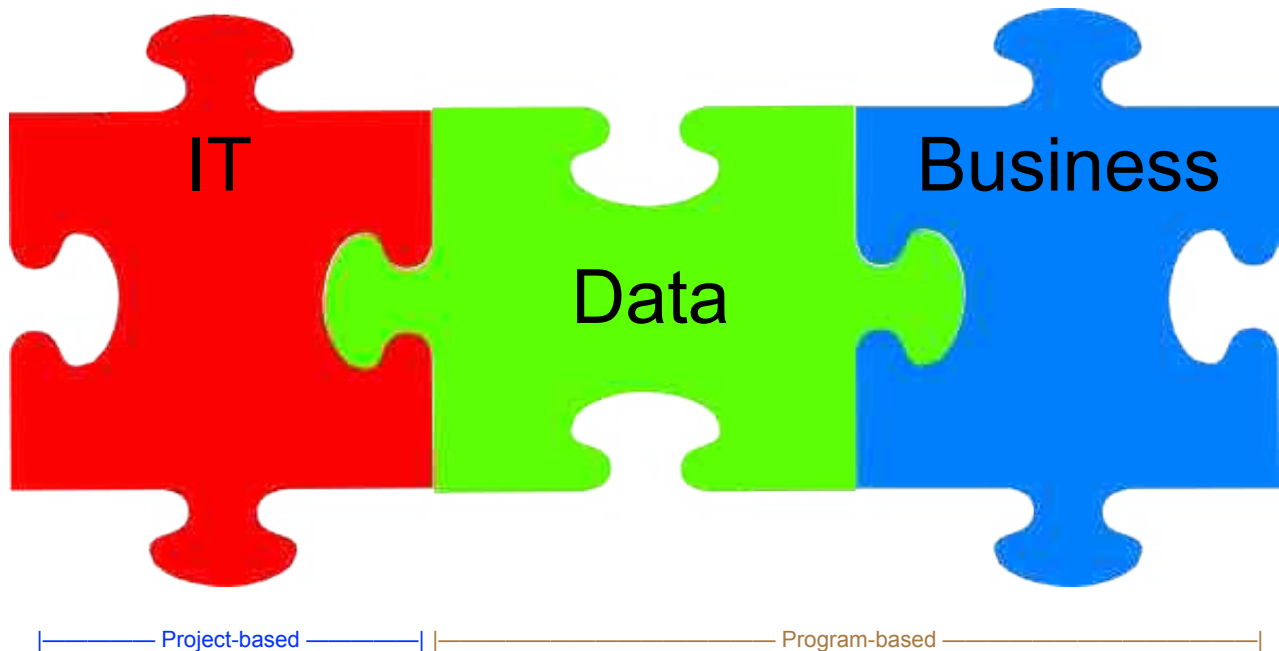
## Data Leverage

- Permits organizations to better manage their sole non-depletable, non-degrading, durable, strategic asset - data
  - within the organization, and
  - with organizational data exchange partners
- Leverage
  - Obtained by implementation of data-centric technologies, processes, and human skill sets
  - Increased by elimination of data ROT (redundant, obsolete, or trivial)
    - The bigger the organization, the greater potential leverage exists
- Treating data more asset-like simultaneously
  1. lowers organizational IT costs and
  2. increases organizational knowledge worker productivity

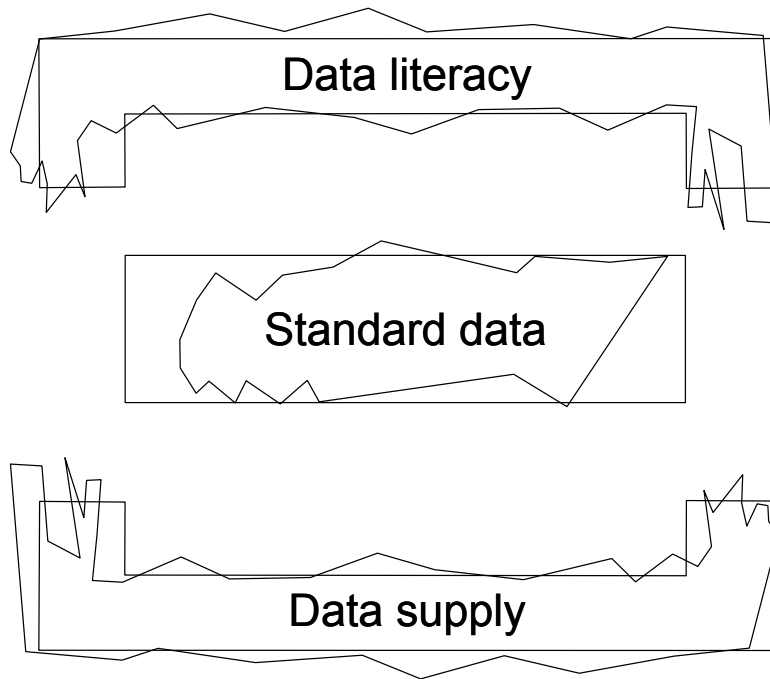
## As Is State of Data (as Perceived)



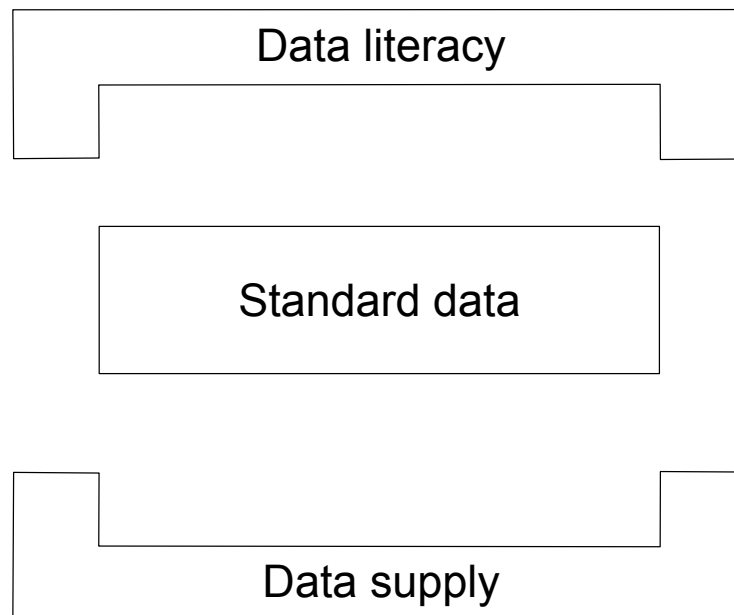
## Desired To Be State of Data (as Understood)



# Making a Better Data Sandwich

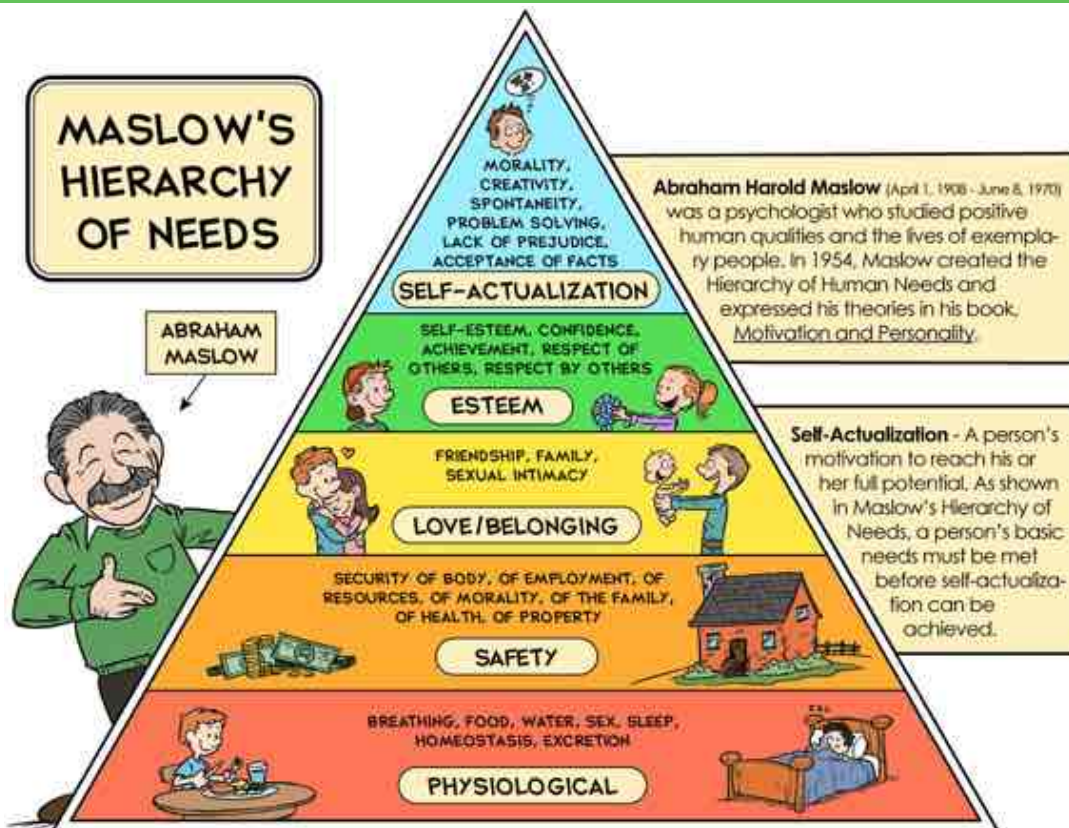
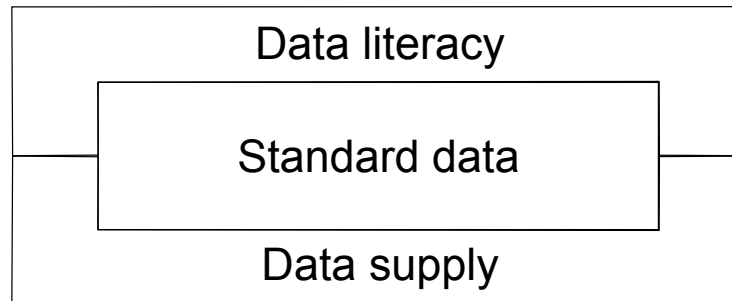


