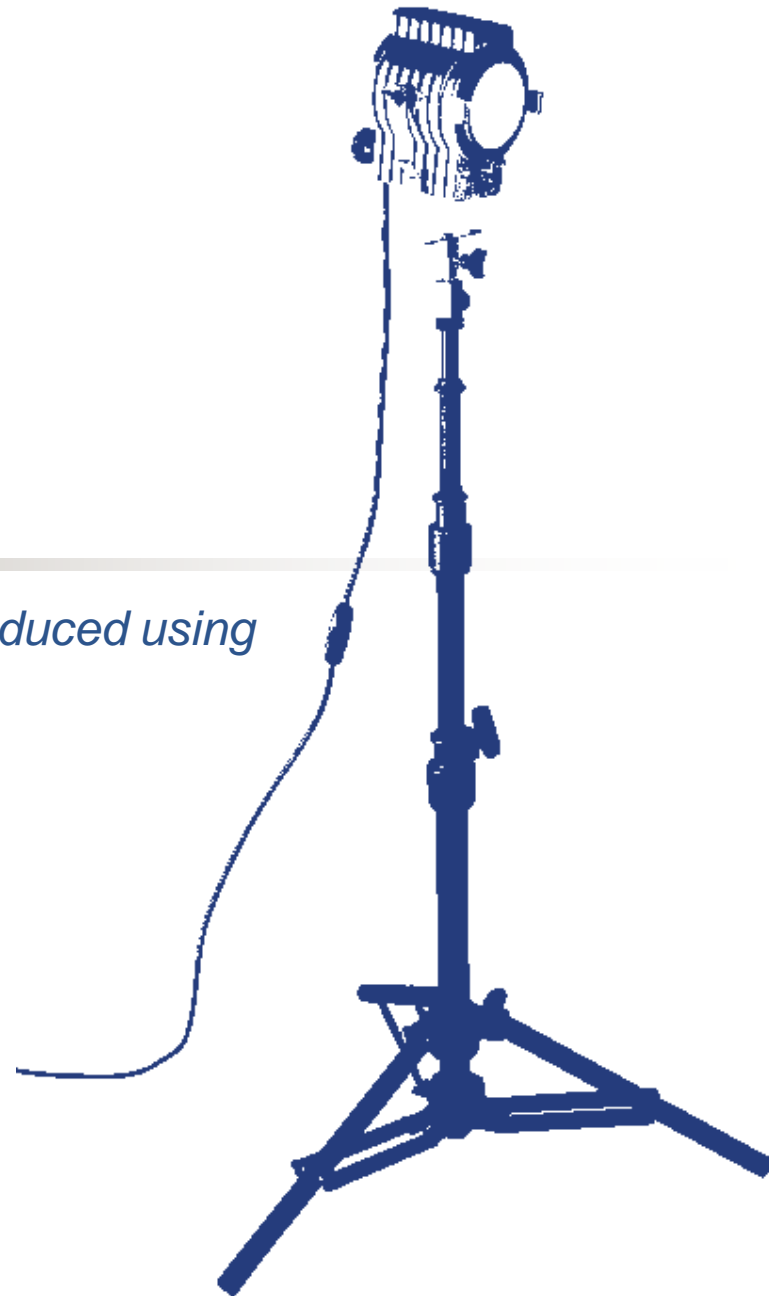


# Enterprise Architecture 101

(Includes numerous ***samples/ templates*** produced using  
***TOGAF*** methodology)

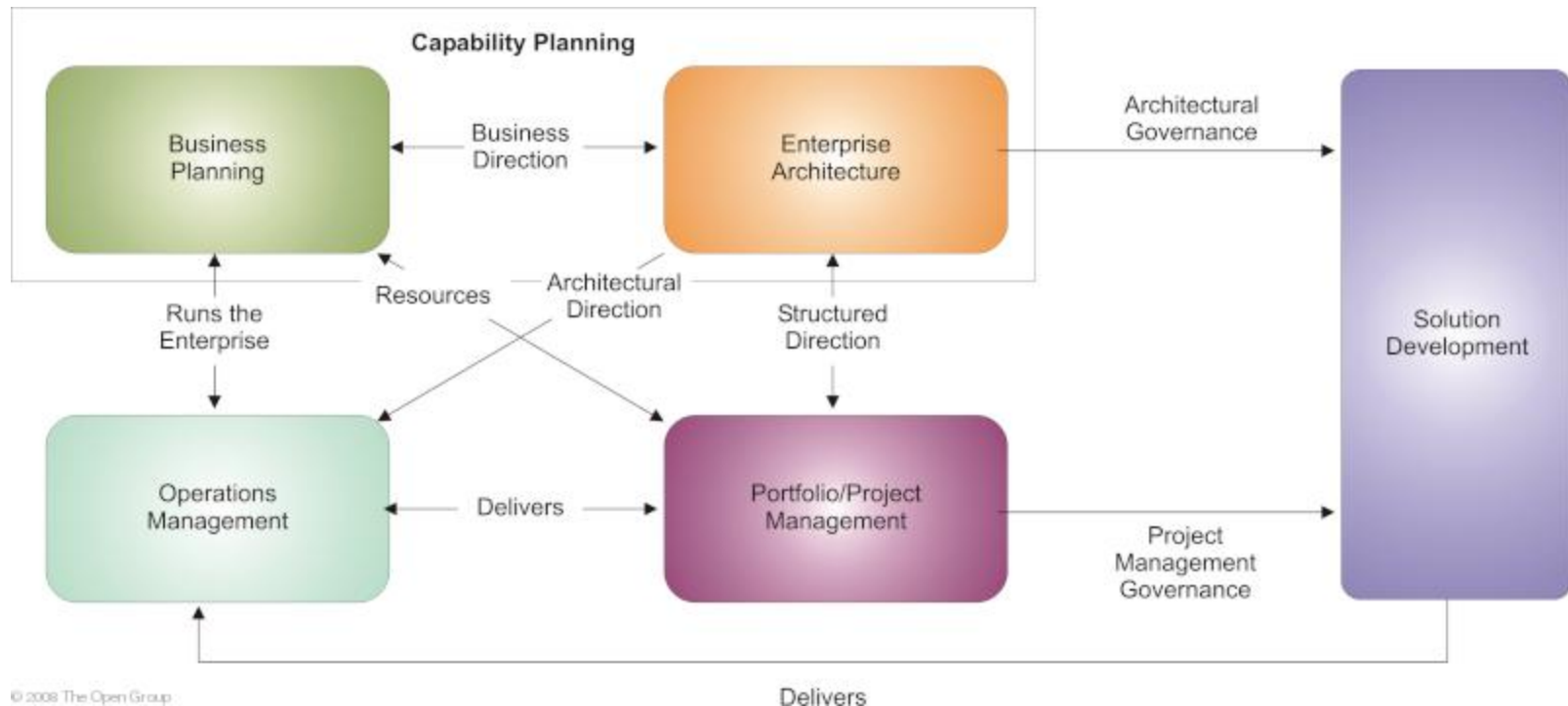
ARTH Consulting



# Enterprise Architecture

Key Question	Answer
What is Enterprise Architecture?	An effective enterprise architecture is critical to business survival and success and is the indispensable means to achieving competitive advantage through IT
Why Enterprise Architecture?	The purpose of enterprise architecture is to optimize across the enterprise the often fragmented legacy of processes (both manual and automated) into an integrated environment that is responsive to change and supportive of the delivery of the business strategy
What is Architecture Framework?	An architecture framework is a foundational structure, or set of structures, which can be used for developing a broad range of different architectures
Who would benefit from TOGAF?	Any organization undertaking, or planning to undertake, the design and implementation of an enterprise architecture for the support of mission-critical business applications will benefit from use of TOGAF

# Relationships between Mgmt Frameworks



The management frameworks are required to complement each other and work in close harmony for the good of the enterprise.

