Strategy Is Where Data Architecture & Data Governance Collide

peter.aiken@anythingawesome.com +1.804.382.5957

Peter Aiken, Ph.D.

- I've been doing this a long time
- My work is recognized as useful
- Associate Professor of IS (vcu.edu)
- Institute for Defense Analyses (ida.org)
- DAMA International (dama.org)
- MIT CDO Society (iscdo.org)
- Anything Awesome (anythingawesome.com)
- Experienced w/ 500+ data management practices worldwide
- Multi-year immersions
  - US DoD (DISA/Army/Marines/DLA)
  - Nokia
  - Deutsche Bank
  - Wells Fargo
  - Walmart
  - HUD …
- 12 books and dozens of articles

$1,500,000,000.00 USD

Program Overview

- Introduction
  - Data's Confounding Characteristics
  - Uneven understanding
  - DM BoK Foundations
- Defining Data Governance
  - Need an elevator pitch
  - Increasing costs of organizational data debt
  - Requires an adaptive rather than a prescriptive approach
- Defining Data Architecture
  - Ubiquitous and not well understood
  - Keeping improvements practically focused on strategy
  - Cannot use what is not understood
- Strategic Focus Improves Coordination
  - Upending the traditional
  - Defensive Driving
  - Storytelling but don't relate everything
- Take Aways/References/Q&A

Strategy Is Where Data Architecture & Data Governance Collide

Data's Unique Properties

- Today, data is the most powerful, yet underutilized and poorly managed organizational asset
- Data is
  - Nearly unlimited
  - Not really visible (absent competent visualization expertise)
  - 'Cheap' to keep and transport
  - 'Free' to make copies (non rivalrous)
  - Impossible to clean-up if you spill it
- 80% of organizational data is **(ROT)**
  - **R**edundant
  - **O**bsolete
  - **T**rivial
  - of unknown quality
- Data specific education is
  - Generally non-existent outside of IT
  - Inconsistently taught
  - Missing 'business' context
  - (Re)learned by every workgroup

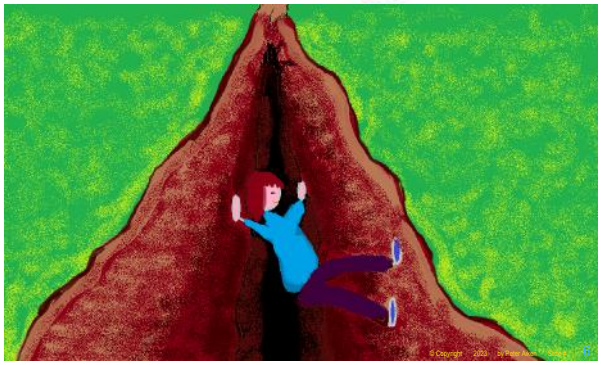
Asset: A resource controlled by the organization as a result of past events or transactions and from which future economic benefits are expected to flow [Wikipedia]

https://www.inc.com/jim-schleckser/why-need-for-too-much-data-is-a-fatal-leadership-flaw.html

Wally Easton Playing Piano https://www.youtube.com/watch?v=NNbPxSvII-Q

Confusion as to data responsibility

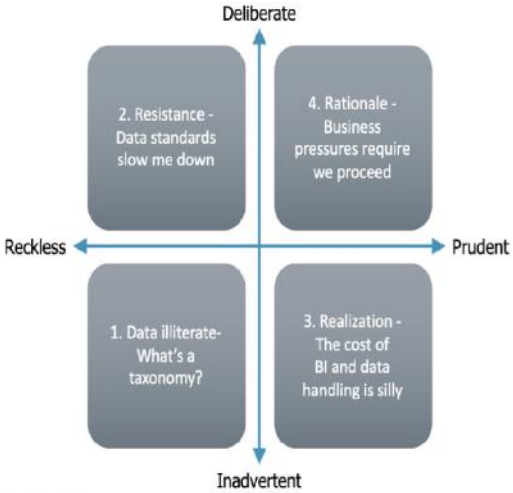
- IT thinks data is a business problem
  - *"If they can connect to the server, then my job is done!"*
- The business thinks IT is managing data adequately
  - *"Who else would be taking care of it?"*



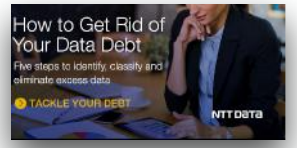
You Must Address Data Debt Proactively

Data debt:
- Slows progress
- Decreases quality
- Increases costs
- Presents greater risks

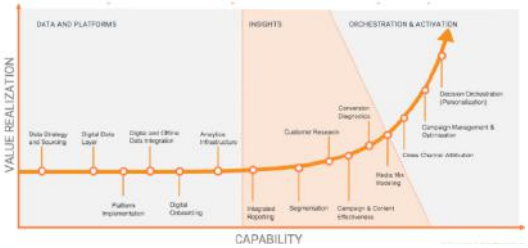
- Data debt
  - The time and effort it will take to return your shared data to a governed state from its (likely) current state of ungoverned
- Getting back to zero
  - Involves undoing existing stuff
  - Likely new skills are required



https://johnladley.com/a-bit-more-on-data-debt/



https://uk.nttdataservices.com/en/blog/2020/february/how-to-get-rid-of-your-data-debt



https://www.merkleinc.com/blog/are-you-buried-alive-data-debt

Forbes

2020 American Airlines market value ~ $6b
AAdvantage valued between $19.5-$31.5b
2020 United market value ~ $9b
MileagePlus ~ $22b

EDITORS' PICK | Jul 15, 2020, 09:00am EDT

How Airlines Make Billions From Monetizing Frequent Flyer Programs

Forbes Advisor

JT Genter Advisor Contributor
Advisor Contributor Group
Personal Finance

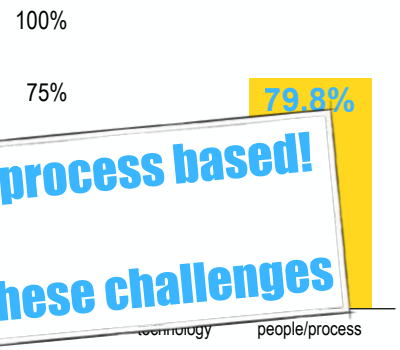
https://www.forbes.com/sites/advisor/2020/07/15/how-airlines-make-billions-from-monetizing-frequent-flyer-programs/?sh=66da87a614e9

What We Learned From Top Execs About Their Big Data And AI Initiatives

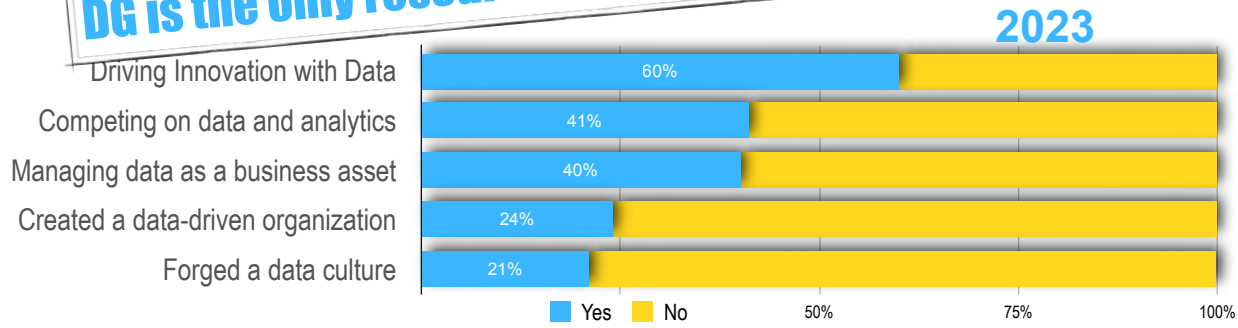
Randy Bean Contributor
CIO Network Contributor Group
Enterprise & Cloud

Culture still eats strategy for breakfast

This aphorism is attributed to legendary management consultant Peter Drucker, and it certainly appears to hold true for data transformation efforts. Leading companies continue to identify culture – people, process, organization, change management – as the biggest impediment to becoming data-driven organizations – 92.2%. Few companies – only 30.0% – have even developed a well-articulated data strategy that culture could eat for breakfast. There is plenty of work to be done.



80% of data challenges are people/process based!
&
DG is the only resource to address these challenges



Source: Big Data and AI Executive Survey 2021 by Randy Bean and Thomas Davenport www.newvantage.com

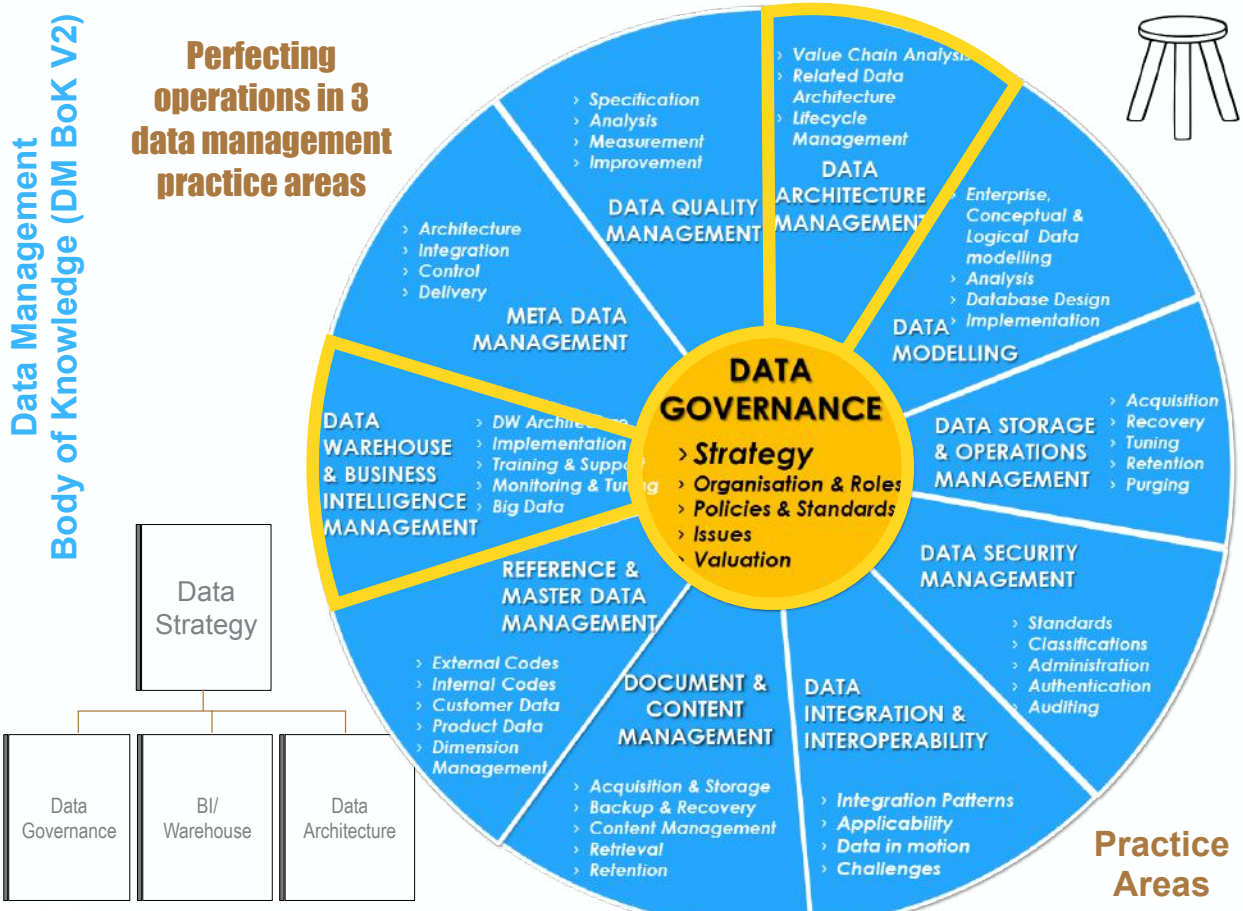
Data Management Body of Knowledge (DM BoK V2)

Practice Areas

from *The DAMA Guide to the Data Management Body of Knowledge* 2E © 2017 by DAMA International

Data Management Body of Knowledge (DM BoK V2)