# Making a Better Data Sandwich





# Making a Better Data Sandwich

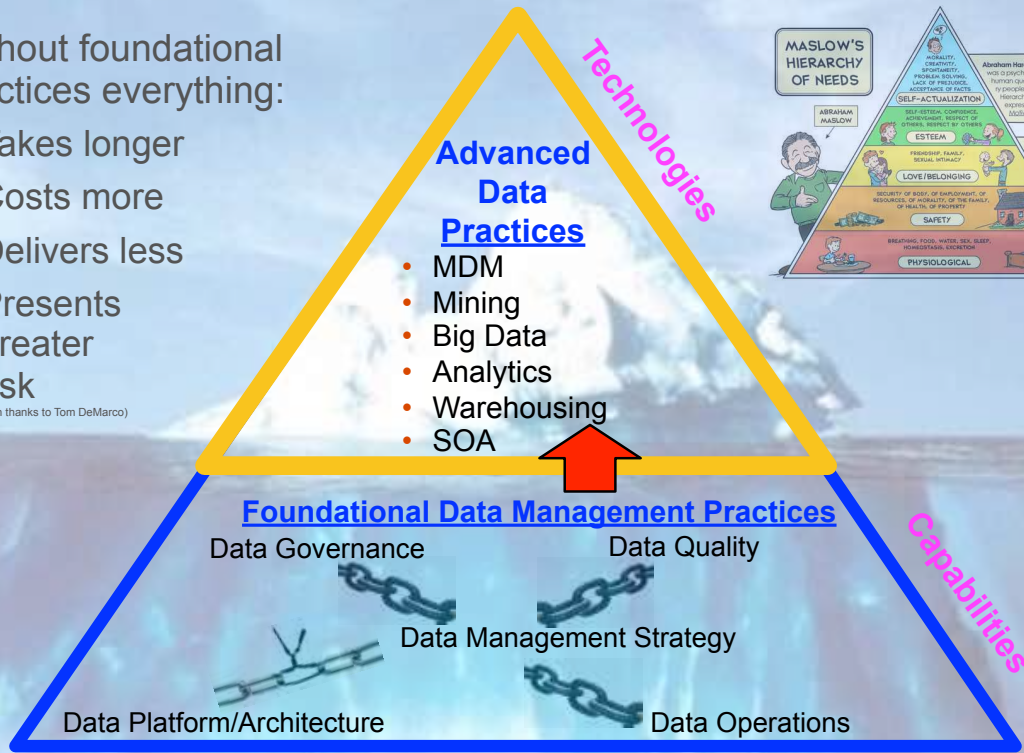


# Data Management Practices Hierarchy

Without foundational practices everything:

- Takes longer
- Costs more
- Delivers less
- Presents greater risk

(with thanks to Tom DeMarco)



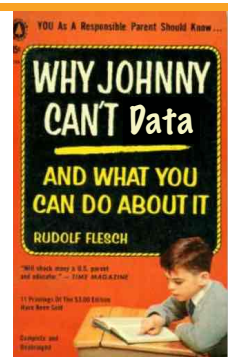
# My barn had to pass a foundation inspection



- Before further construction could proceed
- No IT equivalent

# The Case for the Chief Data Officer

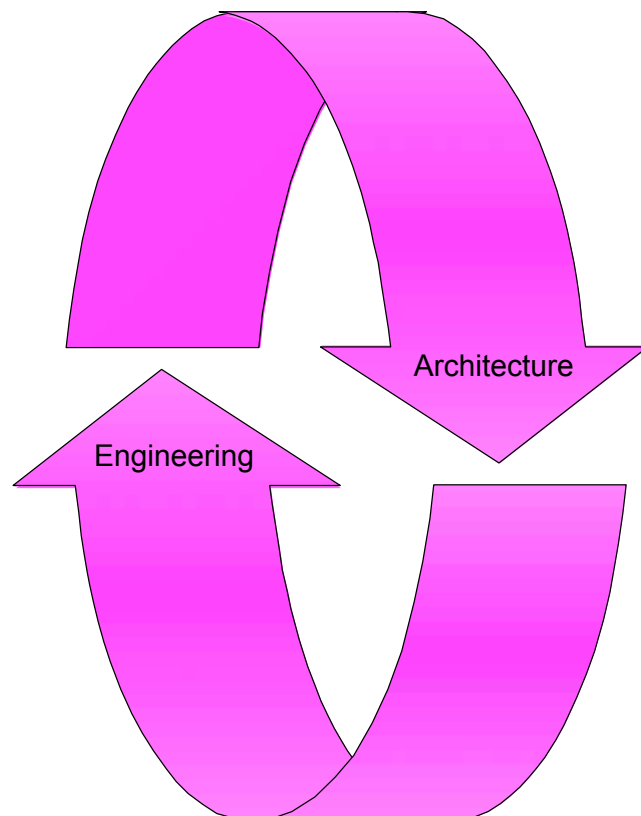
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## Architecture and Engineering

- Architecture enables complex "things" to be built
- Engineering ensures a disciplined approach to development





## Niccolo Machiavelli

(1469-1527)



*He who doesn't lay his foundations before hand, may by great abilities do so afterward ...*

*... although with great trouble to the architect and danger to the building.*

Machiavelli, Niccolò. *The Prince*. 19 Mar. 2004 <http://pd.sparknotes.com/philosophy/prince>



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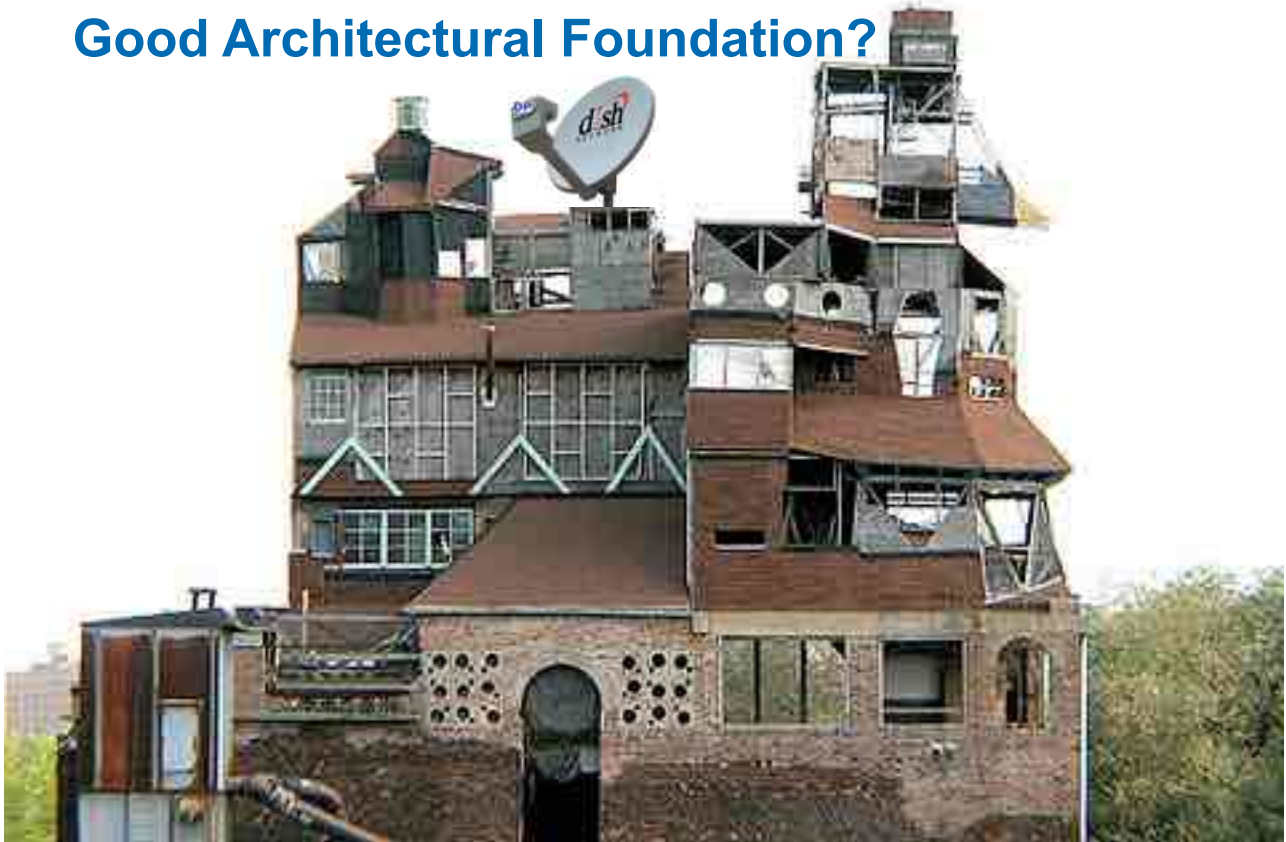
***You cannot architect after implementation!***



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## Good Architectural Foundation?



## Poor Architectural Foundation



## What they think they are purchasing!



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## What is this?



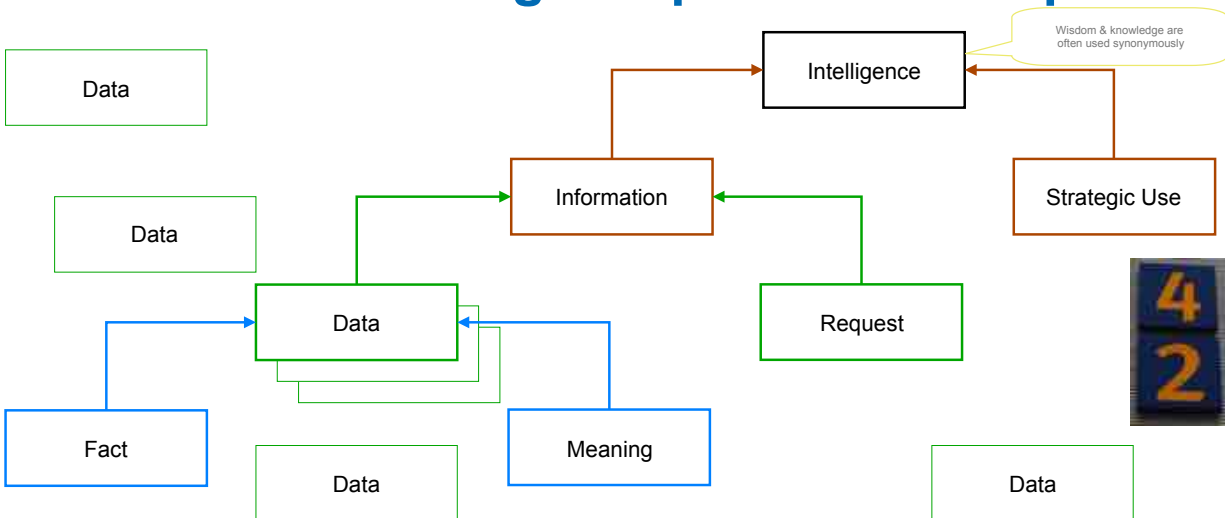
- It is tall
- It has a clutch
- It was built in 1942
- It is still in regular use!



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# A Model Defining 3 Important Concepts



1. Each FACT combines with one or more MEANINGS.
2. Each specific FACT and MEANING combination is referred to as a DATUM.
3. An INFORMATION is one or more DATA that are returned in response to a specific REQUEST
4. INFORMATION REUSE is enabled when one FACT is combined with more than one MEANING.
5. INTELLIGENCE is INFORMATION associated with its STRATEGIC USES.
6. DATA/INFORMATION must formally arranged into an ARCHITECTURE.