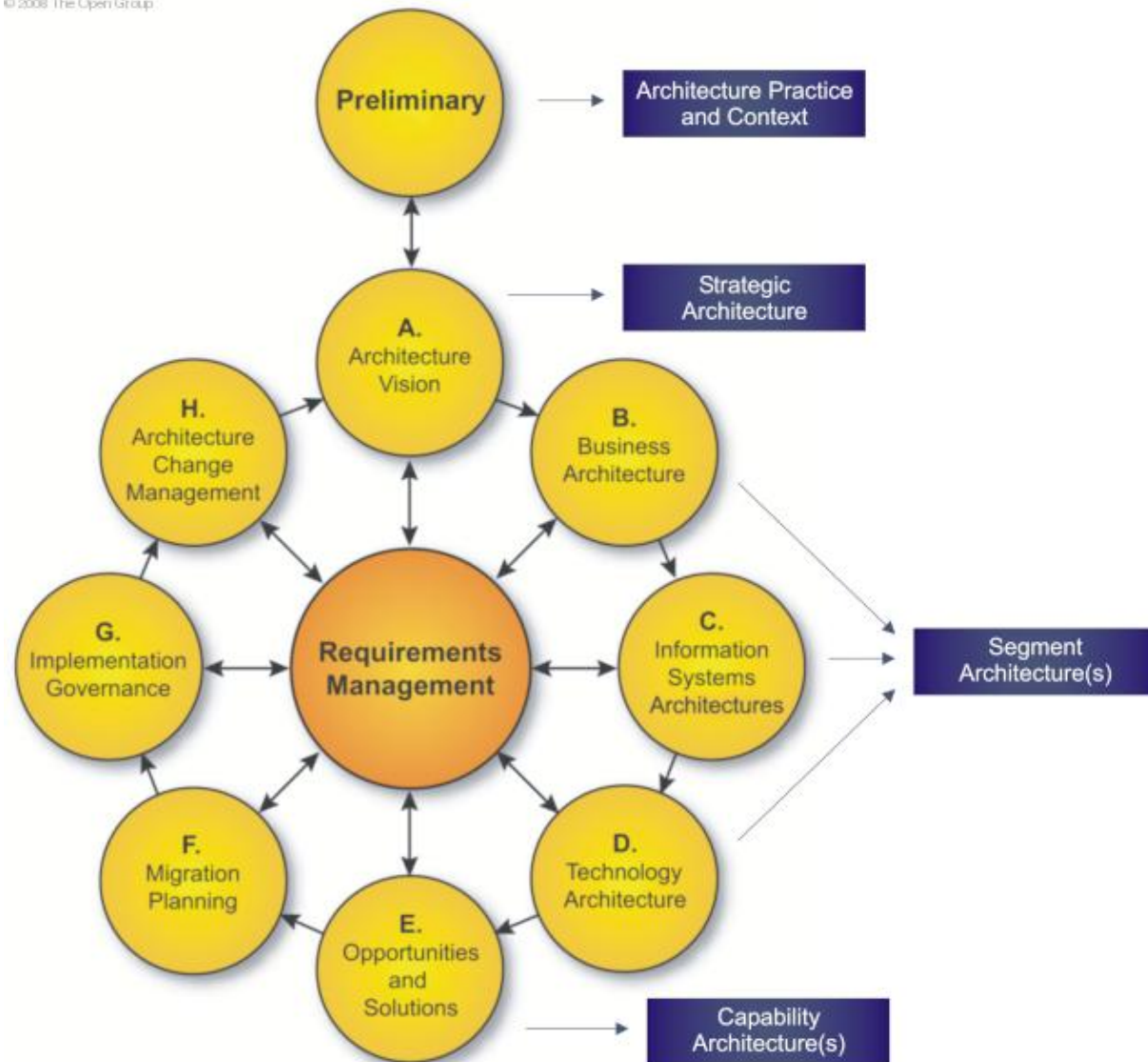
Business planning at the strategy level provides the initial direction to enterprise architecture. Updates at the annual planning level provide a finer level of ongoing guidance. Capability-based Planning is one of many popular techniques for business planning

# TOGAF Methodology – High Level View

© 2008 The Open Group

Implementing Enterprise Architecture program using TOGAF methodology requires you to go through “eight” stated phases – Segment Architecture(s) being the most critical ones.

In the following pages, I have highlighted the key steps in each one of the segment architectures as well as the sample/ template deliverable produced in all “eight” phases.



# Segment Architecture Phases

- Business Architecture
- Information System: Data Architecture
- Information System: Application Architecture
- Technology Architecture

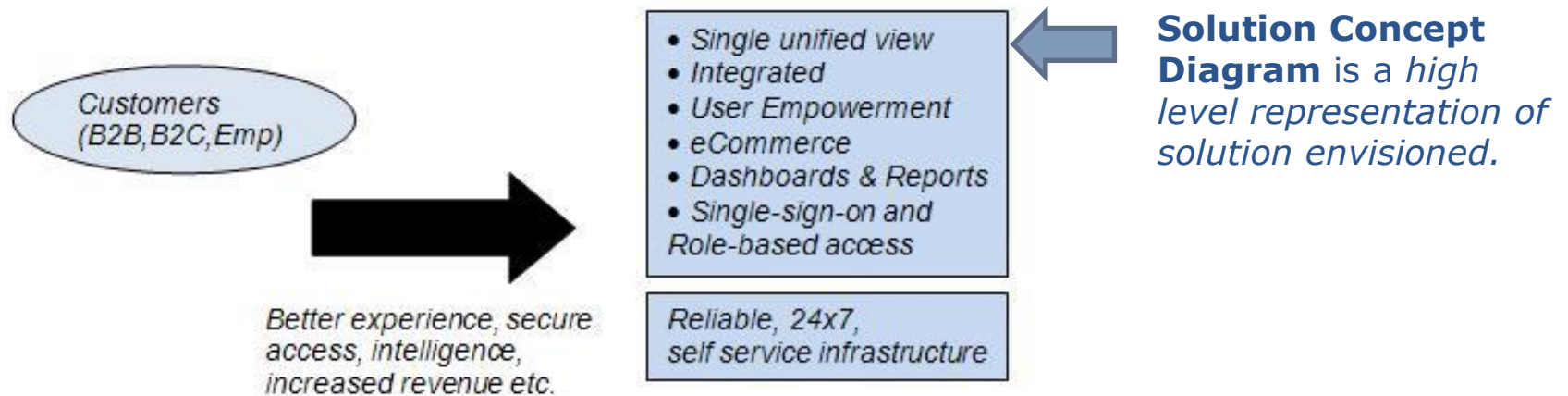
*Key Steps in  
these architecture  
phases*

