



Enterprise IT Architectures

Enterprise IT Architectures Enterprise Architecture (EA)

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Agenda

- I. Positioning Enterprise Architecture (EA)
- II. Enterprise Architecture Purpose
- III. Enterprise Architecture Methods
- IV. Enterprise Capabilities & Principles
- V. EA Architecture – Architectures
- VI. EA Governance, Transition
- VII. Example JKE

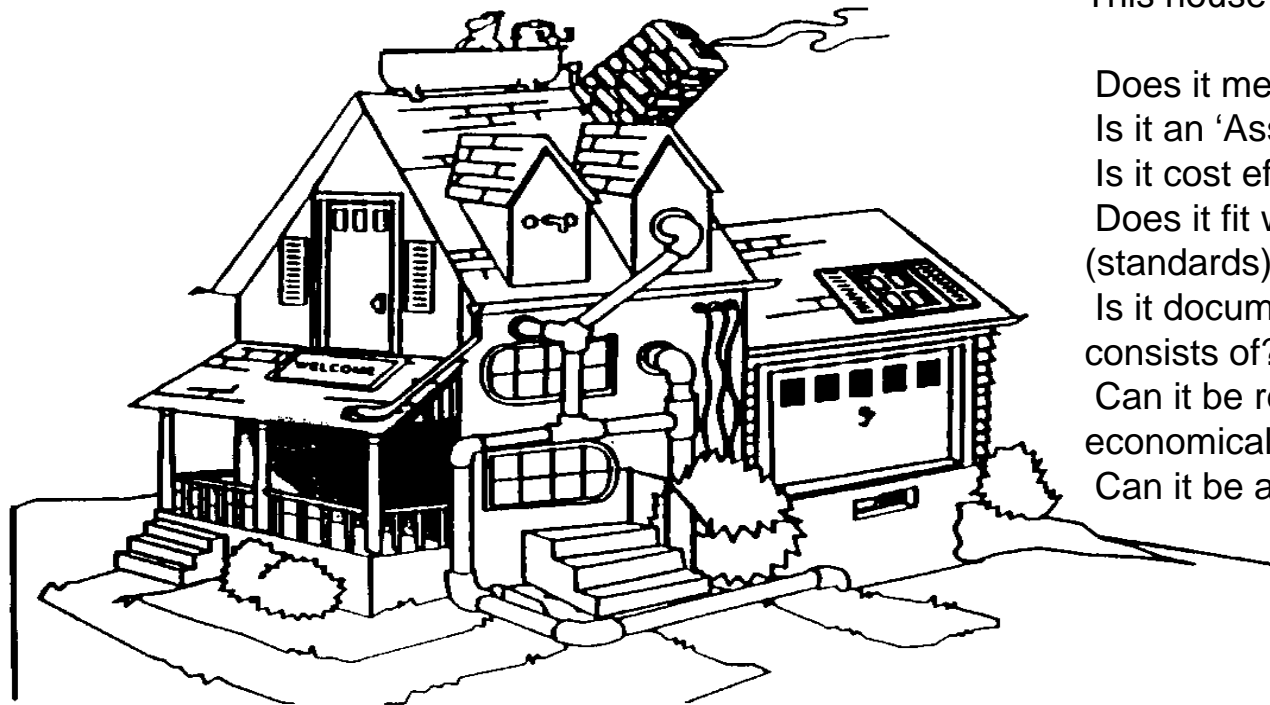
I. Positioning Enterprise Architecture (EA)

Why “Enterprise Architecture”

- ***EA is helping enterprises do the right things right***
- EA is a **holistic** approach to the control and co-ordination of IT based business projects
- Two viewpoints:
 - **Solution Architects** are focused on creating an IT based solution to a business problem
 - **Enterprise Architects** with a sense of what the enterprise needs to be and do, and how IT should be used in a wider sense

Winchester House Syndrome

Yesterday's management approaches are not working in today's complex and fast-paced environment.