[Built on definitions from Dan Appleton 1983]



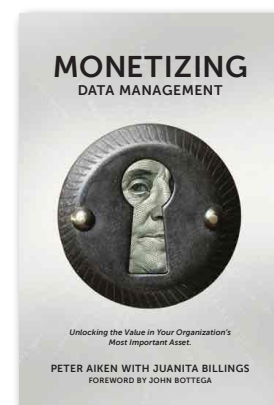
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## Data is a hidden IT Expense

- Organizations spend between 20 - 40% of their IT budget evolving their data - including:
  - Data **migration**
    - Changing the location from one place to another
  - Data **conversion**
    - Changing data into another form, state, or product
  - Data **improving**
    - Inspecting and manipulating, or re-keying data to prepare it for subsequent use

– Source: *John Zachman*

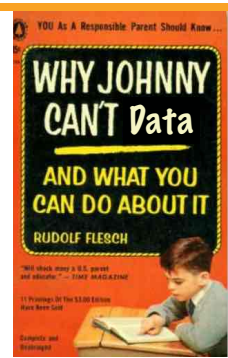


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# The Case for the Chief Data Officer

Why Johnny Can't Data ...



- As-Is/Cause for Concern
  - Disclaimer/Bad Data Decisions Spiral
  - Data Management Practices Hierarchy Structure
  - Cost of the Lack of Architecture/Engineering Capabilities
  - Self Assessment/Root Cause Analysis
- To-Be/Necessary (but insufficient) CDO Prerequisites
  1. Dedicated solely to Data Asset Leveraging
  2. Unconstrained by an IT project Mindset
  3. Reporting directly to the Business



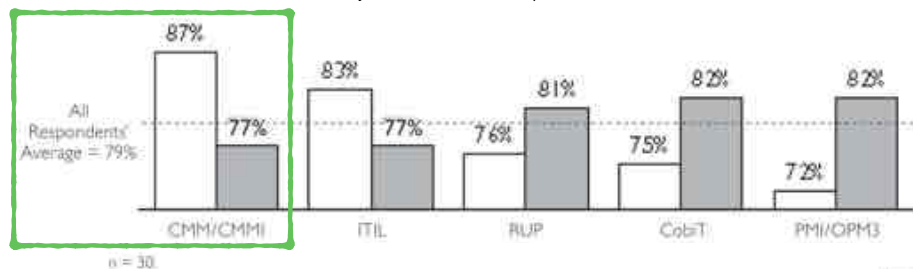
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## Key Finding: Process Frameworks are not Created Equal

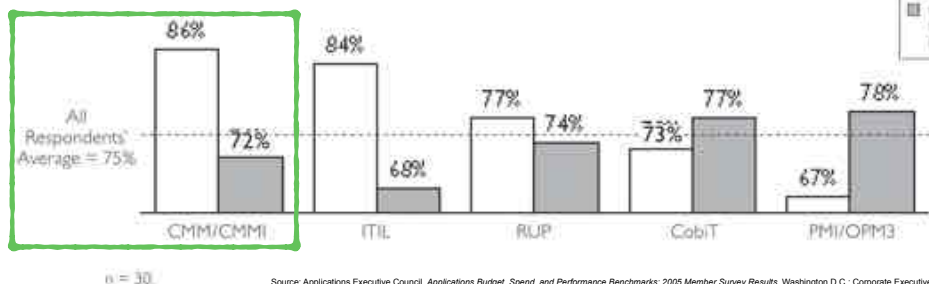
*With the exception of CMM and ITIL, use of process-efficiency frameworks does not predict higher on-budget project delivery...*

**Percentage of Projects on Budget**  
By Process Framework Adoption



*...while the same pattern generally holds true for on-time performance*

**Percentage of Projects on Time**  
By Process Framework Adoption



Process Efficiency Framework Adoption  
 Companies Using Given Framework  
 Companies Not Using Given Framework



Source: Applications Executive Council, Applications Budget, Spend, and Performance Benchmarks: 2005 Member Survey Results, Washington D.C.: Corporate Executive Board 2006, p. 23.

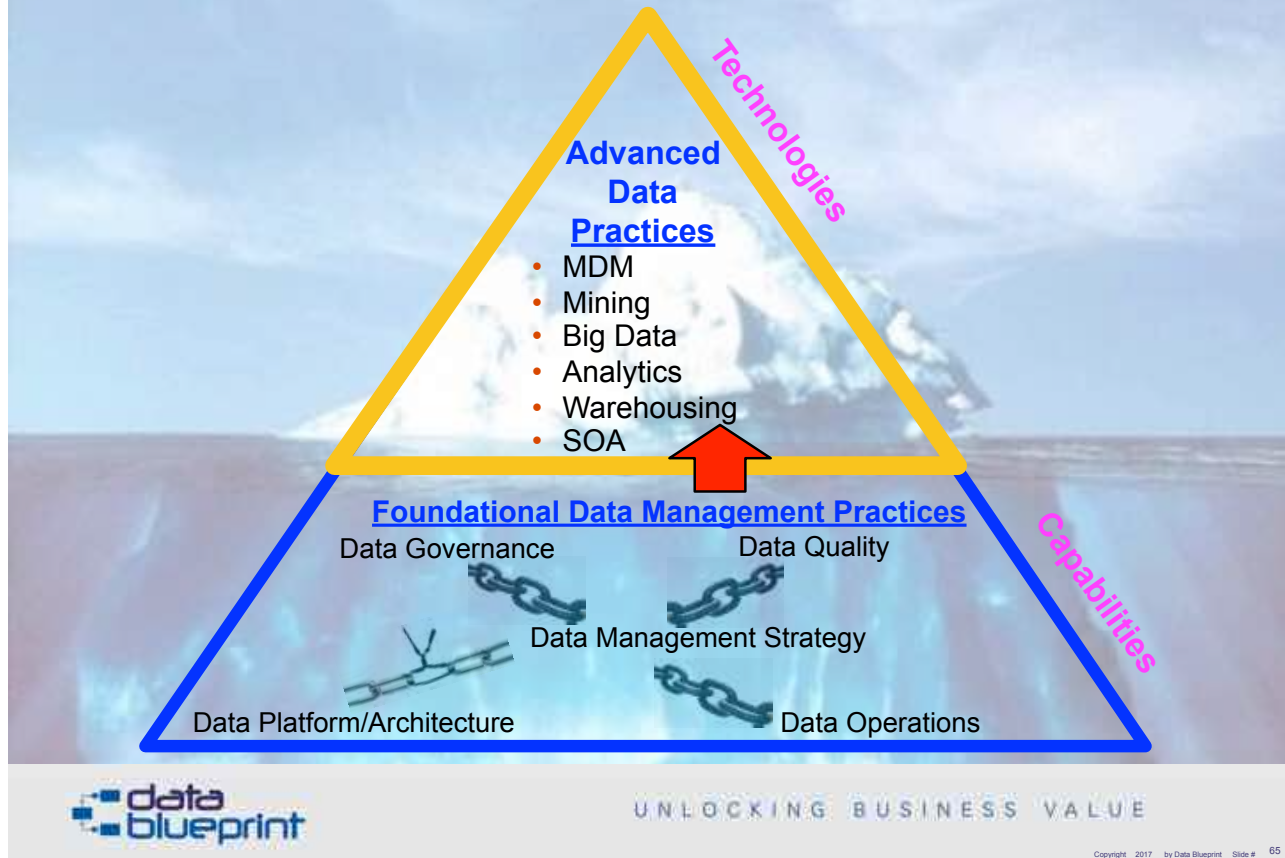


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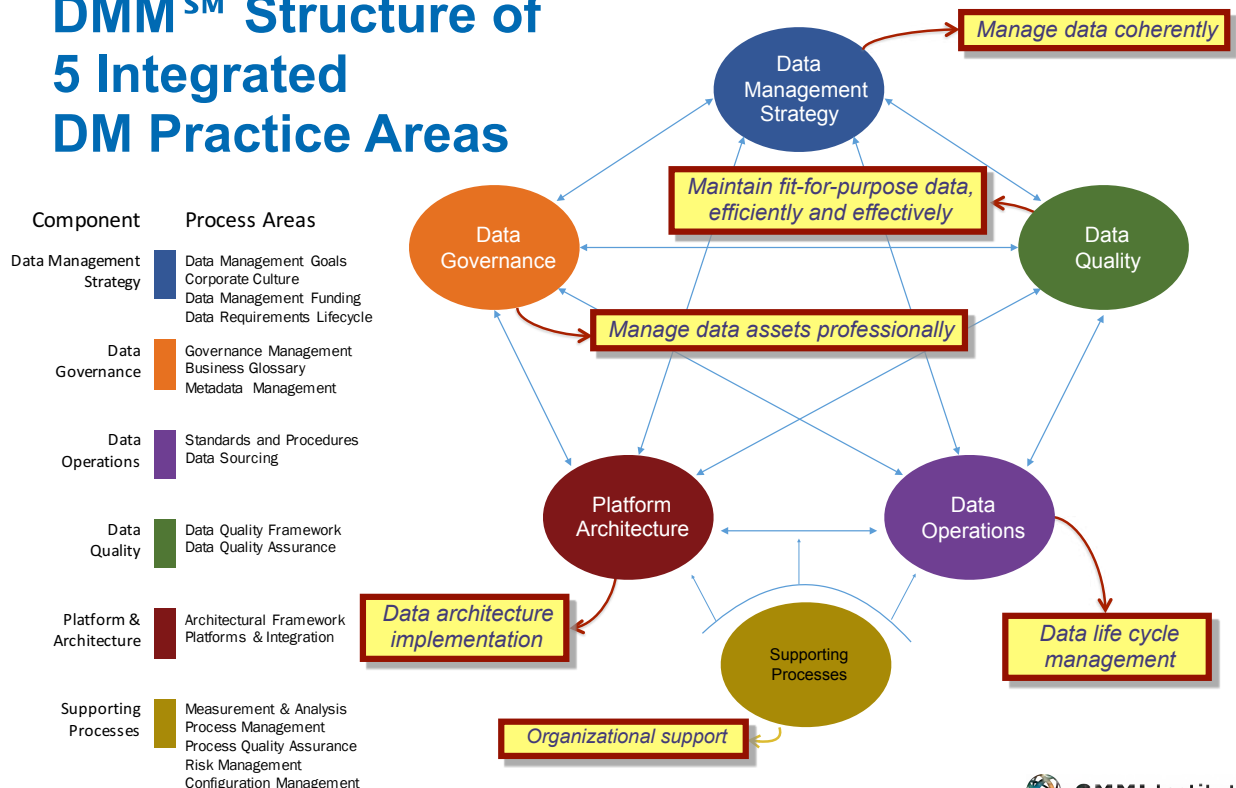
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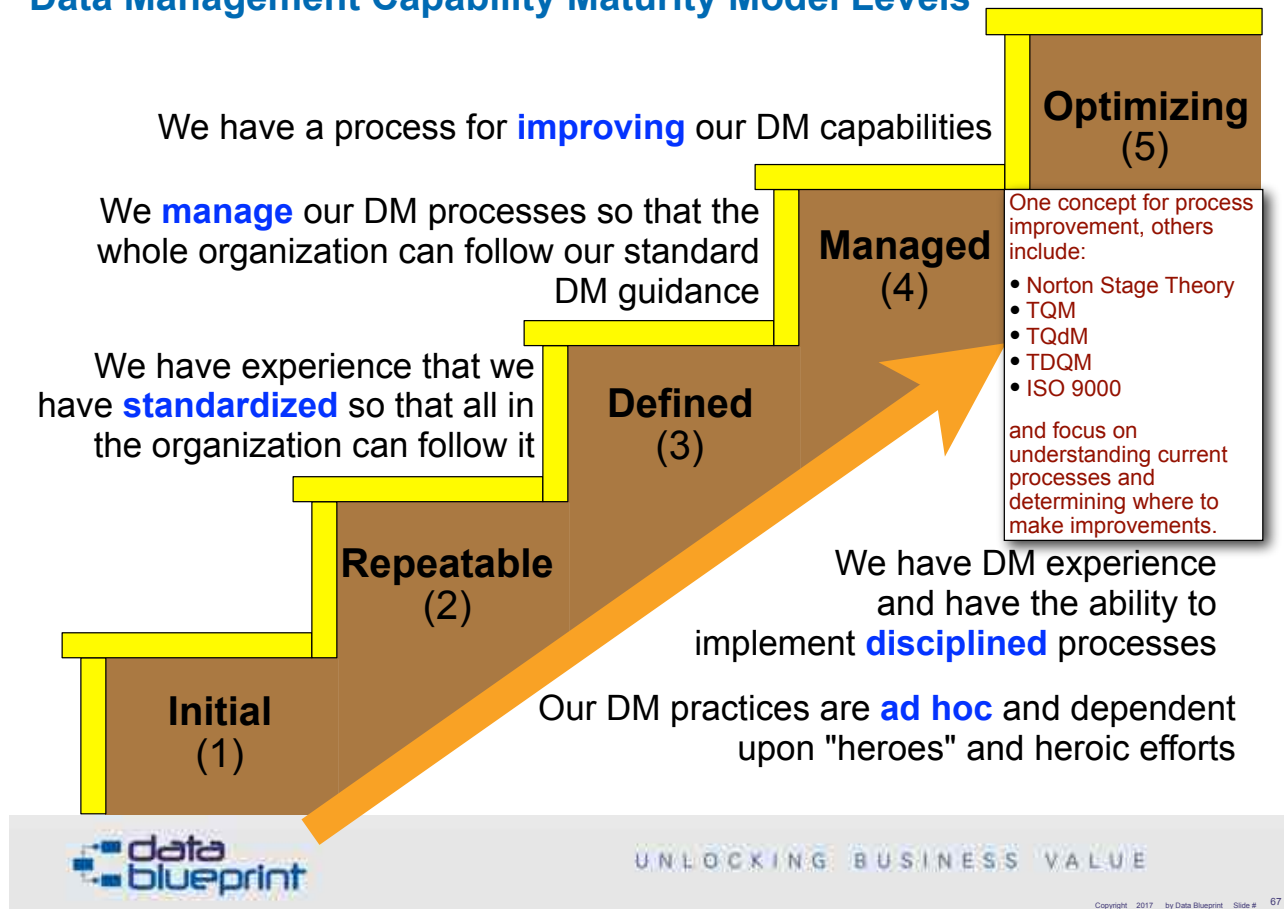
# Data Management Practices Hierarchy



