



Assuring full Enterprise Value - from information & technology.

**A Pragmatic Guide to Constructing
A Compelling Business Architecture**
(That Results in the CEO & Board Making 'Happy Noises')

PRESENTED TO
CIO Association of Canada - Calgary

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June 22, 2010

CEO

Business Leadership

- “How do I know if IT really understands the business?”
- “How do I know if IT is doing the right things?”
- “How can I tell if IT is adding value?”

CIO

IT Leadership

- “How do we enable the business strategy?”
- “How can we effectively demonstrate that we are doing the right things?”
- “How can we demonstrate that we are adding value?”

These questions have nothing to do with technology

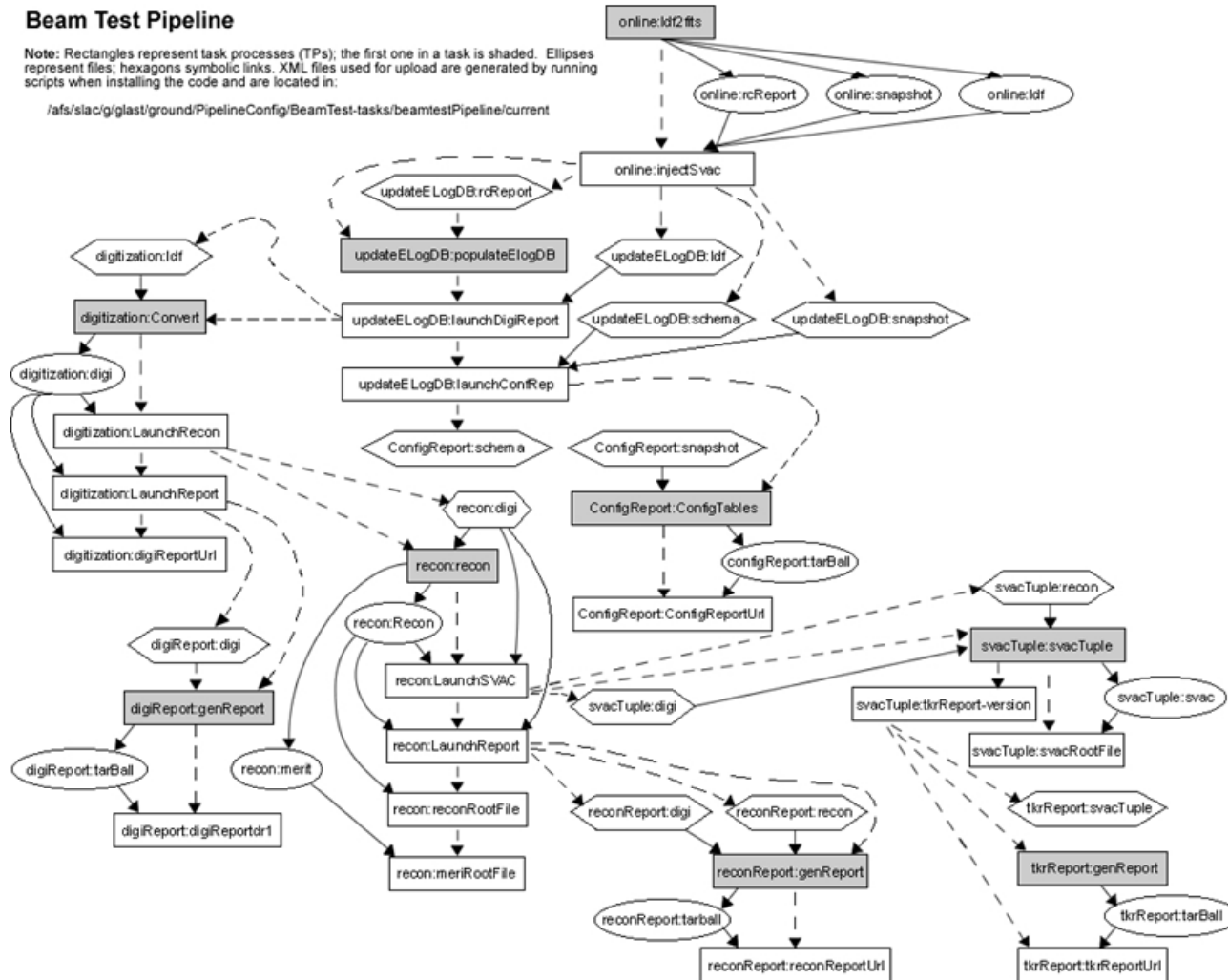
EXAMPLE #1:

What Most CEOs Do NOT Want to See

Beam Test Pipeline

Note: Rectangles represent task processes (TPs); the first one in a task is shaded. Ellipses represent files; hexagons symbolic links. XML files used for upload are generated by running scripts when installing the code and are located in:

/afs/slac/g/glast/ground/PipelineConfig/BeamTest-tasks/beamtestPipeline/current



EXAMPLE #2:

What Most CEOs Do NOT Want to See



There is a 'Golden Triangle'
That Integrates Business & IT

“A triangle is the most important shape in engineering.”