Perfecting operations in 3 data management practice areas



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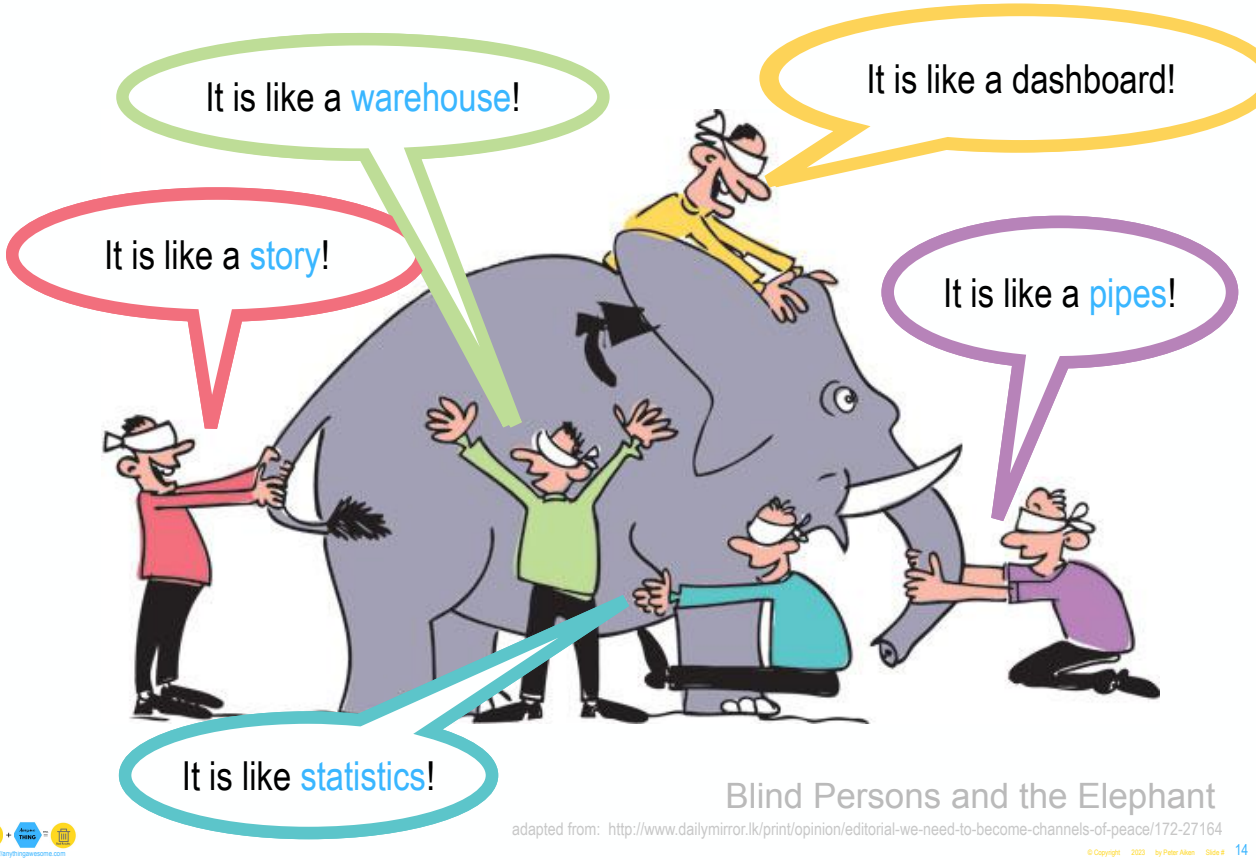
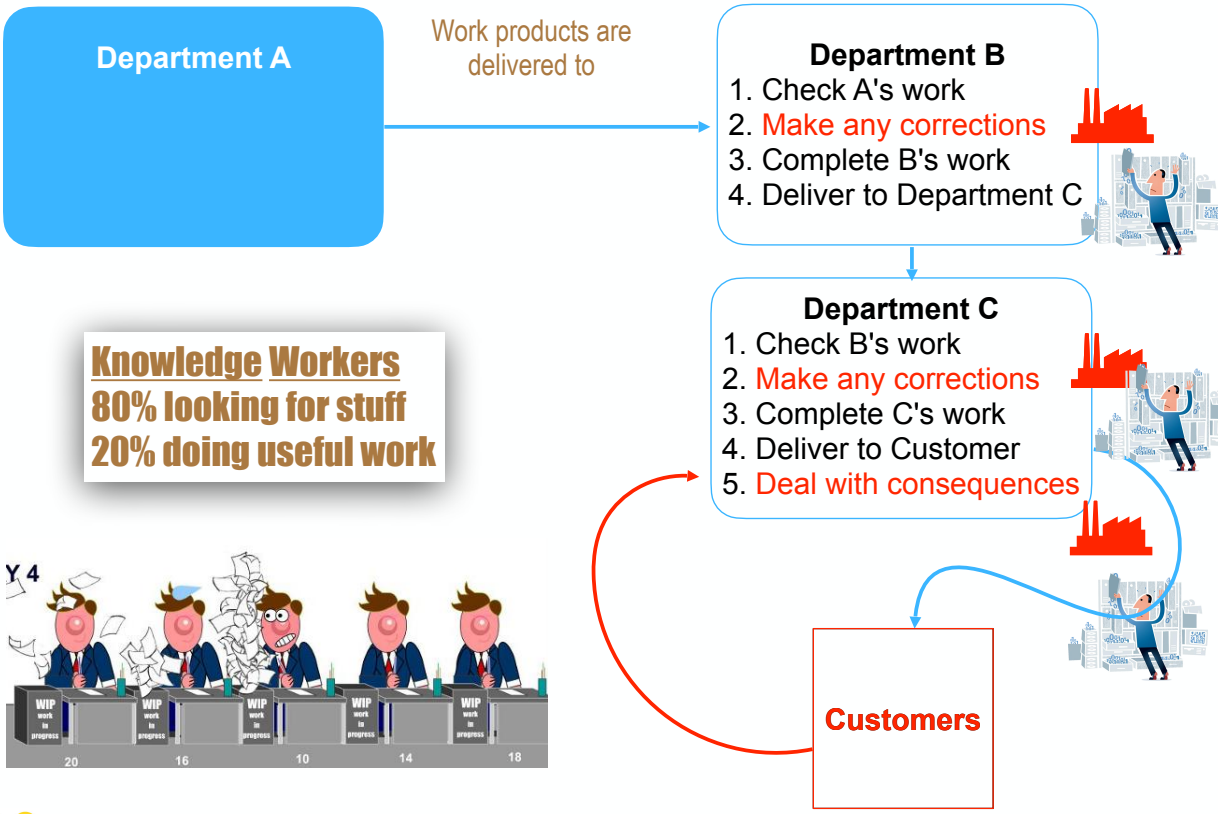
Data is not broadly or widely understood



Blind Persons and the Elephant

adapted from: http://www.dailymirror.lk/print/opinion/editorial-we-need-to-become-channels-of-peace/172-27164

Hidden Data Factories



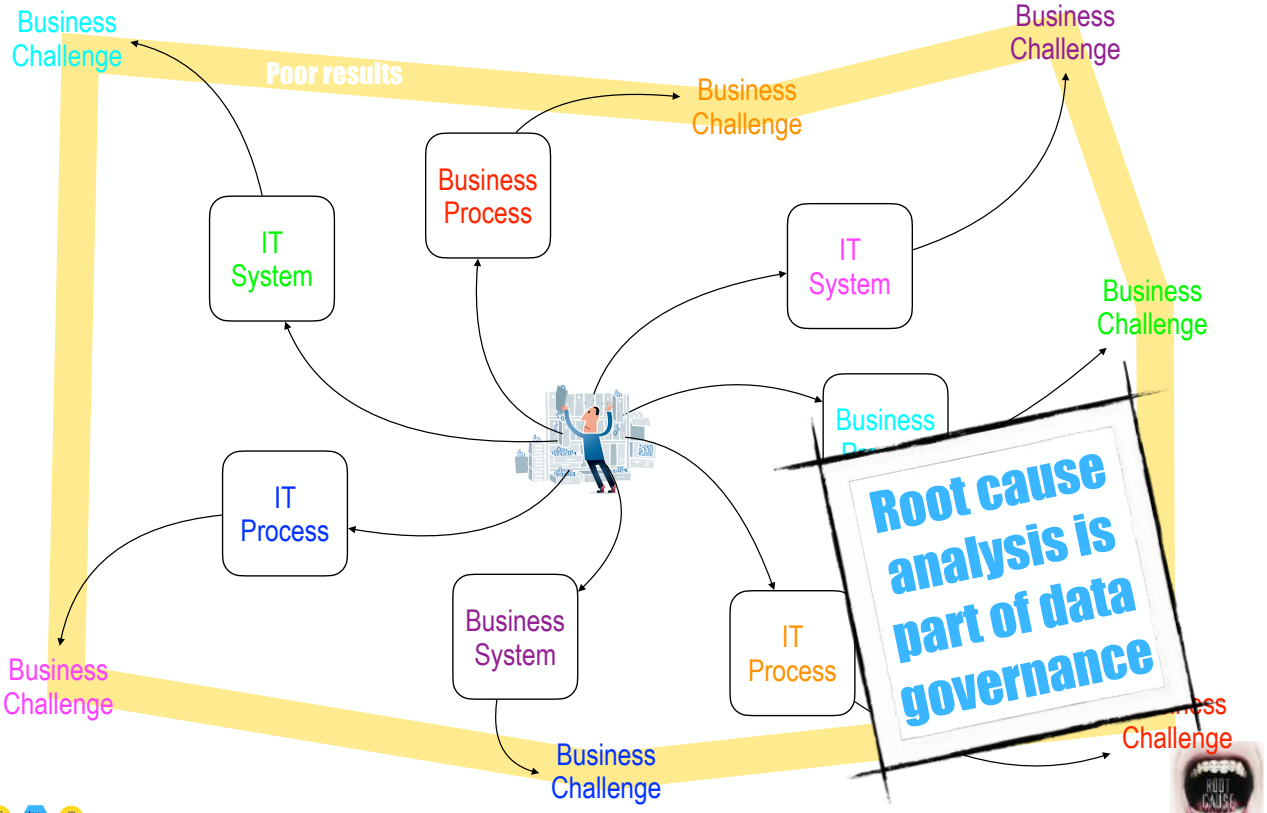
Knowledge Workers
80% looking for stuff
20% doing useful work

https://en.wikipedia.org/wiki/Theory_of_constraints

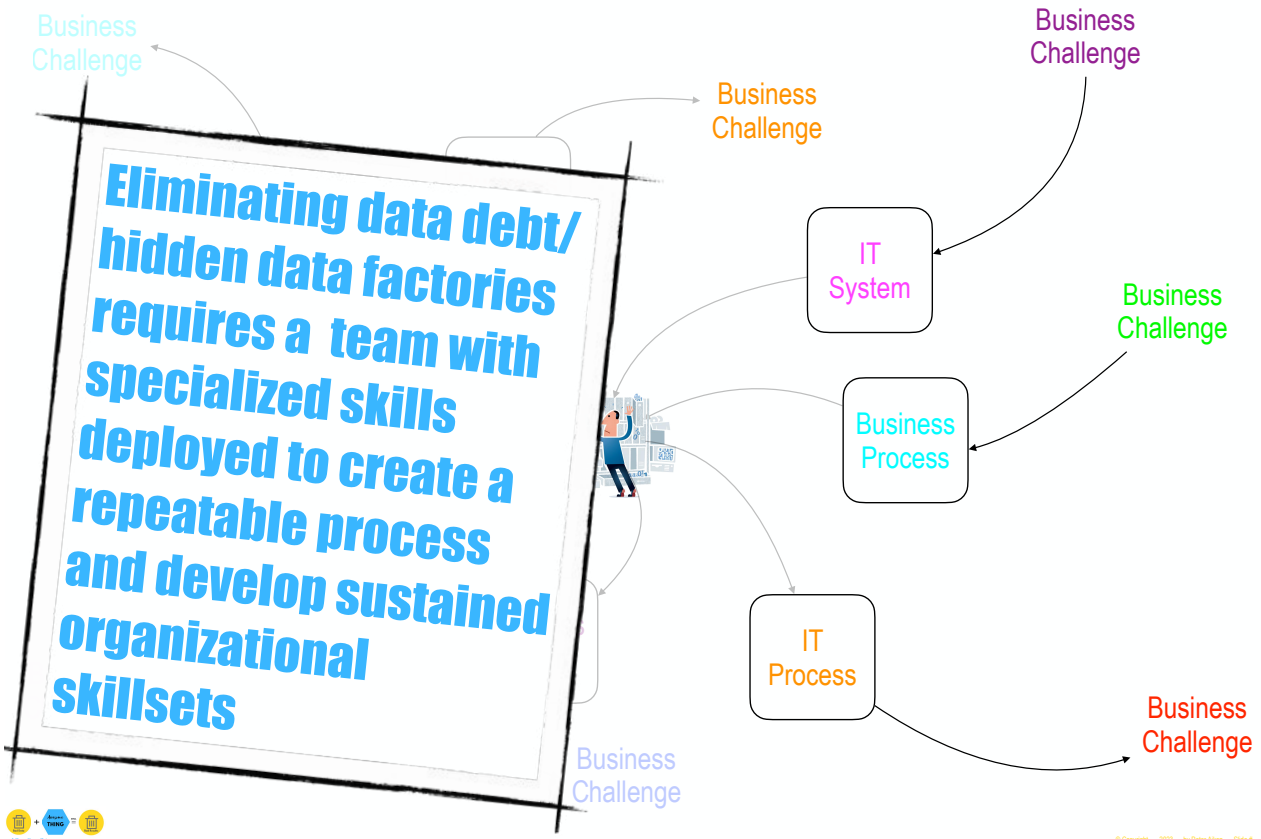
https://hbr.org/2016/09/bad-data-costs-the-u-s-3-trillion-per-year

Poor data manifests as multifaceted organizational challenges

Poor data manifests as multifaceted organizational challenges



Consistency Encourages Quality Analysis



Definitions

- Corporate governance
  - The relationship of an organization to society
- IT Governance
  - Align IT strategy with organizational strategy–measure IT's performance
- 7 Data Governance Definitions
  - The formal orchestration of people, process, and technology to enable an organization to leverage data as an enterprise asset – The MDM Institute
  - A convergence of data quality, data management, business process management, and risk management surrounding the handling of data in an organization – Wikipedia
  - A system of decision rights and accountabilities for information-related processes, executed according to agreed-upon models which describe who can take what actions with what information, and when, under what circumstances, using what methods – Data Governance Institute
  - The execution and enforcement of authority over the management of data assets and the performance of data functions – KiK Consulting
  - A quality control discipline for assessing, managing, using, improving, monitoring, maintaining, and protecting organizational information – IBM Data Governance Council
  - Data governance is the formulation of policy to optimize, secure, and leverage information as an enterprise asset by aligning the objectives of multiple functions – Sunil Soares
  - The exercise of authority and control over the management of data assets – DM BoK

Elevator Pitch

An **elevator pitch**, **elevator speech**, or **elevator statement** is a short description of an idea, product, or company that explains the concept in a way such that any listener can understand it in a short period of time. (Wikipedia)

What is Data Governance?

Managing Data with Guidance

Would you want your sole, non-depletable, non-degrading, durable, strategic asset managed <u>without</u> guidance?

