

The Role of Governance in Enterprise Information Architecture

It's not what you think ...

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Peter Aiken, PhD

- 25+ years of experience in data management
- Multiple international awards & recognition
- Founder, Data Blueprint (datablueprint.com)
- Associate Professor of IS, VCU (vcu.edu)
- President, DAMA International (dama.org)
- 8 books and dozens of articles
- Experienced w/ 500+ data management practices in 20 countries
- Multi-year immersions with organizations as diverse as the US DoD, Nokia, Deutsche Bank, Wells Fargo, and the Commonwealth of Virginia



Evolving Your Information Architecture-What? Why? How?:

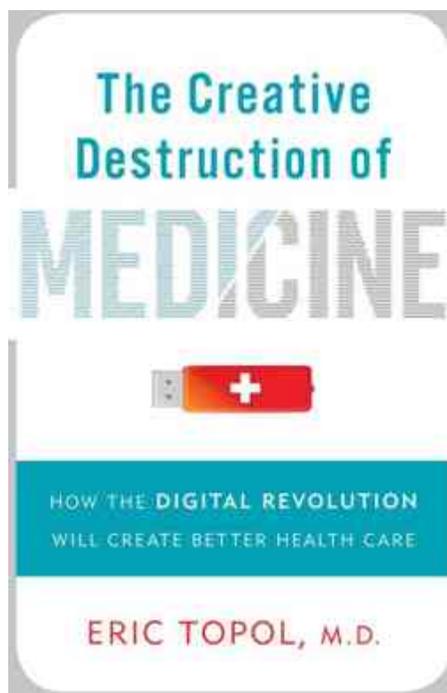
An introduction to its use and component reengineering

Content

- Day One:
 - Understanding what is an information architecture?
- Day Two:
 - Understanding why information architecture is a key element in organizational strategy or what is meant by use of an information architecture?
- Day Three:
 - How does an organization achieve better use of its information architecture?



Book Recommendation



- Permits the reorientation of medicine
 - From populations
 - To individuals
- Big Data Capture
 - Wireless sensors
 - Genome sequencing
 - Printing organs

IBM's Data Baby



Evolving Data is Different than Creating New Systems

Common Organizational Data
(and corresponding data needs requirements)



Future State



(Version +1)

Evolve

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

Systems Development Activities

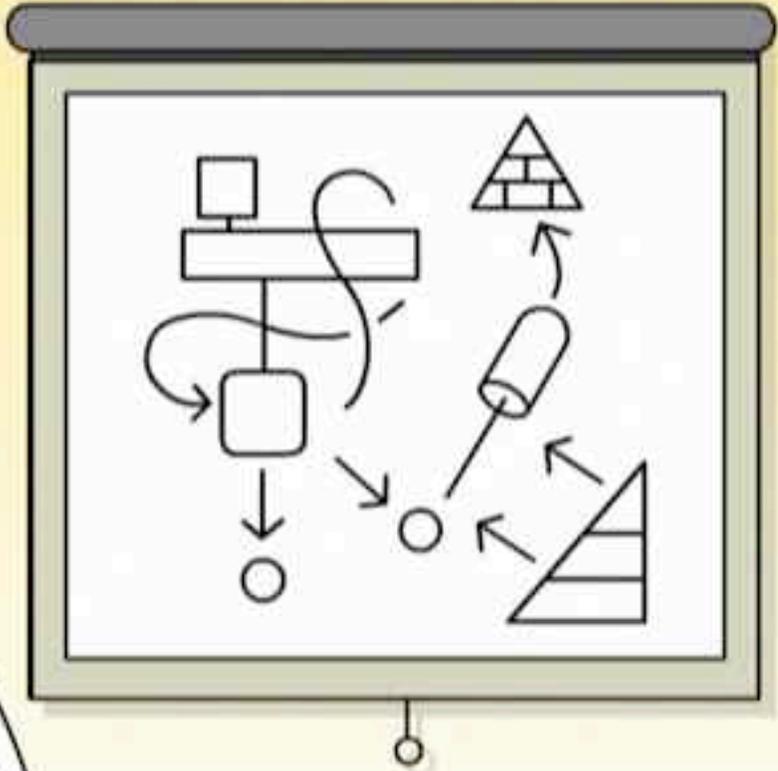
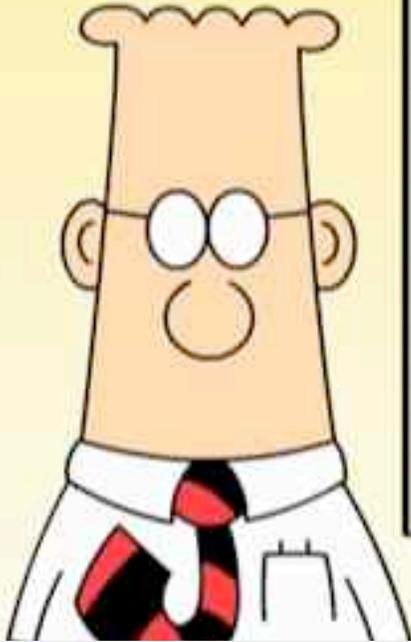


Create

New Organizational Capabilities

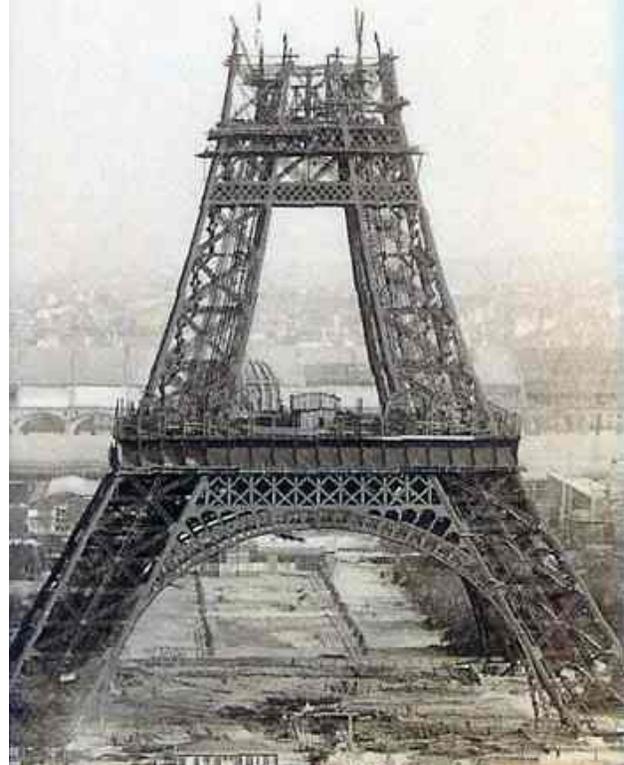


Complicated Diagrams



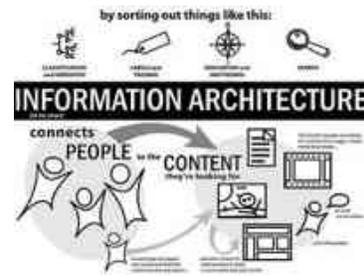
Information Architectures

- ~~• The underlying (information) design principals upon which construction is based~~
 - ~~- Source: <http://architecturepractitioner.blogspot.com/>~~
- ~~• ... are plans, guiding the transformation of strategic organizational information needs into specific information systems development projects~~
 - ~~- Source: Internet~~
- ~~• A framework providing a structured description of an enterprise's information assets — including structured data and unstructured or semistructured content — and the relationship of those assets to business processes, business management, and IT systems.~~
 - ~~- Source: Gene Leganza, Forrester 2009~~
- ~~• "Information architecture is a foundation discipline describing the theory, principles, guidelines, standards, conventions, and factors for managing information as a resource. It produces drawings, charts, plans, documents, designs, blueprints, and templates, helping everyone make efficient, effective, productive and innovative use of all types of information."~~
 - ~~- Source: Information First by Roger & Elaine Evernden, 2003 ISBN 0 7506 5858 4 p.1.~~
- ~~• Defining the data needs of the enterprise and designing the master blueprints to meet those needs~~
 - ~~Source: DM BoK~~



