

# A PwC Perspective: Enterprise Architecture & Technology Strategy\*

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\*connectedthinking



# Agenda

- Setting the Business Context
- Aligning Technology with Business Strategy – the Information Supply Chain
- The Architecture Stack
- Summing up

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# Setting the Business Context - Data

- Data as the raw fuel of Performance Management
  - In a recent survey of CIOs and IT directors, respondents estimated that the value of their data represented some 37% of the worth of their organization.
    - PwC Global Data Management Survey, 2004
- Challenges
  - Plethora of data everywhere, lack of information
  - No clear ownership, accountability and responsibility of data
- Key Question
  - Do you know how information flows across your organization ?

# Setting the Business Context - Data

- **The Internal Focus**

- Operating Efficiencies derive from systems that provide a performance management perspective
- Risk Management Concerns are on the rise
  - Financial, regulatory, legal, security and privacy
- Increasing IT Complexity
  - Enterprise Wide Silos ? Interoperability ? SOA ?

- **The External Challenges**

- Regulatory Changes putting greater pressure on data processes
  - SARBOX, AML, FDA
- Data and Systems Driven Competitive Advantage around Market and Customer

# Setting the Business Context - Data

- Most companies do not have a formal data strategy
  - Can I map my business process to a data process and to a tangible business / performance metric
- Data Strategy ownership primarily resides in IT
- Critical gap between intention and execution around data
- Board level commitment to data is faltering

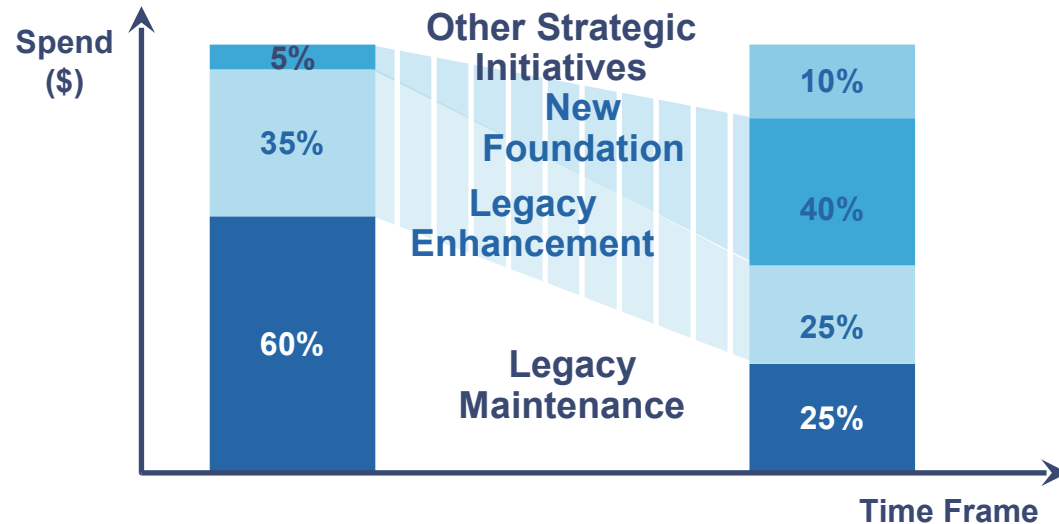
*"Our number one challenge is to improve the integration and sharing of critical business information between businesses, operations, and technical divisions."*

*-- Finance Operations Executive, Large North American Bank*

# Setting the Business Context – a Fundamental Change in Technology

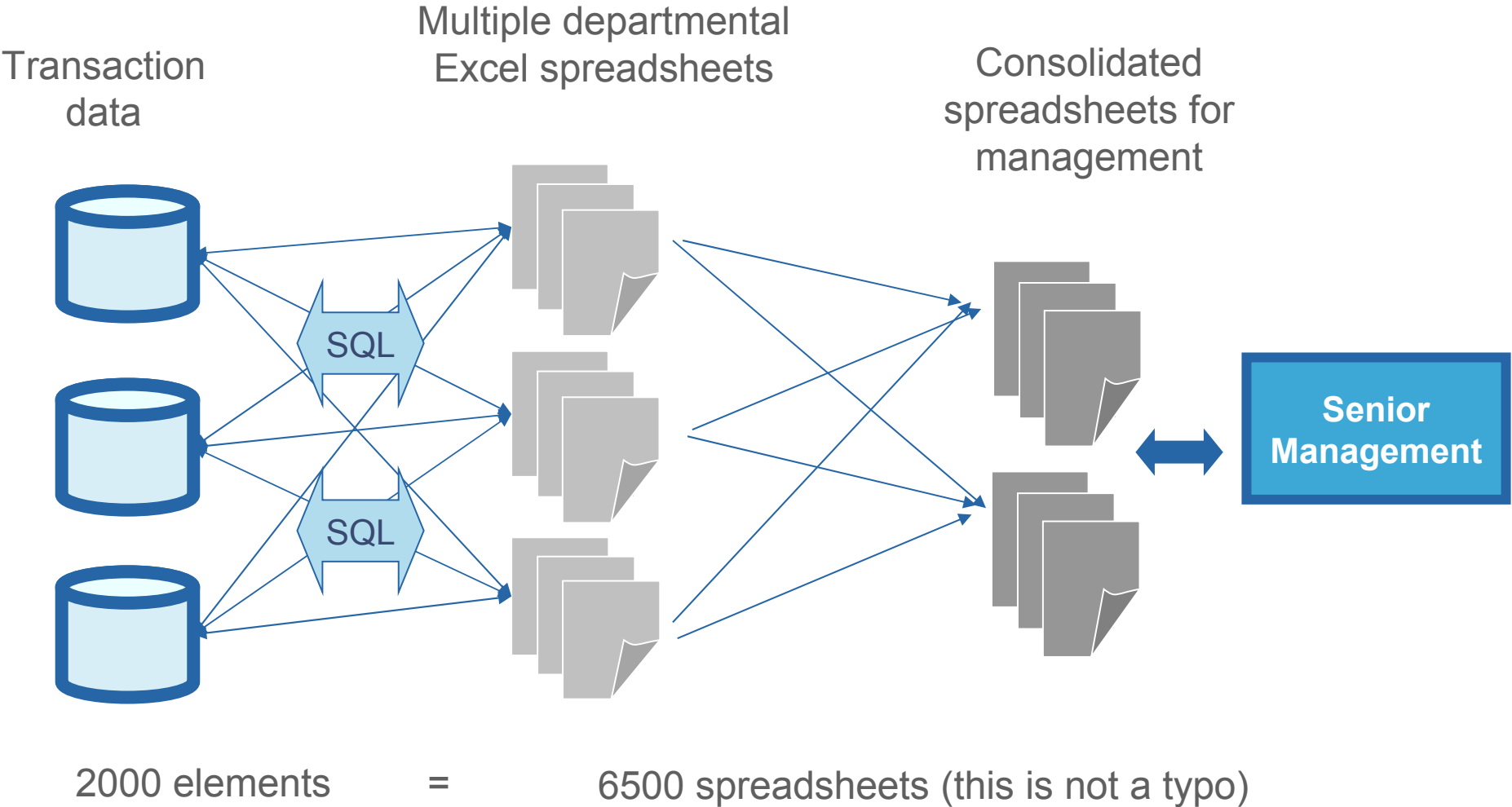
## IT Constraining vs. Enabling

- Cost of changes exceeds benefits
- Legacy Application holding companies hostage
- Accidental Architectures
- Armies of IT professionals necessary to support extensive customizations and unique compilations of technology that exists within enterprises