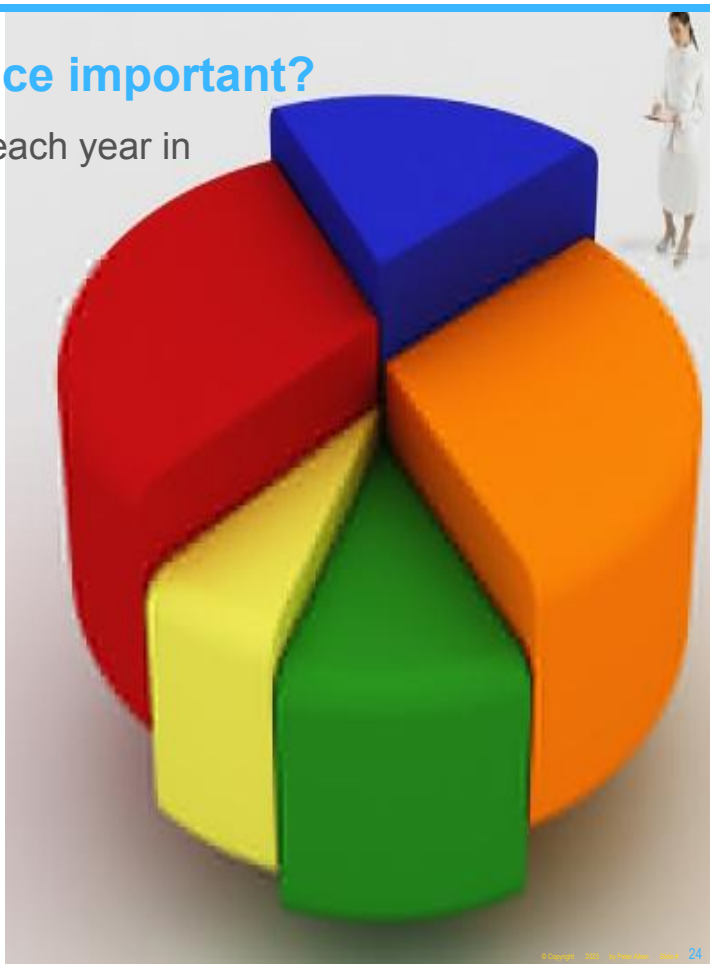
Data Governance is

Managing Data Decisions with Guidance

Would you want your sole, non-depletable, non-degrading, durable, strategic asset managed <u>without</u> guidance?

Why is Data Governance important?

- Cost organizations millions each year in
  - Productivity
  - Redundant and siloed efforts
  - Poorly thought out hardware and software purchases
  - Delayed decision making using inadequate information
  - Reactive instead of proactive initiatives
  - 20-40% of IT spending can be reduced through better data governance

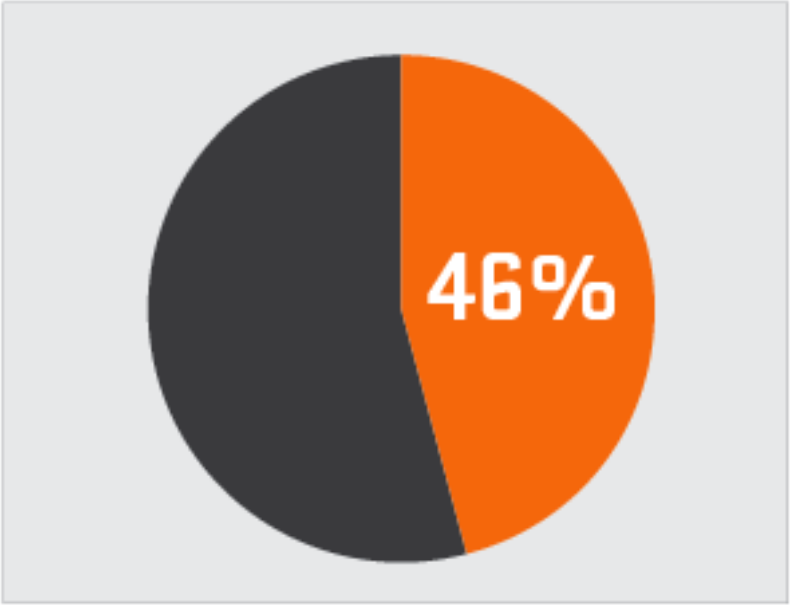


Bad Data Decisions Spiral

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



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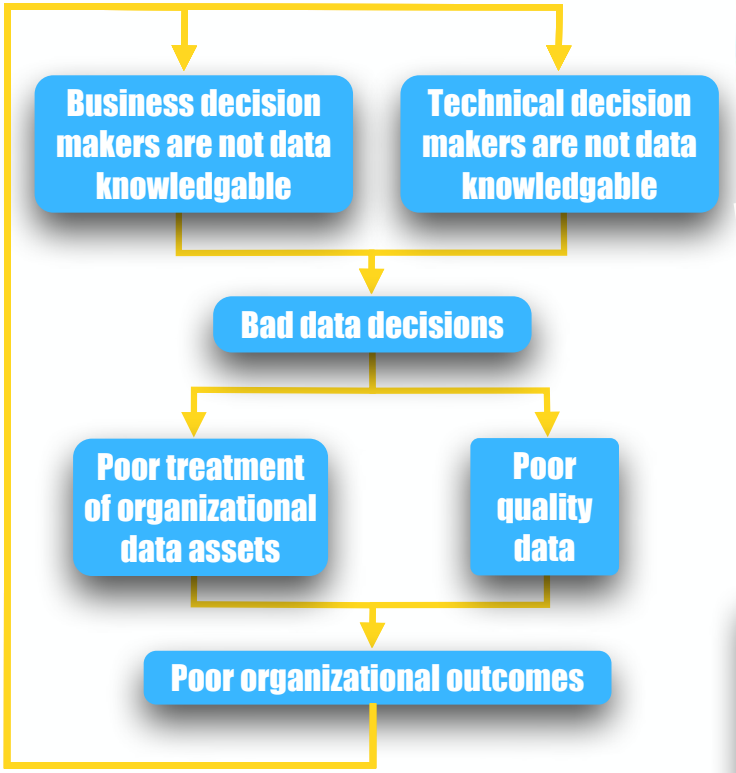

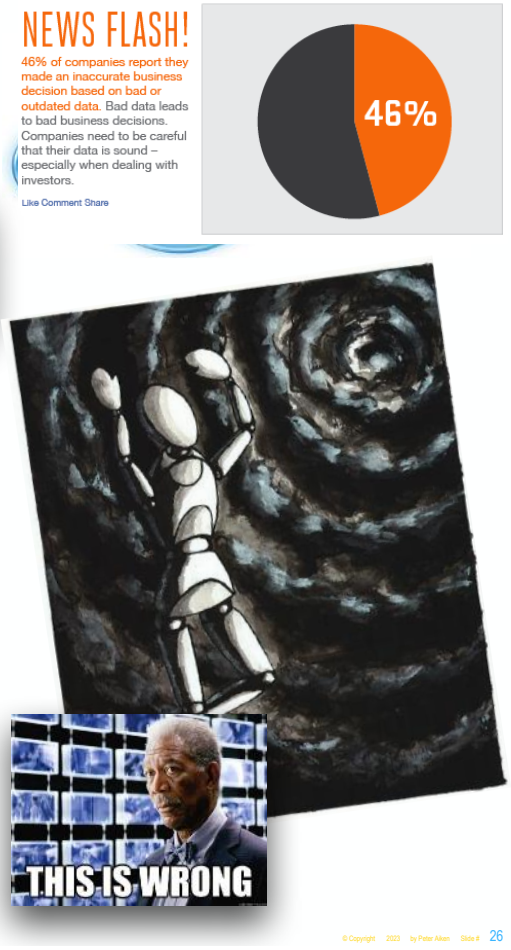

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Like Comment Share
46%

Goals and Principles

- To define, approve, and communicate data strategies, policies, standards, architecture, procedures, and metrics.
- To track and enforce regulatory compliance and conformance to data policies, standards, architecture, and procedures.
- To sponsor, track, and oversee the delivery of data management projects and services.
- To manage and resolve data related issues.
- To understand and promote the value of data assets.

Illustration from *The DAMA Guide to the Data Management Body of Knowledge* © 2009 by DAMA International

Primary Deliverables

- Data Policies
- Data Standards
- Resolved Issues
- Data Management Projects and Services
- Quality Data and Information
- Recognized Data Value

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Roles and Responsibilities

- Suppliers:
  - Business Executives
  - IT Executives
  - Data Stewards
  - Regulatory Bodies
- Consumers:
  - Data Producers
  - Knowledge Workers
  - Managers and Executives
  - Data Professionals
  - Customers
- Participants:
  - Executive Data Stewards
  - Coordinating Data Stewards
  - Business Data Stewards
  - Data Professionals
  - DM Executive
  - CIO

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Scorecard: Data Governance Practices/Techniques

- Data Value
- Data Management Cost
- Achievement of Objectives
- # of Decisions Made
- Steward Representation/Coverage
- Data Professional Headcount
- Data Management Process Maturity

from *The DAMA Guide to the Data Management Body of Knowledge* © 2009 by DAMA International

Data Governance Checklist

- ✓ Decision-Making Authority
- ✓ Standard Policies and Procedures
- ✓ Data Inventories
- ✓ Data Content Management
- ✓ Data Records Management
- ✓ Data Quality
- ✓ Data Access
- ✓ Data Security and Risk Management

Source: "Data Governance Checklist for Educators" by Angela Guess; http://www.dataversity.net/archives/5198

DG Components

- Practices and Techniques
  - Data Value
  - Data Management Cost
  - Achievement of Objectives
  - # of Decisions Made
  - Steward Representation/Coverage
  - Data Professional Headcount
  - Data Mana Maturity

- What do I include in my Data Governance Program?
  - Security and Privacy of Data
  - Quality of Data
  - Life Cycle Management
  - Risk Management
  - Content Valuation
  - Standards (Data Design, Models and Tools)
  - Governance Tool Kits and Case Studies

Illustration from *The DAMA Guide to the Data Management Body of Knowledge* © 2009 by DAMA International

Evolve

Goals and Principles

- To define, approve, and communicate data strategies, policies, standards, architecture, procedures, and metrics.
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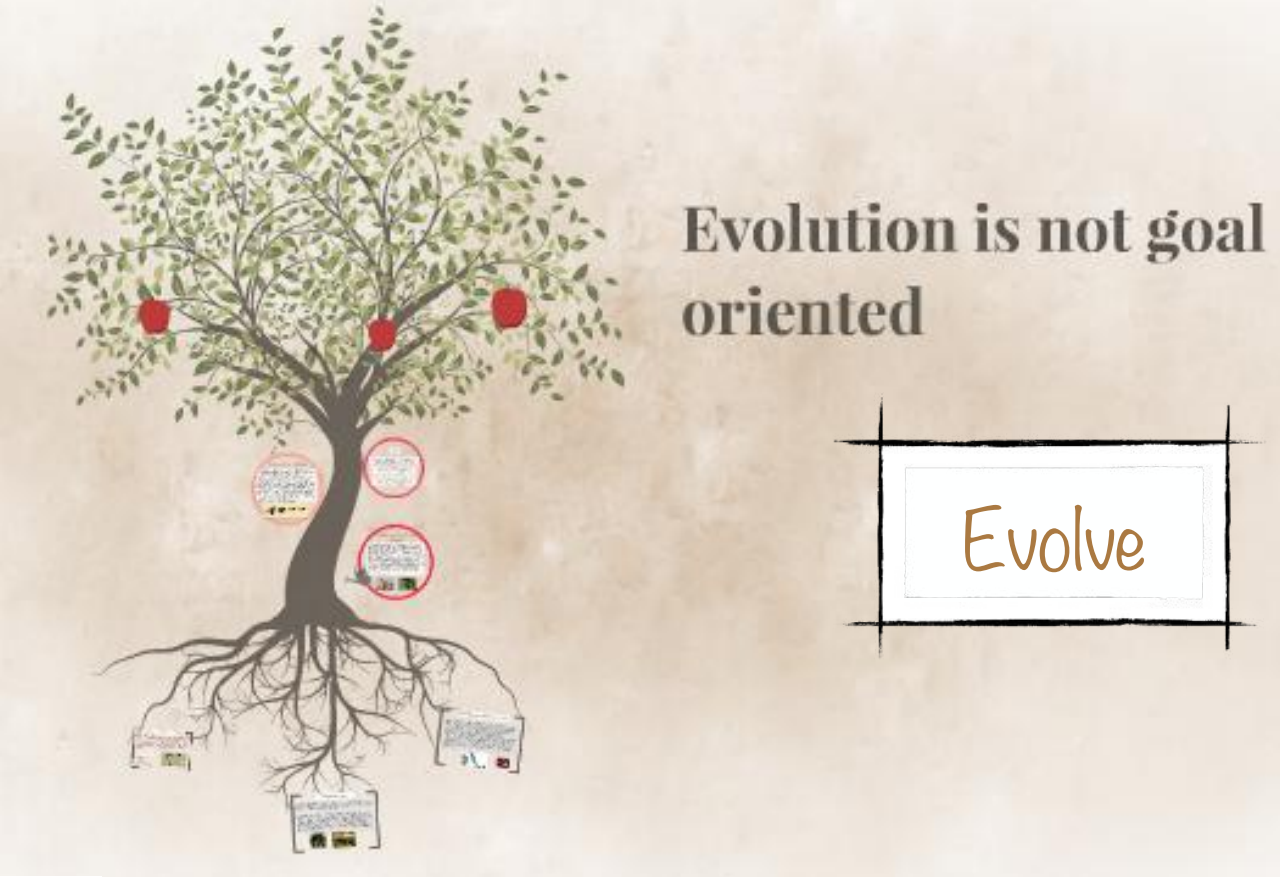
https://www.google.com/url?sa=i&url=https%3A%2F%2Fprezi.com%2Fel_1jxok7t-x%2Fevolution-is-not-goal-oriented%2F&psig=AOvVaw3rFrerRanKFatDfESqab4C&ust=1591700086354000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCODBilyH8ukCFQAAAAAdAAAAABAD