#	Steps
1	Build Catalogs, Matrices, and Diagrams
2	Develop Baseline Architecture
3	Develop Target Architecture
4	Perform gap analysis
5	Define roadmap

*\*\*\* Several general, reusable, but critical TOGAF recommended samples/ templates are explained and attached ... \*\*\**

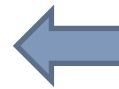
# Architecture Vision *(Sample Documents)*

## ***Solution Concept Diagram***



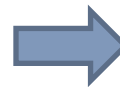
# Business Architecture *(Sample Documents)*

<b>Driver/ Goal/ Objective catalog</b>				
<i>Organization</i>	<i>Driver</i>	<i>Goal</i>	<i>Objective</i>	<i>Measure</i>
<i>Sales</i>	<i>Competitor A Unit Sales Price</i>	<i>Match USP</i>	<i>...</i>	<i>...</i>
<i>Sales</i>	<i>Competitor B Retail Price</i>	<i>Beat Price</i>	<i>...</i>	<i>...</i>
<i>...</i>				



*A cross-organizational reference of how an organization meets its drivers in practical terms through goals, objectives, and (optionally) measures.*

*A functional decomposition in a form that can be filtered, reported on, and queried, as a supplement to graphical Functional Decomposition diagrams*



<b>Business Service/ Function Catalog</b>			
<i>Organization</i>	<i>Business Function</i>	<i>Business Service</i>	<i>Info. System Service</i>
<i>Sales</i>	<i>Customer Relationship Mgmt</i>	<i>Promotion</i>	<i>Monthly Email Alerts</i>
<i>Sales</i>	<i>Order Management</i>	<i>Order Capture</i>	<i>Order Capture</i>
<i>...</i>			

# Business Architecture (cont ...) *(Sample Documents)*

<b>Process/Event/Control/Product Catalog</b>			
<i>Process</i>	<i>Event [Input]</i>	<i>Control [Precondition]</i>	<i>Product</i>
<i>Order Closure</i>	<i>Order Confirmation</i>	<i>Price agreed, Stock available</i>	<i>Order Closed</i>
<i>Fulfillment Instruction</i>	<i>End of Day</i>	<i>Order closed</i>	<i>Instruction</i>
...			

*It provides a hierarchy of processes, events that trigger processes, outputs from processes, and controls applied to the execution of processes*

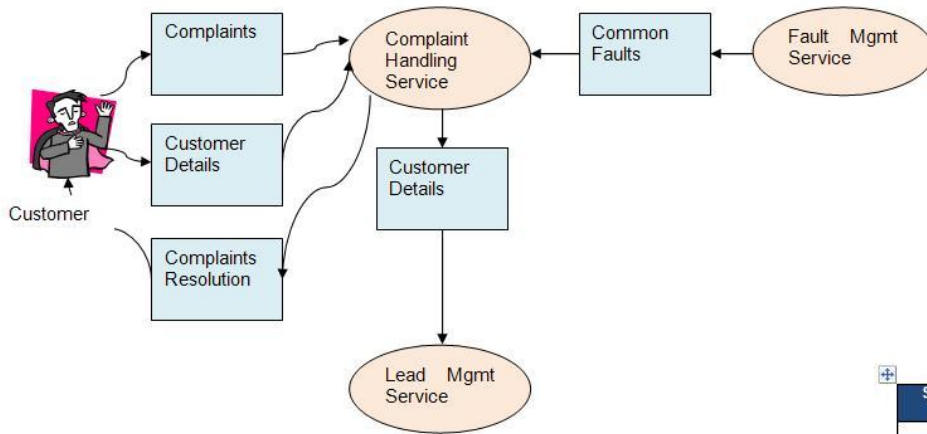
*The purpose of this matrix is to depict the relationship interactions between organizations and business functions across the enterprise.*

<b>Business Interaction Matrix</b>					
	<i>Providing Business Services</i>				
<i>Consuming Bus. Services</i>	<i>Engineering</i>	<i>Procurement</i>	<i>Manufacturing</i>	<i>Sales &amp; Distribution</i>	<i>Customer Service</i>
<i>Engineering</i>					
<i>Procurement</i>					
<i>Manufacturing</i>		<i>Contract for supply of material</i>		<i>Contract for supply of sales forecasts</i>	
<i>Sales &amp; Distribution</i>	<i>Contract for supply of product specification</i>		<i>Contract for supply of product</i>		
<i>Customer Service</i>				<i>Contract for fulfillment of customer orders</i>	



# Business Architecture (cont ...) *(Sample Documents)*

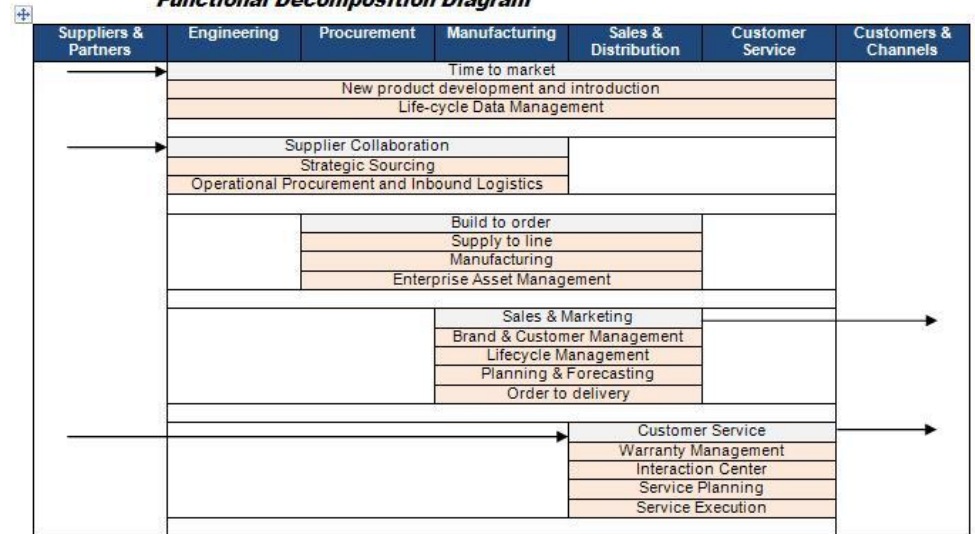
**Business Service/Information Diagram**