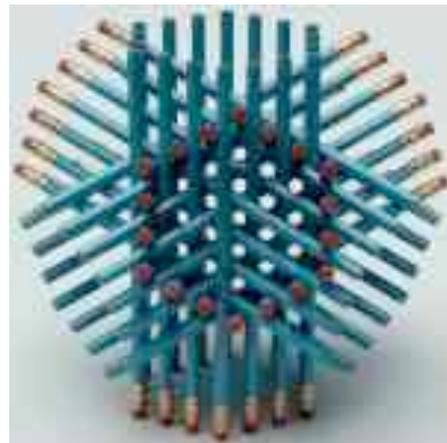
Data Architecture – Better Definition

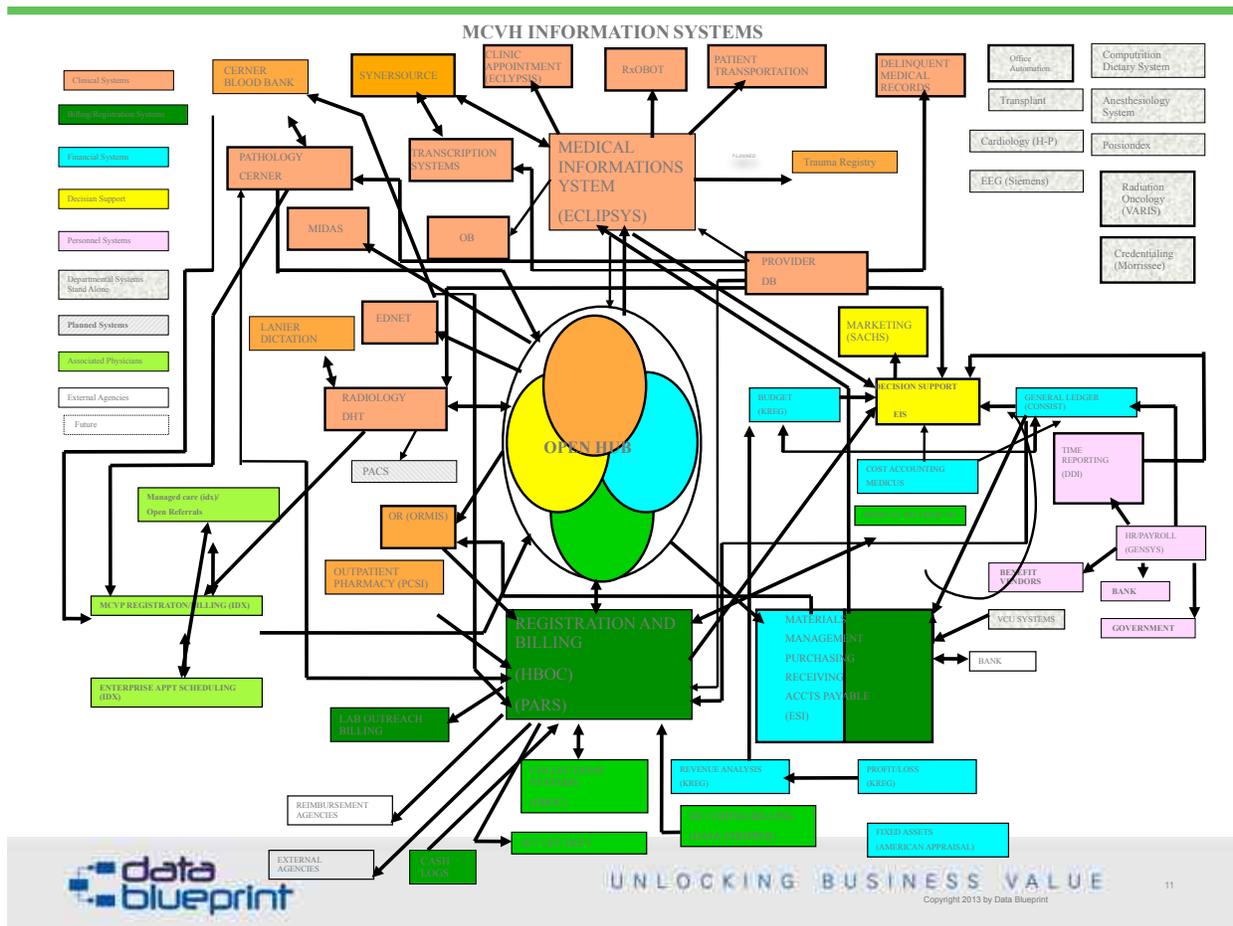
- All organizations have information architectures
 - Some are better **understood** and **documented** (and therefore more **useful** to the organization) than others.
- Common vocabulary expressing integrated requirements ensuring that data assets are stored, arranged, managed, and used in systems in support of organizational strategy [Aiken 2010]



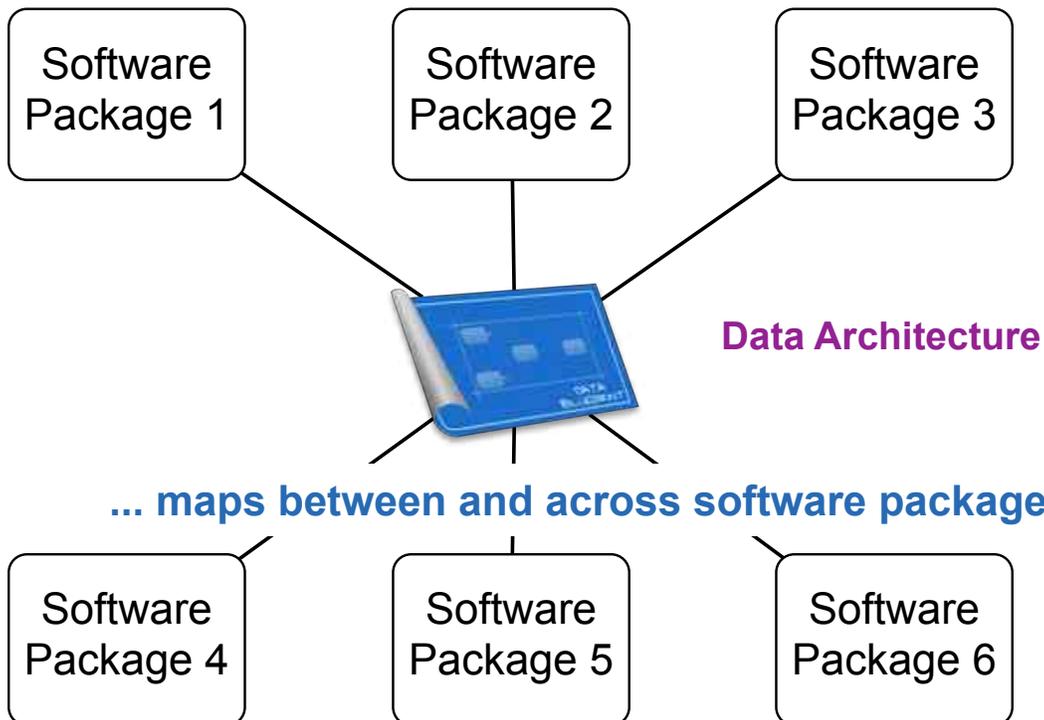
What is an information architecture?