Getting Started with Data Governance

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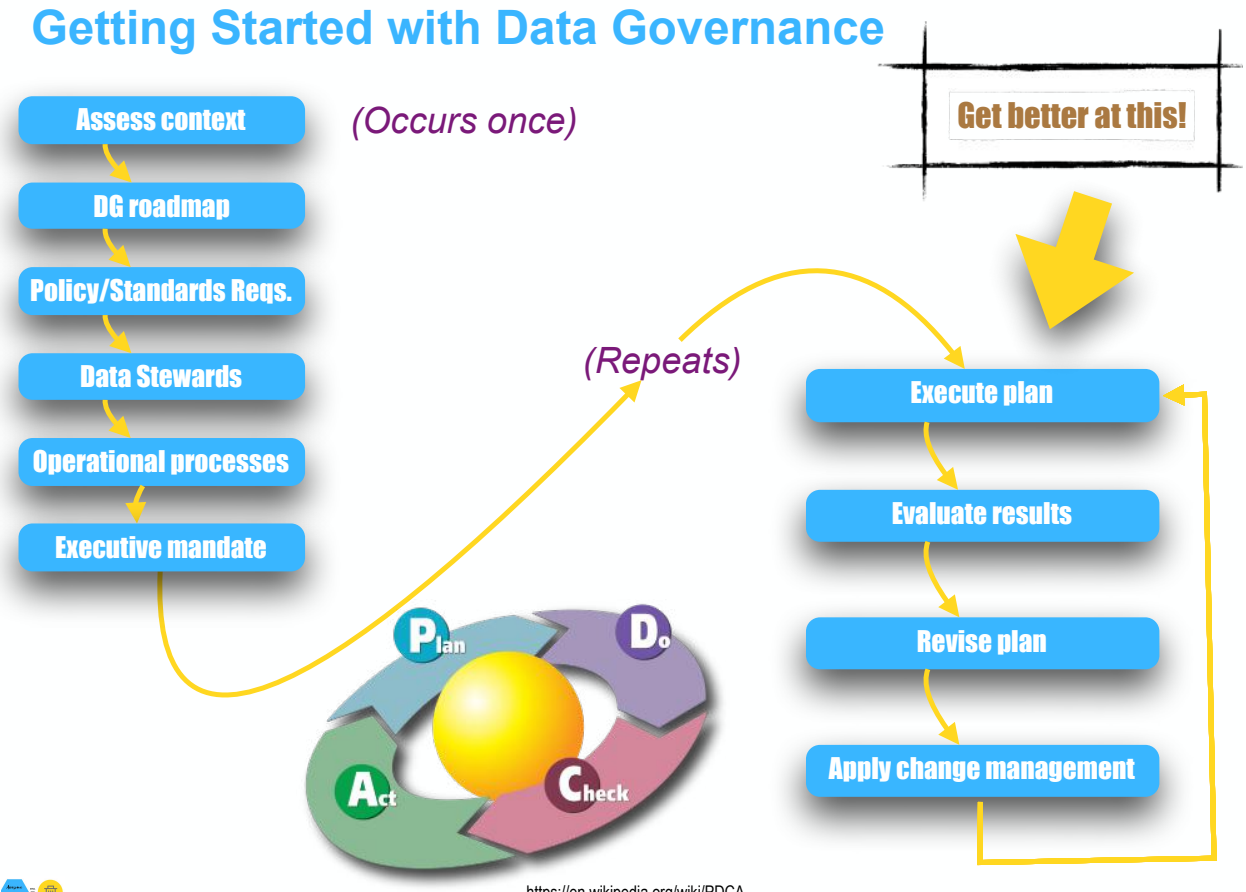


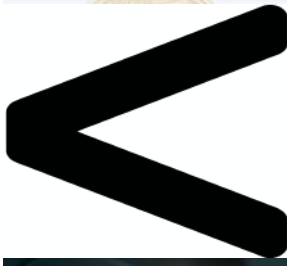
https://en.wikipedia.org/wiki/PDCA

The Princess on the Pea

by
Hans Christian Andersen

Doing a poor job with data governance

- Failure to understand the role of data governance re: proposed <u>and</u> existing software/services
  - Locks in imperfections for the life of the application
  - Restricts data investment benefits
  - Decreases organizational data leverage
- Accounts for 20-40% of IT budgets devoted to evolving
  - Data migration (Changing the data location)
  - Data conversion (Changing data form, state, or product)
  - Data improving (Inspecting and manipulating, or re-keying data to prepare it for subsequent use)
- Lack of data governance causes everything else to
  - Take longer
  - Cost more
  - Deliver less
  - Present greater risk (with thanks to Tom DeMarco)



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Architecture is about ...

- Things
  - (components)

- Business
- Process
- Systems
- Security
- Technical
- Data / Information

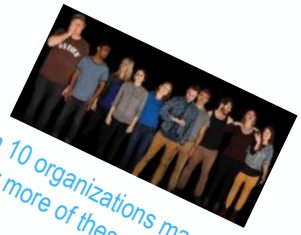
- The functions of the things
  - (individually)

- How the things interact
  - (as a system,
  - towards a goal)

Typically Managed Architectures

Technical committees

- Business Architecture
  - Goals, strategies, roles, organizational structure, location(s)
- Process Architecture
  - Arrangement of inputs -> transformations = value -> outputs
  - Typical elements: Functions, activities, workflow, events, cycles, products, procedures
- Systems Architecture
  - Applications, software components, interfaces, projects
- Security Architecture
  - Arrangement of security controls relation to IT Architecture
- Technical Architecture/Tarchitecture
  - Relation of software capabilities/technology stack
  - Structure of the technology infrastructure of an enterprise, solution or system
  - Typical elements: Networks, hardware, software platforms, standards/protocols
- Data / Information Architecture
  - Arrangement of data assets supporting organizational strategy
  - Typical elements: specifications expressed as entities, relationships, attributes, definitions, values, vocabularies



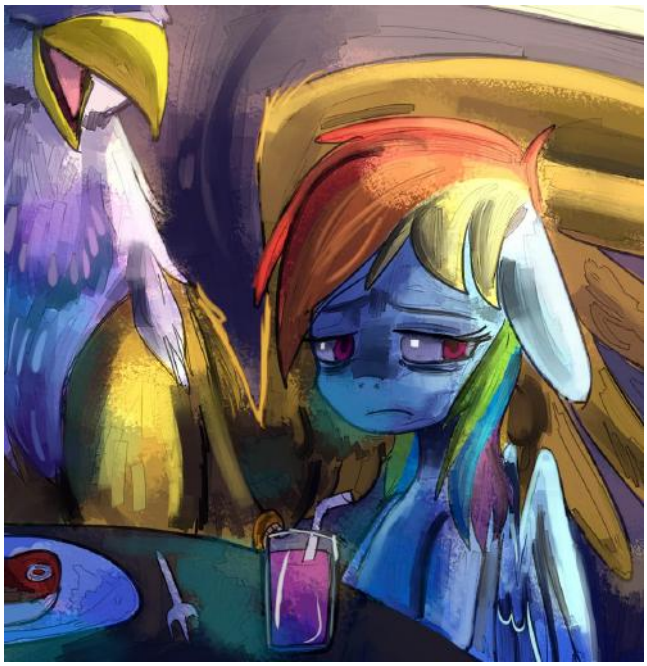
1 in 10 organizations manage 1 or more of these formally!

Data Architectures: here, whether you like it or not

- All organizations have data architectures
  - Some are better **understood** and **documented** (and therefore more **useful** to the organization)

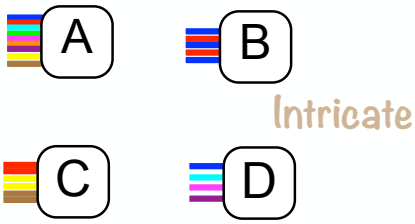
Business
Process
Systems
Security
Technical
Data/Information

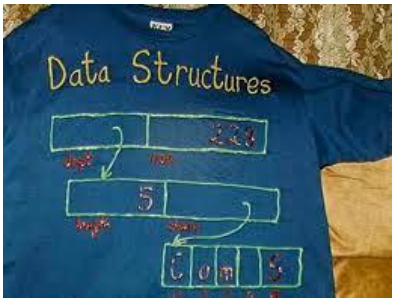
deviantart.com

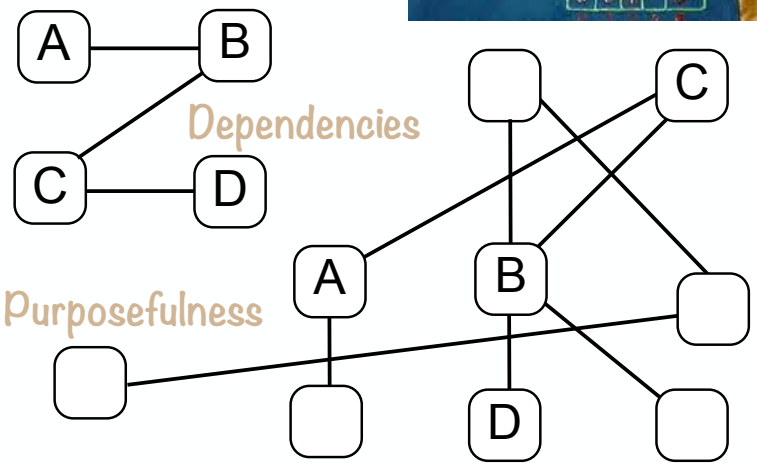


How are components expressed as architectures?

- Details are organized into larger components
- Larger components are organized into models
- Models are organized into architectures (composed of architectural components)







How are data structures expressed as architectures?

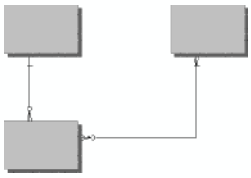
- Attributes are organized into entities/objects
  - Attributes are characteristics of "things"
  - Entitles/objects are "things" whose information is managed in support of strategy
  - Example(s)

Intricate

THING
Thing.Id #
Thing.Description
Thing.Status
Thing.Sex.To.Be.Assigned
Thing.Reserve.Reason

- Entities/objects are organized into models
  - Combinations of attributes and entities are structured to represent information requirements
  - Poorly structured data, constrains organizational information delivery capabilities
  - Example(s)

Dependencies

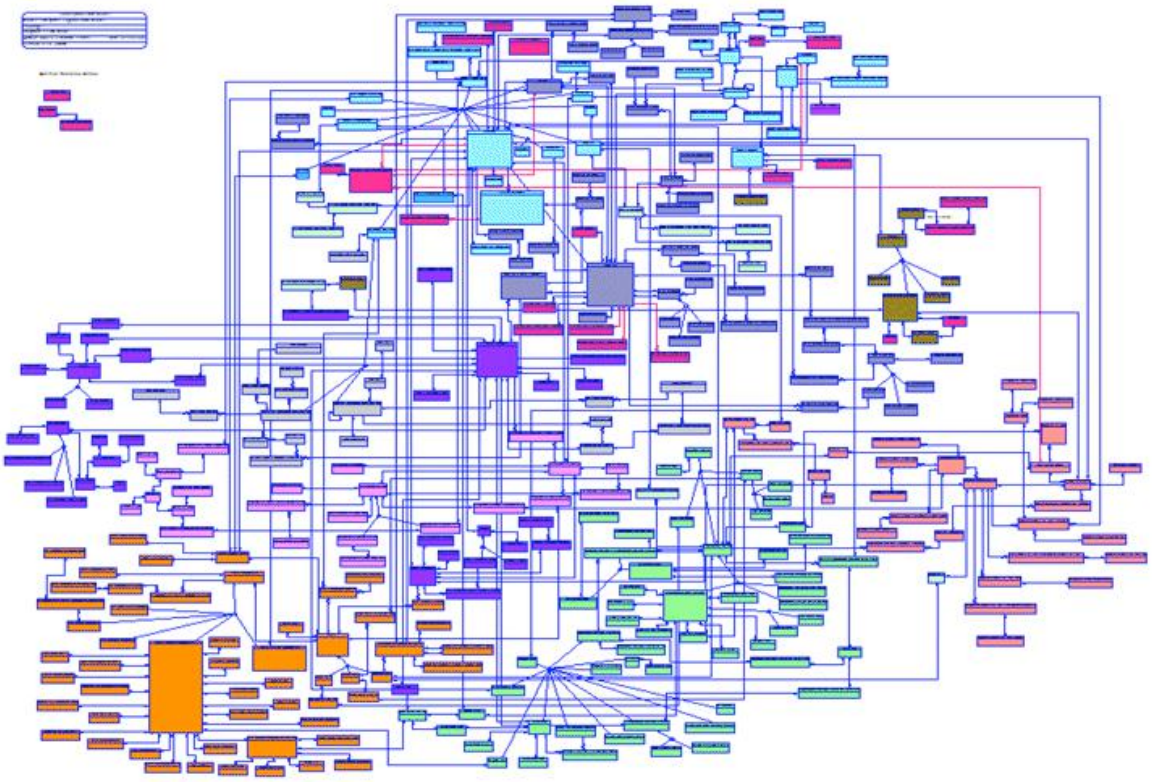


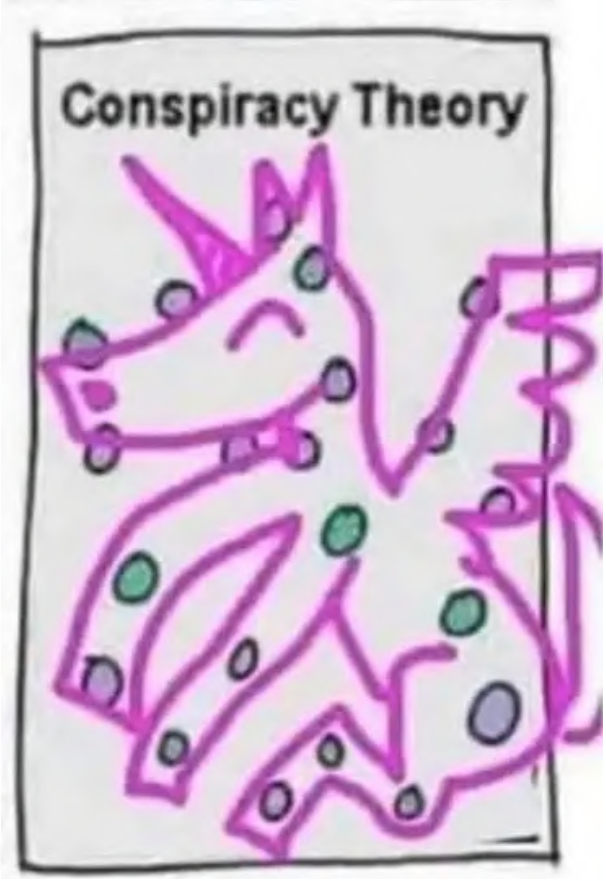
- Models are organized into architectures
  - When building new systems, architectures are used to plan development
  - More often, data managers do not know what existing architectures are and - therefore - cannot make use of them in support of strategy implementation