**Business Service/ Information Diagram** shows the information needed to support one or more business services.

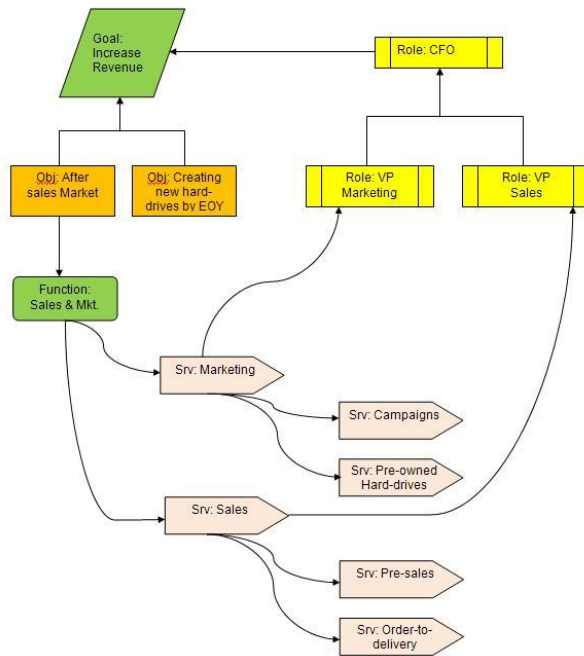
**Functional Decomposition Diagram** shows on a single page the capabilities of an organization that are relevant to the consideration of an architecture.

**Functional Decomposition Diagram**



# Business Architecture (cont ...) *(Sample Documents)*

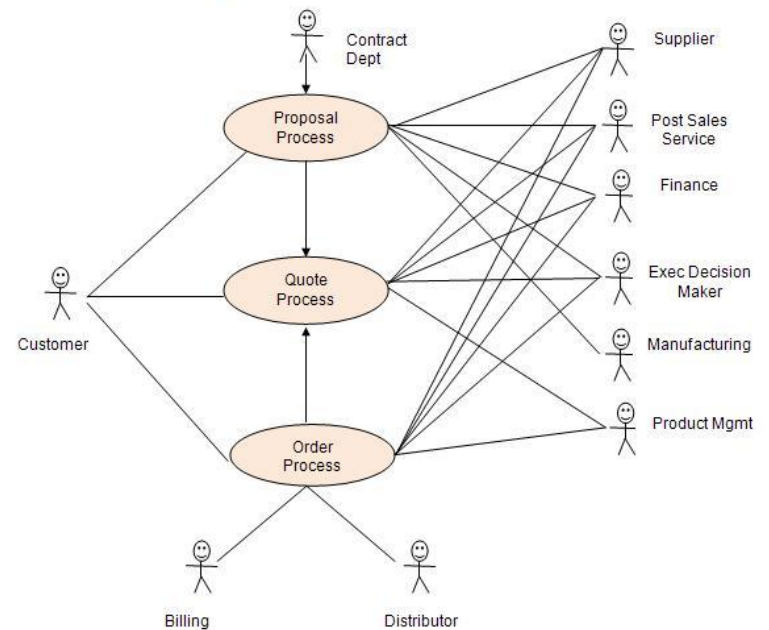
**Goal/ Objective/ Service Diagram**



**Goal/ Objective Service Diagram** defines the ways in which a service contributes to the achievement of a business vision or strategy.

**Use Case Diagram** displays the relationships between consumers and providers of business services.

**Use Case Diagram**



## Business Architecture (cont ...) *(Sample Documents)*

<b>Business Gap Analysis</b>		
#	Gap Category	Findings (Area)
1	People	e.g. cross-training requirements
2	Process	e.g. process inefficiencies
3	Tools	e.g. duplicate or missing tool functionality
4	Information	
5	Measurement	
6	Financials	
7	Facilities	

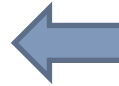


**Business Gap Analysis** is a key step in validating an architecture is to consider what may have been forgotten.

# Data Architecture *(Sample Documents)*

## Data Entity/ Data Component Catalog

Data Entity	Logical Data Component	Physical Data Component



To identify and maintain a list of all the data use across the enterprise, including data entities and also the data components where data entities are stored.

The purpose of the **Data Entity/Business Function matrix** is to depict the relationship between data entities and business functions within the enterprise.



## Data Entity/ Business Function Matrix

	Data Entity			
Business Function	Customer Master	Business Partner	Customer Leads	Product Master
Customer Relationship Management	<ul style="list-style-type: none"> <li>Business partner data management service</li> <li>Owner – Sales &amp; Marketing business unit executive</li> </ul>	<ul style="list-style-type: none"> <li>Business partner data management service</li> <li>Owner of data entity (person or organization)</li> </ul>	<ul style="list-style-type: none"> <li>Lead Processing Service</li> <li>Owner – Customer Relationship Manager</li> </ul>	N/A
Supply Chain Management	<ul style="list-style-type: none"> <li>Customer Requirement Processing Service</li> <li>Owner – Supply Chain Manager</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Product data management service</li> <li>Owner – Global product development organization</li> </ul>

## Data Architecture (cont ...) *(Sample Documents)*

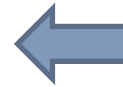
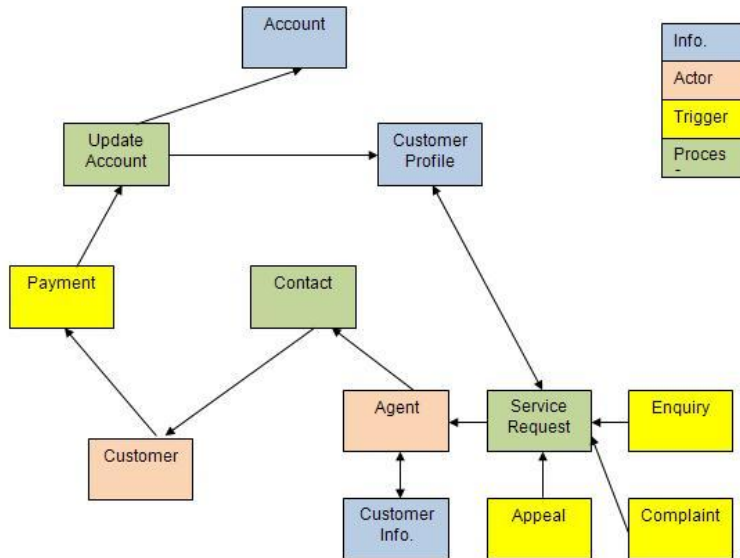
<b>System Data Matrix</b>			
	<i>Data</i>		
<i>Application</i>	<i>Description or Comments</i>	<i>Data Entity</i>	<i>Data Entity Type</i>
<i>CRM</i>	<i>System of record for customer master data</i>	<i>Customer data</i>	<i>Master data</i>
<i>Commerce Engine</i>	<i>System of record for order book</i>	<i>Sales order</i>	<i>Transactional data</i>
<i>Sales Business Warehouse</i>	<i>Warehouse and datamart that supports North American region</i>	<i>Intersection of multiple data entities (e.g. All sales orders by customer XYZ and by month for 2006)</i>	<i>Historical data</i>