## DMM<sup>SM</sup> Structure of 5 Integrated DM Practice Areas



## Data Management Capability Maturity Model Levels



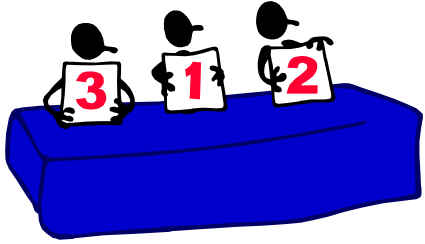
## Assessment Components



Data Management Practice Areas		Capability Maturity Model Levels	Examples of practice maturity
Data Management Strategy	DM is practiced as a coherent and coordinated set of activities	1 – Performed	Our DM practices are ad hoc and dependent upon "heroes" and heroic efforts
Data Quality	Delivery of data is support of organizational objectives – <i>the currency of DM</i>	2 – Managed	We have DM experience and have the ability to implement disciplined processes
Data Governance	Designating specific individuals caretakers for certain data	3 – Defined	We have standardized DM practices so that all in the organization can perform it with uniform quality
Data Platform/Architecture	Efficient delivery of data via appropriate channels	4 – Measured	We manage our DM processes so that the whole organization can follow our standard DM guidance
Data Operations	Ensuring reliable access to data	5 – Optimized	We have a process for improving our DM capabilities

# Industry Focused Results

- CMU's Software Engineering Institute (SEI) Collaboration
- Results from hundreds organizations in various industries including:
  - ✓ Public Companies
  - ✓ State Government Agencies
  - ✓ Federal Government
  - ✓ International Organizations
- Defined industry standard
- Steps toward defining data management "state of the practice"

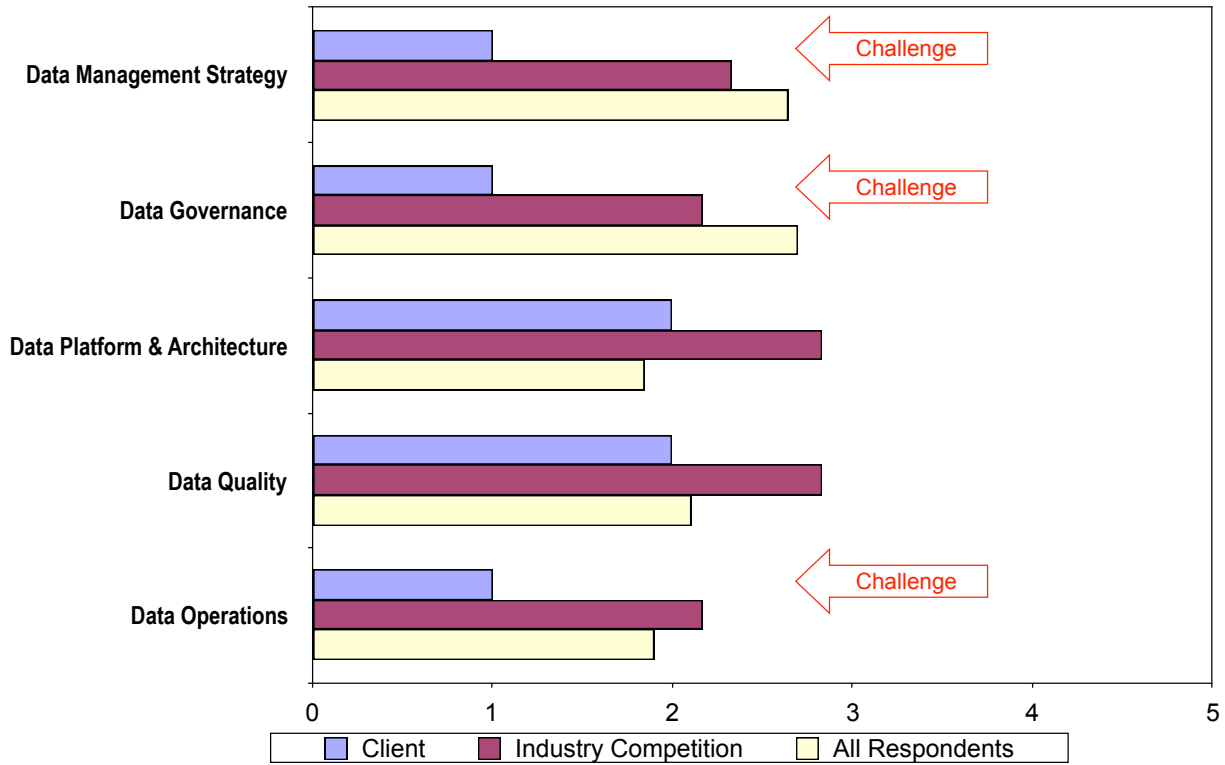


	Initial (I)	Managed (II)	Defined (III)	Measured (IV)	Optimized (V)
Data Management Strategy	Red	Yellow	Focus: Guidance and Facilitation		
Data Governance	Red	Yellow			
Platform & Architecture	Red	Yellow			
Data Quality	Red	Yellow	Focus: Implementation and Access		
Data Operations	Red	Yellow			

# Weak Chain Link



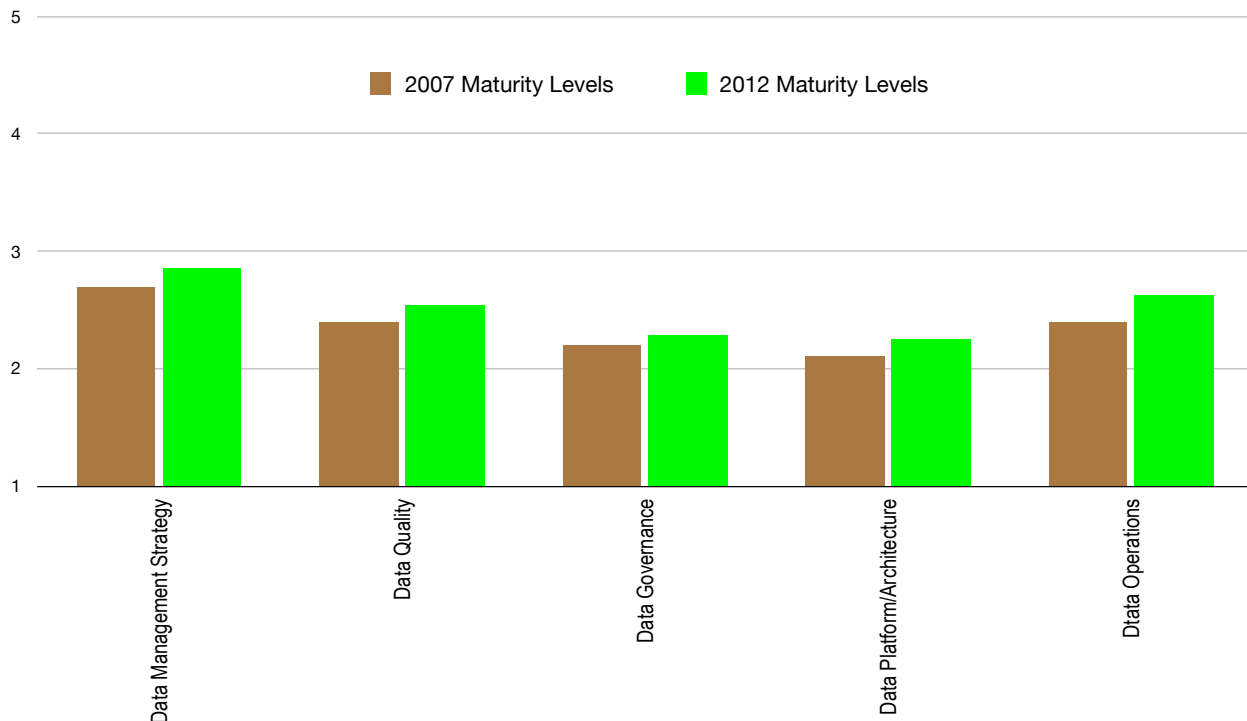
# Comparative Assessment Results



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# Comparison of DM Maturity 2007-2012



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# The likely state of your data management efforts