Purposefulness

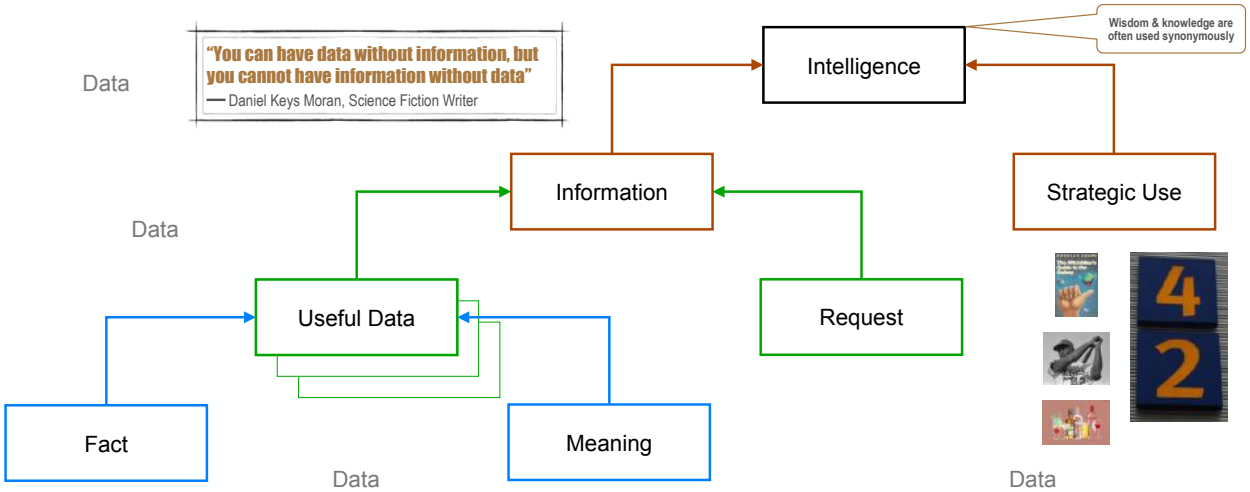
- *Why no examples?*

Data architectures are composed of data models





A model precisely defining 3 important concepts



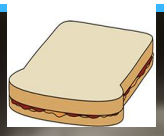
1. Each FACT combines with one or more MEANINGS.
2. Each specific FACT and MEANING combination is referred to as a DATUM.
3. An INFORMATION is one or more DATA that are returned in response to a specific REQUEST
4. INFORMATION REUSE is enabled when one FACT is combined with more than one MEANING.
5.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

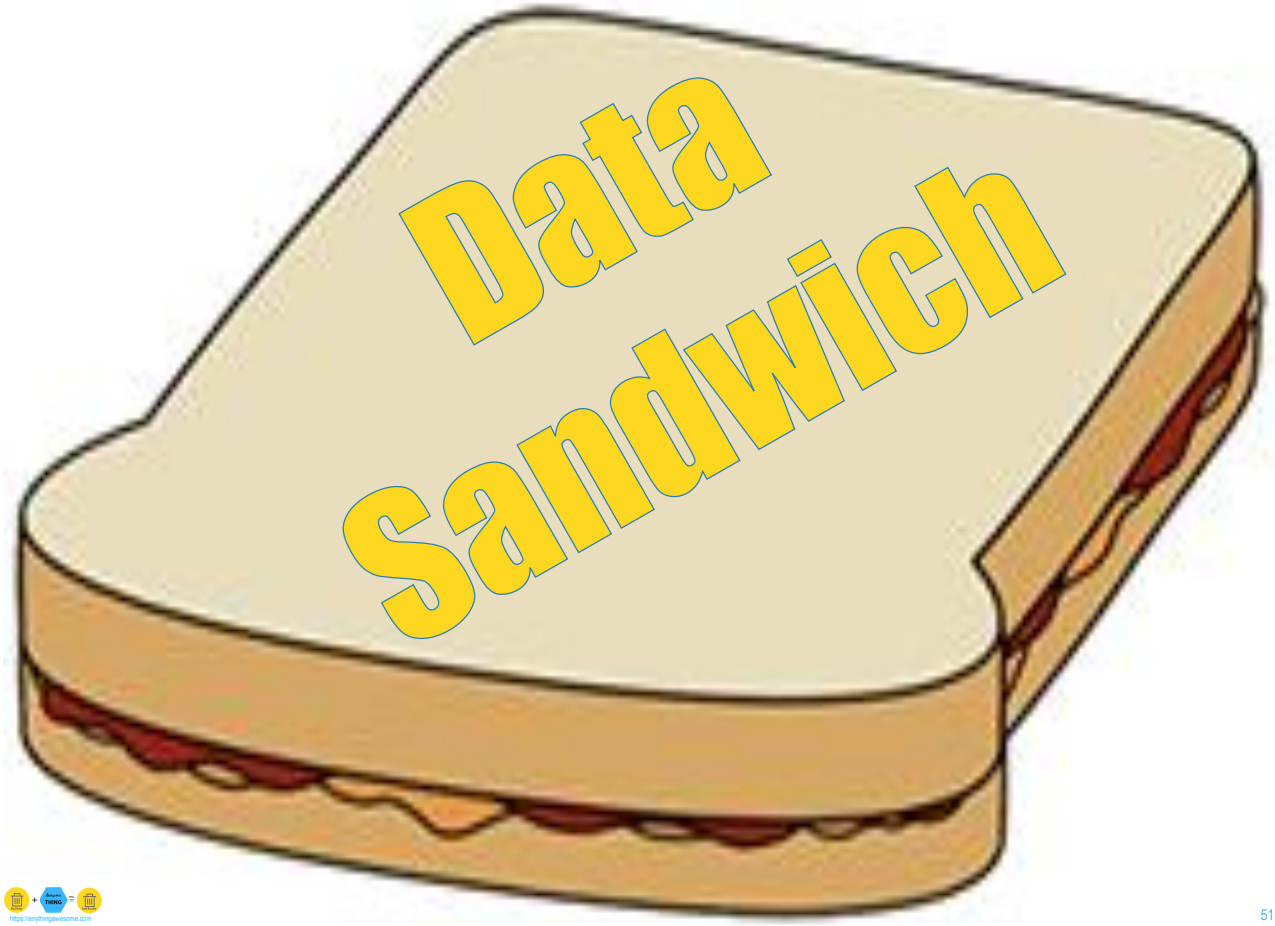
[Built on definitions from Dan Appleton. 1983]

Data structures organized into an Architecture

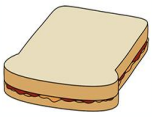
- How do data structures support strategy?
- Consider the opposite question?
  - Were your systems explicitly designed to be integrated or otherwise work together?
  - If not then what is the likelihood that they will work well together?
  - They cannot be helpful as long as their structure is unknown
- Two answers/two separate strategies
  - Achieving efficiency and effectiveness goals
  - Providing organizational dexterity for rapid implementation

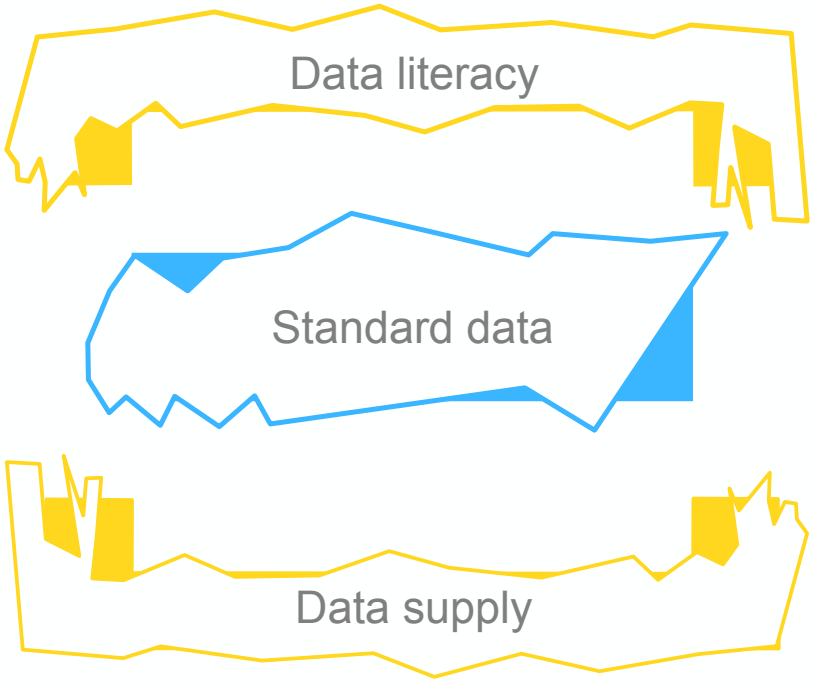
Data should not be Sand in Organizational Functions





Leverage point - high performance automation





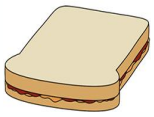
Leverage point - high performance automation

Data literacy

Standard data

Data supply

Leverage point - high performance automation



This cannot happen without investments in engineering and architecture!

Data literacy

Standard data

Data supply

Quality engineering/ architecture work products do not happen accidentally!

Leverage point - high performance automation

This cannot happen without investments in data engineering and architecture!

Data literacy

Standard data

Data supply

Quality data engineering/ architecture work products do not happen accidentally!

Our barn had to pass a foundation inspection

- **Before further construction could proceed**
- **It makes good business sense**
- **No IT equivalent**

Take Aways

- What is a data architecture?
  - A structure of data-based assets supporting implementation of organizational strategy
  - Most organizations have data assets that are not supportive of strategies - *i.e., information architectures that are not helpful*
  - The really important question is: *how can organizations more effectively use their data architectures to support strategy implementation?*
- What is meant by **use** of an information architecture?
  - Application of data assets towards organizational strategic objectives
  - Assessed by the maturity of organizational data management practices
  - Results in increased capabilities, dexterity, and self awareness
  - Accomplished through use of data-centric development practices (including taxonomies, stewardship, and repository use)
- *How does an organization achieve better use of its data architecture?*
  - Continuous re-development; the starting point isn't the beginning
  - Information architecture components must typically be reengineered
  - Using an iterative, incremental approach, typically focusing on one component at a time and applying formal transformations

Program Overview

- Introduction
  - Data's Confounding Characteristics
  - Uneven understanding
  - DM BoK Foundations
- Defining Data Governance
  - Need an elevator pitch
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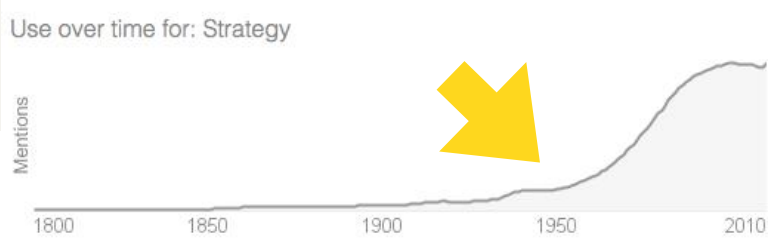
  - Requires an adaptive rather than a prescriptive approach
- Defining Data Architecture
  - Ubiquitous and not well understood
  - Keeping improvements practically focused on strategy
  - Cannot use what is not understood
- Strategic Focus Improves Coordination
  - Upending the traditional
  - Defensive Driving
  - Storytelling but don't relate everything
- Take Aways/References/Q&A

Strategy Is Where Data Architecture & Data Governance Collide

What is Strategy?