The 3 Basics that Connect Business & IT...

...after \$\$\$\$

**Organizational
Structure**

Applications

Information

...after \$\$\$\$

Organizational
Structure

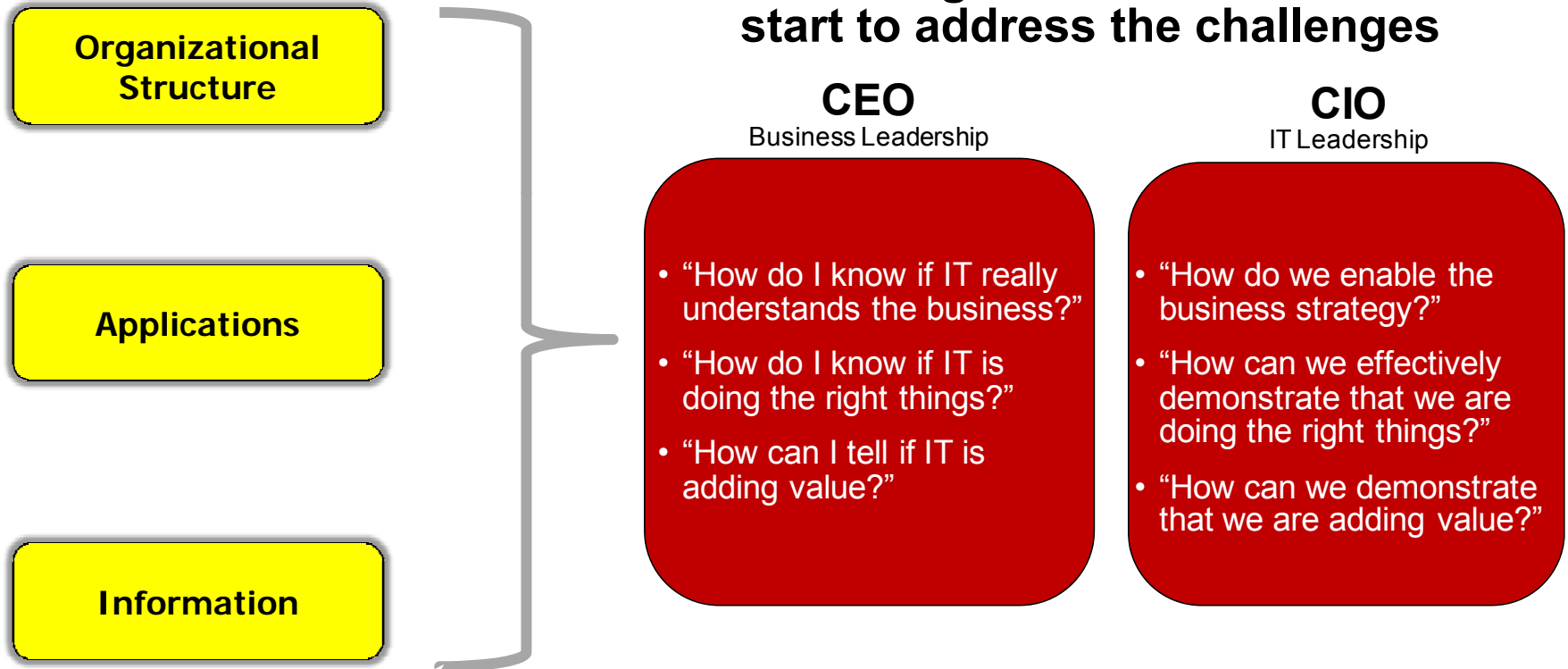
Applications

Information

By 'Information' I mean
Common Business Terms

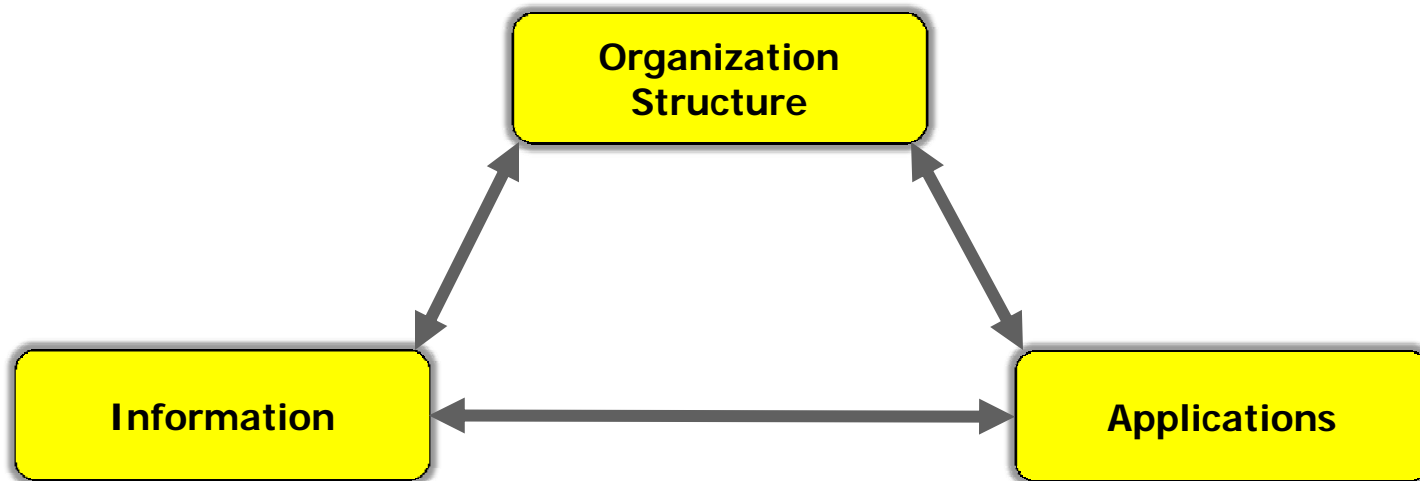
- Customer
- Vendor
- Employee
- SKU
- Well
- Completion
- Substation