*The purpose of the **System/ Data matrix** is to depict the relationship between systems (i.e., application components) and the data entities that are accessed and updated by them.*

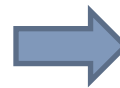
# Data Architecture (cont ...) *(Sample Documents)*

**Class Diagram**

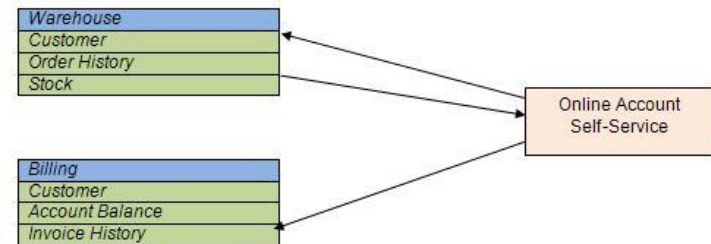


The purpose of the **Class Diagram** is to depict the relationships among the critical data entities (or classes) within the enterprise.

The purpose of the **Data Dissemination Diagram** is to show the relationship between data entity, business service, and application components.



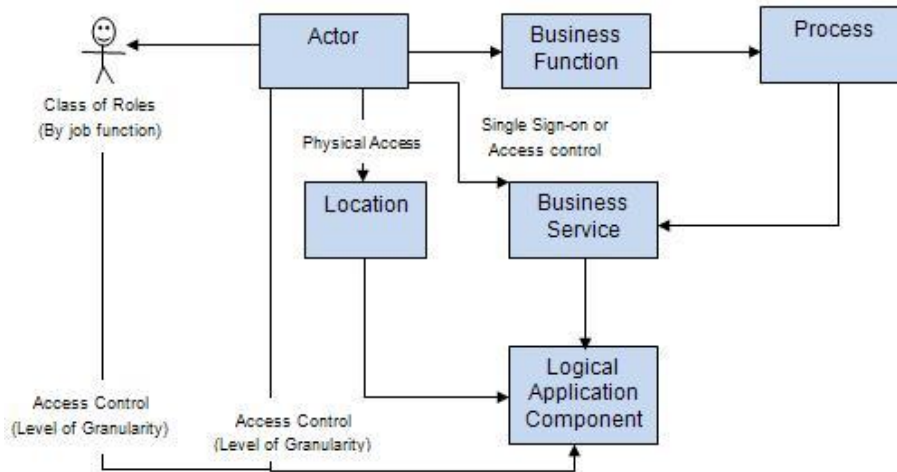
**Data Dissemination Diagram**



Business Service	Data Entity	Application
Online Account Self-Service	Customer	<ul style="list-style-type: none"> <li>Warehouse</li> <li>Billing</li> </ul>
	Order History	Warehouse
	Stock	Warehouse
	Account Balance	Billing
	Invoice History	Billing

# Data Architecture (cont ...) *(Sample Documents)*

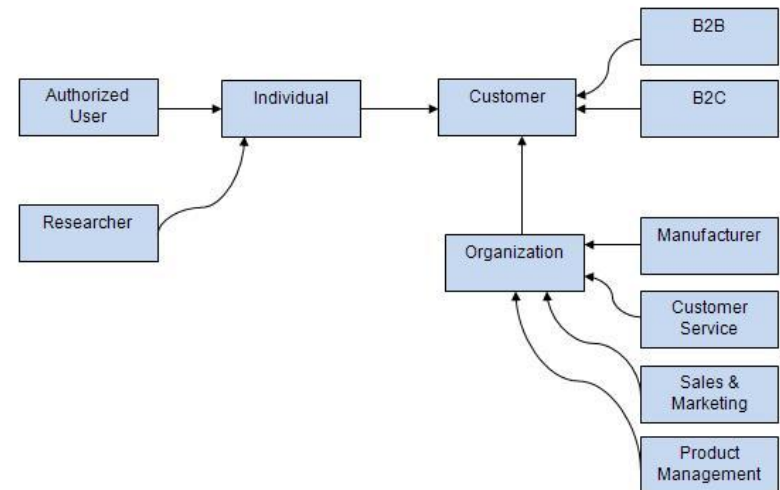
**Data Security Diagram**



The purpose of the **Data Security diagram** is to depict which actor (person, organization, or system) can access which enterprise data.

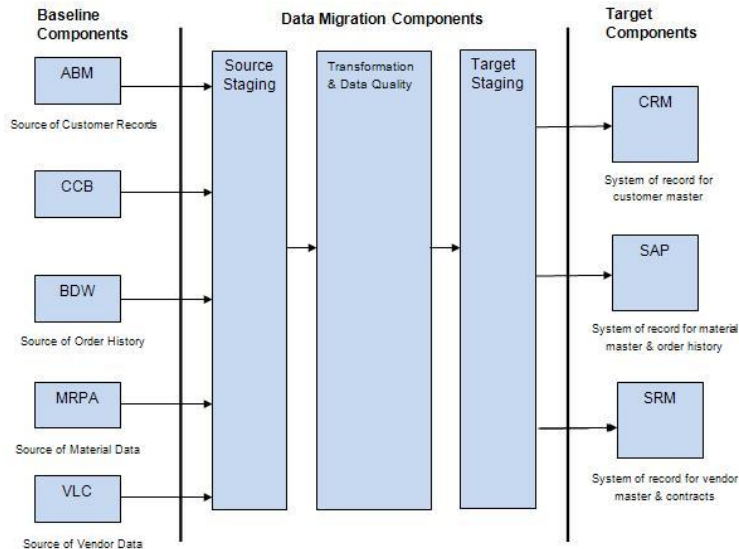
The purpose of the **Class Hierarchy diagram** is to show the technical stakeholders a perspective of the class hierarchy.

**Class Hierarchy Diagram**



# Data Architecture (cont ...) *(Sample Documents)*

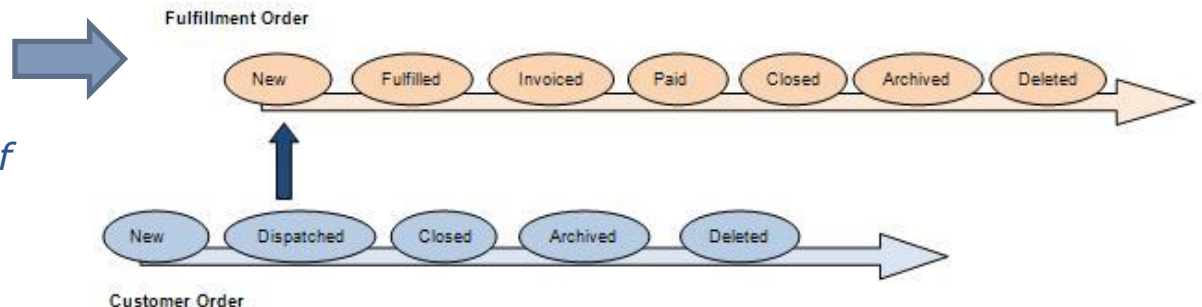
**Data Migration Diagram**



The purpose of the **Data Migration diagram** is to show the flow of data from the source to the target applications.