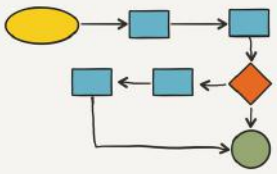


strat·e·gy
/ˈstratəjē/

noun

1. a plan of action or policy designed to achieve a major or overall aim.
   "time to develop a coherent economic strategy"
   synonyms: master plan, grand design, game plan, plan (of action), action plan, policy, program; More

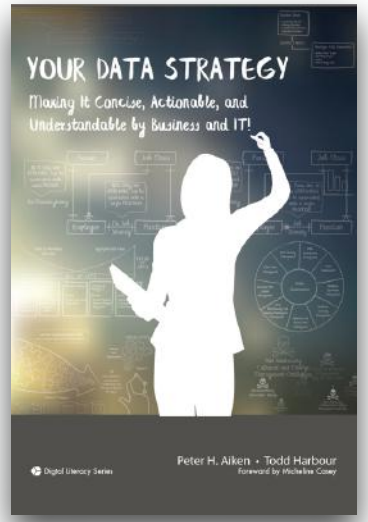
- Current use derived from military
  - **a pattern in a stream of decisions**
    [Henry Mintzberg]



PROCESS

Your Data Strategy

- Highest level data guidance available ...
- Focusing data activities on business-goal achievement ...
- Providing guidance when faced with a stream of decisions or uncertainties
- Data strategy most usefully articulates how data can be best used to support organizational strategy
- This usually involves a balance of remediation and proactive measures



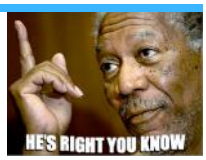
This is the wrong way to think about data strategy

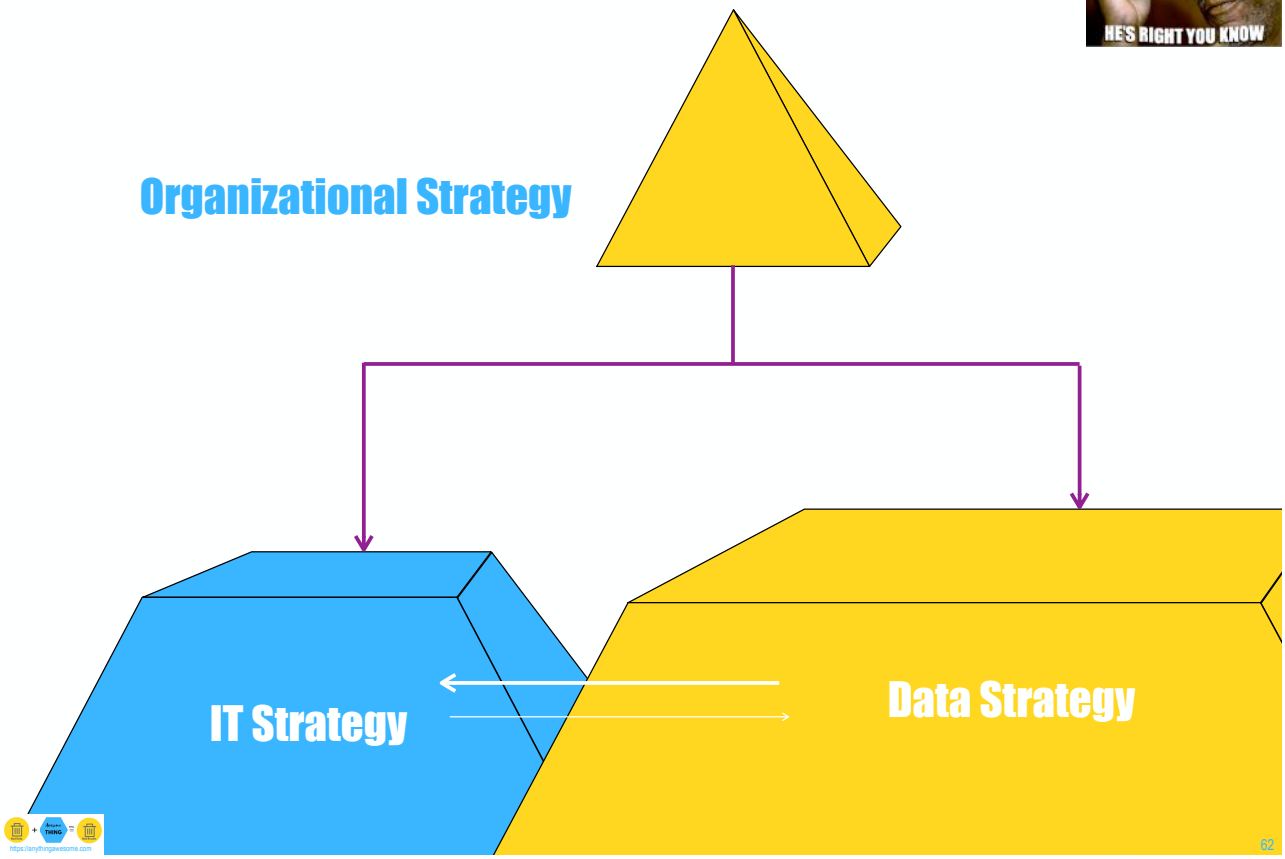
Organizational Strategy

IT Strategy

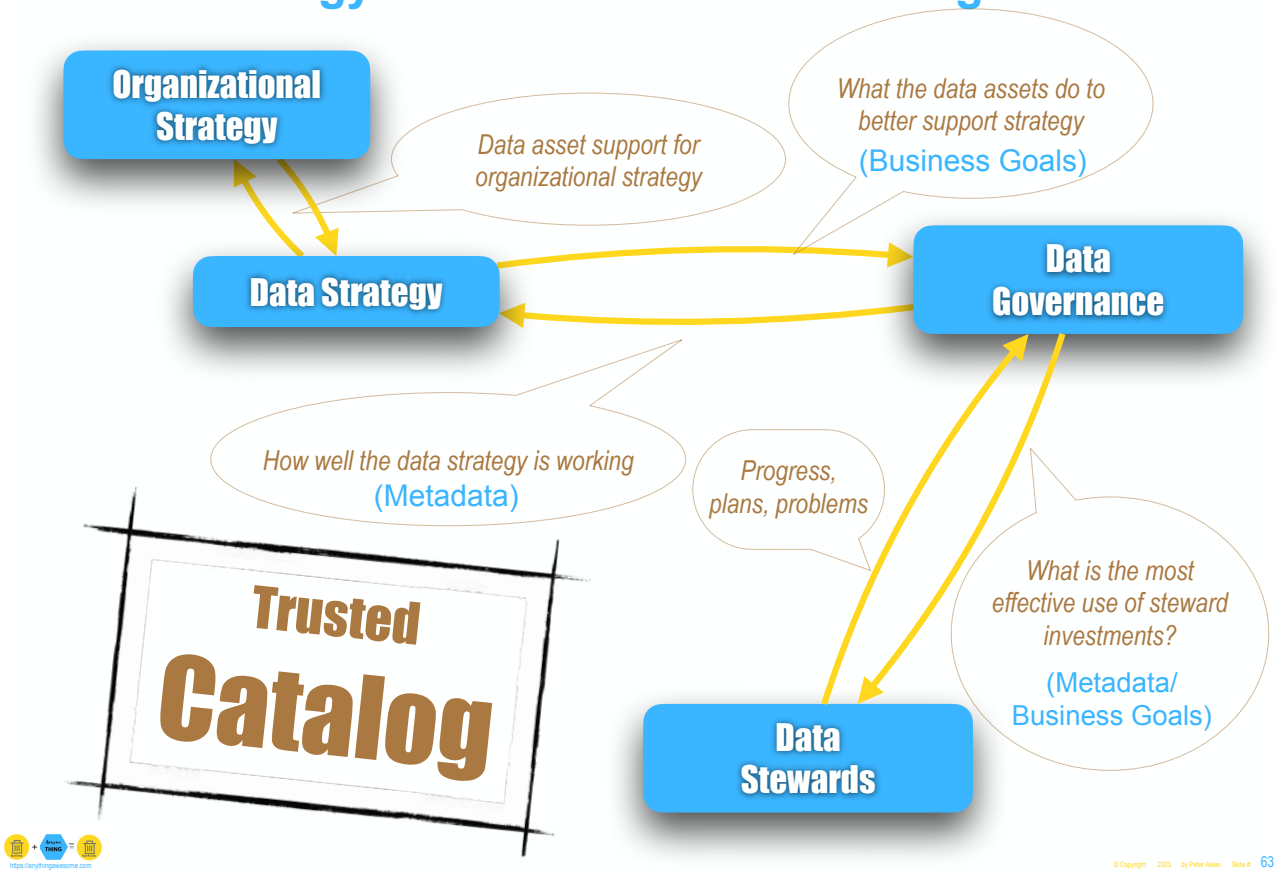
Data Strategy

This is correct …

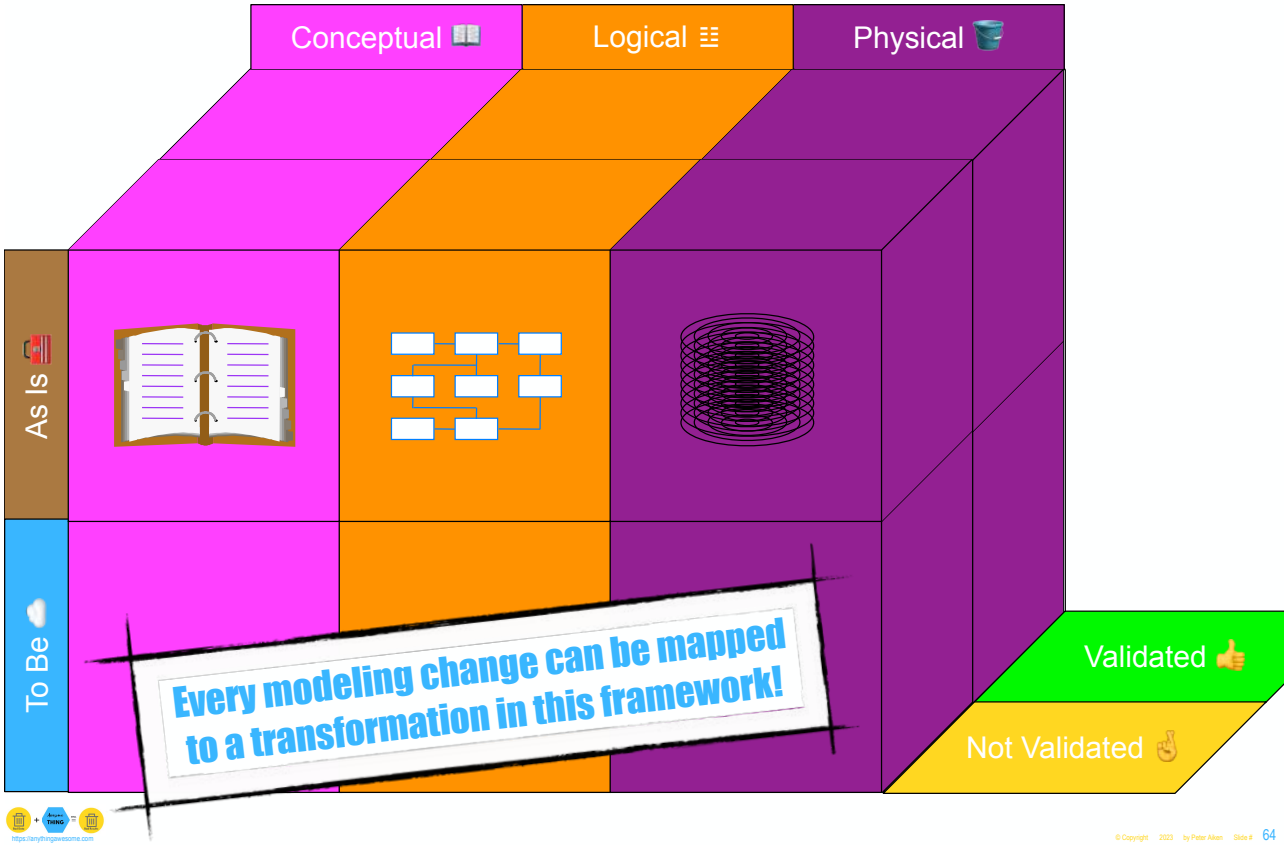




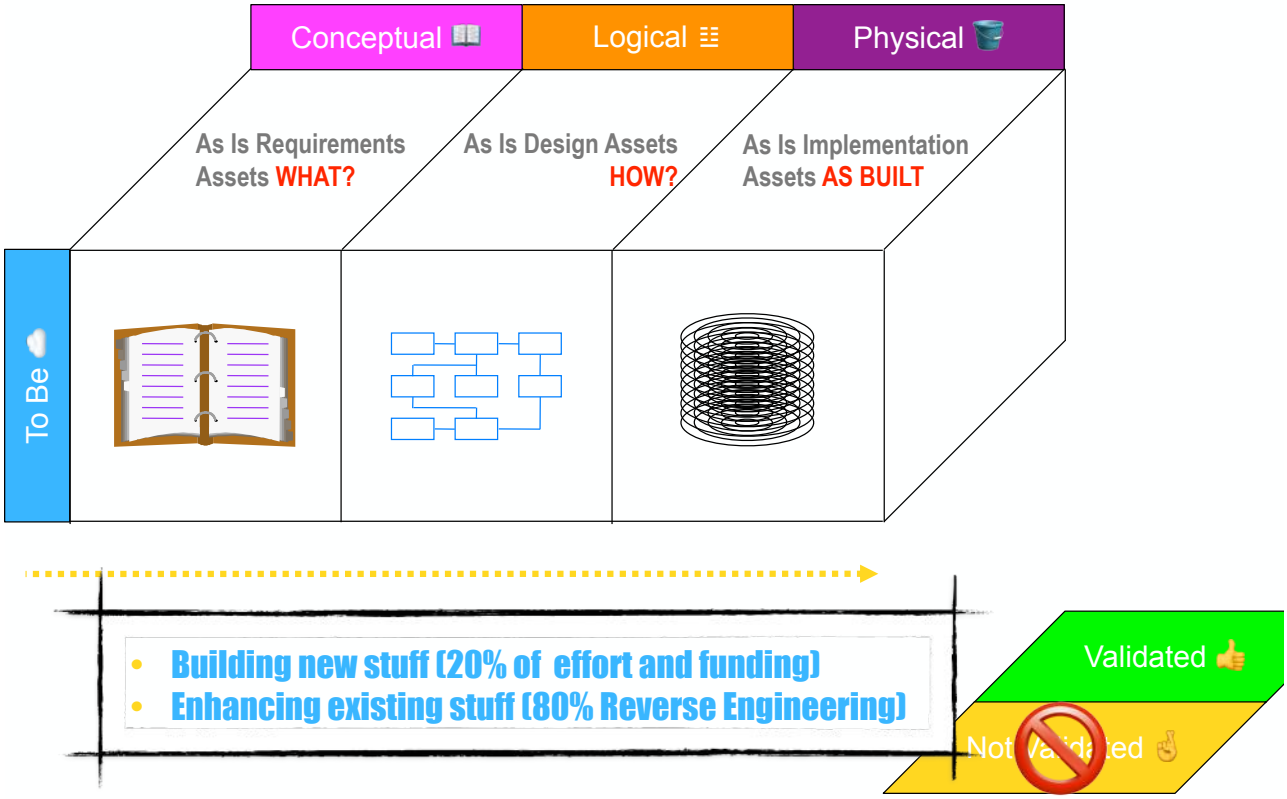
Data Strategy and Governance in Strategic Context