...after \$\$\$\$



If we have been consistent in our approach and decision-making we should be able to 'map':

- Information (CBTs) to Organization
- Information (CBTs) to Applications
- Applications to Organization

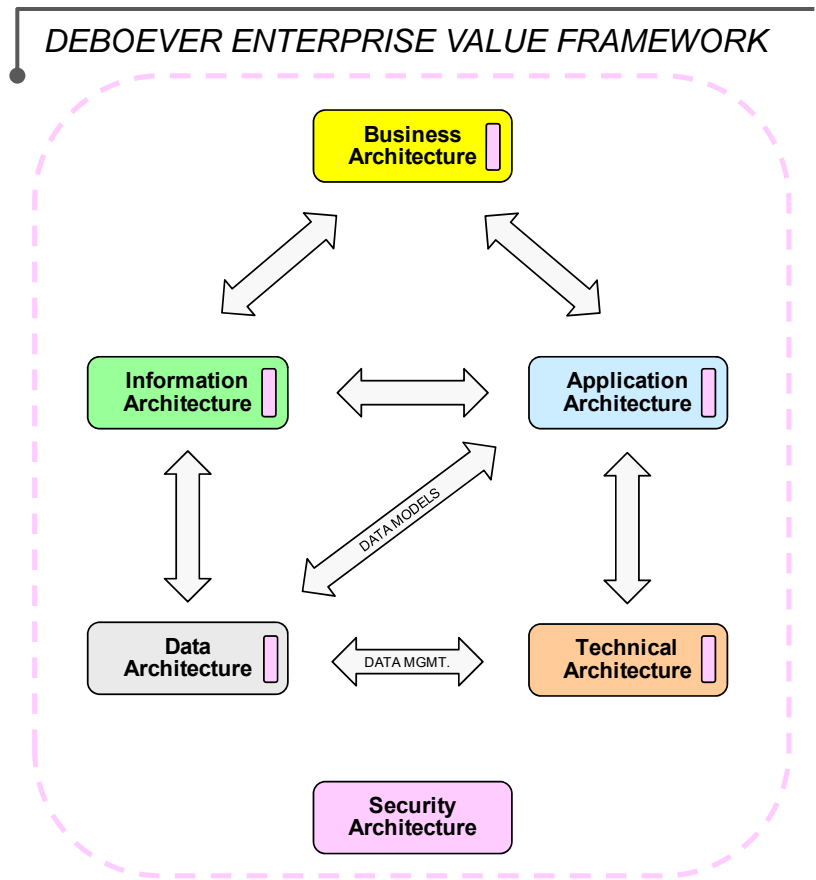


If I can triangulate the artifacts in this manner, I have 'proof' that they are consistent.

DEVF

The Underlying Framework & Method

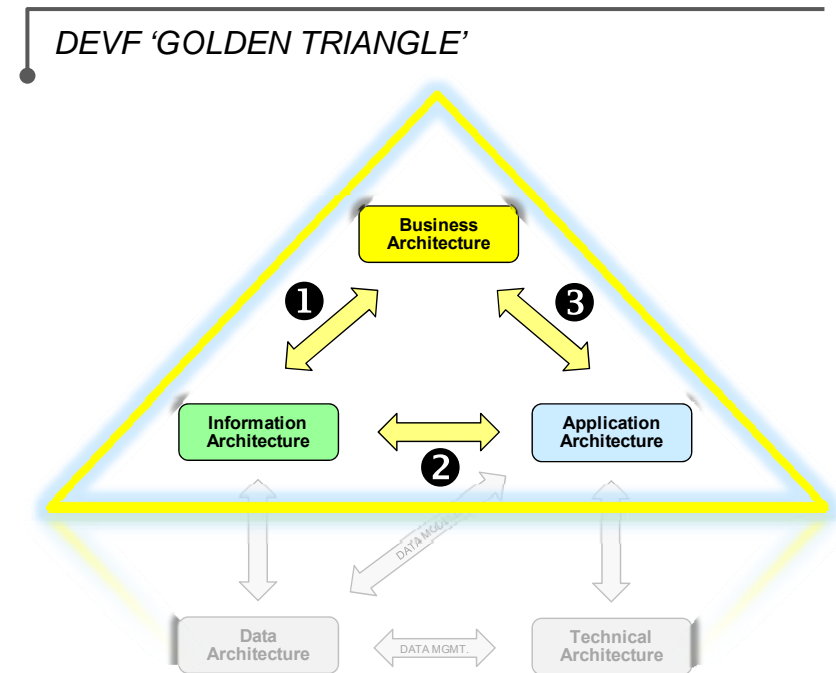
- **DEVF is very pragmatic and easily understood by IT staff without formal EA training**
 - Easy for IT staff to understand how they can contribute and key relationships
- **The 6 Domains of DEVF are:**
 - Business Architecture
 - Information Architecture
 - Application Architecture
 - Data Architecture
 - Technical Architecture
 - Security Architecture
- **Information Architecture is a key component**
- **Security Architecture is integrated into all Domains as well as stand-alone functions**