Very Silo'ed or conflicting data sources

Multiple Data Sources

Redundancy

Multiple changes to source system

Inconsistent data definitions of common terms

ISD are data owners

Inconsistent Data Quality

Difficult to report and mine against

Lots of Data...Minimum Information



***There will never be less data than right now!***

## Conclusion must be?

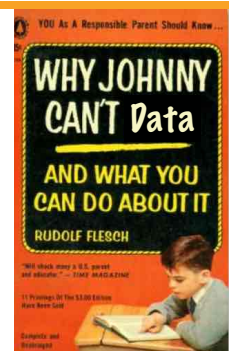
1. CIOs are unaware of the strategic nature of data; or
2. CIOs are not concerned about how data management is accomplished in their organizations; or
3. CIOs think data management is being adequately accomplished in their organizations



## The Case for the Chief Data Officer

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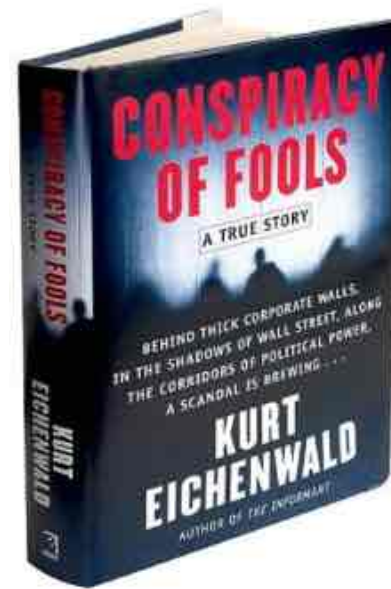


## Enron

- August 2001 Enron stock falls to \$42/share from \$90/share
- Dynergy brings several \$ billion in an attempted rescue
- Enron spends entire amount in 1 week
  - Any person can write a check at Enron for
  - Any amount of money for
  - Any purchase at
  - Any time
- Enron goes back to Dynergy for more \$
- Dynergy: *What happened to the several \$ billion I gave you last week?*

- Enron:

• <http://en.wikipedia.org/wiki/Enron>



## CFO Necessary Prerequisites/Qualifications

- CPA
- CMA
- Masters of Accountancy
- Other recognized degrees/certifications
- These are necessary but insufficient prerequisites/qualifications



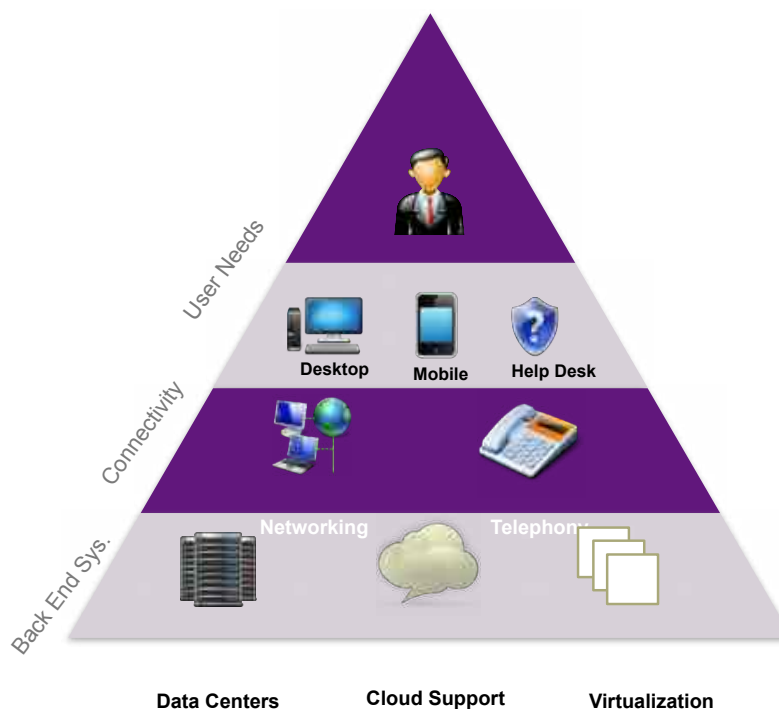
# The "Chief Officer" Title



- Chief
  - The head or leader of an organized body of people; the person highest in authority: the chief of police
- Chief Financial Officer (CFO)
  - Individual possessing the knowledge, skills, and abilities to be both the final authority and decision-maker in organizational financial matters
- Chief Risk Officer (CRO)
  - Individual possessing the knowledge, skills, and abilities makes decisions and implements risk management
- Chief Medical Officer (CMO)
  - Responsible for organizational medical matters. The organization, and the public, has similar expectations for any of chief officer – especially after the Sarbanes-Oxley bill.

[dictionary.com]

# CIO Infrastructure Focus





# Top Five CIO Concerns 2005-2011

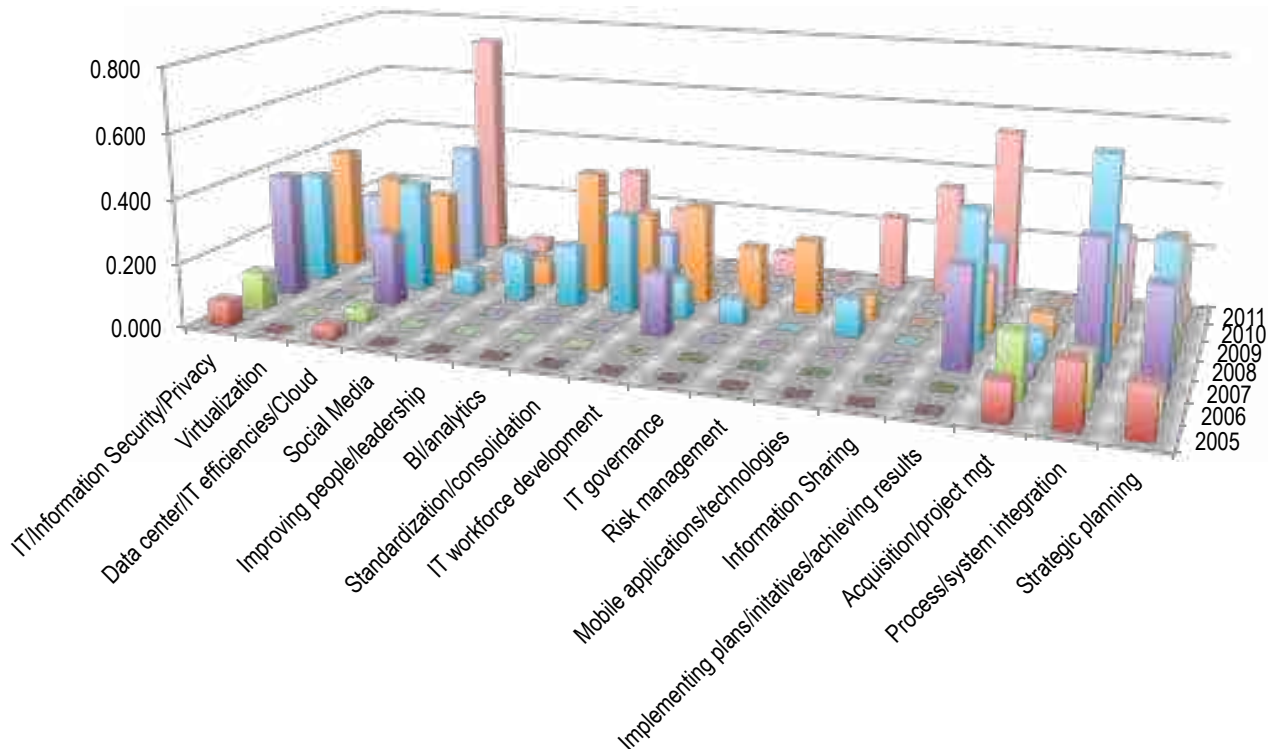
	2005	2006	2007	2008	2009	2010	2011	
Grant Thornton-State CIO Survey								6
Ameritech ITAA Annual CIO survey								6
CIO Magazine-State of the CIO								5
UK CIO Survey								1
Gartner Annual Priorities								7
Informationweek Global CIO top 10 issues								3
Accenture CIO Survey								1
KPMG & Harvey Nash								6
NASCIO Survey								7
Robert Half Technology								6
	3	6	9	7	8	8	7	48



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# Top Five CIO Concerns 2005-2011



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## Where does data go?

### The Top Job

- Finance
- Operations
- Sale/Marketing
- HR
- Risk
- Technology/CIO
  - Align IT initiatives with business goals
  - Improving IT operations performance
  - Cultivating the IT/business partnership
  - Cost control/expense management
  - Implementing new systems
  - Leading change efforts
  - Driving business innovation
  - Redesigning business processes
  - Developing and refining business strategy
  - Negotiating with IT vendors
  - Managing IT crises
  - Developing market strategies & technologies
  - Security management
  - Studying trends to identify opportunities

## Information?



... data



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## Change the status quo!

- *Keep in mind that the appointment of a CDO typically comes from a high-level decision. In practice, it can trigger an array of problematic reactions within the organization including:*
  - confusion,
  - uncertainty,
  - doubt,
  - resentment and
  - resistance.
- *CDOs need to rise to the challenge of changing the status quo if they expect to lead the business in making data a strategic asset.*
  - from *What Chief Data Officers Need to Do to Succeed* by Mario Faria

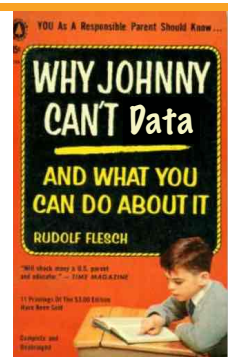


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# The Case for the Chief Data Officer

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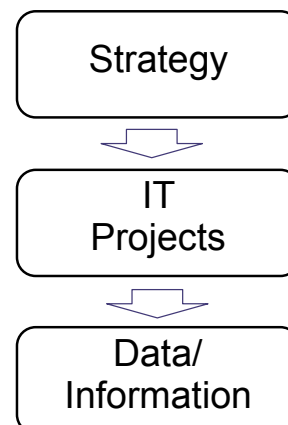


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## IT Project or Application-Centric Development

- In support of strategy, organizations implement IT projects
- Data/information are typically considered within the scope of IT projects
- Problems with this approach:
  - Ensures data is formed to the applications and not around the organizational-wide information requirements
  - Process are narrowly formed around applications
  - Very little data reuse is possible