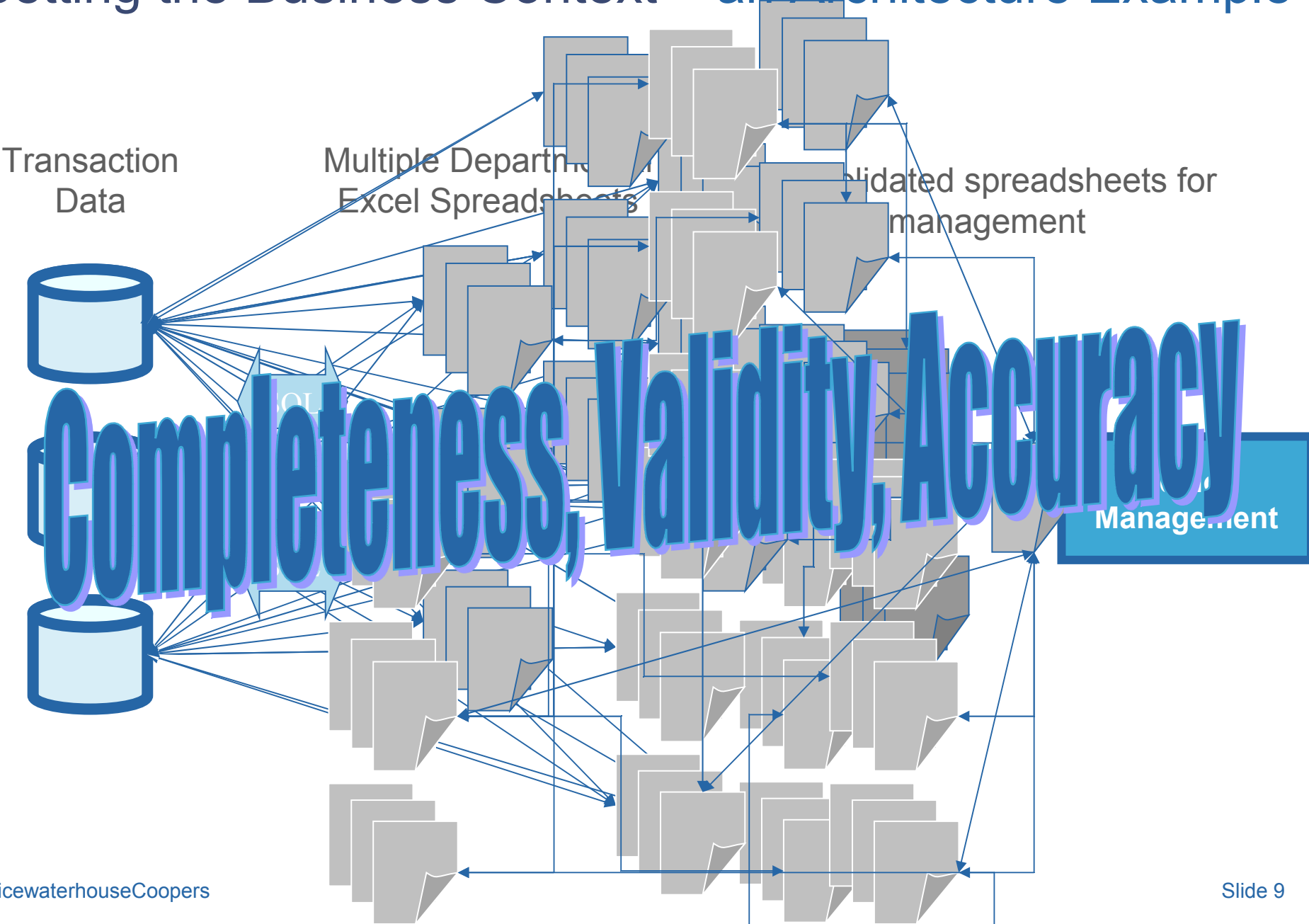
Focus of the “new” CIO

# Setting the Business Context – an Architecture Example





# Setting the Business Context – an Architecture Example



# Setting the Business Context - Metadata

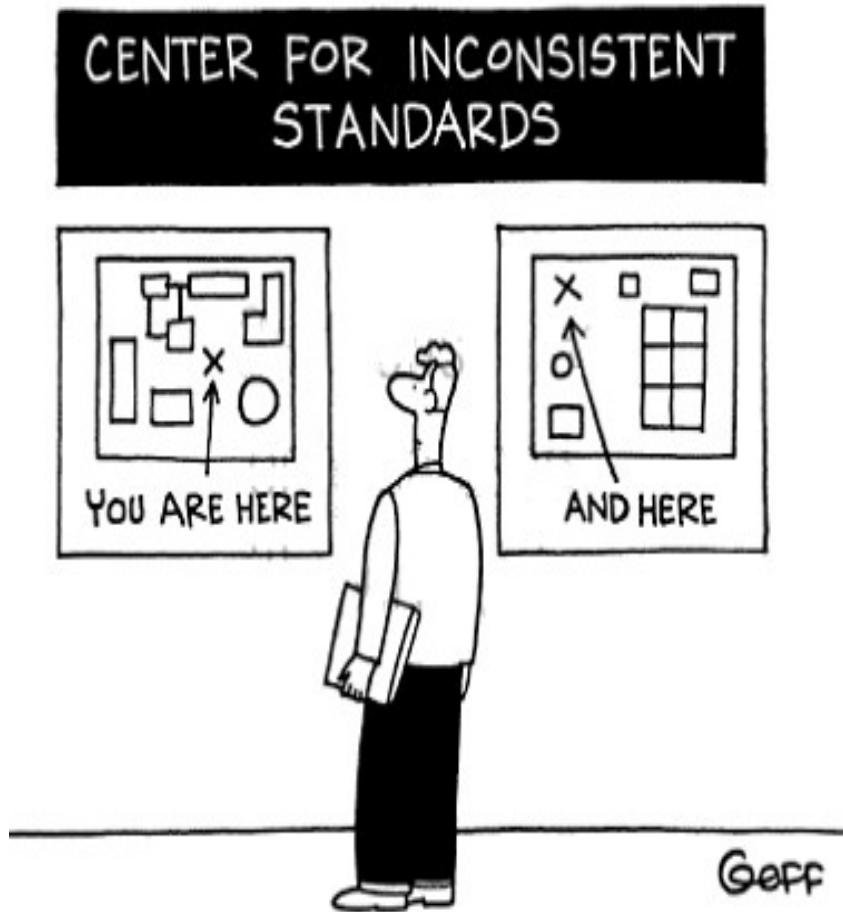
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E-mail: randyg@norwich.net



**“Hello, Bob? It’s your father again.  
I have another question about my new computer.  
Can I tape a movie from cable TV then fax it from  
my VCR to my CD-ROM then E-mail it to my  
brother’s cellular phone so he can make a  
copy on his neighbor’s camcorder?”**

**A consistent,  
agreed upon  
vocabulary,  
spanning across  
applications,  
infrastructure  
and usage**

# Setting the Business Context - Metadata



**A vocabulary that  
is context  
sensitive and  
non-ambiguous,  
forming the basis  
of a consistent  
taxonomy**

# Setting the Business Context - Metadata



**Given a taxonomy (e.g. location), the information based on the taxonomy has to add value (e.g. is getting out a feasibility)**

# Setting the Business Context – to summarize

*Anyone have a 'perfect' business – people, processes, technology?*

- *Everything working together, high-value, low costs, flexible, agile, growing...*

*Why not?*

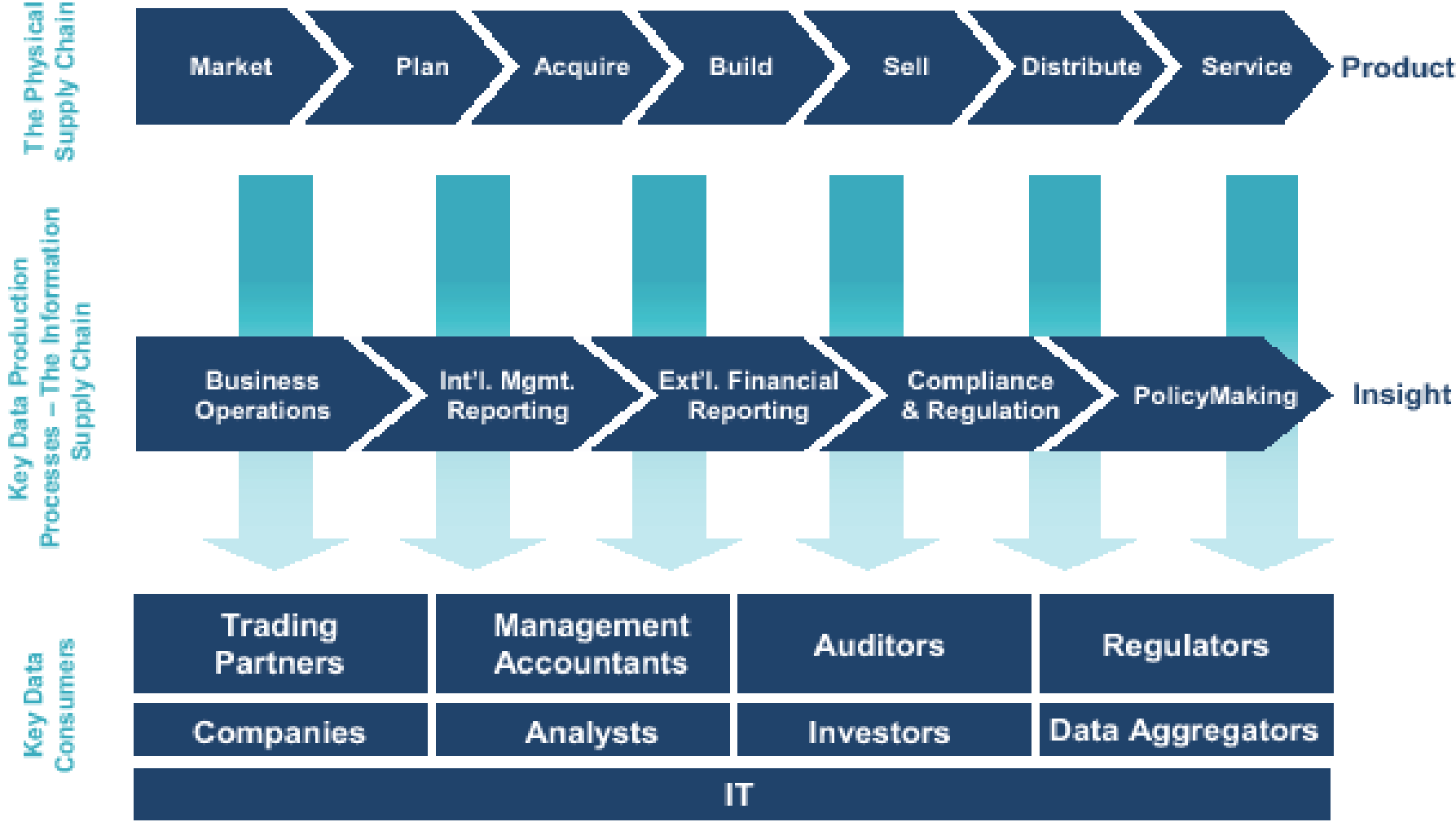
- Incomplete *alignment* of people, processes, customers, suppliers and technology with business goals:
  - Everyone does their own thing – little *sharing* of capabilities or services
  - IT for IT's sake
  - Business processes are often *constrained*, not *enabled* by technology
- Unclear transparency of *costs* across the business:
  - What does IT *really* cost? Is it value-for money?
  - Are investments justified? Could there be cheaper ways to provide the required business services?
- No overall control and *value* prioritisation of various business / IT initiatives:
  - Lots of projects – which ones are *really* contributing to P&L?
  - Why are the benefits usually less than expected?