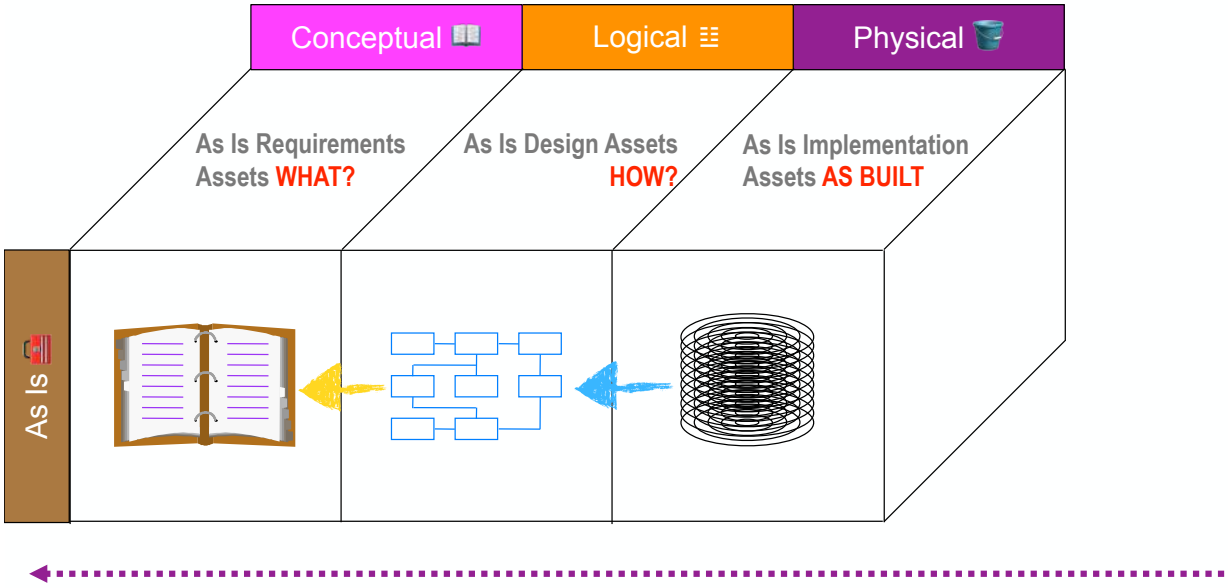
3-Dimensional Model Evolution Framework



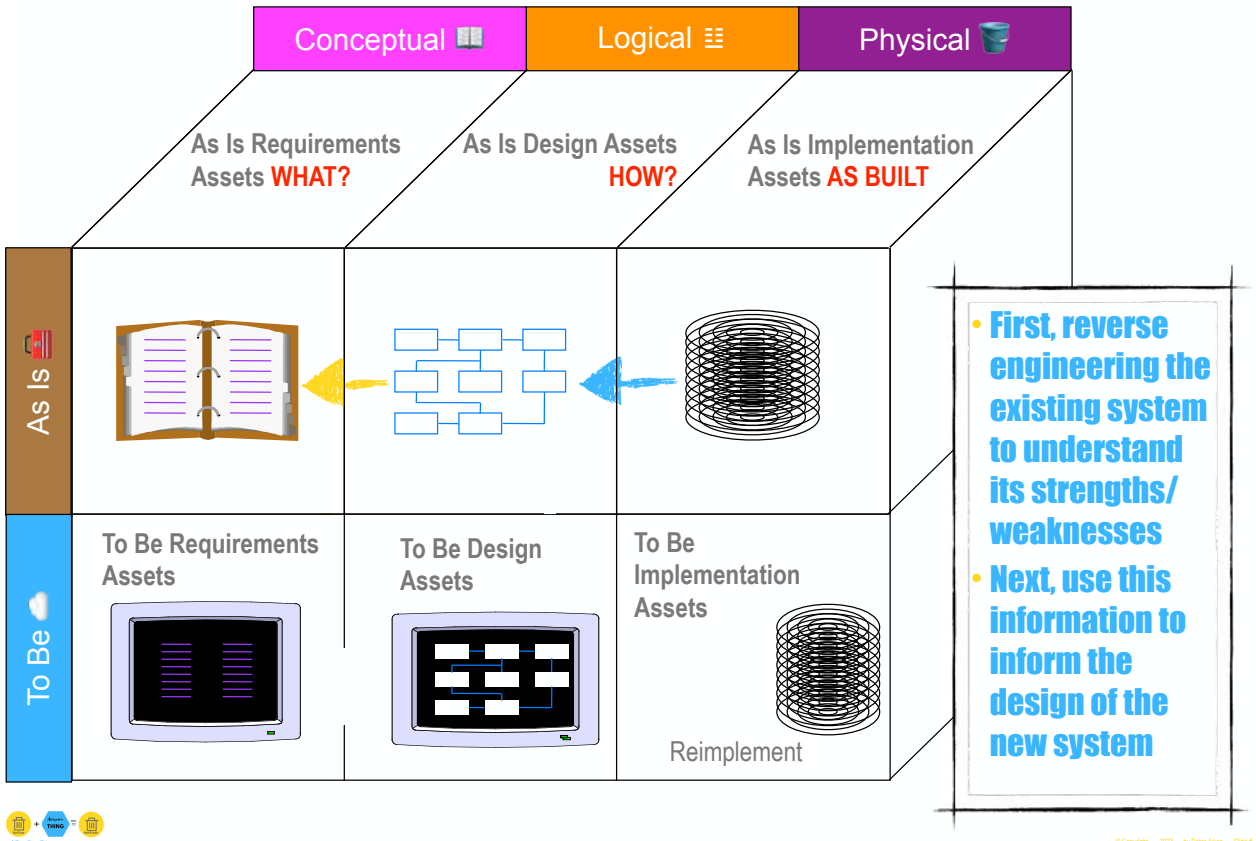
Forward Engineering



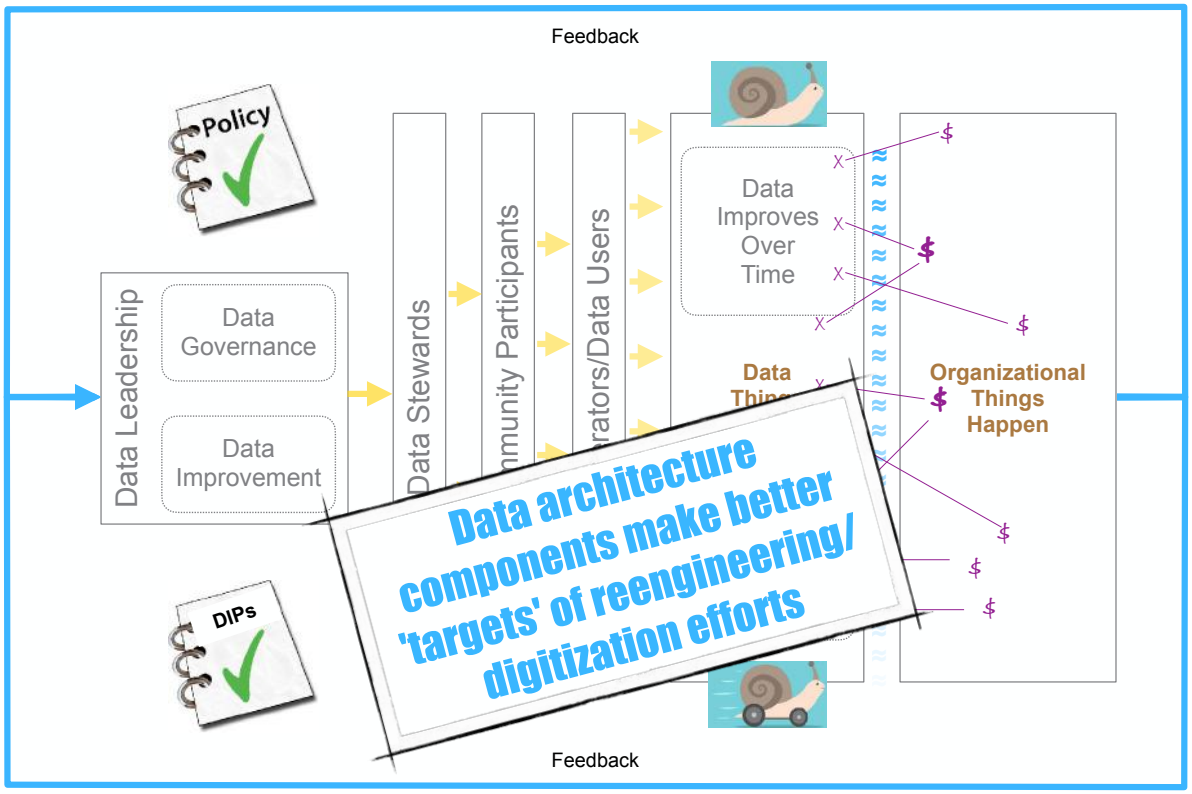
80% Reverse Engineering



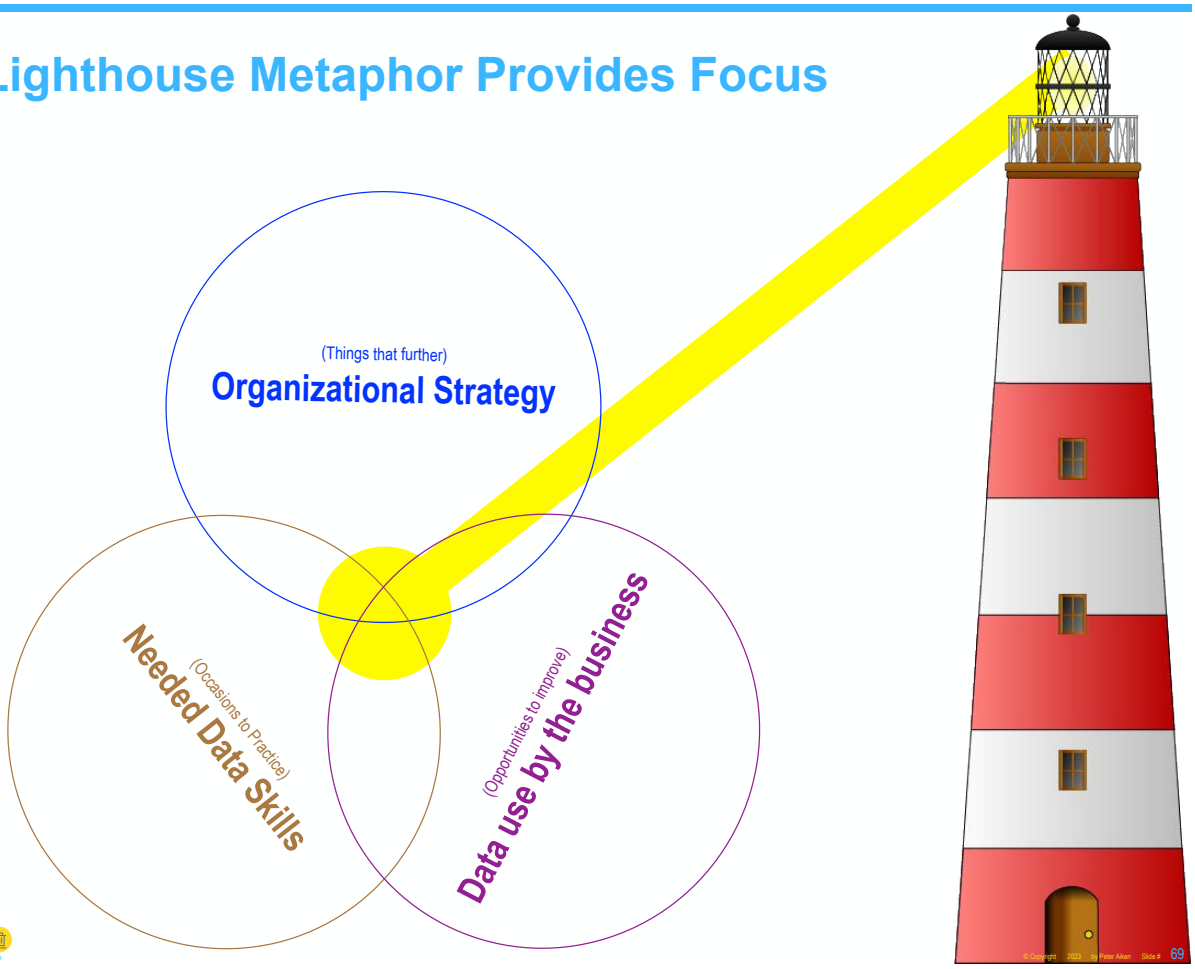
Reengineering



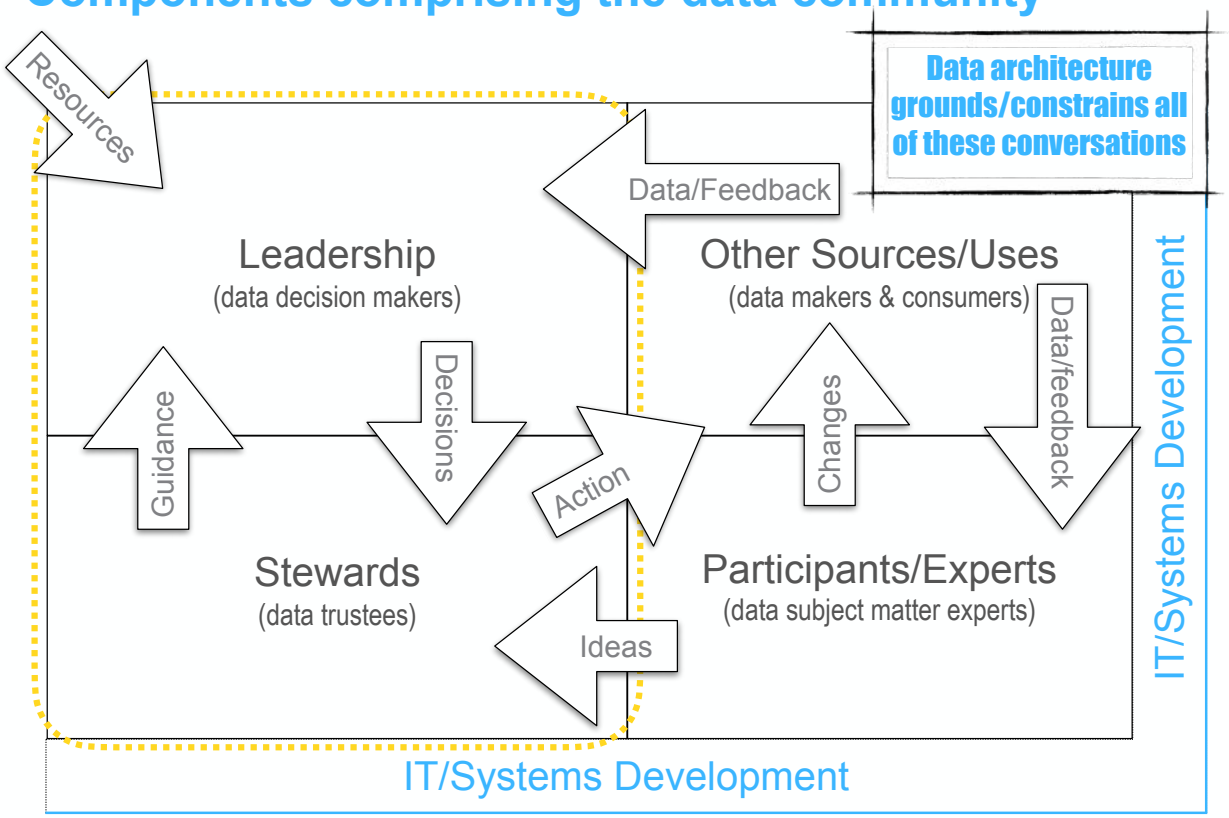
Data Governance Role: Produce systemic organizational changes that impact data and work practices over time



Lighthouse Metaphor Provides Focus



Components comprising the data community



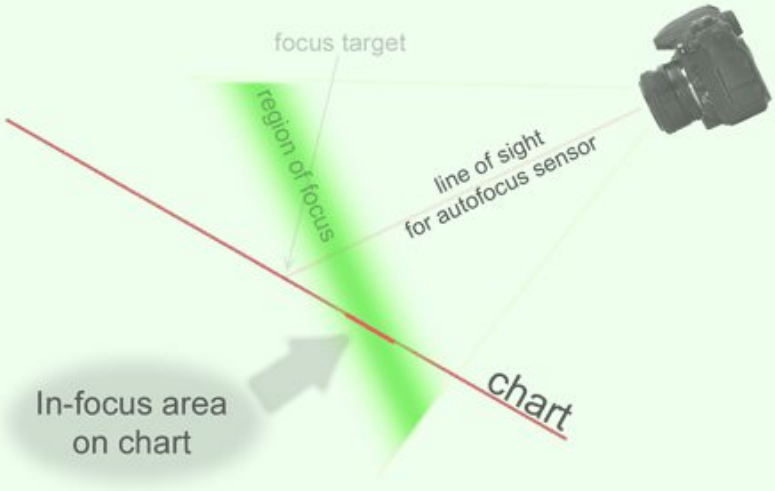
The MacGyver approach to DG uses paperclips and duct tape

MACGYVER

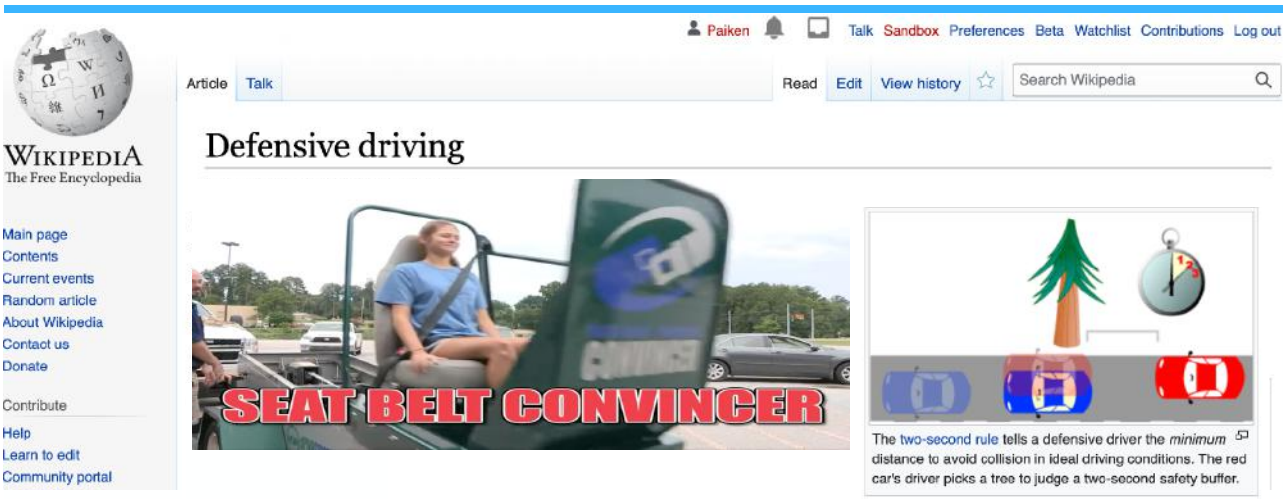
- First, reverse engineering the existing system to understand its strengths/ weaknesses
- Next, use this information to inform the design of the new system

Keep the proper focus

- Wrong question:
  - How should we govern all this data?
- Right question:
  - Should we include this data item within the scope of our current data govenance practices?



- Regardless of the decision, document why!



- When taught as part of basic driving, behavior becomes part of a lifelong practice
- Difficult to practice when learned after driving has been taught
- The Convincer

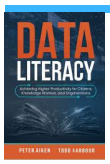
- General principles:
  - Controlling your speed.
  - Looking ahead and being prepared for unexpected events.
  - Being alert and distraction free.
- Regarding other participants in traffic:
  - Preparedness for all sorts of actions and reactions of other drivers and pedestrians.
  - Not expecting the other drivers to do what you would ordinarily do.
  - Watching and respecting other drivers.
- Regarding your own vehicle:
  - Maintaining a safe following distance.
  - Driving safely considering (adjusting for) weather and/or road conditions.
  - Adjusting your speed before entering a bend, in order to avoid applying the brakes in the middle of a bend.

Differences between Programs and Projects

- Programs are Ongoing, Projects End
  - aging a program involves long term strategic planning and us process improvement is not required of a project
- Pro Tied to the Financial Calendar
  - Progra re often responsible for delivering results tied ation's financial calendar
- Program Manag overnance Intensive
  - Programs are governed oard that provides direction, oversight, and control while to be less governance-intensive
- Programs Have Greater Scop ial Management
  - Projects typically have a straight-forward roject financial management is focused on spending to budg am planning, management and control is significantly more co
- Program Change Management is an Executive Capability
  - Projects employ a formal change management process while at the level, change management requires executive leadership skills and prog change is driven more by an organization's strategy and is subject to market conditions and changing business goals