- A structure of data-based information assets supporting implementation of organizational strategy (or strategies)
- 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 information architectures to support strategy implementation?





An organization's data architecture ...

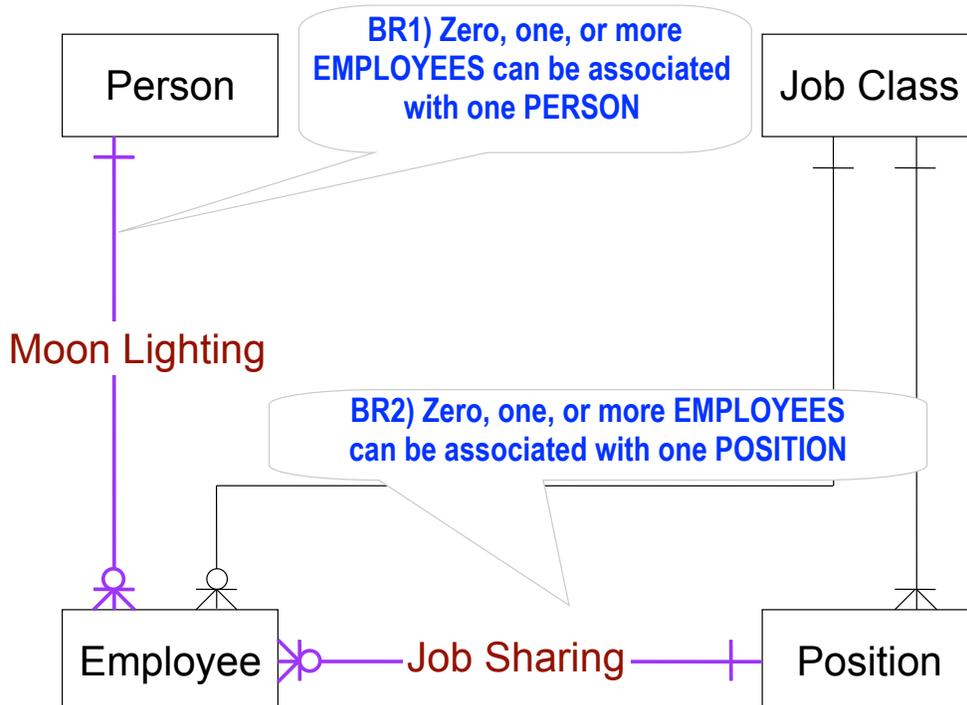


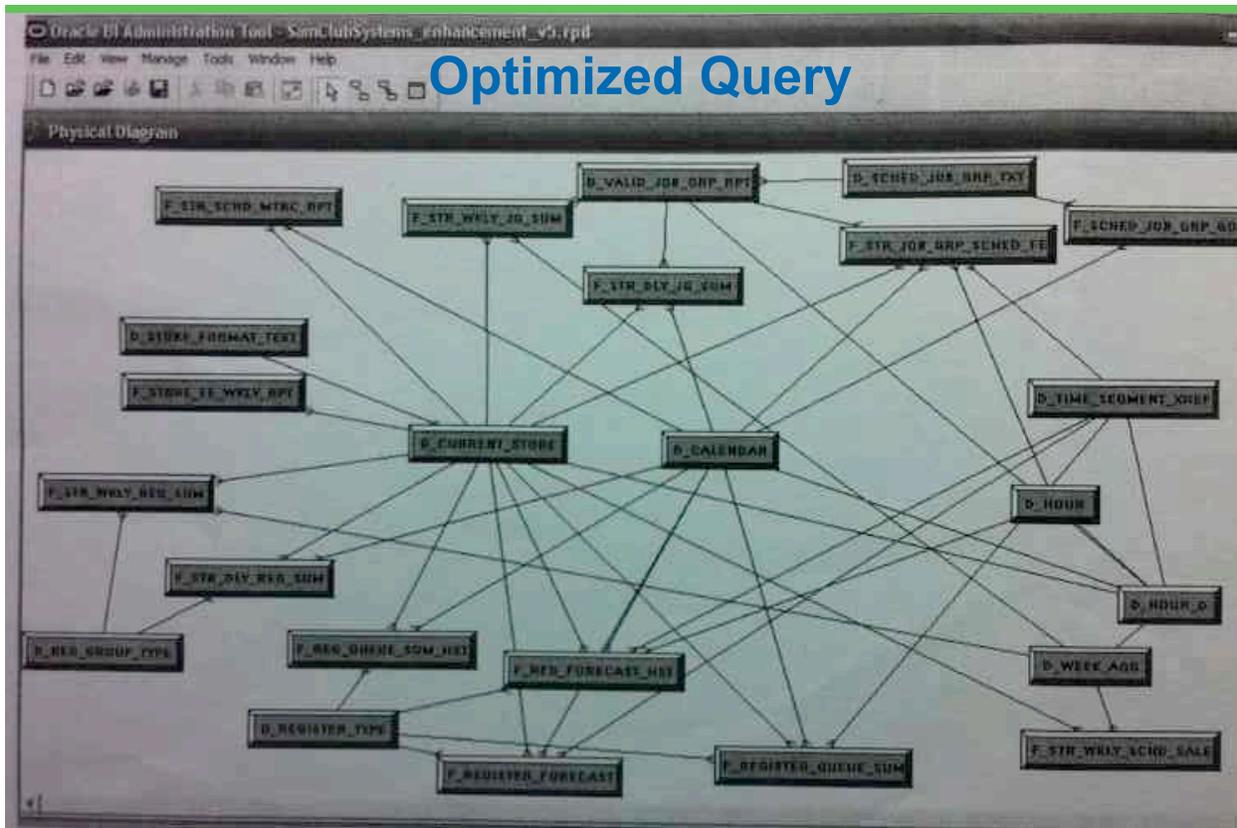
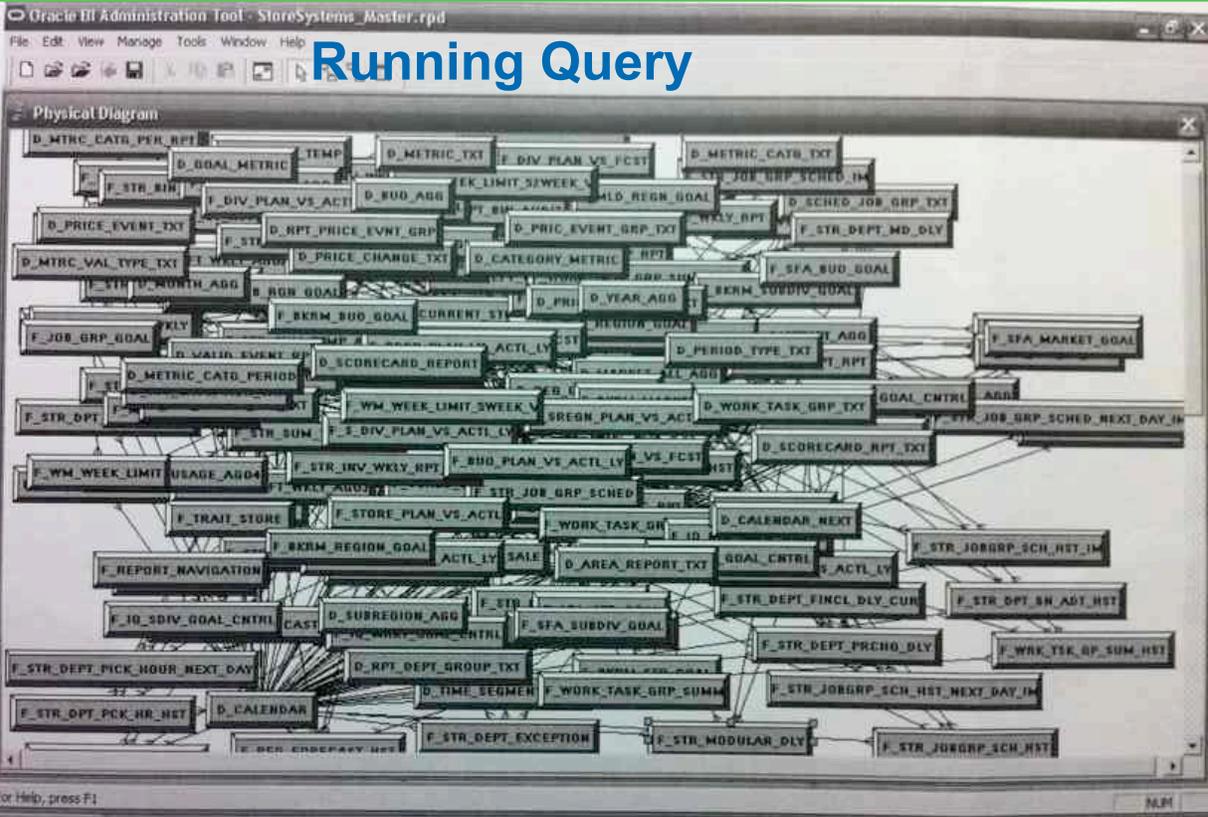
Benefits of a Database