The **Data Lifecycle diagram** is an essential part of managing business data throughout its lifecycle from conception until disposal within the constraints of the business process.

**Data Lifecycle Diagram**





## Data Architecture (cont ...) *(Sample Documents)*

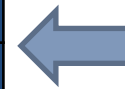
<b>Data Gap Analysis</b>		
#	Gap Category	Findings (Area)
1	<i>Not the data that is needed</i>	
2	<i>Data not located where it is needed</i>	
3	<i>Data not available when needed</i>	
4	<i>Data not created</i>	
5	<i>Data not consumed</i>	
6	<i>Data relationship gaps</i>	



**Data Gap Analysis** is a key step in validating an architecture is to consider what may have been forgotten.

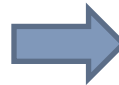
# Application Architecture *(Sample Documents)*

<b>Application Portfolio Catalog</b>		
<i>Information System Service</i>	<i>Is logically provided by</i>	<i>Is realized in</i>
	<i>Logical App Component</i>	<i>Physical App Component</i>
<i>Customer Look-up</i>	<i>CRM</i>	<i>Salesforce.com</i>
<i>Monthly email alert</i>	<i>CRM</i>	<i>Salesforce.com</i>
<i>Stock availability</i>	<i>ERP</i>	<i>SAP</i>
...		



*To identify and maintain a list of all the applications in the enterprise. This list helps to define the horizontal scope of change initiatives that may impact particular kinds of applications.*

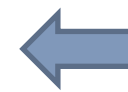
*The purpose of the **Interface catalog** is to scope and document the interfaces between applications to enable the overall dependencies between applications to be scoped as early as possible.*



<b>Interface Catalog</b>		
<i>Application Component</i>	<i>Relationship</i>	<i>Application Component</i>
<i>CRM (Salesforce.com)</i>	<i>Communicates with</i>	<i>ERP (SAP)</i>
...		
...		
...		

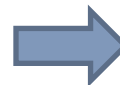
# Application Architecture (cont ...) *(Sample Documents)*

System/ Organization Matrix				
	Organization Unit			
Application	Customer Service	Procurement & Warehousing	HR	Finance
SAP HR	X	X	X	
Salesforce.com	X	X		
SAP Financial	X	X		X



The purpose of **System/ Organization matrix** is to depict the relationship between systems (i.e., application components) and organizational units within the enterprise.

The purpose of the **Role/System matrix** is to depict the relationship between systems (i.e., application components) and the business roles that use them within the enterprise.



Role/ System Matrix				
	Role			
Application	Call Centre Operator	Call Centre Manager	Finance Analyst	Chief Accountant
SAP HR	X	X	X	X
Salesforce.com	X	X		
SAP Financial	X	X	X	X

# Application Architecture (cont ...) *(Sample Documents)*

System Function Matrix				
	Function			
Application	Call Centre 1st line	Warehouse Control	Vacancy Filling	General Ledger Maintenance
SAP HR	X	X	X	X
Salesforce.com	X	X		
SAP Financial	X	X		X

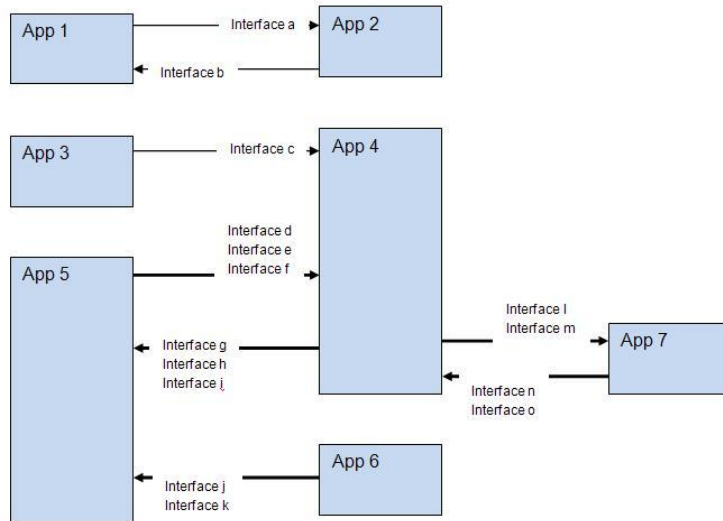
The purpose of the **System/Function matrix** is to depict the relationship between systems (i.e., application components) and business functions within the enterprise.

The purpose of the **Application Interaction matrix** is to depict communications relationships between systems (i.e., application components).

Application Interaction Matrix			
	Application		
Application	Service	Logical Component	Physical Component
Service	consumes		
Logical Component		Communicates with	
Physical Component			Communicates with
...			

# Application Architecture (cont ...) *(Sample Documents)*

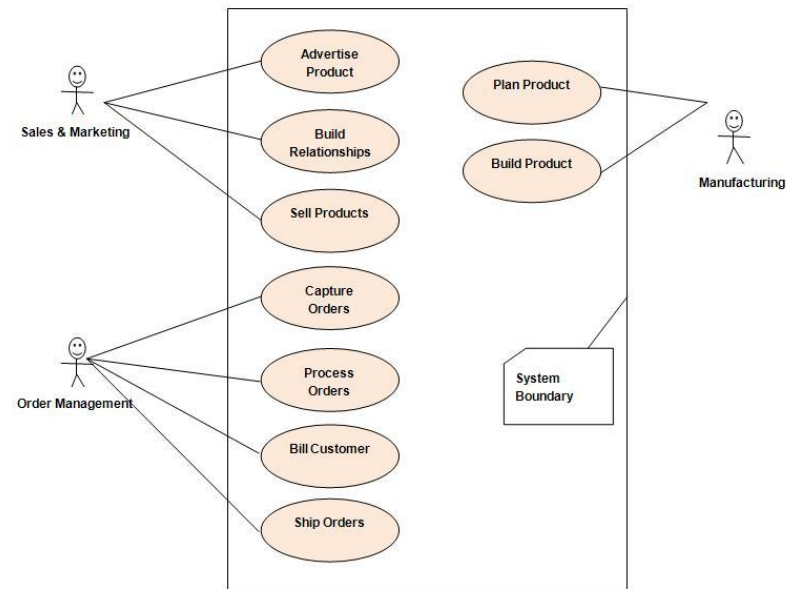
**Application Communication Diagram**



The purpose of the **Application Communication diagram** is to depict all models and mappings related to communication between applications in the meta-model entity.