At the highest level of abstraction, each Domain should fit on a single page.

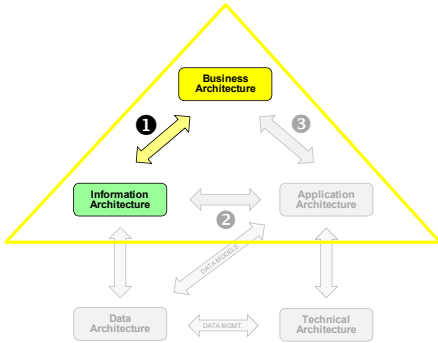
'Golden Triangle' of EA Artifacts for Leadership

- The 'Golden Triangle' is composed of 3 DEVF Domain Maps:
 - ① Information Architecture mapped to Business Architecture
 - ② Information Architecture mapped to Application Architecture
 - ③ Business Architecture mapped to Application Architecture
- At the highest level, each Domain Map is a single page
- The Domain Architectures are also at the highest level of abstraction:
 - Information Architecture consists of the 20-50 most Common Business Terms (CBTs)
 - Business Architecture consists of the organizational structure
 - Application Architecture consists of the primary mission critical systems
- Executive Leadership, in most organizations, sees immediate value in ① followed by ② and ③



'Golden Triangle' is particularly valuable in organizations that lack effective business transparency and/or information governance

1 Mapping Information to Organization Structure



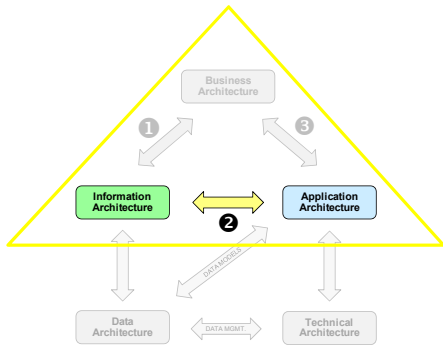
- The Common Business Terms (InfArch) are on the vertical axis
- A high-level Organization Structure (BusArch) is on the horizontal axis
- In these simple examples, only two indicators are used: '●' for Information Producers & '○' for Information Consumers (more complex types of indicators are discussed later)

LCE Oil's Organizational Structure

	Exploration & Production															Portfolio Management	Marketing	Midstream	Finance & Accounting	Corporate & Administration	Human Resources	Legal		
	Entry	Exploration			Commercial Dev.			Production Operations																
	Prospect Generation	Exploration Well Drilling & Evaluation	Geology	Project Appraisal	Front-End Engineering Design	Construction	Risk Mitigation	Infrastructure Planning & Installation	Drilling & Completions	Production Optimization	Equipment Maintenance	Well Maintenance	Well Production & Reporting	Joint Venture Management	Manage Non-Operated Interests	Abandonment or Divestiture								
CE Oil's Common Business Term																								
Cornerstone Data																								
Partner	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○
Contract	●	●					●											●	●	●	●		●	
Cost Center	○		●		○	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Operator														●	●		○	○	○	○	○	○	○	○
Well		○	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Land																								
Acreage	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Mineral Rights	●	○	○	○	○	○		○									○				○		○	
Lease	●	○	○	○	○	○		○									○				○		○	
Surface Rights	●	○	○	○	○	○	○	○									○				○		○	
Exploration																								
Prospect	○	●	○	○	○	○											○				○			
Seismic	○	●	○	○	○												○							
Development																								
Project	○	●	●	○	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Completion									●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Production Operations																								
Field	○	●	●	○	●					○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Recompletion				○					●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○
Workover		○		○					●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○
Reserves		○		○			○		●	○			○	○	○	○	○	○	○	○	○	○	○	○

LEGEND
 Information Producer ●
 Information Consumer ○

2 Mapping Information to Applications



- The Common Business Terms (InfArch) are on the vertical axis
- A list of non-vendor specific Application Systems (AppArch) is on the horizontal axis*
- In these simple examples, only two indicators are used: '●' for Information Producers and '○' for Information Consumers (more complex types of indicators are discussed later)