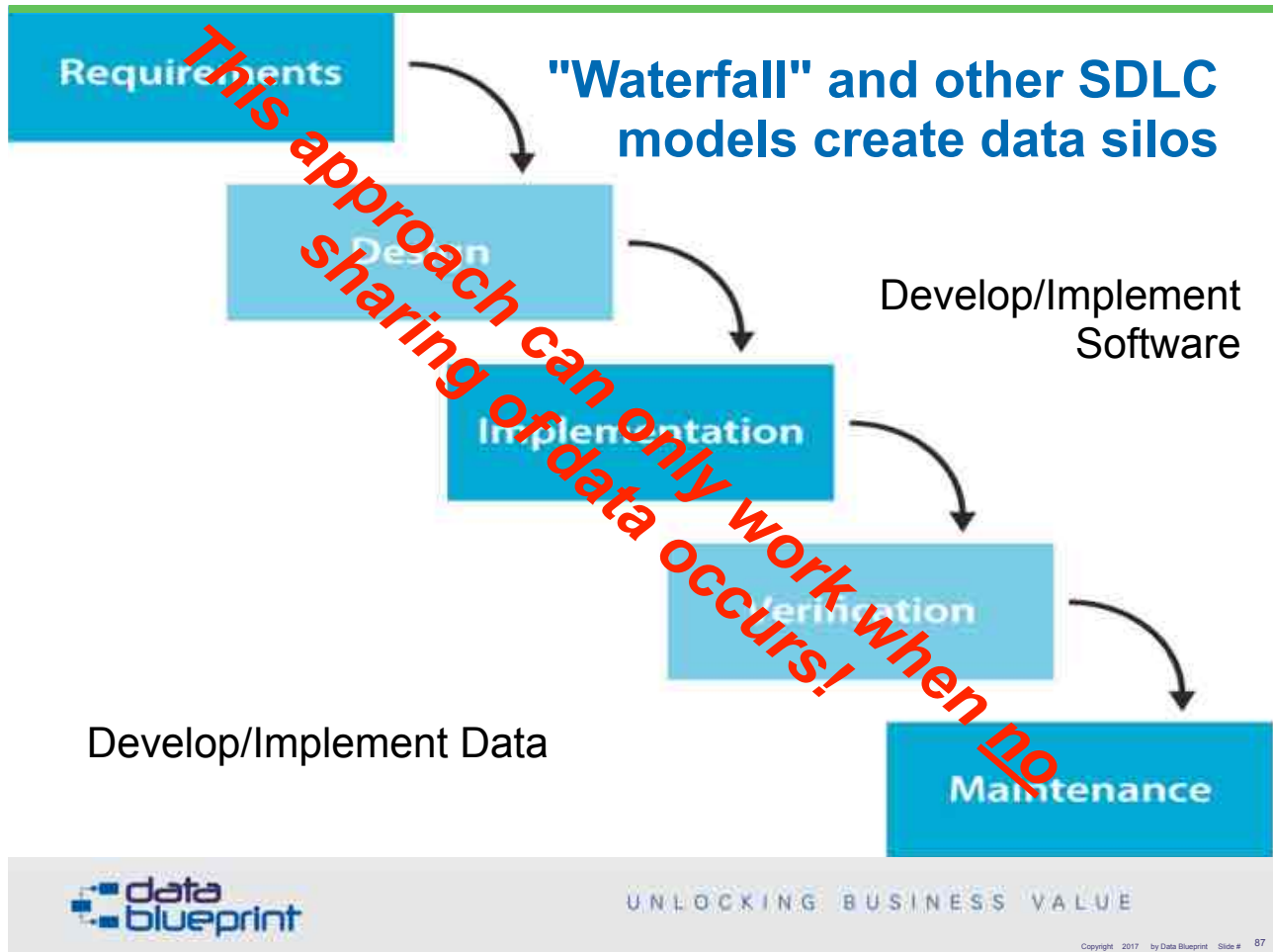


Original articulation from Doug Bagley @ Walmart



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## Evolving Data is Different than Creating New Systems

Common Organizational Data  
(and corresponding data needs requirements)



Future State



Evolve

*Data evolution is separate from, external to, and precedes system development life cycle activities!*

Systems Development Activities



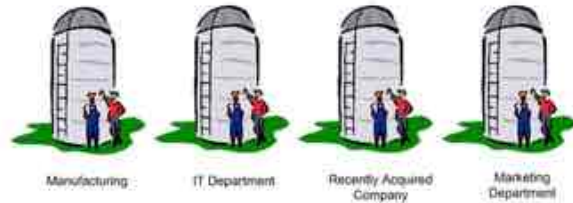
Create

New Organizational Capabilities



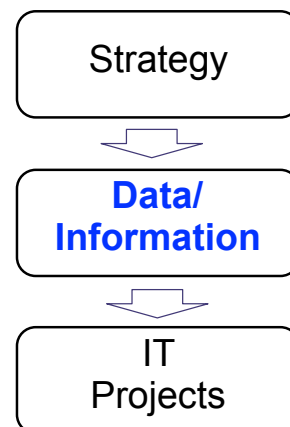
# Data is not a Project

- Durable asset
  - An asset that has a usable life more than one year
- Reasonable project deliverables
  - 90 day increments
  - Data evolution is measured in years
- Data
  - Evolves - it is not created
  - Significantly more stable
- Readymade data architectural components
  - Prerequisite to agile development
- Only alternative is to create additional data siloes!



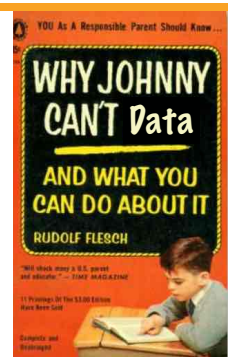
# Data-Centric Development

- In support of strategy, the organization develops specific, shared data-based goals/objectives
- These organizational data goals/objectives drive the development of specific IT projects with an eye to organization-wide usage
- Advantages of this approach:
  - Data/information assets are developed from an organization-wide perspective
  - Systems support organizational data needs and compliment organizational process flows
  - Maximum data/information reuse



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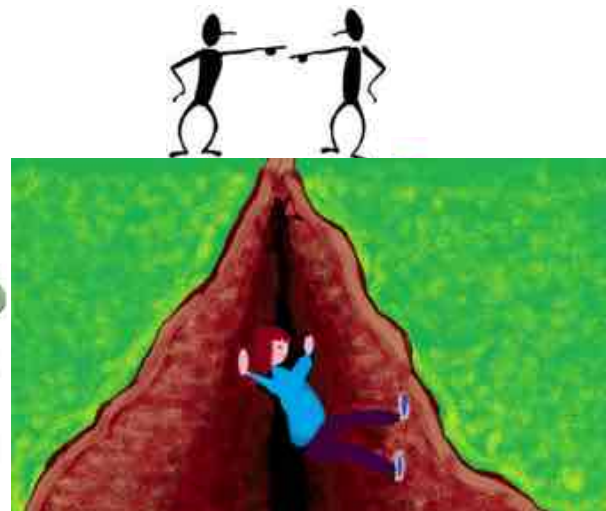


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## Confusion

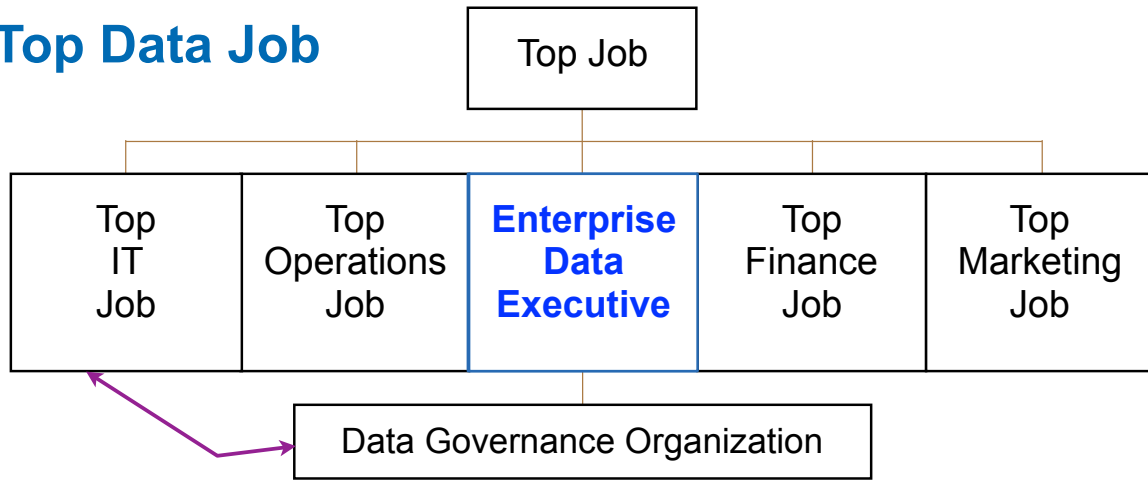
- IT thinks data is a business problem
  - *"If they can connect to the server, then my job is done!"*
- The business thinks IT is managing data adequately
  - *"Who else would be taking care of it?"*



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## Top Data Job



- Dedicated solely to data asset leveraging
- Unconstrained by an IT project mindset
- Reporting to the business
- There is enough work to justify the function and not much talent
- The CDO provides significant input to the Top Information Technology Job
- 90 Percent of Large Global Organizations Will Have Appointed Chief Data Officers By 2019 Gartner press release. Gartner website (accessed January 26, 2016). January 26, 2016. <http://www.gartner.com/newsroom/id/3190117?>
- By 2020, 60% of CIOs in global organizations will be supplanted by the Chief Digital Officer (CDO) for the delivery of IT-enabled products and digital services (IDC)
- 2015 Experian survey of 250 CIOs found 90% of feel that data is transforming the way they do business, with some 92% suggesting that the CDO is best placed to define data strategy and be the guardian of data quality within an organisation

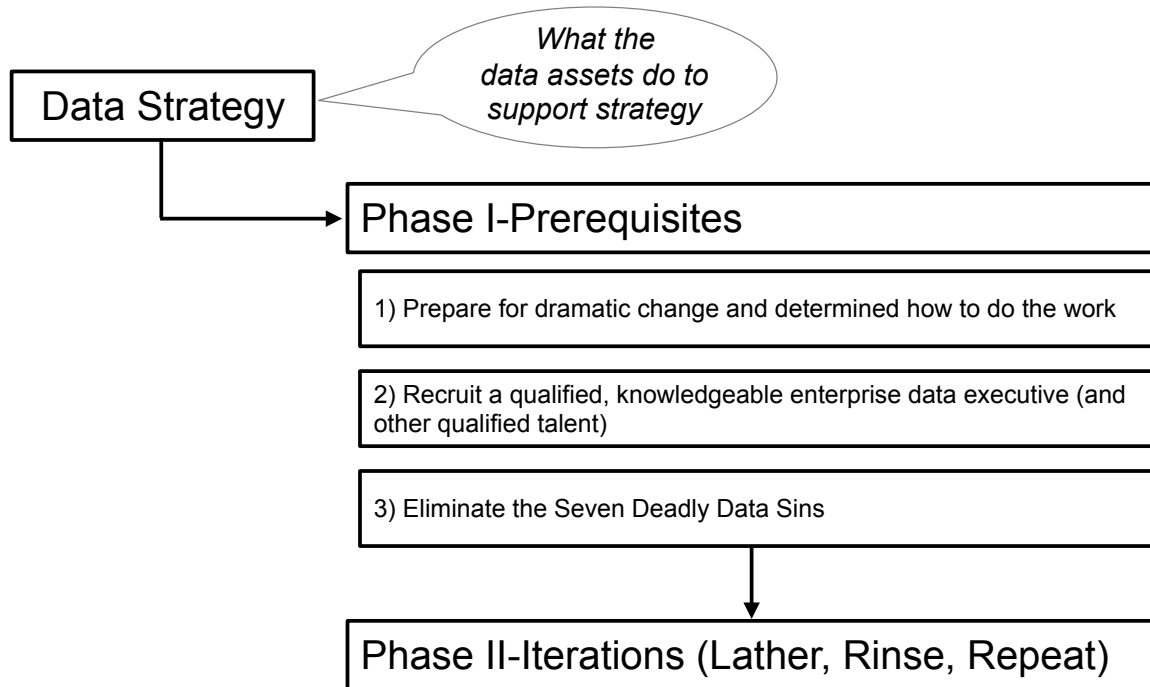
## CDO Agenda

Manage data as an organizational asset in an attempt to obtain a strategic advantage (achieve the organizational mission)!