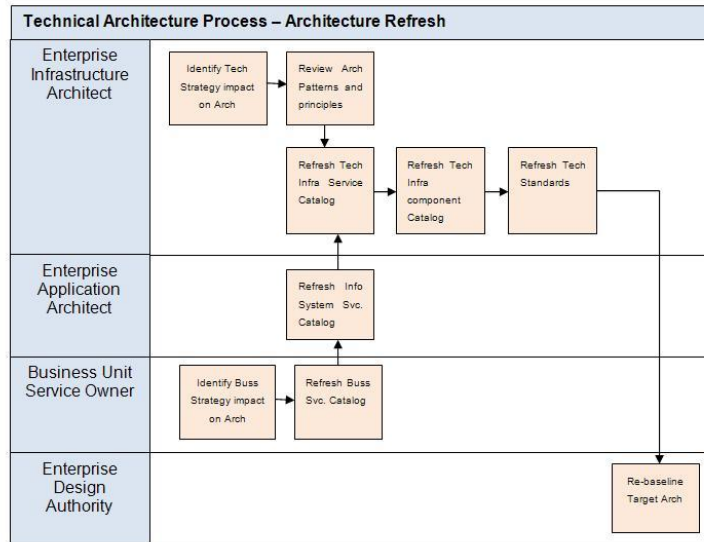
**System Use-Case diagram** provides added richness in describing application functionality by illustrating how and when that functionality is used.

**System Use-Case Diagram**



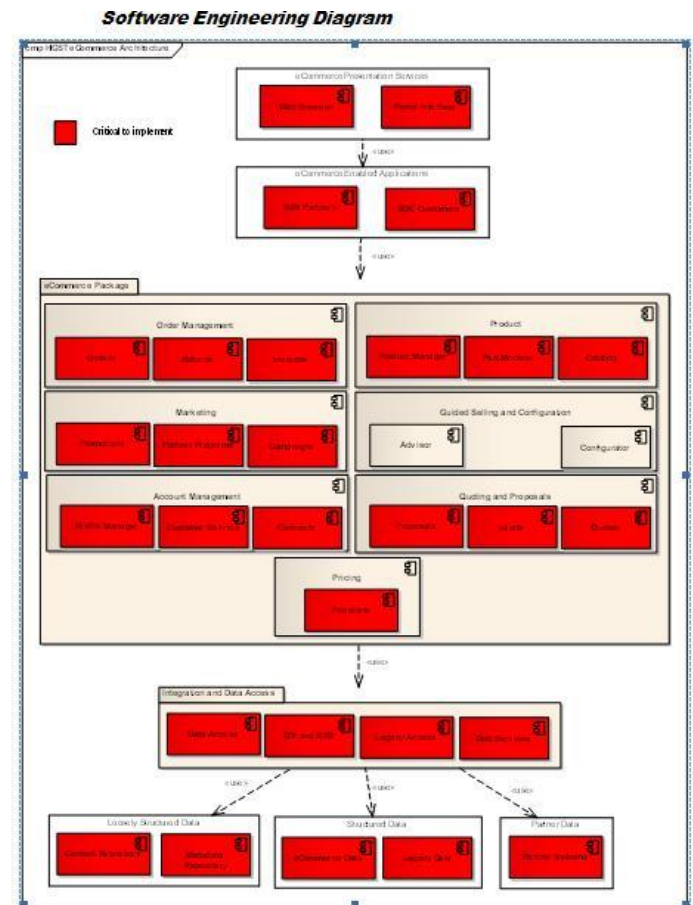
# Application Architecture (cont ...) *(Sample Documents)*

**Process System Realization Diagram**



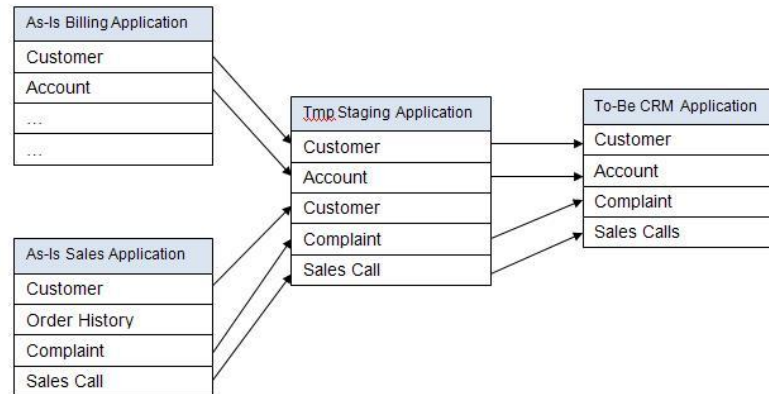
The purpose of the **Process/System Realization diagram** is to clearly depict the sequence of events when multiple applications are involved in executing a business process.

The **Software Engineering diagram** breaks applications into packages, modules, services, and operations from a development perspective.



# Application Architecture (cont ...) *(Sample Documents)*

**Application Migration Diagram**



← The **Application Migration diagram** identifies application migration from baseline to target application components.

The **Software Distribution diagram** shows how application software is structured and distributed across the estate. It is useful in systems upgrade or application consolidation projects.

<i>Software Distribution</i>	<i>Composed of</i>	<i>Deployed on</i>	<i>Deployed at</i>
	<i>Physical Application Component</i>	<i>Physical Technology Component</i>	<i>Location</i>
<i>Physical Application Component</i>			
<i>Physical Application Component</i>			

# Application Architecture (cont ...) *(Sample Documents)*

<b>Application Gap Analysis</b>		
#	Gap Category	Findings (Area)
1	Applications Eliminated	
2	Applications Created	
3	Applications Updated	

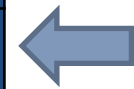


**Application Gap Analysis** is a key step in validating an architecture is to consider what may have been forgotten.



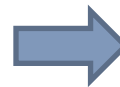
# Technology Architecture *(Sample Documents)*

<b>Technology Standards Catalog</b>		
<i>Standards</i>	<i>Logical Technology Component</i>	<i>Physical Technology Component</i>



*This documents the agreed standards for technology across the enterprise covering technologies, and versions, the technology lifecycles, and the refresh cycles for the technology.*

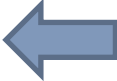
*The purpose of **Technology Portfolio catalog** is to identify and maintain a list of all the technology in use across the enterprise, including hardware, infrastructure software, and application software.*



<b>Technology Portfolio Catalog</b>		
	<i>[provided by]</i>	<i>[realized in]</i>
<i>Platform Service</i>	<i>Logical Technology Component</i>	<i>Physical Technology Component</i>