Your data program must last at least as long as your HR program!

Adapted from http://top.idownloadnew.com/program_vs_project/ and http://management.simplicable.com/management/new/program-management-vs-project-management

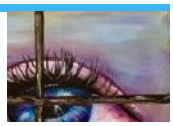


Level 3–KW–Citizen Data Knowledge Areas

- Elevator story
- Data stewardship
- Demonstrating value
- Currency
- Fiduciary responsibilities
- Shared fate

https://www.techtarget.com/searchenterpriseai/definition/data-scientist

Sample from: https://artist.com/kathy-linden/on-outside-looking-in/?artid=4385

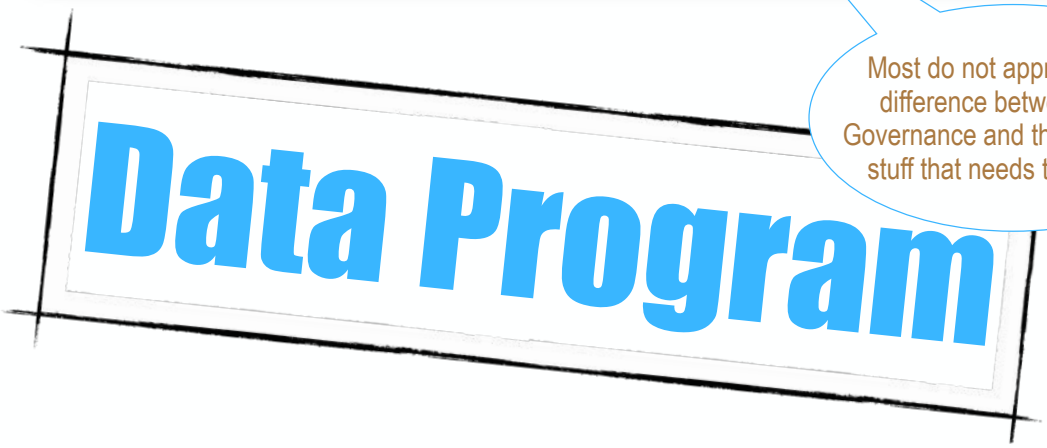


External Comprehension

Everything Else Data | Data Architecture | Data Governance Program

Data (blah blah blah)

Most do not appreciate the difference between Data Governance and the other data stuff that needs to be done



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Strategy Is Where Data Architecture & Data Governance Collide

Take Aways

- Need for DA/DG is increasing
  - Increase in data volume
  - DG is a new discipline
  - Must conform to constraints
  - No single best way
- DG/DA must become strategy driven
  - Reengineer opportunistically
  - Quantify strategic improvements
  - Programmatic implementation
- Shared focus produces reusable, shared results
  - Implement data as a program not a project
  - Gradually add ingredients
  - Learn the value of stories/storytelling
- The goal is to improve DG/DA effectiveness and efficiencies (and the data itself) over time
- The more data literate the organization, the easier the transformations

Upcoming Events

Time: 19:00 UTC (2:00 PM NYC) | Presented by: Peter Aiken, PhD

What's in Your Data Warehouse?

14 November 2023

Data Governance & Information Quality CONFERENCE

Data Management Best Practices

12 December 2023

Data Strategy

9 January 2024

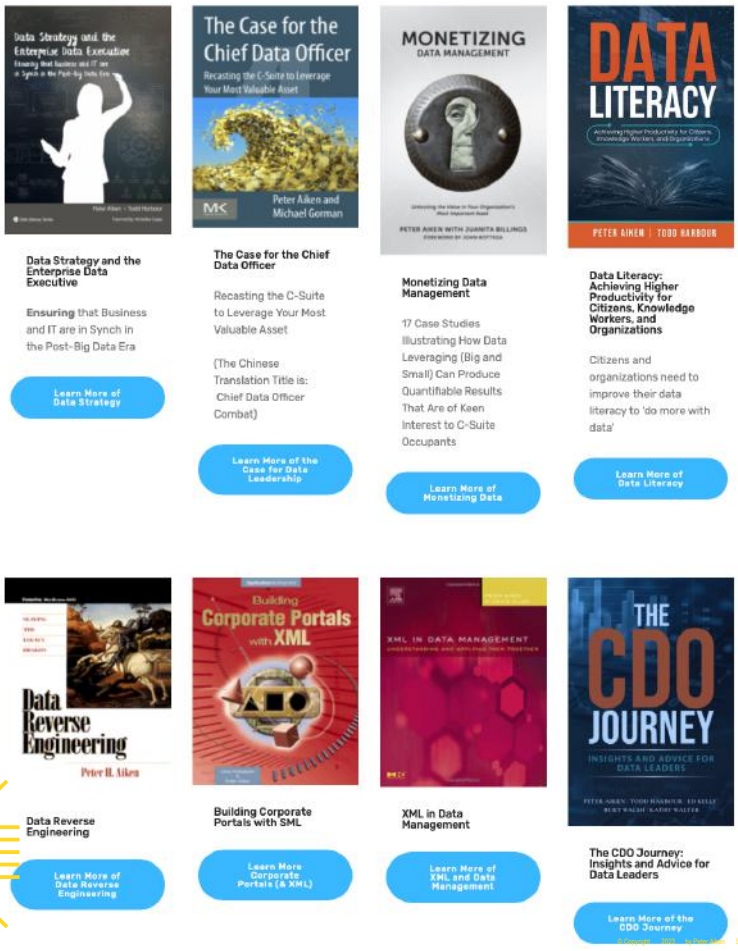
Brought to you by:

DATAVERSITY

[Clicking any webinar title will link directly to the registration page]

Event Pricing on Peter's Books

- 20% off directly from the publisher on select titles
- My 'Book Store' @ https://anythingawesome.com/books-overview.html
- Enter the code "anythingawesome" at the Technics bookstore checkout where it says to "Apply Coupon"

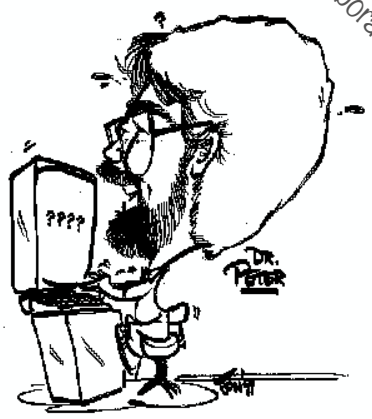


Critical Design Review?

Mentoring?

Executive Data Literacy Training?

Collaboration?



Independent Verification & Validation

Peter.Aiken@AnythingAwesome.com +1.804.382.5957

Reverse Engineering Expertise?

Hiring Assistance?

Thank You!

Use your data more strategically?

Tool/automation evaluation?

Book a call with Peter to discuss anything - https://anythingawesome.com/OfficeHours.html