LCE Oil's Exploration & Production Application Systems

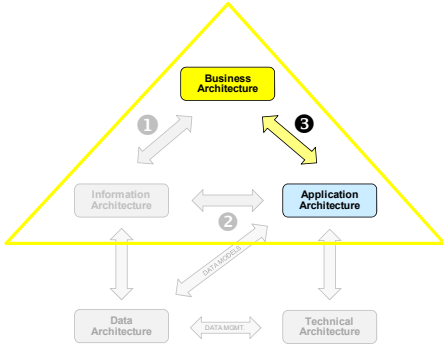
	Exploration & Development Systems							Production Systems				Midstream Systems					
	Seismic Interpretation (SI)	Reservoir Simulation (RS)	Reserves Economics (RE)	Seismic Data Management (SDM)	Geographic Information Systems (GIS)	Drilling Management (DM)	Well Lifecycle Management (WLC)	Well Data Management (WDM)	Well Content Management (WCM)	Field Data Capture (FDC)	Field Operations (FO)	Land Management (LM)	Production Accounting and Allocation (PA)	...	Pipeline Monitoring (MA/PM)	Plant Operations (PO)	Midstream Financials (MF)
LCE Oil's Common Business Term																	
Cornerstone Data																	
Partner	●			●		●	●	○		●		●	●		●		●
Contract				●								●					
Cost Center				○	○	○	●	●				○					○
Operator							●	●									
Well					○	●	●	●	○	○	○		○				○
Land																	
Acreage			○		○							●					
Mineral Rights			○		○			○	○			●	○				
Lease			○		○		○	○	○			●	○				
Surface Rights					○	○	●	●	○			●			○	○	
Exploration																	
Prospect	○	●	●		○		○	○									
Seismic				●	○												
Development																	
Project	○	●	●	○	○	●	○	○									
Completion					○	●			○	○	○		○		○	○	○
Production Operations																	
Field					○										○	○	
Recompletion						●	○			○	○					○	○
Workover						●	○			○	○					○	○
Reserves		●	●		○		○						○				○

LEGEND	
Information Producer	●
Information Consumer	○

* For the purpose of this high-level overview of DEVF, we decided not to name specific E&P software products or vendors

3 Mapping Organization Structure to Applications

- A list of non-vendor specific Application Systems (AppArch) is on the vertical axis*
- A high-level Organization Structure (BusArch) is on the horizontal axis
- The types of information and other indicators that can be used to populate these cells are discussed later



LCE Oil's Exploration & Production Application Systems

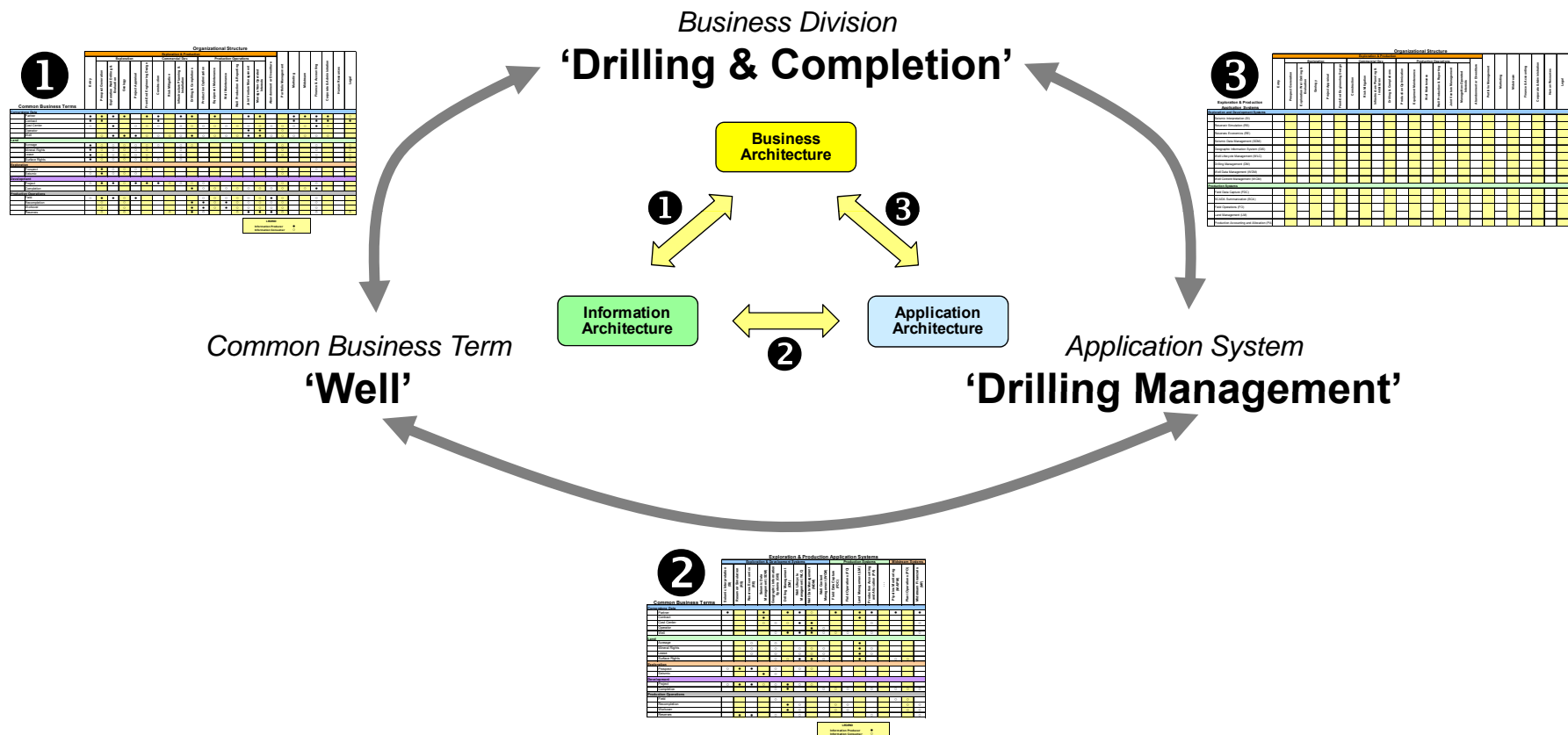
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Drilling Management (DM)																				
Well Data Management (WDM)																				
Well Content Management (WCM)																				
Production Systems																				
Field Data Capture (FDC)																				
SCADA Summarization (SCA)																				
Field Operations (FO)																				
Land Management (LM)																				
Production Accounting and Allocation (PA)																				