**A first step in addressing potential alignment, cost and value issues is to explicitly expose them to the business – architecture can help do this...**

# Agenda

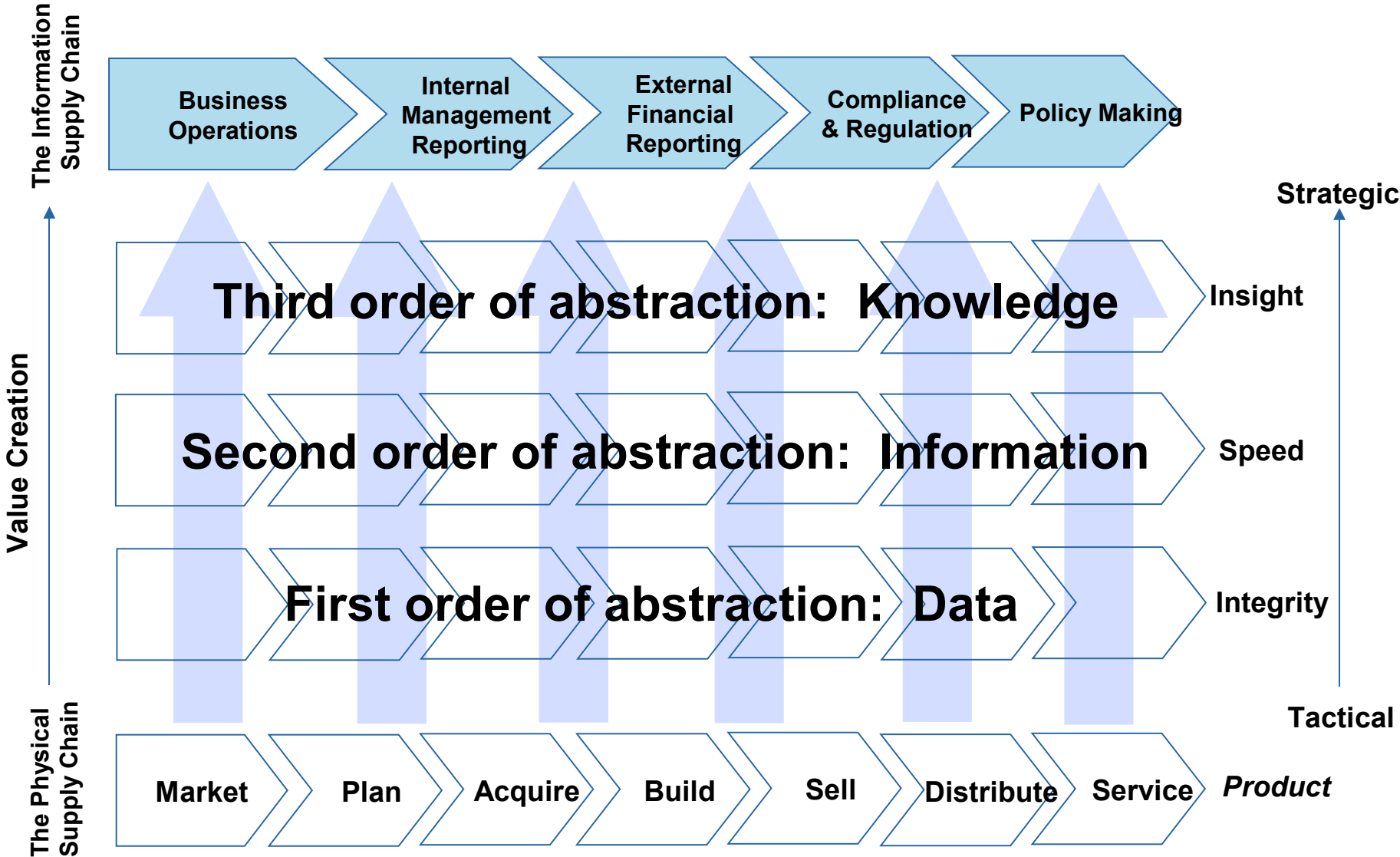
- Setting the Business Context
- **Aligning Technology with Business Strategy – the Information Supply Chain**
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# The Information Supply Chain : Fueling Business Processes with Insight



**Figure 1:**  
“What is the Information Supply Chain?”

# The Orders of Data Abstraction Along the Information Lifecycle

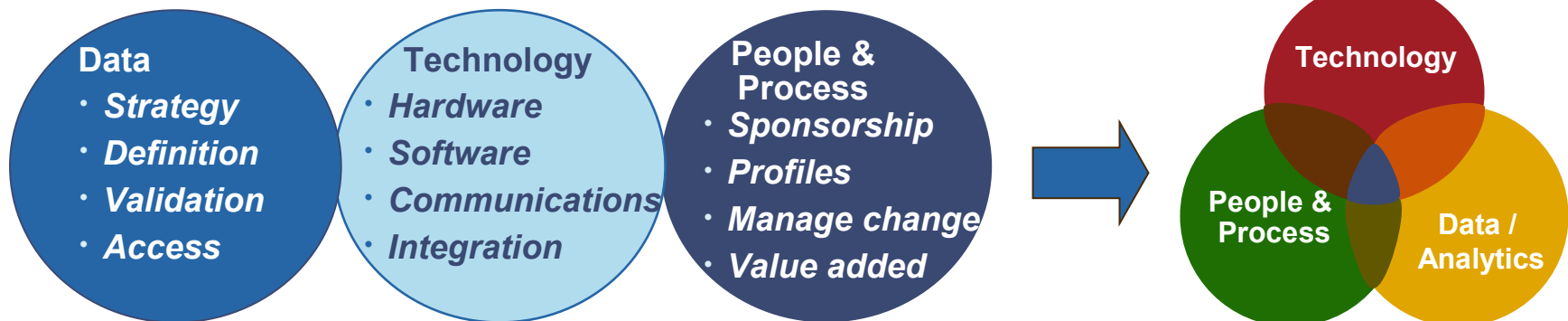


Adapted from "Refining Information Value from Supply Chains" Meta Group, October 2003