- Data can be shared
- Redundancy can be reduced
 - All redundancy cannot be or necessarily should be reduced
- Inconsistency can be avoided
 - Data obtained by Physics department will be the same as the Chemistry department
- Transaction support can be provided
 - Transaction is not complete until money is deleted from the savings account after adding it to the checking account
- Integrity can be maintained
 - A student can be recorded as having obtained 1000 marks, as compared to 100 – this can be corrected by enforcing integrity.
- Security can be enforced
 - Information on demand – Finance need to see the records related to Human resources
- Conflicting requirements can be balanced
 - Volume of data as compared to speed Business Standards can be enforced
- Data Dependency
 - Technique used to physically stored and accessed are dictated by the application, and the knowledge of physical representation and access technique is built into the application code.
 - Not desirable in a Database System Different users require different views of the same data
 - Freedom to change the physical representation or access technique in view of the changing requirements
 - Changing record types
 - Physical storage location



Information Architectural In Support of Strategy



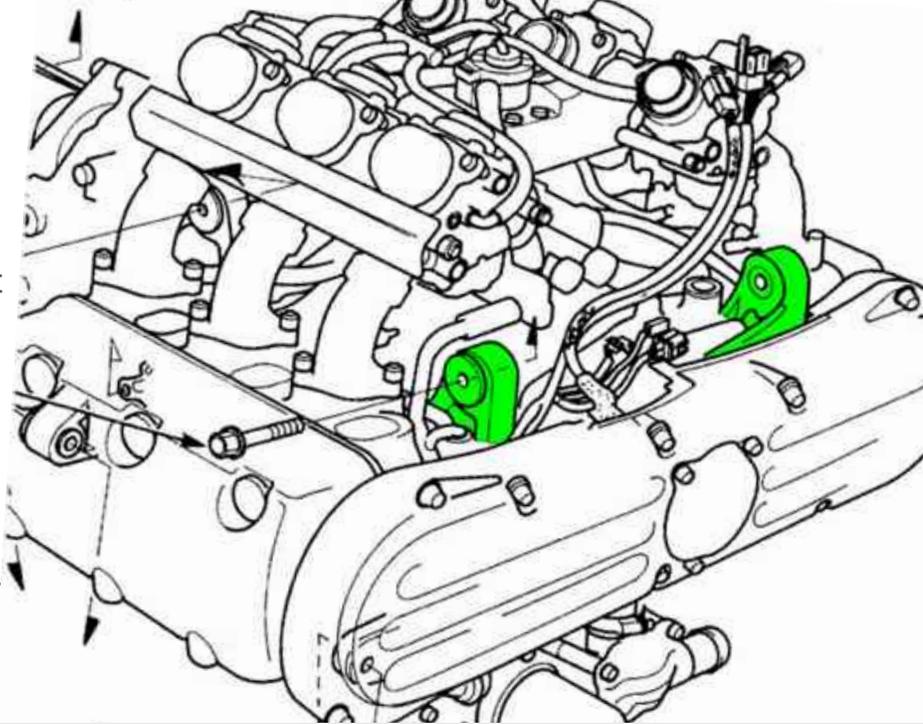


Repeat 100s, thousands, millions of times ...



Toyota versus Detroit Engine Mounting

- Detroit
 - 3 different bolts
 - 3 different wrenches
 - 3 different bolt inventories
- Toyota
 - Same bolts used for all three assemblies
 - 1 bolt inventor
 - 1 type of wrench



Data Integration/Exchange Challenges

- **Customer** typically has had different meanings to different parts of the organization:
 - Accounting -> organization that buys products or services
 - Service -> client
 - Sales -> prospect
- Assigning the same mission to the DoD 'lines of business' to: "**Secure the building**" elicits very different results from each 'line of business':
 - **Army**: Posts guards at all entrances and ensures no unauthorized access
 - **Navy**: Turns out all the lights, locks up, and leaves
 - **Marines**: Sends in a company to clear the building room-by-room; forms perimeter defense around the building
 - **Air Force**: Signs three year lease with option to buy

[Second example courtesy of Burt Parker]