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EXAMPLE
A Single Business/IT Triangle

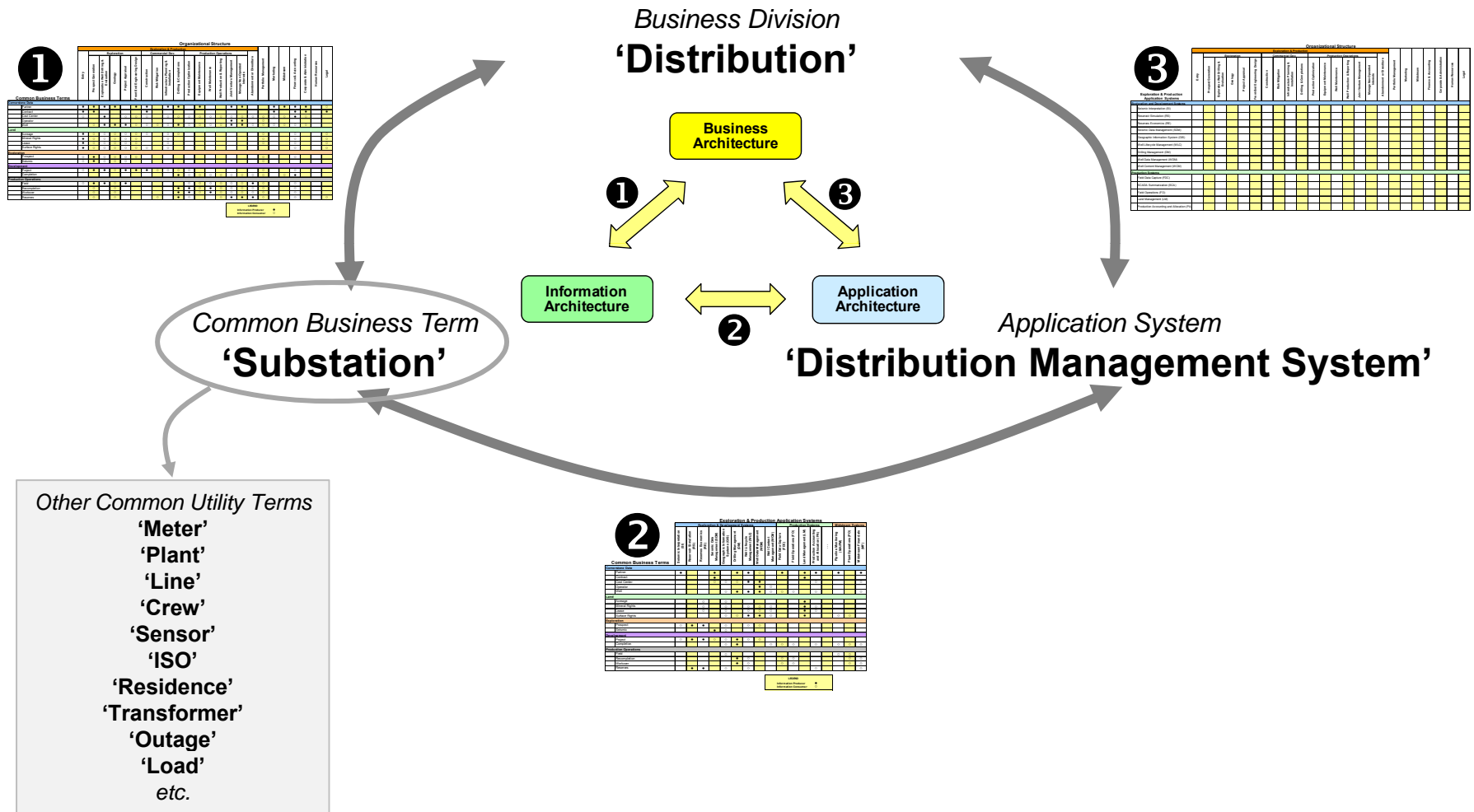
Triangulation Ensures Consistent EA Analysis