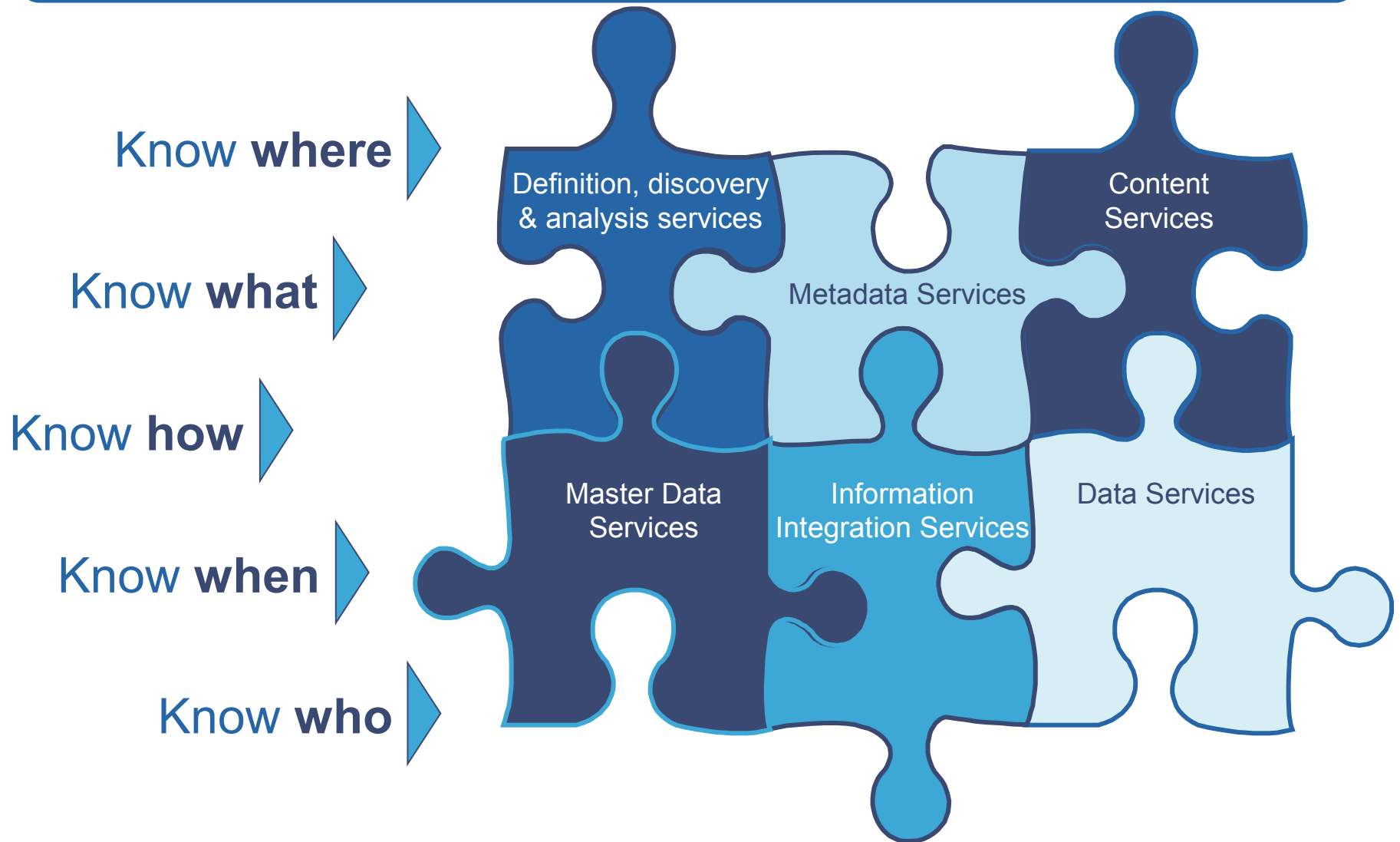


# IT as an Enabler : Aligning IT with Business

- **Strategy through Architecture / Implementation**
  - Business Processing Mapped to Data Process through Architecture
  - Information Supply Chain Riding on Physical Supply Chain
- **Focus on Performance Measurement and Optimization**
  - How can I measure what I do : business process, data process, alignment
  - What is the architecture to enable such a solution
  - How can I tie it in to my decision making process ?
- **Challenges of Governance, Security and Control**



*Architecture is not just IT, it is a way of modelling all parts of a business to identify root causes and make appropriate decisions to address them*



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# What is Architecture?

## “Architecture” –

- “A common framework for systematically planning, aligning and understanding the relationships between business needs, business information, and IT”
- By “IT”, we mean in its widest sense – systems, data, technology, IT delivery, organisation / people, costs, standard et al.

**Developing a good architecture is fundamental to avoiding business / IT mismatches and ensuring visibility of IT value and costs**

# Dimensions of Architecture

Architecture provides models and linkages between key business areas:

- Business, Information, Information Systems, and Technology Viewpoints...

## Business Models & Requirements

- Business drivers, concepts, strategy, principles
- Business operating model
- Business interaction model
- Business processes & functions

## Information Models & Requirements

- Information types (e.g. customers)
- Information flow model (supporting business interaction model)
- Information relationships & organisation



## IS Models / Applications

- IT drivers, concepts, strategy, principles
- Business logic (supporting business processes)
- User presentation
- Application data (supporting information models)

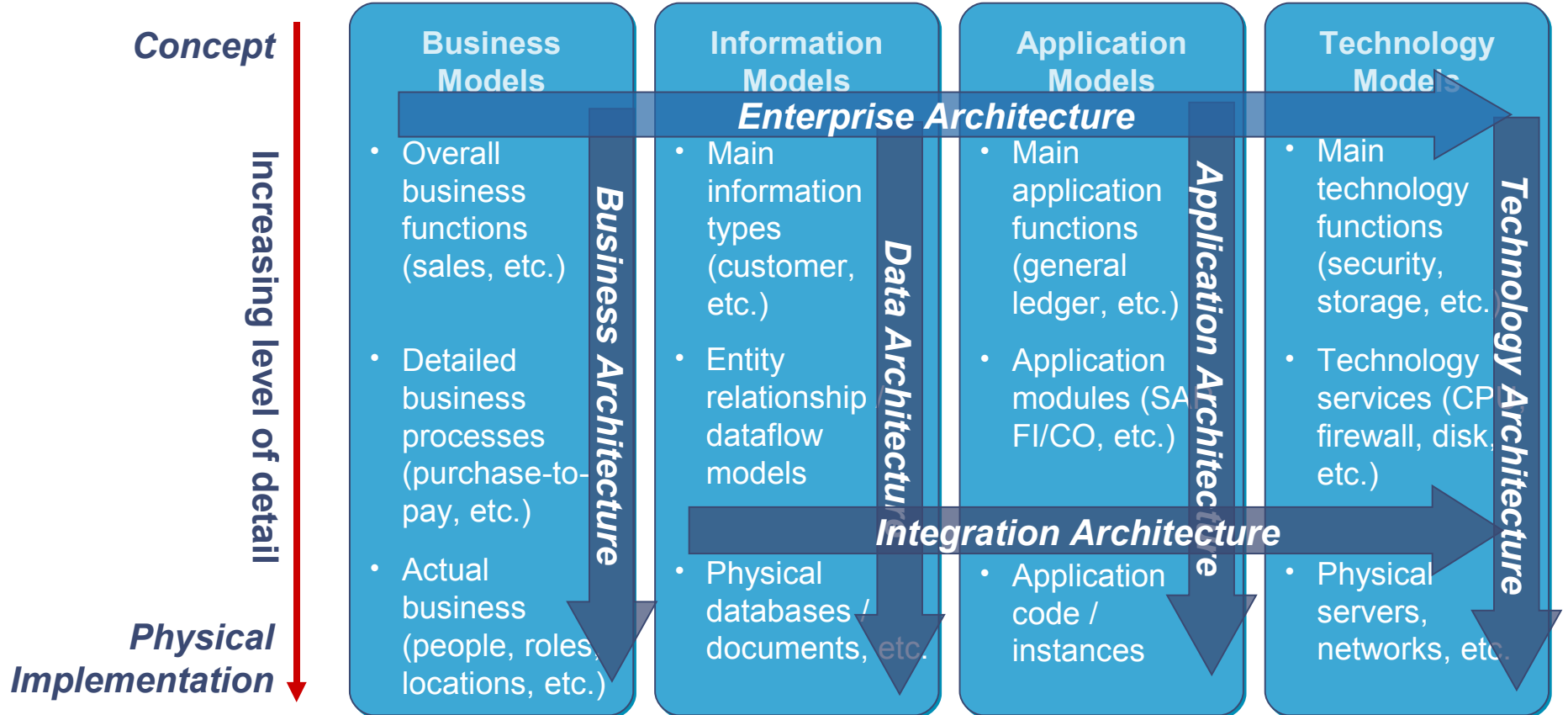
## Technology Models / Infrastructure

- Hardware / software platforms
- Networks / communications
- Storage
- Integration
- Security
- Service levels (performance, etc.)

# Types of Architecture (1)

The overall architecture framework, e.g. TOGAF can be used to model various different aspects of architecture:

- Different development paths through the framework give us different architectures



# Types of Architecture (2)

- **Enterprise Architecture:**

- Provides a joined-up model of how business functions (e.g. sales) are or could be supported by combining information, software applications and technology infrastructure

- **Business Architecture:**

- Provides a detailed model of how business functions (e.g. finance) are or could be realised by business processes (e.g. order-to-cash), business organisations, people, physical locations and assets

- **Information Architecture:**

- Provides a detailed model of how key business information (e.g. products) is or could be represented by relationships with other information (e.g. customers) and is implemented in databases, documents, etc.