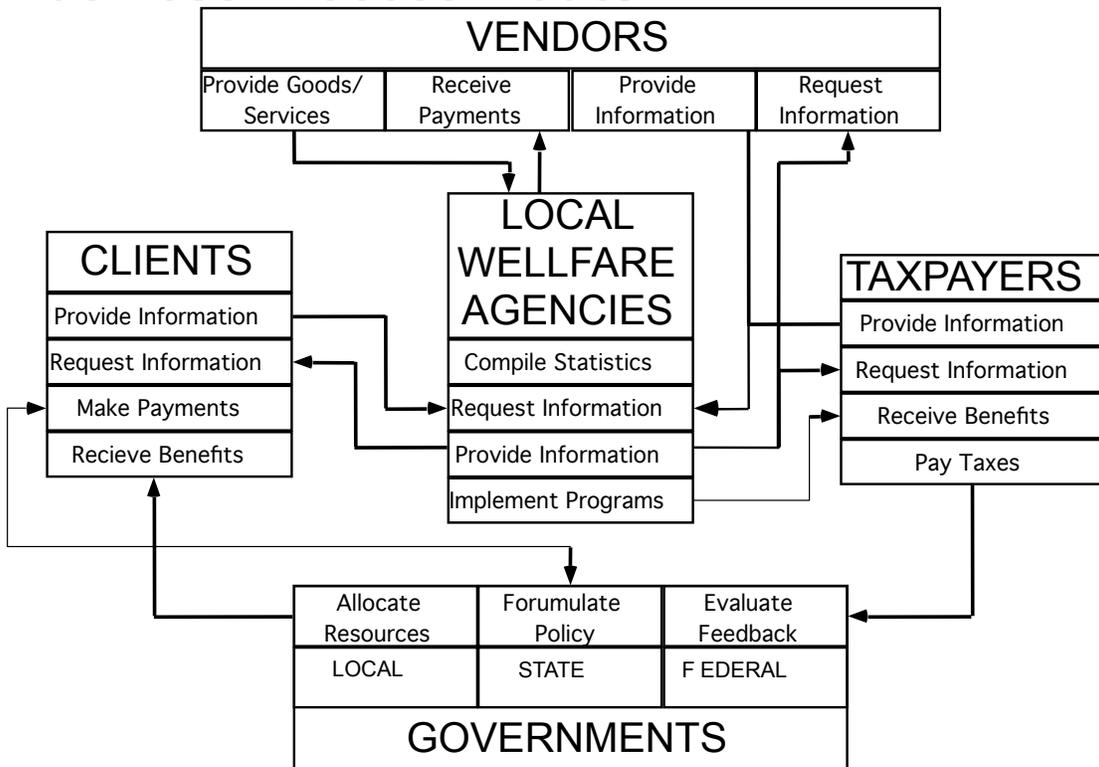
Engineering Standards



Concrete Blocks & Engineering Continuity



Business Process Model

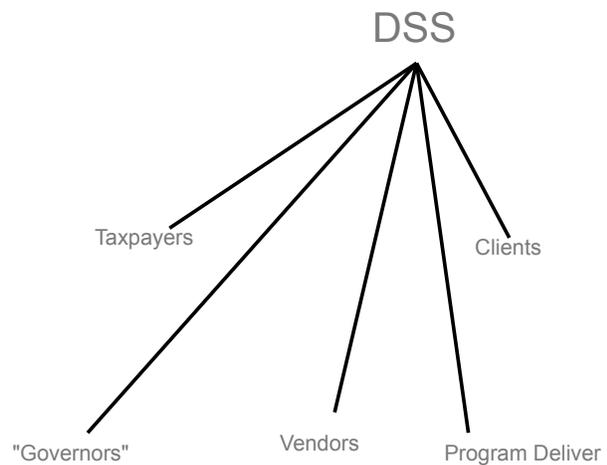


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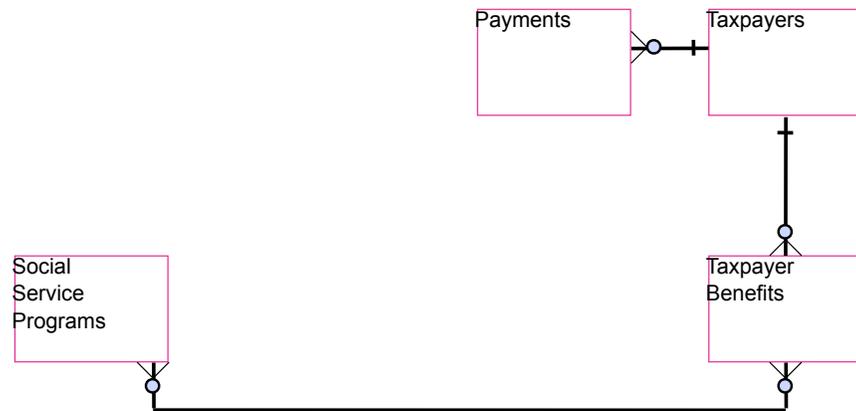
Data model is comprised of model views

DSS Strategic Data Model

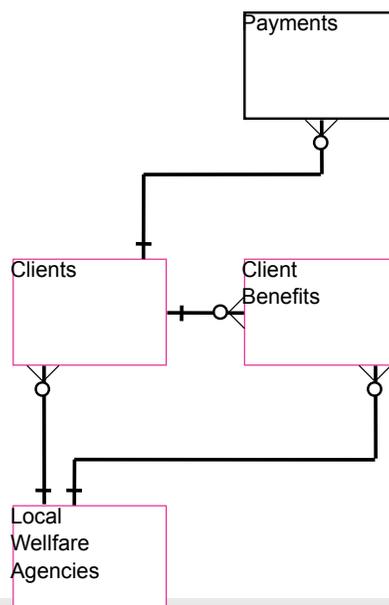
- ├ Taxpayer view
- ├ Client view
- ├ Governance view
- ├ Program Delivery view
- └ Vendor view