- Creates confidence in Leadership, Business and IT that analysis and design are well thought through, and that they have been validated
- Very effective from a planning perspective



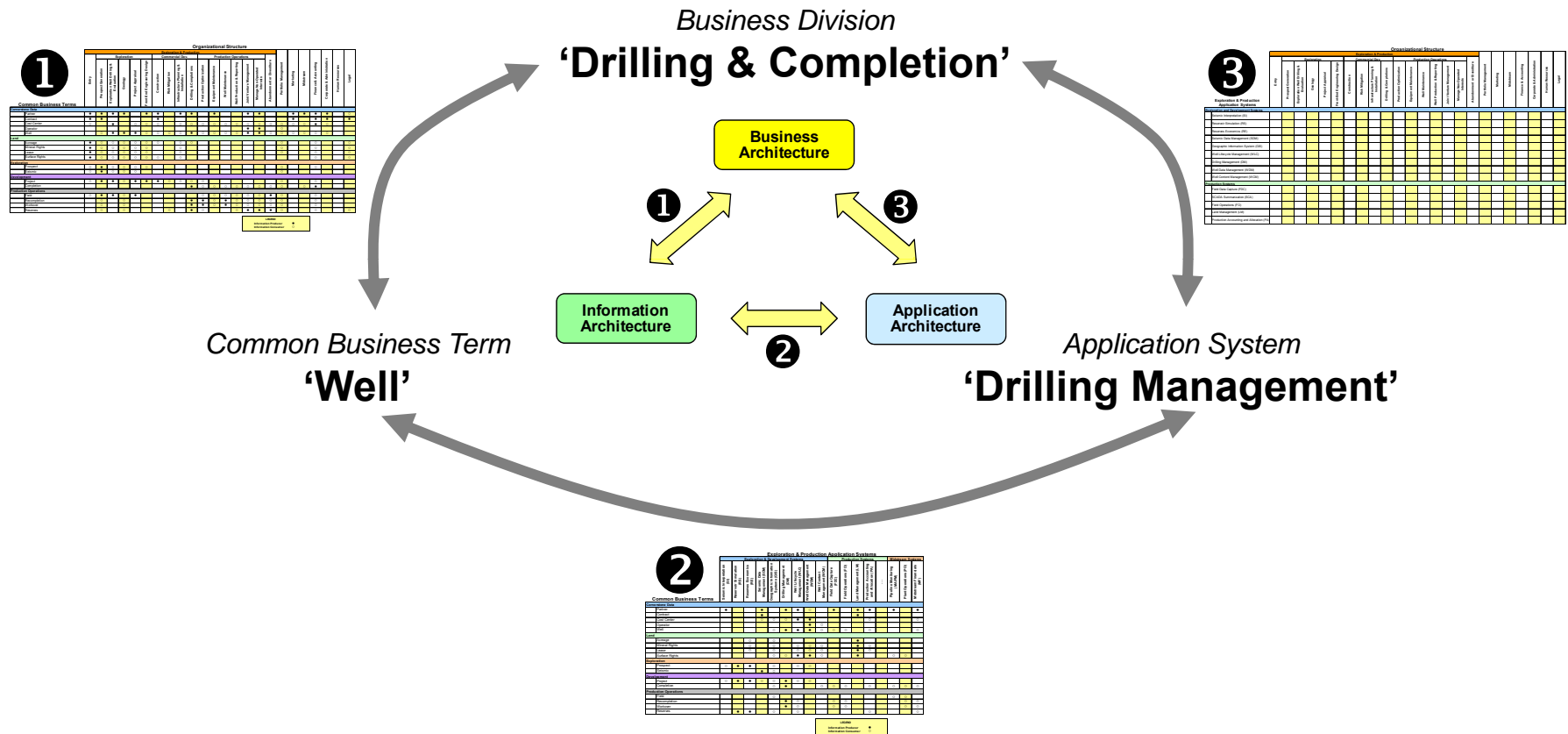
If I can triangulate my EA artifacts in this manner, I have 'proof' that they are consistent ('EA Proof')