- **Application Architecture:**

- Provides a detailed model of how software automation (e.g. e-procurement) is or could be realised by software modules (e.g. Oracle Purchasing) as built by specific configuration / coding and deployed into physical instances

# Types of Architecture (3)

- **Technology Architecture:**

- Provides a detailed model of how non-functional requirements (e.g. storage, security, performance) are or could be realised by technology services (e.g. disks, processors, connectivity) as implemented by physical computer clients, servers, networks, switches, etc.

- **Integration Architecture:**

- Provides a joined-up model of how software applications (e.g. SAP) share or could share data and functions with other applications and databases and how technologies such as EAI or ETL can facilitate such interoperability

- **Other Architectures:**

- Can include sub-sets or combinations of the above such as Security Architecture, Business Process Architecture, Governance Architecture, Organisation Architecture, Network Architecture...

- All can look at the current situation and/or a desired future state...

**Whichever architecture is most relevant to the problem at hand, we need to understand **how** we are going to produce it, and **what** it will be used for...**



# Architecture Framework for Business Integration : from Business Process to Business Performance Management

## Business activity monitoring

Real time analysis, statistical reports, instance tracking, information aggregation, key performance indicators

## Process integration

Executable process model, long running flows, state management, human interaction workflow, Packaged flows, and data transformations, canonical object models

## Business process modelling

## B2B integration

Public process models, trading partner agreements, Reliable internet messaging, security, business Transaction, common business vocabulary

## Application integration

Connectors, event triggers, A2A process automation, transaction coordination and compensation, message broker

## Connectivity and Data integration

Communications middleware, RPC, COM/COBRA, message queuing  
Publish/subscribe, TP monitor, data translation, transformation

# Enterprise Integration Stack

## Business Process Integration

- Define, execute and monitor multi step processes
- Multiple records, multiple systems
- Includes human decision making via workflow

## Application Integration

- Transport data structures (records)
- Content based routing
- Format validation/transformation
- Event and rule based data transformation

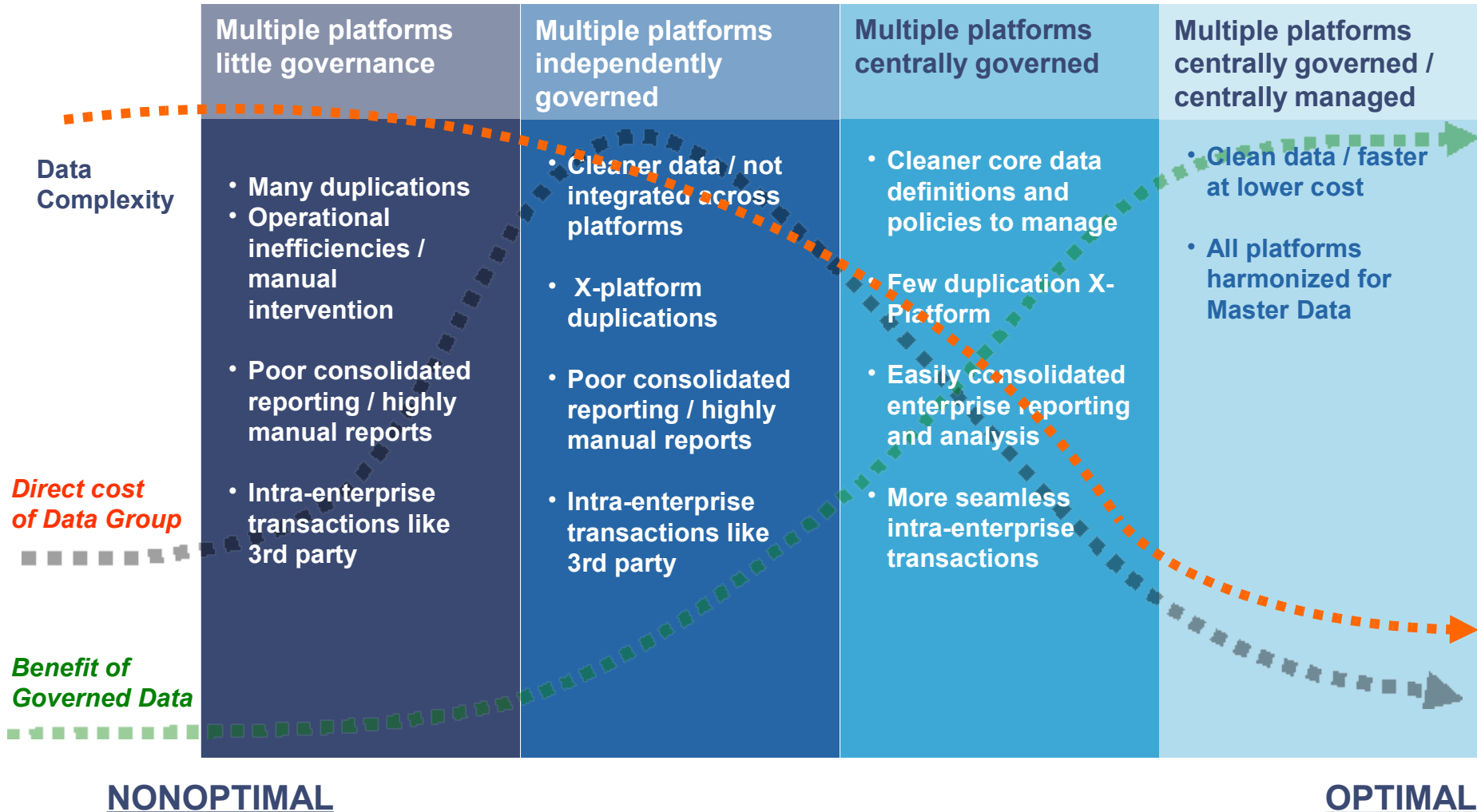
## Data Integration

- Transport messages (bits)
- Reliable delivery, publish-and-subscribe
- Message oriented middleware

## Security Integration

- Define, execute and monitor security policies
- Manage and monitor identity life cycle
- Manage and monitor other security controls

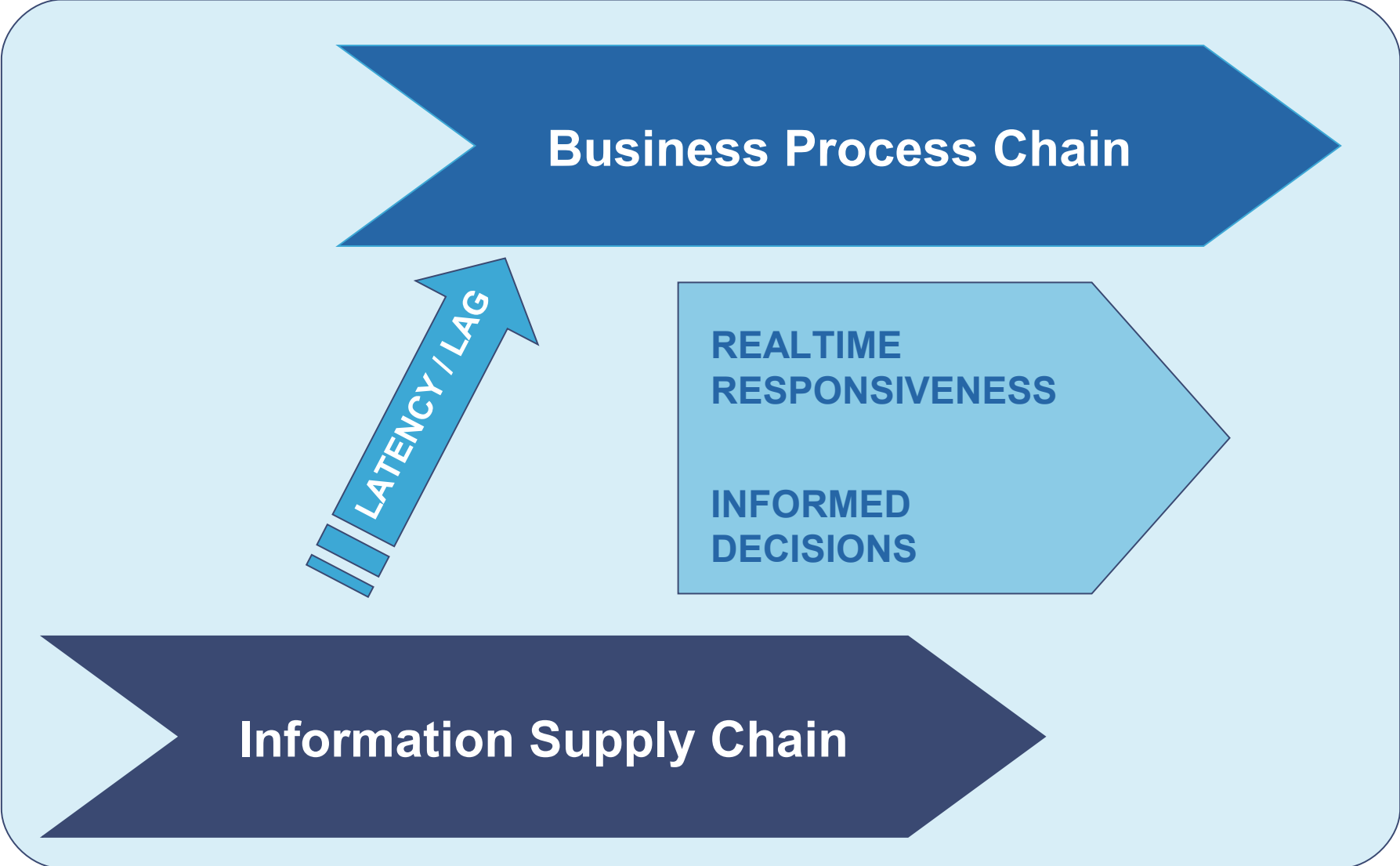
# PwC's View of Complexity Management Governance of Enterprise Data