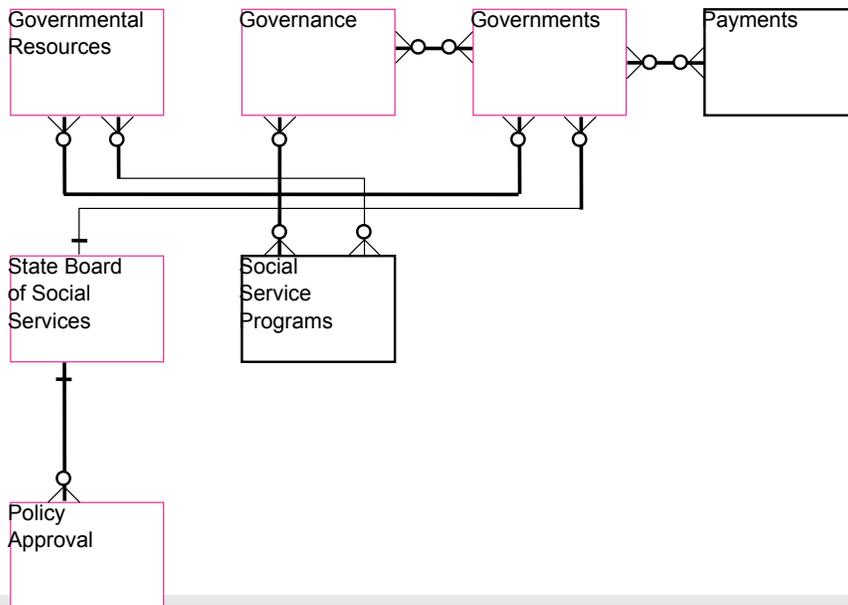
Taxpayer view



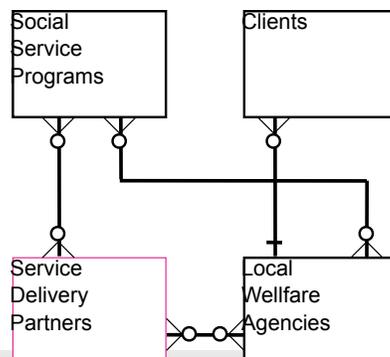
Client view



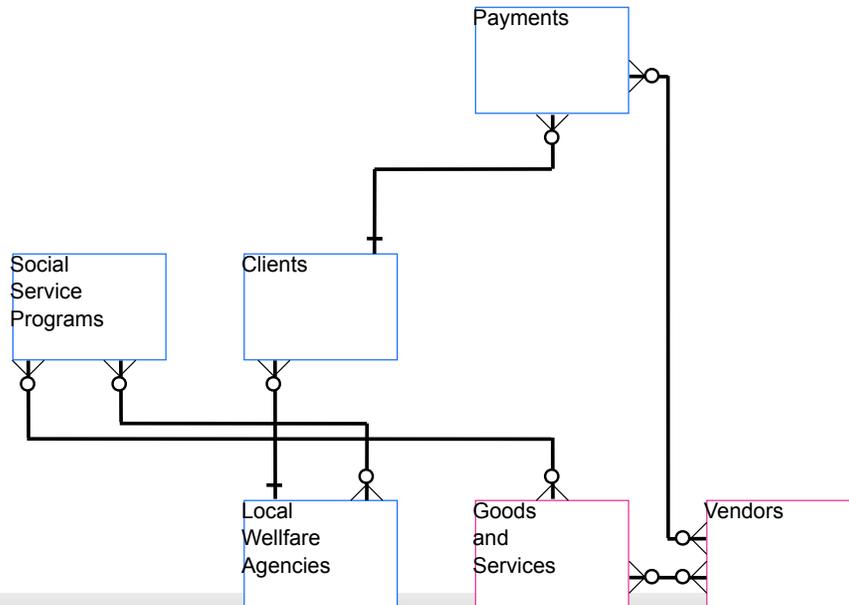
Governance view



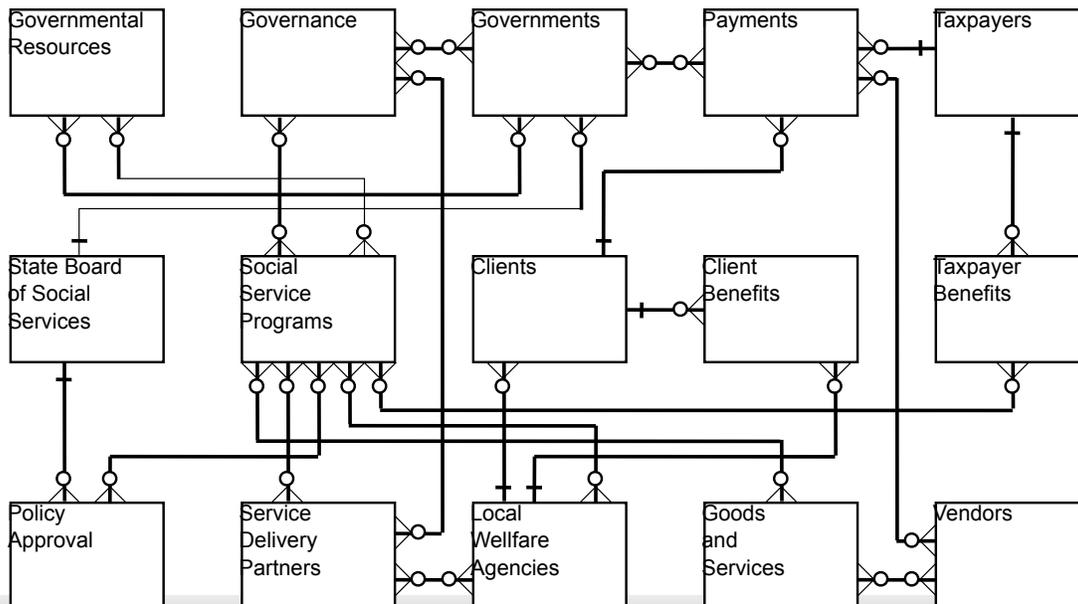
Program Delivery view



Vendor view



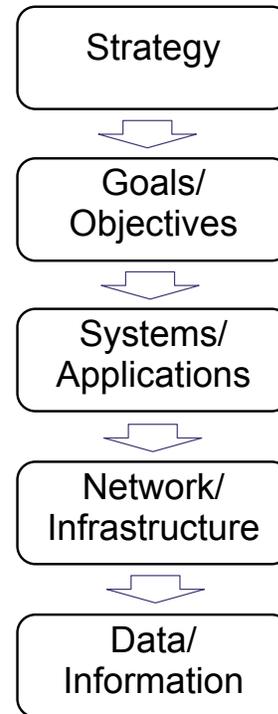
DSS Strategic Level Data Model



Application-Centric Development



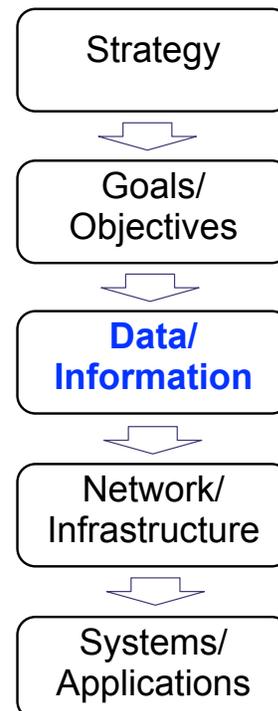
- In support of strategy, organizations develop specific goals/objectives
- The goals/objectives drive the development of specific systems/applications
- Development of systems/applications leads to network/infrastructure requirements
- Data/information are typically considered after the systems/applications and network/infrastructure have been articulated
- Problems with this approach:
 - Ensures data is formed to the applications and not around the organization-wide information requirements
 - Process are narrowly formed around applications
 - Very little data reuse is possible