A SmartGrid Example



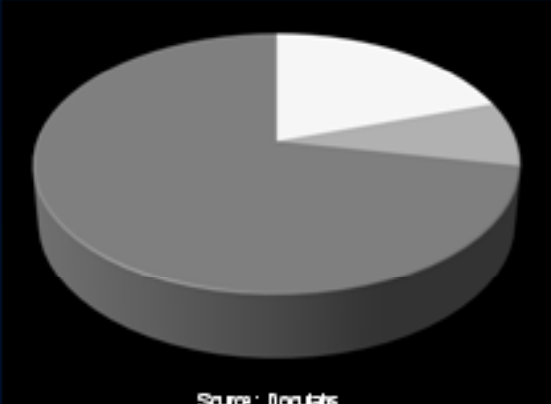



Triangulation Ensures Consistent EA Analysis

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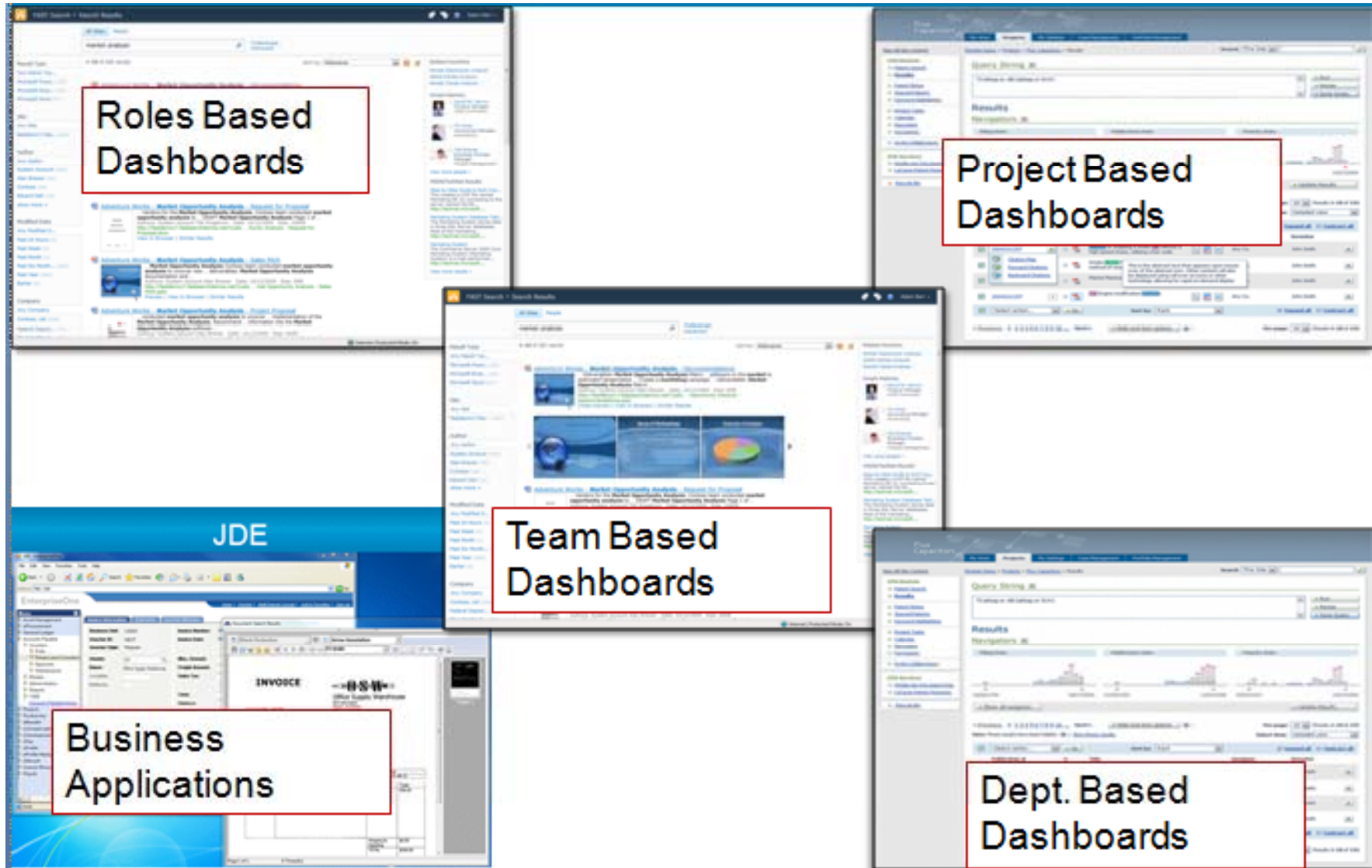
Increasing Information Value: Next Step

Capture	Move	Manage
<ul style="list-style-type: none">EmailWordExcelContractsInvoicesManualsMapsDrawingsTickets	<h2>ECM Impact Scope Is Growing</h2>  <p>Source: DocuLife</p> <ul style="list-style-type: none"><li>Only 20% of data is held in structured systems<li>80% of data is therefore held in unstructured systems<li>90% of unstructured data is also unmanaged <ul style="list-style-type: none"><li>Conservative estimates put data growth at 36% per year<li>Content types and "new media" are proliferating and gaining uptake with a lack of governance<li>Discovery demands are increasing in number and scope	 <p>Retrieval, Control & Maintenance</p>  <p>Computer Storage, Backup & Mgmt</p>  <p>Physical Storage</p>

SEARCH...SECURE...ROUTE...REPORT...RETAIN...INTEGRATE

- 1. Intranet 101**
- 2. Electronic Well File**
- 3. AP Workflow**
- 4. Project Tracking and Cost Control**
- 5. Roles, Team, Project and Departmental Dashboards**

Most Common Energy Dashboards





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