# Agenda

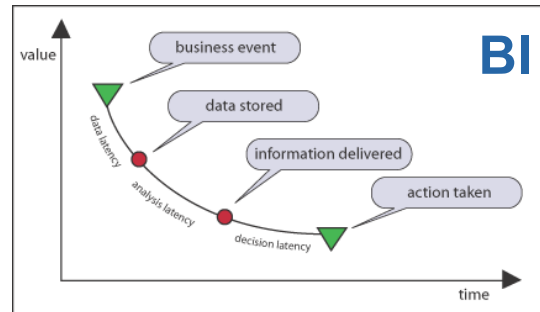
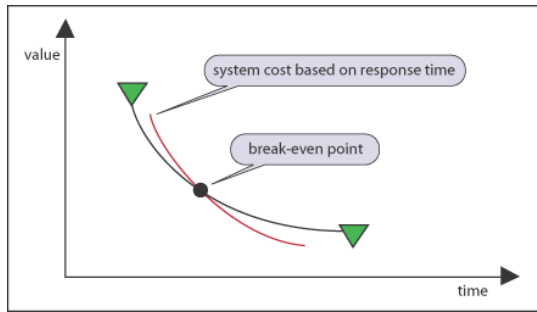
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# The Core Issue

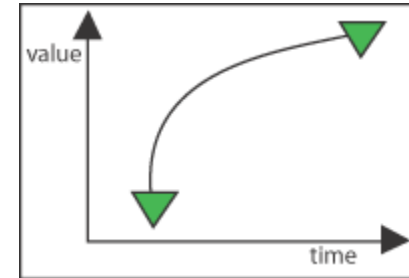


# Architecture decisions: Real-Time vs. Right-Time vs. Value-Time

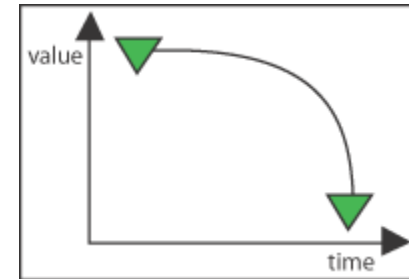
- Real-time is the 'friendly' term
- Right-time is a better description
- But actually, it's about *Value time*\*



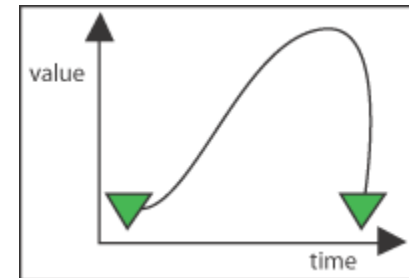
Wine



BI



Tickets

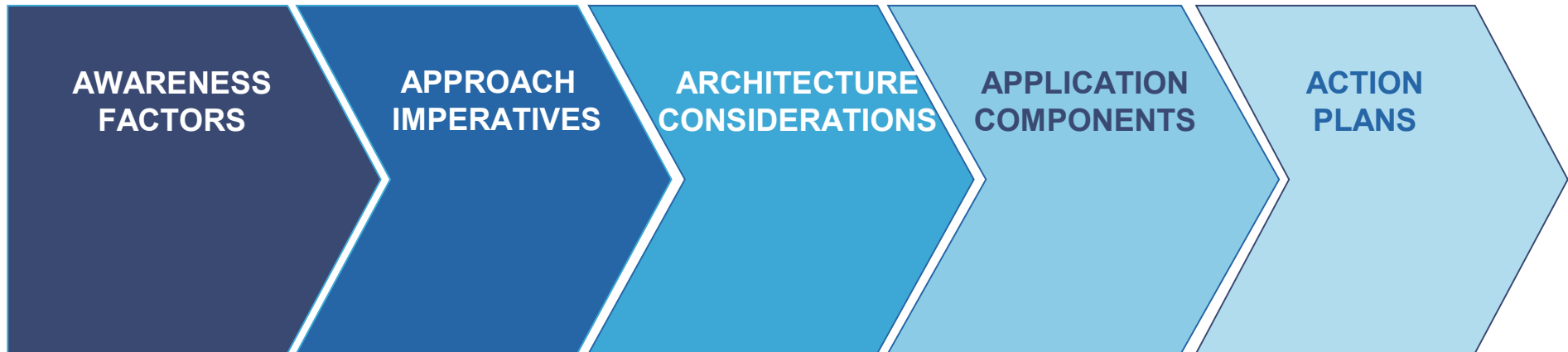


- *The goal is to maximize value*

\*Hackathorn, Richard. *Real-Time to Real-Value*, DM Review Magazine, January 2004 Issue