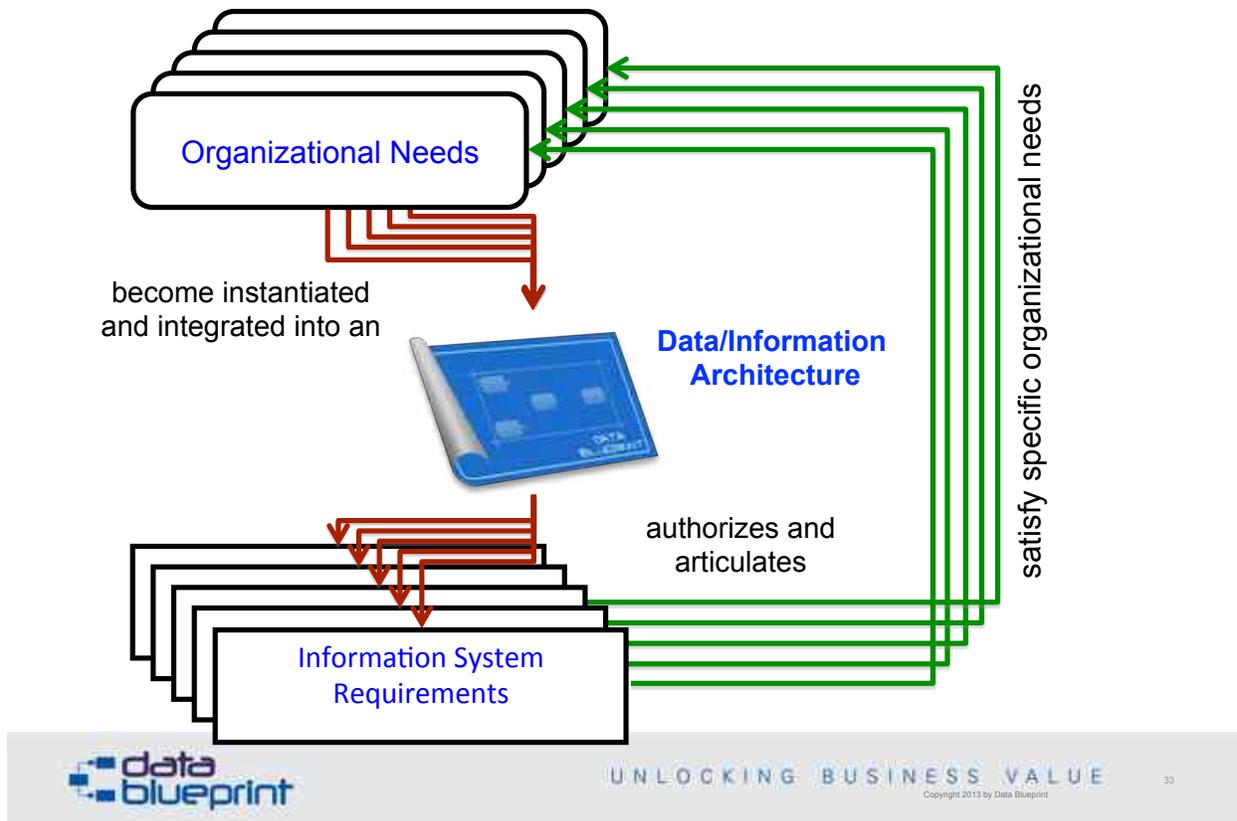
Data-Centric Development



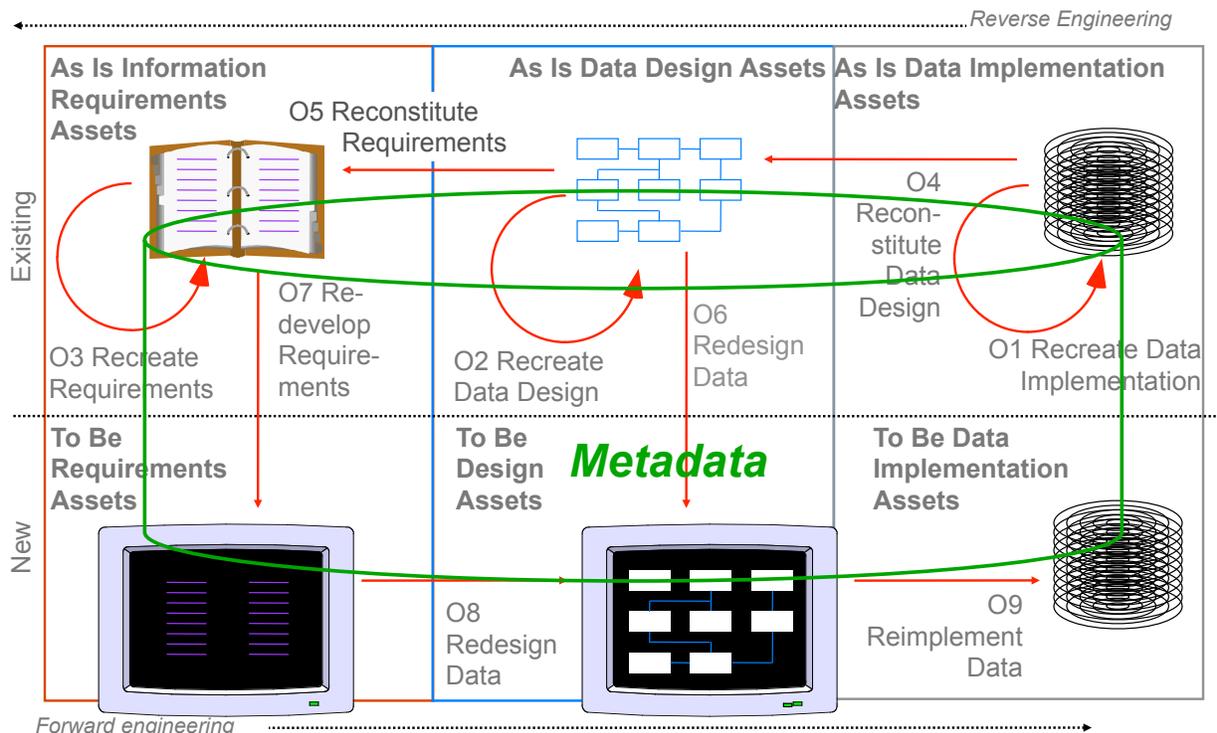
- In support of strategy, the organization develops specific goals/objectives
- The goals/objectives drive the development of specific data/information assets with an eye to organization-wide usage
- Network/infrastructure components are developed to support organization-wide use of data
- Development of systems/applications is derived from the data/network architecture
- 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