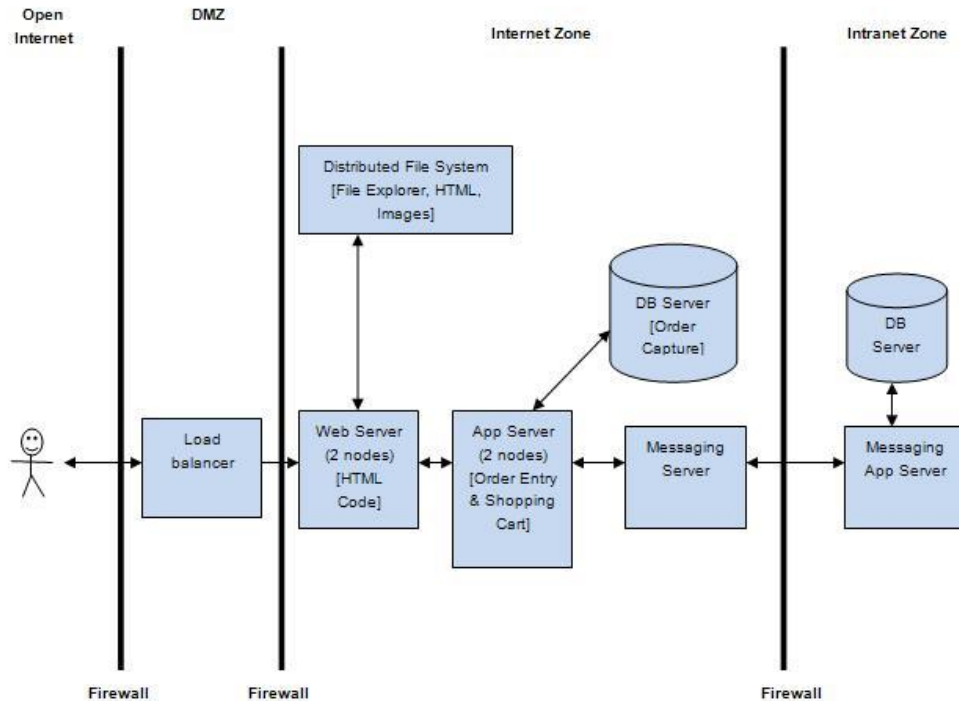
# Technology Architecture (cont ...) *(Sample Documents)*

<b>System Technology Matrix</b>			
<i>Logical Application Component</i>	<i>Physical technology Component</i>	<i>Server Address</i>	<i>IP Address</i>
<i>ABM</i>	<i>Webserver node 1</i>	<i>F01ws001@host.com</i>	<i>10.xx.xx.xx</i>
	<i>Webserver node 2</i>	<i>F01ws002@host.com</i>	<i>10.xx.xx.xx</i>
	<i>Webserver node 3</i>	<i>F01ws003@host.com</i>	<i>10.xx.xx.xx</i>
	<i>Appserver node 1</i>	<i>F02as001@host.com</i>	<i>10.xx.xx.xx</i>
	<i>Appserver node 2</i>	<i>F02as002@host.com</i>	<i>10.xx.xx.xx</i>
	<i>Appserver node 3</i>	<i>F02as003@host.com</i>	<i>10.xx.xx.xx</i>
	<i>Database (prod)</i>	<i>F03dbp001@host.com</i>	<i>10.xx.xx.xx</i>
	<i>Database (staging)</i>	<i>F03dbs001@host.com</i>	<i>10.xx.xx.xx</i>
<i>Load balancer and dispatcher</i>	<i>Dispatcher Server</i>	<i>F03nd001@host.com</i>	<i>242.xx.xx.xx</i>
<i>...</i>			

 **The System/Technology matrix** documents the mapping of business systems to technology platform.

# Technology Architecture (cont ...) *(Sample Documents)*

**Processing Diagram**



The **Processing diagram** focuses on deployable units of code/ configuration and how these are deployed onto the technology platform.

# Technology Architecture (cont ...) *(Sample Documents)*

<b>Technology Gap Analysis</b>		
#	Gap Category	Findings (Area)
1	Technologies Eliminated	
2	Technologies Created	
3	Technologies Updated	



**Technology Gap Analysis** is a key step in validating an architecture is to consider what may have been forgotten.

# Opportunities and Solutions *(Sample Documents)*

		Year X		Year X+1			
		Q3	Q4	Q1	Q2	Q3	Q4
Enterprise Architecture Implementation Roadmap	Governance	Establish PMO					
		Adopt & promote standards					
		Select vendor(s) / platform(s)					
	Institute a rigorous development methodology	Select methodology					
		Define roles & educate team					
		Develop templates and standards					
	Single, unified commercial Portal platform		Develop personas	Impl. Information Arch.	Implement localization and globalization		
			Develop wireframes and visual design				
			Implement search, single sign-on, and role-based security				
	Extend WCM capabilities; expand to include ECM functionality			Document existing content inventory	Analyze/ update content; define metadata and taxonomy		
					Implement workflows, approvals, templates, versioning etc.		
				Implement document management, record management, and digital asset management			
	Adopt an SOA approach for integration				Establish policies, frameworks, & standards for SOA	Implement business services	
						Integrate custom web applications	
						Integrate content management, CRM, and back-end systems	
	Business empowerment/ self-service					Implement dashboards and self-service reports	
						Implement support knowledgebase, FAQ, and live chat	
						Integrate business processes	
	Robust infrastructure services			Build physical architecture and environment (dev, test, perf, prod)			
				Implement critical infrastructure services like high availability, failover, virtualization etc on prod environment			

← The timelines in the **Roadmap** illustrates the recommended approach for implementing the selected architecture initiatives.

# Migration Planning *(Sample Documents)*

Migration Planning							
Architecture Initiatives	Start	End	#	High level technology implementation projects/ activities	Start	End	Resource #
Architecture Initiative 1	1 Mo	10 Mo					9-11 resources
			1	Select Enterprise Portal, CM, eCommerce, Search, and Integration tool that meets your business, technical and architectural requirements	1	1	
			2	....	2	4	

← The table shows the template for the **Migration Plan** which details high level break-up of activities, start and end dates, and resources needed.

**Business Value Assessment** is a technique to assess business value of an initiative.

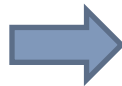
Business Value Assessment							
#	Initiative	Business Value			Risk Assessment		
		High	Medium	Low	On Target	At Risk	In Trouble
1	Partner Portal	X				X	
2							
3							
4							
5							

# Change Management *(Sample Documents)*

Change Request Register							
#	Change Request	Requested By	Requested Date	Request Type	Request Priority	Est. Comp Date	Status
1	Request 1	Name	Date	Scope Change	High	Date	On Target
2							
3							
4							

← **Change Request Register** maintains all Architectural change requests

The objective of **Communication Plan** is to keep people informed, to create an environment of trust, and to provide an opportunity for feedback



Communication Plan						
Stakeholder Category (To Whom)	Stakeholder Name	Information Needs (What)	Purpose (Why)	Trigger (Frequency)	Delivery Method (How)	Responsible Person (By Whom)
Initiative Sponsor						
Business Leader						
Project Leader						
Business Arch Team						
Data Arch Team						
App Arch Team						
Tech Arch Team						
Help Desk						
Operations						
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