# Doing 'things right'

## The 5 'A's



# Doing 'things right'

## The CARTA Topic Map

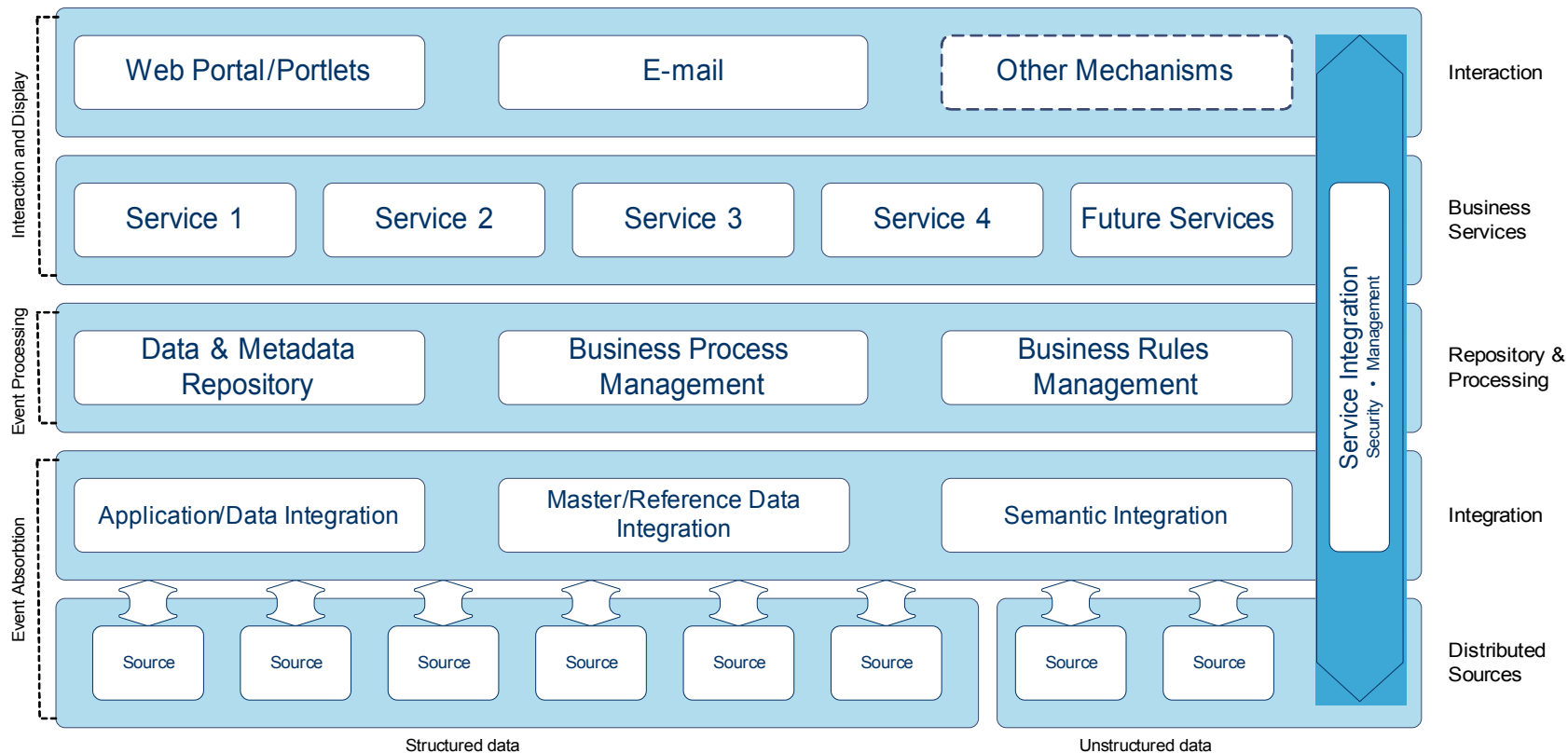
AWARENESS FACTORS	APPROACH IMPERATIVES	ARCHITECTURE CONSIDERATIONS	APPLICATION COMPONENTS	ACTION PLANS	
<ul style="list-style-type: none"> <li>Stakeholders               <ul style="list-style-type: none"> <li>Customers/Users</li> <li>Regulators</li> <li>Key Vendors</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Vendor Agnostic</li> <li>Leverage existing familiarity/training</li> <li>Broad Buy-in</li> <li>Competitive Posture</li> </ul>	<ul style="list-style-type: none"> <li>Transparency Across Stakeholders*</li> <li>Org. Architecture</li> </ul>	<ul style="list-style-type: none"> <li>Skills Inventory</li> <li>Vendor Selection</li> <li>Feedback Mechanism</li> </ul>	<ul style="list-style-type: none"> <li>Staffing Plan</li> <li>Change Man. Plan</li> <li>Training Plan</li> <li>Knowledge Xfer</li> </ul>	PEOPLE
<ul style="list-style-type: none"> <li>Maturity Framework</li> <li>Process models</li> <li>Process Issues</li> <li>Data Assessment</li> </ul>	<ul style="list-style-type: none"> <li>Right/Real-time</li> <li>Distributed</li> <li>Rules Driven</li> <li>Service Oriented</li> <li>Plan for errors</li> </ul>	<ul style="list-style-type: none"> <li>'Factory' Model</li> <li>Event Driven*</li> <li>Agile*</li> <li>Automated Controls</li> <li>Simplification*</li> </ul>	<ul style="list-style-type: none"> <li>Process Integration</li> <li>Error Resolution</li> <li>Process Visibility</li> <li>Cont. Improvement</li> <li>Self Service</li> </ul>	<ul style="list-style-type: none"> <li>Process Improvement Plan</li> <li>Data Management Strategy</li> </ul>	PROCESSES
<ul style="list-style-type: none"> <li>Asset Inventory</li> <li>System Details</li> <li>Interface Inventory</li> <li>Dependencies</li> </ul>	<ul style="list-style-type: none"> <li>Asset Reuse</li> <li>Compose vs. Code</li> <li>Incremental</li> <li>Security Focus</li> <li>Scalable &amp; Agile</li> </ul>	<ul style="list-style-type: none"> <li>Ref. Architectures</li> <li>Service Architecture</li> <li>Info. Architecture</li> <li>Data Architecture</li> <li>System Architecture</li> </ul>	<ul style="list-style-type: none"> <li>Application Selection</li> <li>Portfolio Rationalization</li> </ul>	<ul style="list-style-type: none"> <li>Portfolio Strategy</li> <li>Impl. Blueprint</li> <li>POC's</li> <li>Recommendations</li> </ul>	TECHNOLOGY
<ul style="list-style-type: none"> <li>Industry Std's</li> <li>Internal Std's</li> <li>Best Practices</li> <li>Tech &amp; Dev Std's</li> <li>Regulations</li> </ul>	<ul style="list-style-type: none"> <li>Standards Based</li> <li>Compliance Focus</li> <li>Cross pollination of Best Practices</li> <li>VOC/VOB</li> </ul>	<ul style="list-style-type: none"> <li>Industry Standards</li> <li>Integration Patterns</li> <li>Tech &amp; Dev Std's</li> <li>Best Practices</li> <li>Canonical Models</li> </ul>	<ul style="list-style-type: none"> <li>Level of Standards Adherence</li> <li>Peer Benchmarking</li> <li>PwC GBP</li> <li>Dashboards</li> </ul>	<ul style="list-style-type: none"> <li>Standards Mandate</li> <li>Taxonomy Dev.</li> <li>Regulation Monitor/Tracking</li> <li>Metrics Plan</li> </ul>	METRICS
<ul style="list-style-type: none"> <li>Business Strategy</li> <li>Business Drivers</li> <li>CSF's &amp; KPI's</li> <li>Constraints</li> <li>Other initiatives?</li> </ul>	<ul style="list-style-type: none"> <li>"Strategically Tactical"</li> <li>"Rapid Success Experiences"</li> <li>Stewardship Roles</li> </ul>	<ul style="list-style-type: none"> <li>Bus. Architecture</li> <li>'Context' vs. 'Core'</li> <li>ROI Focus*</li> <li>Out/Offshoring</li> <li>Utility/Grid Computing</li> </ul>	<ul style="list-style-type: none"> <li>Service Contracts               <ul style="list-style-type: none"> <li>Service Registry</li> <li>SLA's</li> </ul> </li> <li>Commercial Terms</li> <li>Controls</li> </ul>	<ul style="list-style-type: none"> <li>Governance Strategy</li> <li>Risk Mitigation</li> <li>Milestone Gating</li> <li>Execution Plan</li> <li>Funding Model</li> </ul>	STRATEGY

\* Also considered an approach imperative



# Doing 'things right'

## PwC's CARTA\* Reference Architecture



\* *Composite Application Real-Time Architecture*

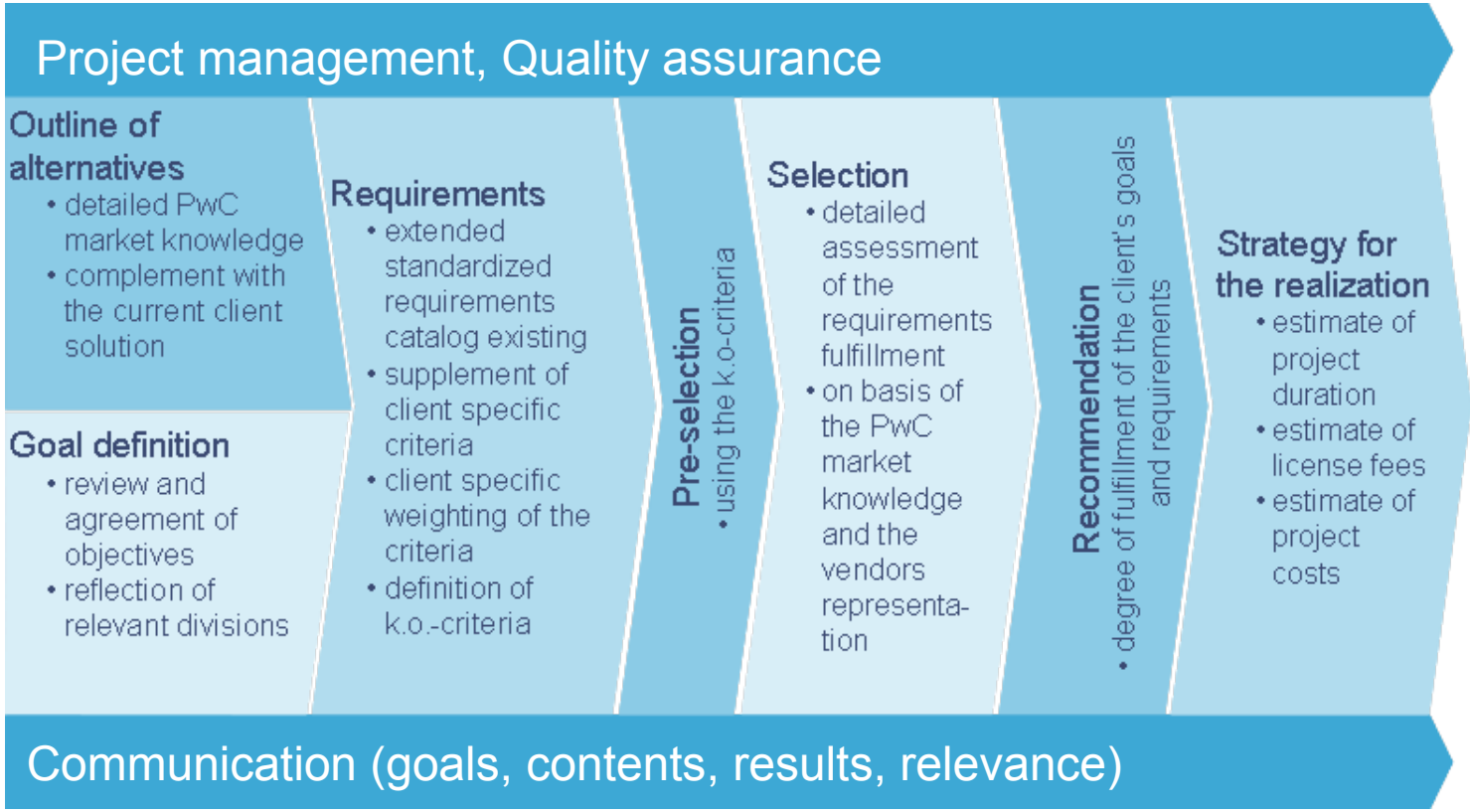
# Doing 'things right'