Data Architectures are Developed in Response to Organizational Needs

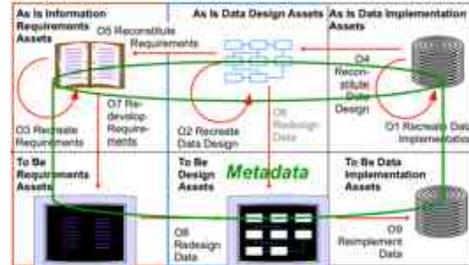


Information Architecture Component Reengineering

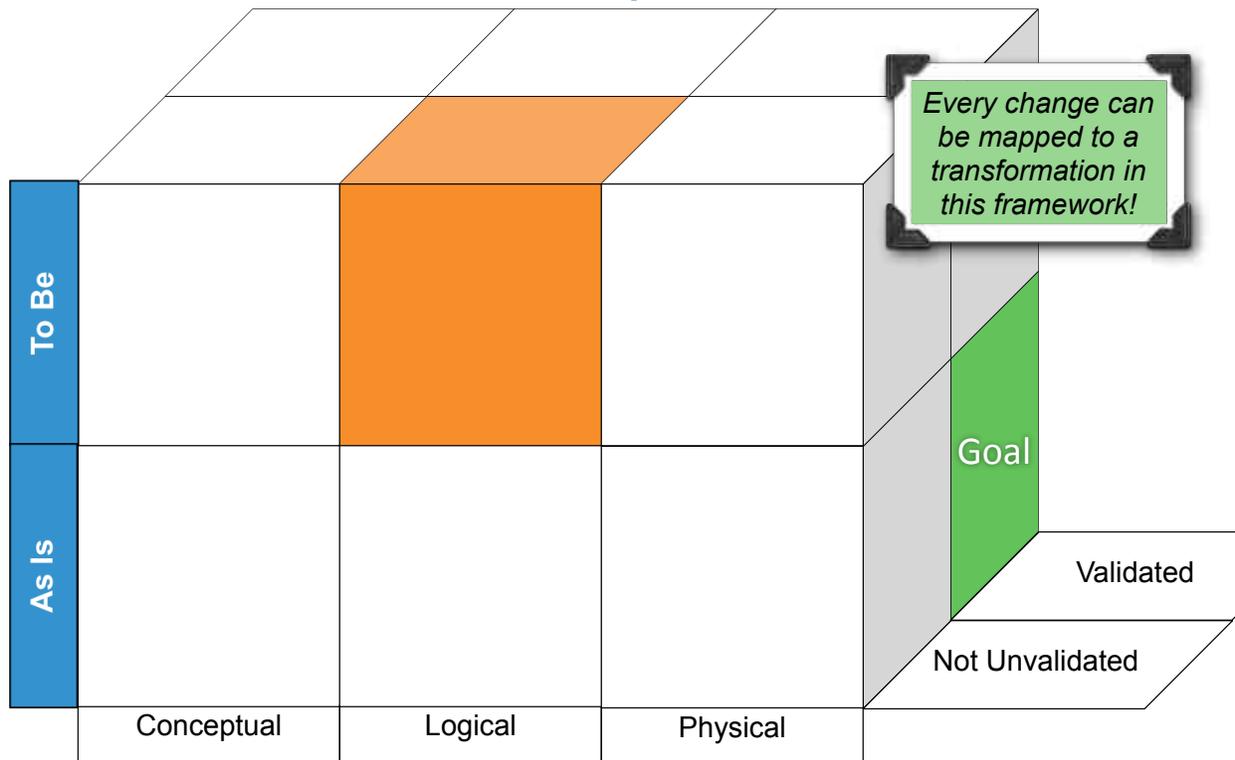


How does an organization achieve better use of its information architecture?

- 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 following a formal component transformation cycle



Information Architecture Component Evolution Framework



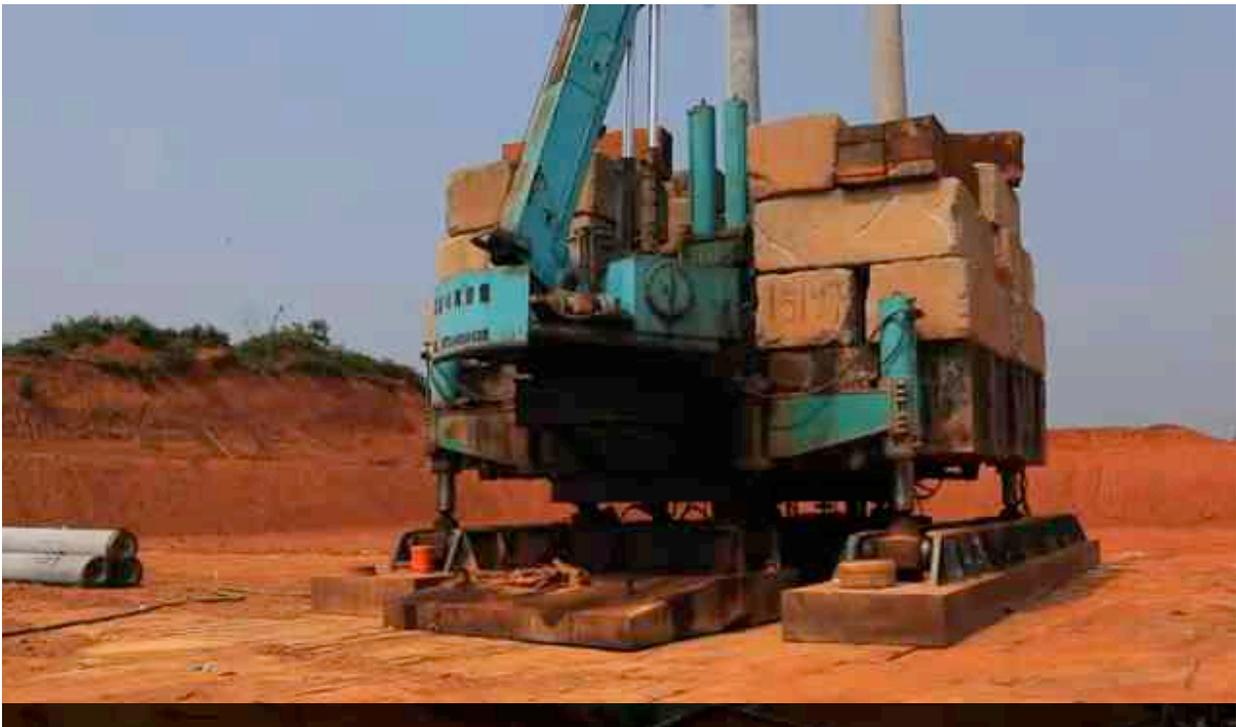
Wally Easton Playing Piano



360 hours or 15 days of continuous building

http://www.youtube.com/watch?v=Hdpf-MQM9vY&feature=player_embedded#

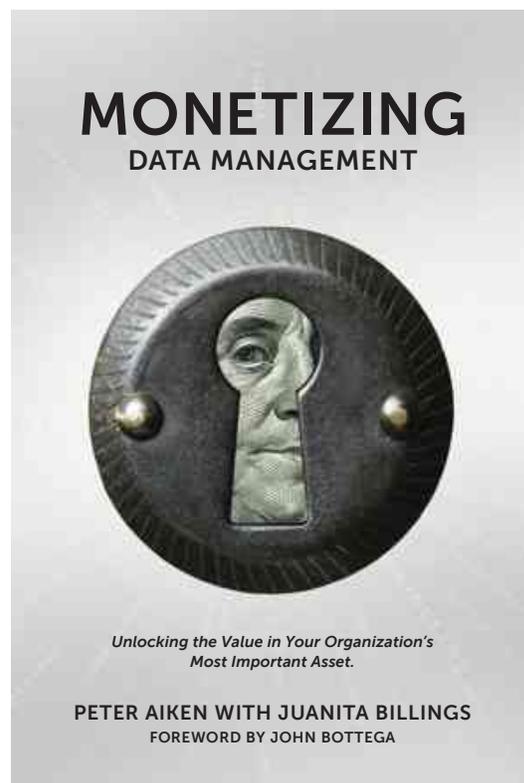
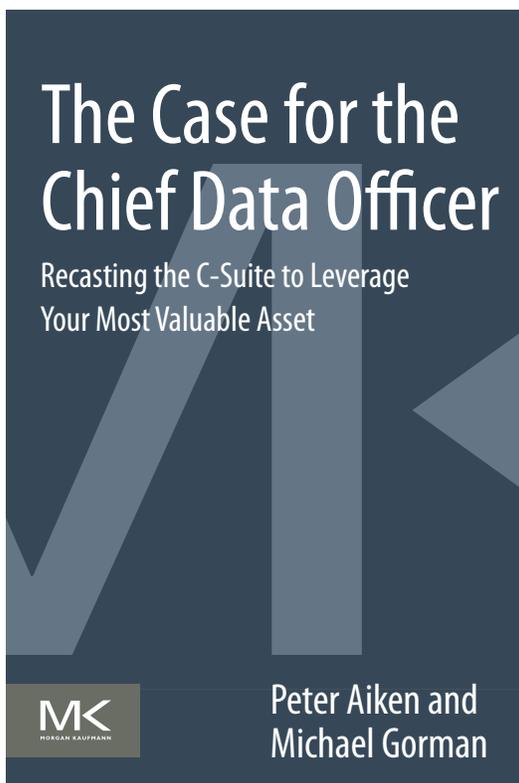
The Role of Engineering/Architecture in Rapid Development





Content Takeaways

- What is an **information architecture**?
 - A structure of data-based information assets supporting implementation of organizational strategy (or strategies)
 - 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 information 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 information 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 following a formal component transformation cycle





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