# AGENDA

- Develop the first version of an organizational data strategy
- Decrease data rot
- Monetize your organization's data

# Data Strategy is Implemented in 2 Phases



## Exorcising the Seven Deadly Data Sins

-  1 Not Understanding Data-Centric Thinking
-  2 Lacking Qualified Data Leadership
-  3 Not implementing a Robust, Programmatic Means of Developing Shared Data
-  4 Not Aligning The Data Program with IT Projects
-  5 Failing to Adequately Manage Expectations
-  6 Not Sequencing Data Strategy Implementation
-  7 Failing To Address Cultural And Change Management Challenges





# Each of the three most common reporting structures has positive and negative implications to consider

## 1. Direct report to CEO



- Raise data to CEO's agenda for full empowerment
- Ensure data ownership independence from individual business units (BUs).
- Risk power issues between CIO and CDO

## 2. Integration within IT



- Leverage data as an operational enabler for business decisions
- Easily coordinate data management, architecture and IT
- Risk loss of business relevance for data

## 3. Report to functional area

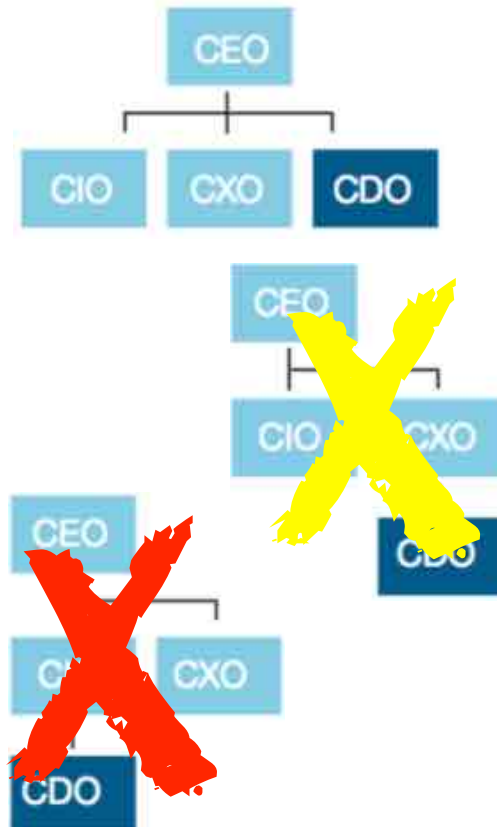


- Provide data independence from IT
- Enable cross-BU functions for data management
- Risk diminished operational effectiveness caused by loss of IT contact

Source: IBM Institute for Business Value, 2016.

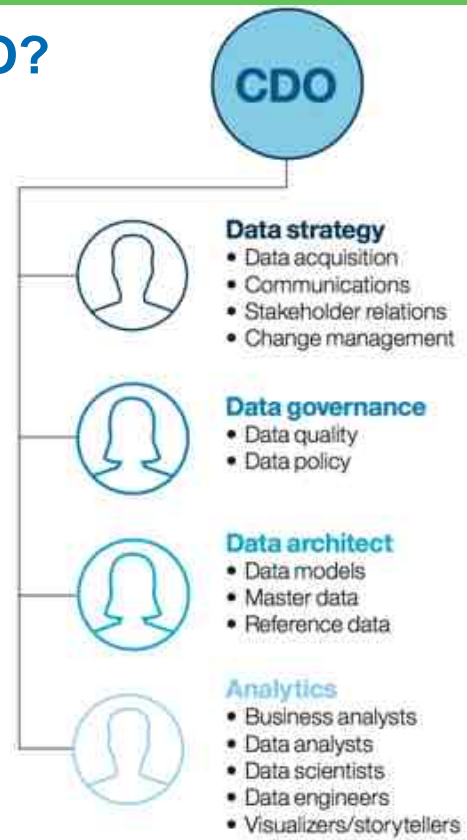
## CDO Reporting Particulars

1. Report outside of IT and the current CIO altogether;
2. Report to the same organizational structure that the CFO and other "top" jobs report into; and
3. Focus on activities that are outside of (and more importantly) upstream from any system development lifecycle activities (SDLC).



# Who should report to the CDO?

- 66 percent have data architects and business analysts reporting to them
- 60 percent have data scientists and data analytics staff
- 50 percent have data acquisition or data management specialists reporting to them
- 40 percent oversee a center of competency for analytics
- 30 percent oversee a Chief Analytics Officer
- One-third of CDOs oversee data stewards as part of their information governance programs
- Finding talent – especially qualified data scientists – is often one of the more overlooked challenges for a CDO
- +40 percent of CDOs reported a lack of skills as one of their top-two obstacles
  - Yet only 20 percent of organizations with plans to hire a CDO consider this an obstacle



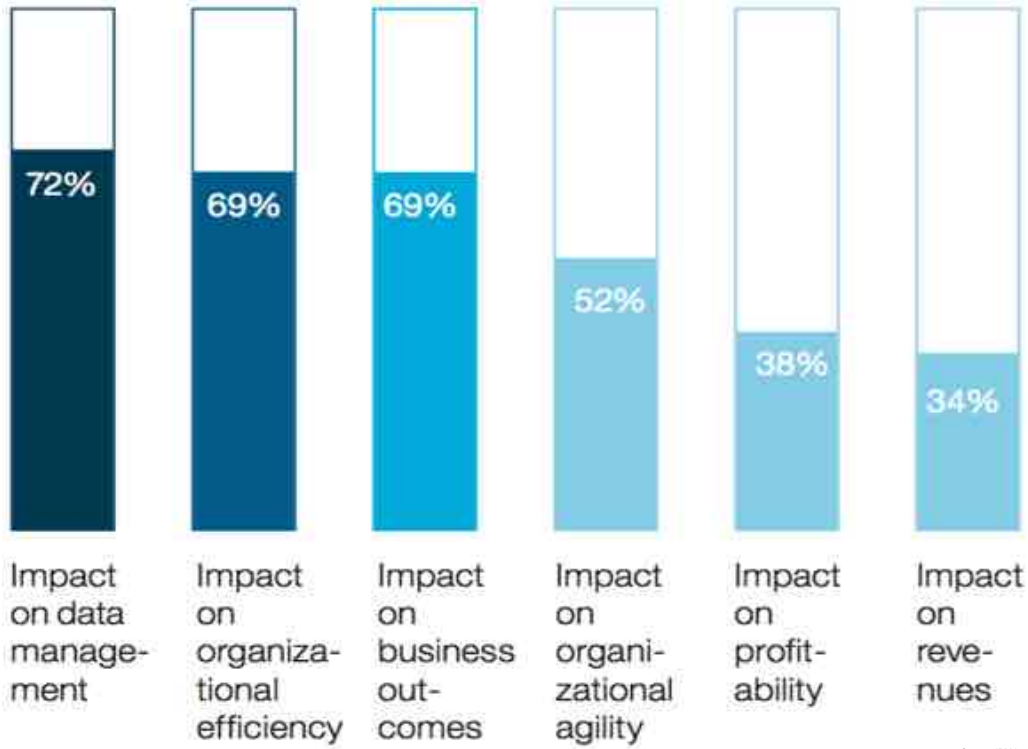
Source: IBM Institute for Business Value, 2016.

## New division of labor

- Reporting to IT
  - Data Development
  - Database Operations Management
- Shared with the business
  - Metadata Management
  - Data Security Management
- Reporting to Business
  - Data Architecture Management
  - Reference & Master Data Management
  - Data Warehousing & BI Management
  - Document & Content Management
  - Data Quality Management
  - Data Governance



**Most CDOs are measured by their impact on data management, organizational efficiency and business outcomes, which aligns with the data value chain**



Source: IBM Institute for Business Value, 2016.



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**The CDO mandate should align with the organization's key aspiration on the data value chain**



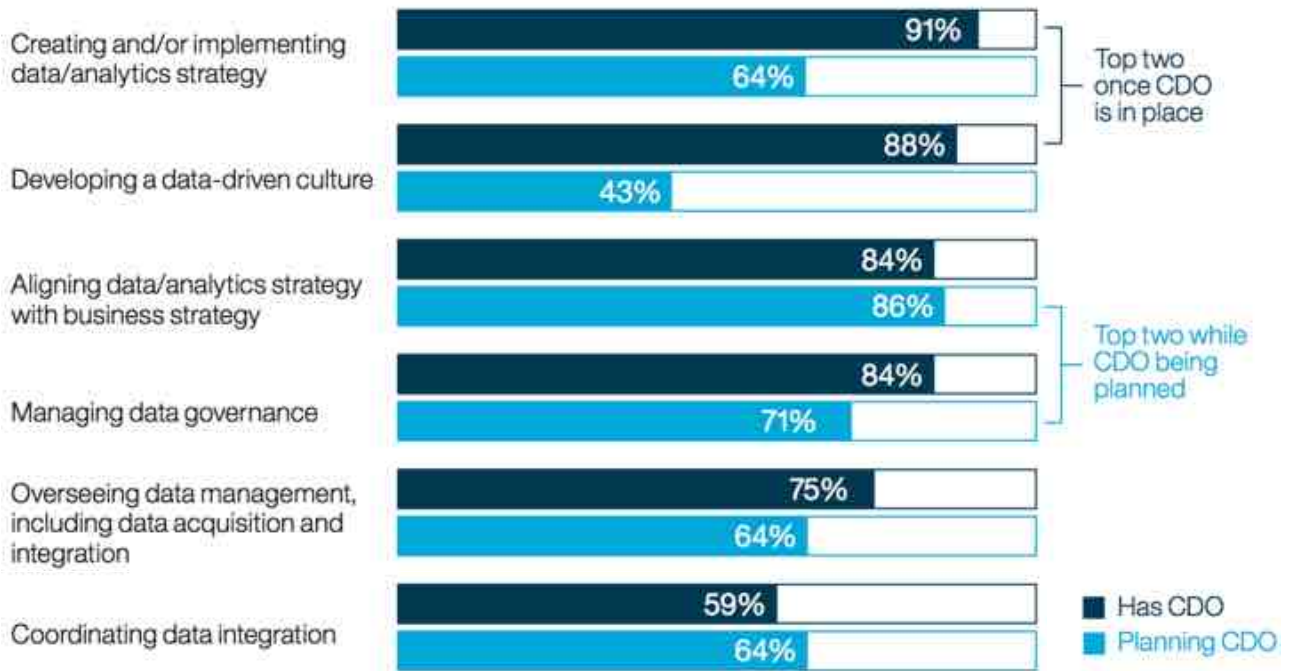
Source: IBM Institute for Business Value, 2016.