## The Candidate Technology Map

Basic Functionality		Candidate Technologies									
		ETL	ESB	BI Tool	BPM Tool	Rules Engine	Database	Custom Coding	Other COTS		
1a	Data Integration: Real-time										
1b	Data Integration: Batch										
2	Master Data Integration										
3	Semantic Integration										
4	Application/Service Integration										
5	Database										
6	Business Rules Management										
7	Business Process Management										
8	State Report Generation										
9	Management Reports										
10	Alerting Service										
11	Web/UI Integration										
12	Roll-based Access Control										

# Doing 'things right'

## Vendor Selection Framework



*Vendor Vision & Viability • Functionality • Technology • Service & Support • Cost*

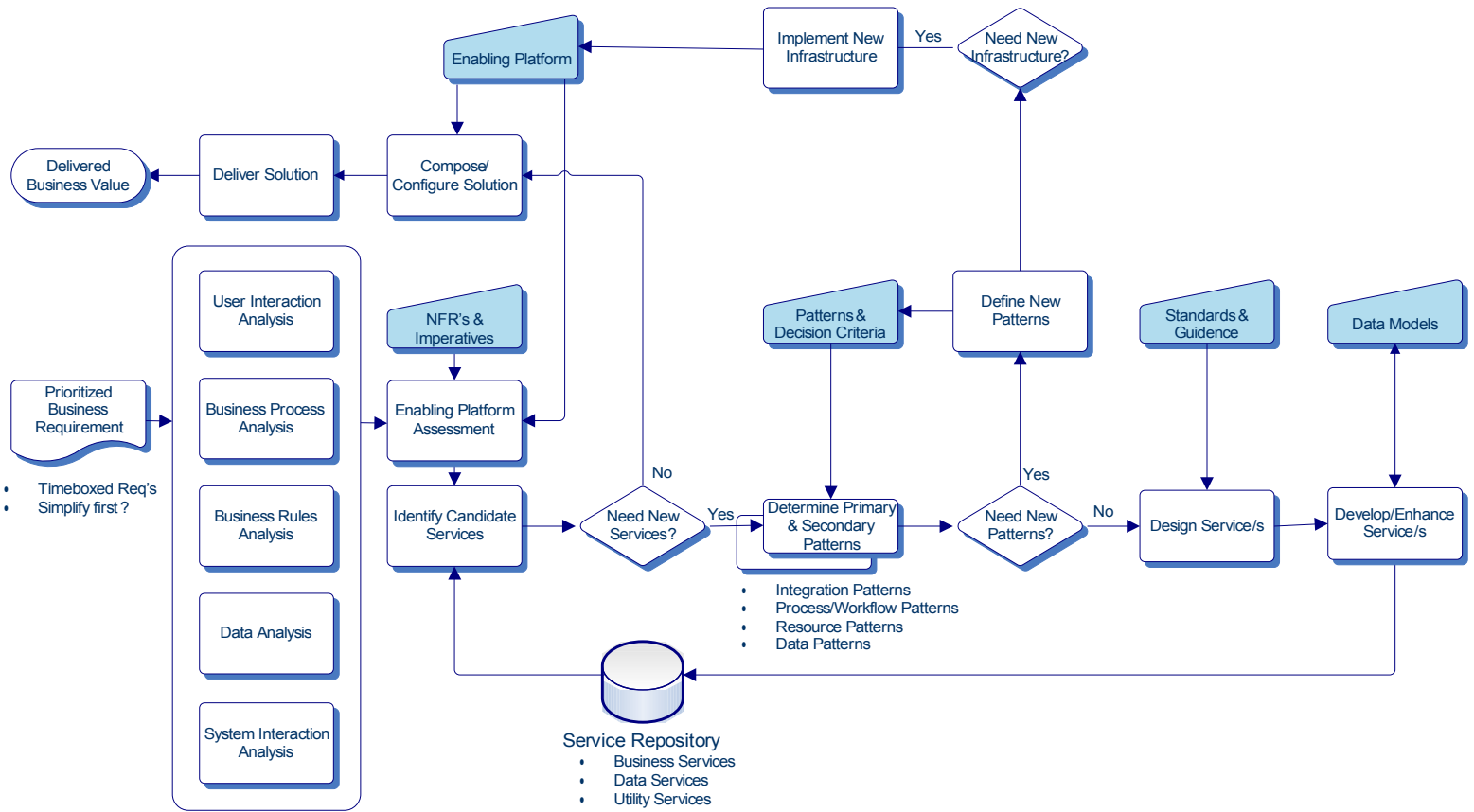
# Doing the 'right thing'

## *Business Value Analysis, Return On Investment & SOA Jumpstart*

<b>BVA (Idea Generation)</b>	<b>ROI (Quantitative)</b>	<b>SOA Jumpstart (Action)</b>
<p><b>Benefit</b></p> <ul style="list-style-type: none"> <li>•Generate Big Picture View                             <ul style="list-style-type: none"> <li>-What the primary challenge</li> <li>-What is potential</li> <li>-Focus on big wins</li> </ul> </li> </ul> <p><b>Who</b></p> <ul style="list-style-type: none"> <li>•CFO,COO</li> </ul> <p><b>How</b></p> <ul style="list-style-type: none"> <li>•1 week effort</li> </ul> <p><b>Deliverable</b></p> <ul style="list-style-type: none"> <li>•BVA Summary</li> </ul> <p><b>Factors</b></p> <ul style="list-style-type: none"> <li>•Time &amp; cost</li> </ul>	<p><b>Benefit</b></p> <ul style="list-style-type: none"> <li>•Involves Stakeholders                             <ul style="list-style-type: none"> <li>-User buyer</li> <li>-Financial buyer</li> <li>-IT buyer</li> </ul> </li> </ul> <p><b>Who</b></p> <ul style="list-style-type: none"> <li>•Finance, Operations, IT</li> </ul> <p><b>How</b></p> <ul style="list-style-type: none"> <li>•3 to 4 week effort</li> </ul> <p><b>Deliverable</b></p> <ul style="list-style-type: none"> <li>•Executive Summary</li> <li>•ROI quantitative analysis</li> <li>•Business Case Document</li> </ul> <p><b>Factors</b></p> <ul style="list-style-type: none"> <li>•Time &amp; cost</li> <li>•Accuracy</li> <li>•Capacity</li> <li>•Costs</li> </ul>	<p><b>Benefit</b></p> <ul style="list-style-type: none"> <li>•Involves Stakeholders                             <ul style="list-style-type: none"> <li>-IT buyer</li> <li>-User buyer</li> </ul> </li> </ul> <p><b>Who</b></p> <ul style="list-style-type: none"> <li>•IT, Business, Finance, Operations</li> </ul> <p><b>How</b></p> <ul style="list-style-type: none"> <li>•10-12 week effort</li> </ul> <p><b>Deliverable</b></p> <ul style="list-style-type: none"> <li>•Maturity &amp; Gap Assessment</li> <li>•Pilot &amp; “Enabling Platform”</li> <li>•SOA Action Plan</li> </ul> <p><b>Factors</b></p> <ul style="list-style-type: none"> <li>•Governance</li> <li>•People &amp; Organization</li> <li>•Processes &amp; Methodology</li> <li>•Technology &amp; Data</li> <li>•Metrics &amp; Measurements</li> </ul>

# Doing 'things right'

## The SOA Factory Model



**Supporting Topics**

- CARTA
- Methodologies & Standards
- Metrics & Measurements
- Project & Process Management
- Organizational Change
- Roles & responsibilities
- SOA Governance
- Funding Model

# Architecture – keeping IT rooted in Business Reality



**Where is the wisdom we have lost in knowledge?**

**Where is the knowledge we have lost in information?**

**T. S. Eliot's *Choruses from the Rock***

**Thank You**

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