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# The CDO key priorities evolve as organizational capabilities develop



Source: IBM Institute for Business Value, 2016.

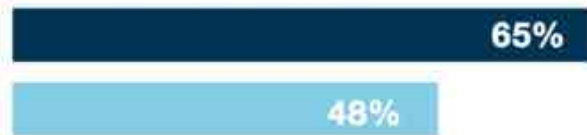


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Organizations with a CDO also collect a more diverse dataset than those without one

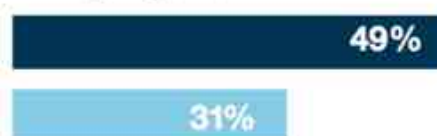
## Customer-generated data



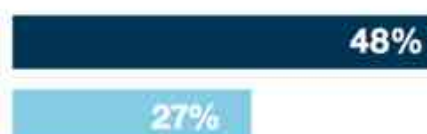
## Streaming data and events



## Third-party data



## Sensors and devices



■ With a CDO ■ Without a CDO

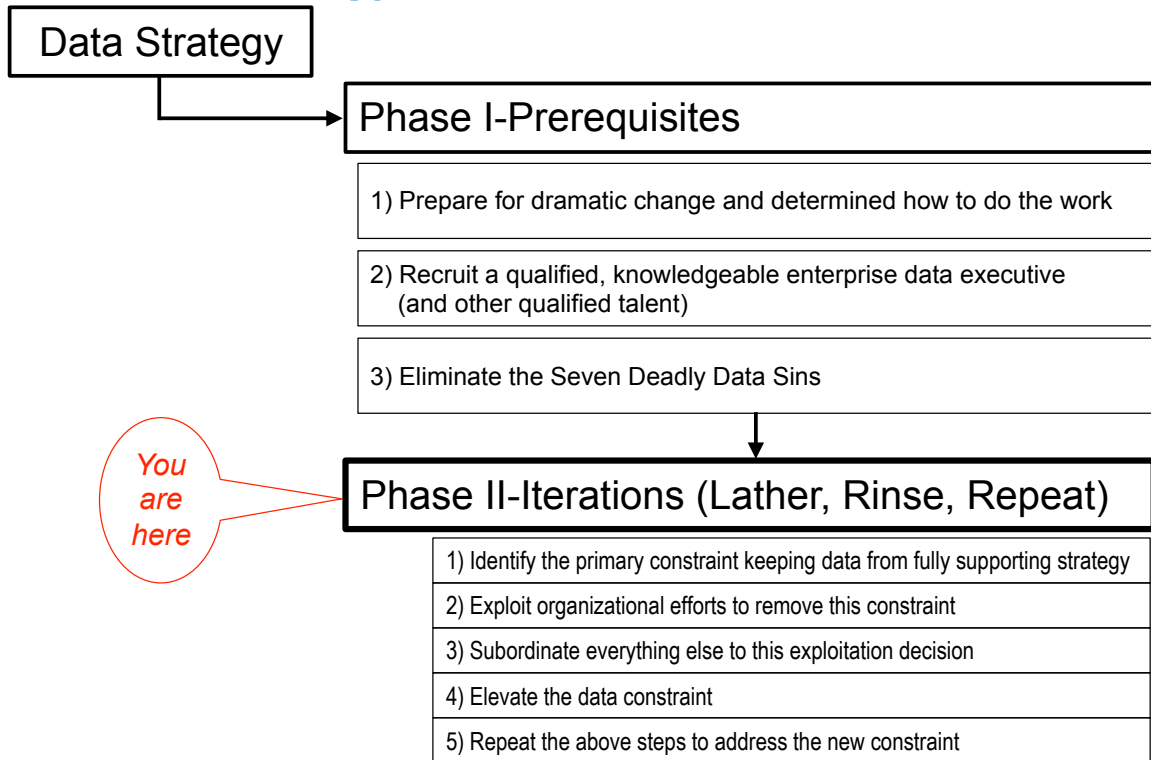
Source: IBM Institute for Business Value, 2016.



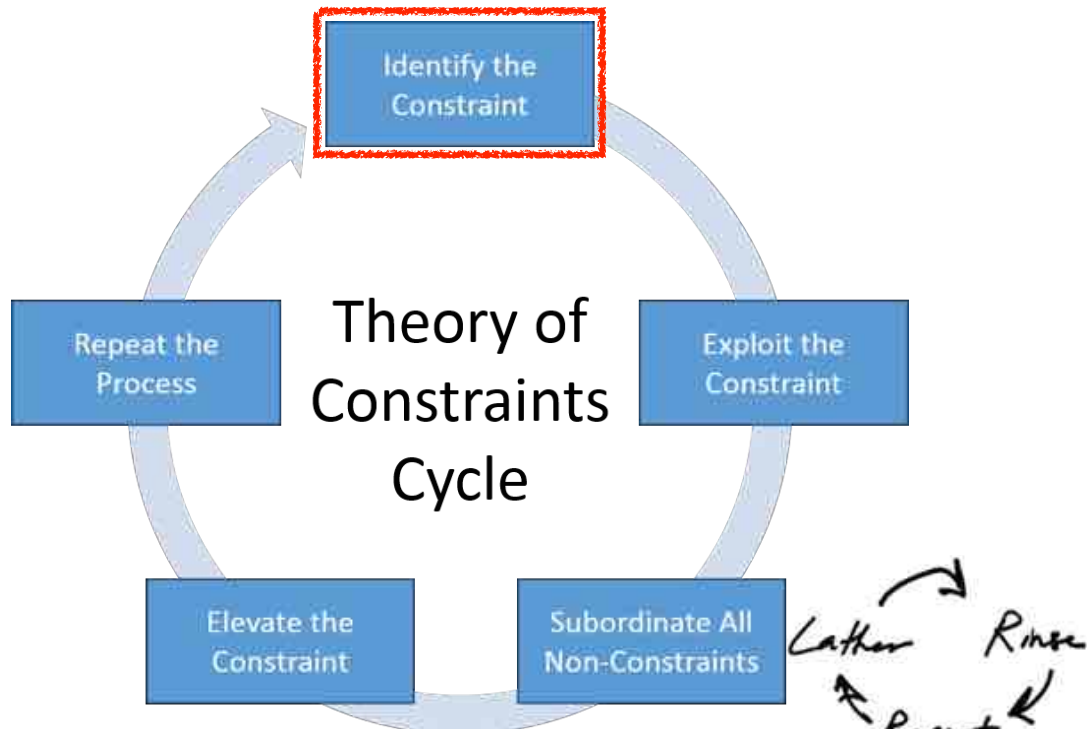
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# Data Strategy is Implemented in 2 Phases



# Theory of Constraints



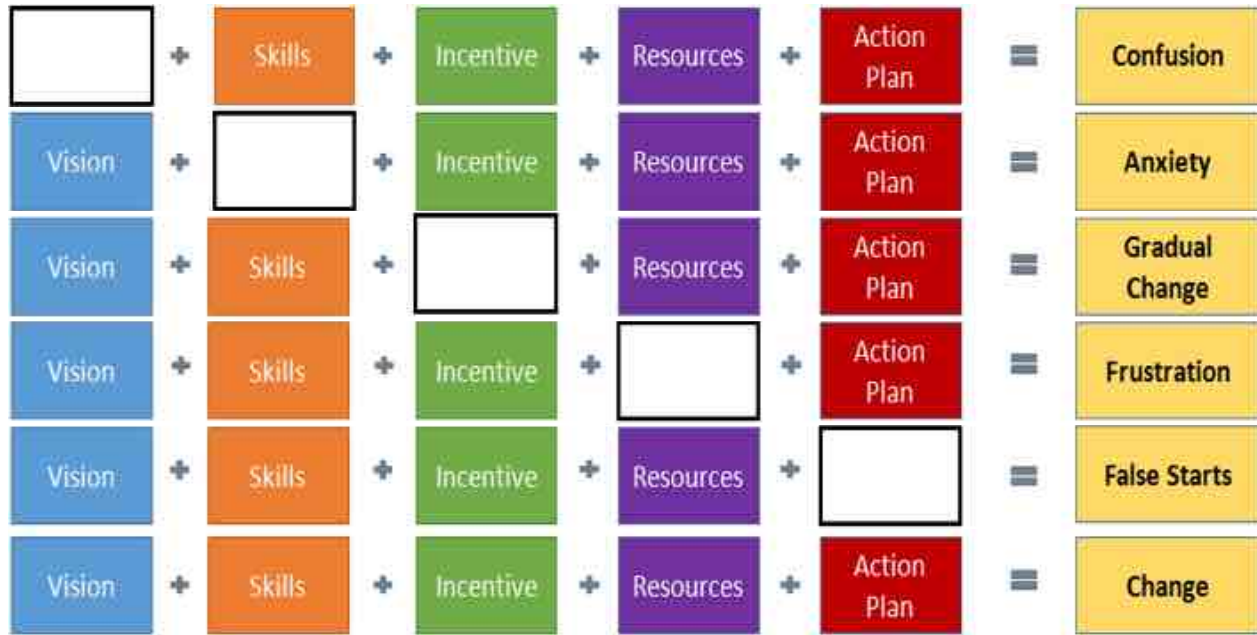
## Sample: Reengineering the Location Data Element

- First, fix the prerequisites!
- The problem:
  - Issuing new store numbers
  - Spreadsheet based
  - Pervasive
  - Not governed
  - Would issue the last available store number is this calendar year
- The solution:
  1. Identify-data/systems inventory
  2. Exploit-3 digit expanded to 10 digits
  3. Subordinate-prioritize and sequence remediation
  4. Elevate-EXECUTE!
  5. Repeat the above steps to address the new constraint



- Chief Electrification Officer – responsible for electrical generating and distribution systems. The title was used mainly in developed countries from the 1880s to 1940s during the electrification of industry, but is still used in some developing countries.

# Diagnosing Organizational Readiness



***Culture is the biggest impediment to a shift in organizational thinking about data!***



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My Author Page My Binders SIGN OUT:  
Dr. Peter Aiken

**EXPERIENCE: Succeeding at Data Management—BigCo Attempts to Leverage Data**

Full Text: PDF

Author: Peter Aiken Virginia Commonwealth University/Data Blueprint

Published in:

Journal  
Journal of Data and Information Quality (JDIQ) - Challenge Papers, Regular Papers and Experience Paper [JDIQ Homepage](#) archive  
Volume 7 Issue 1-2, June 2016  
Article No. 8  
ACM New York, NY, USA  
[table of contents](#) doi>[10.1145/2893482](https://doi.org/10.1145/2893482)

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# The Case for the Top Data Job (TDJ)

Rethinking the Essence of a Critically Lacking Business Function



Peter Aiken

# MONETIZING DATA MANAGEMENT



*Unlocking the Value in Your Organization's Most Important Asset.*

PETER AIKEN WITH JUANITA BILLINGS  
FOREWORD BY JOHN BOTTEGA



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## Data Strategy and the Enterprise Data Executive

Ensuring that Business and IT are in Sync in the Post-Big Data Era



Peter Aiken • Todd Harbour  
Foreword by Micheline Casey

Data Literacy Series



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## Questions?



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It's your turn!



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