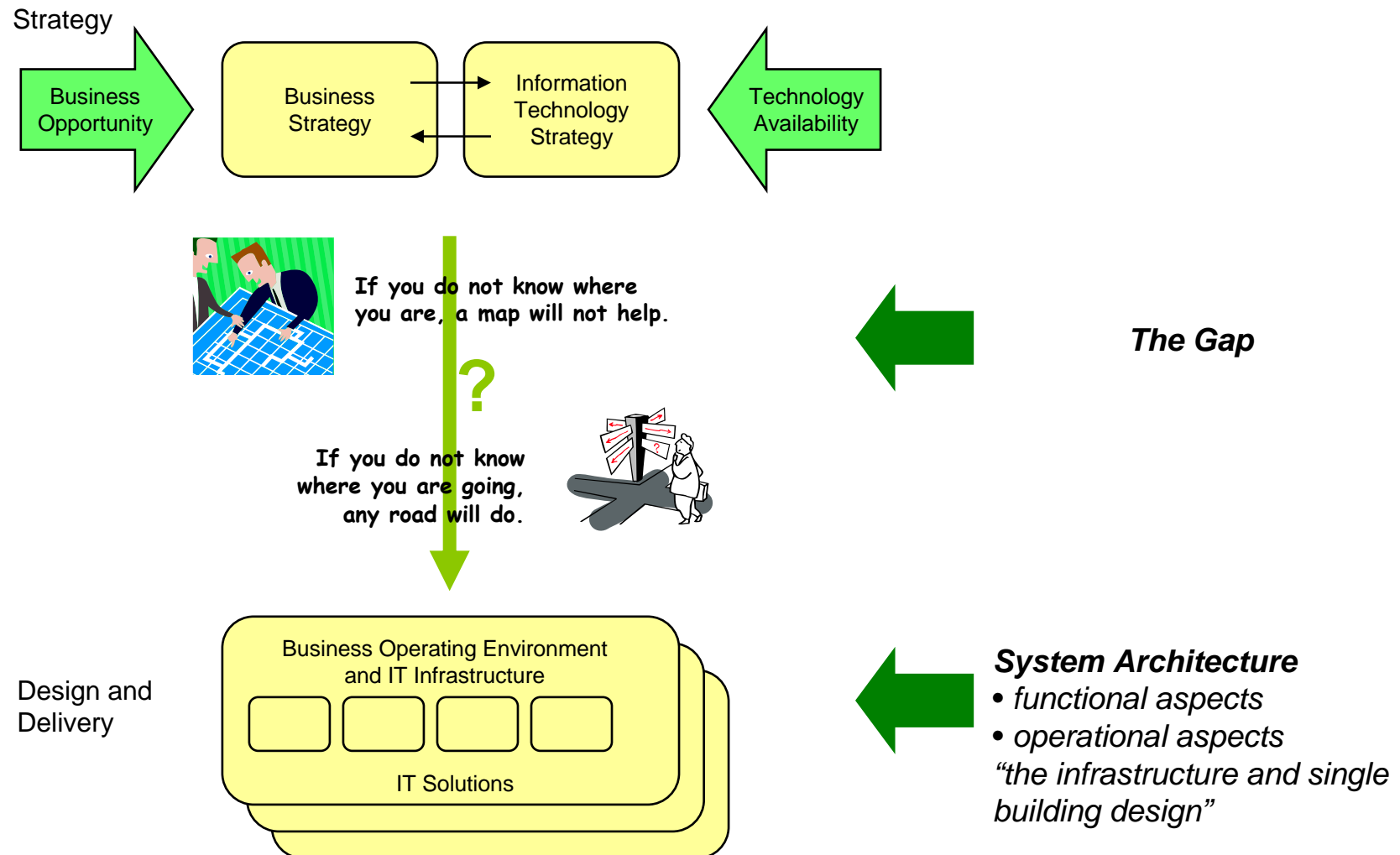
This house may function, but...

- Does it meet business objectives?
- Is it an 'Asset Junkyard'?
- Is it cost effective?
- Does it fit with the community (standards)?
- Is it documented - who knows what it consists of?
- Can it be repaired easily or economically?
- Can it be adapted to changing needs?

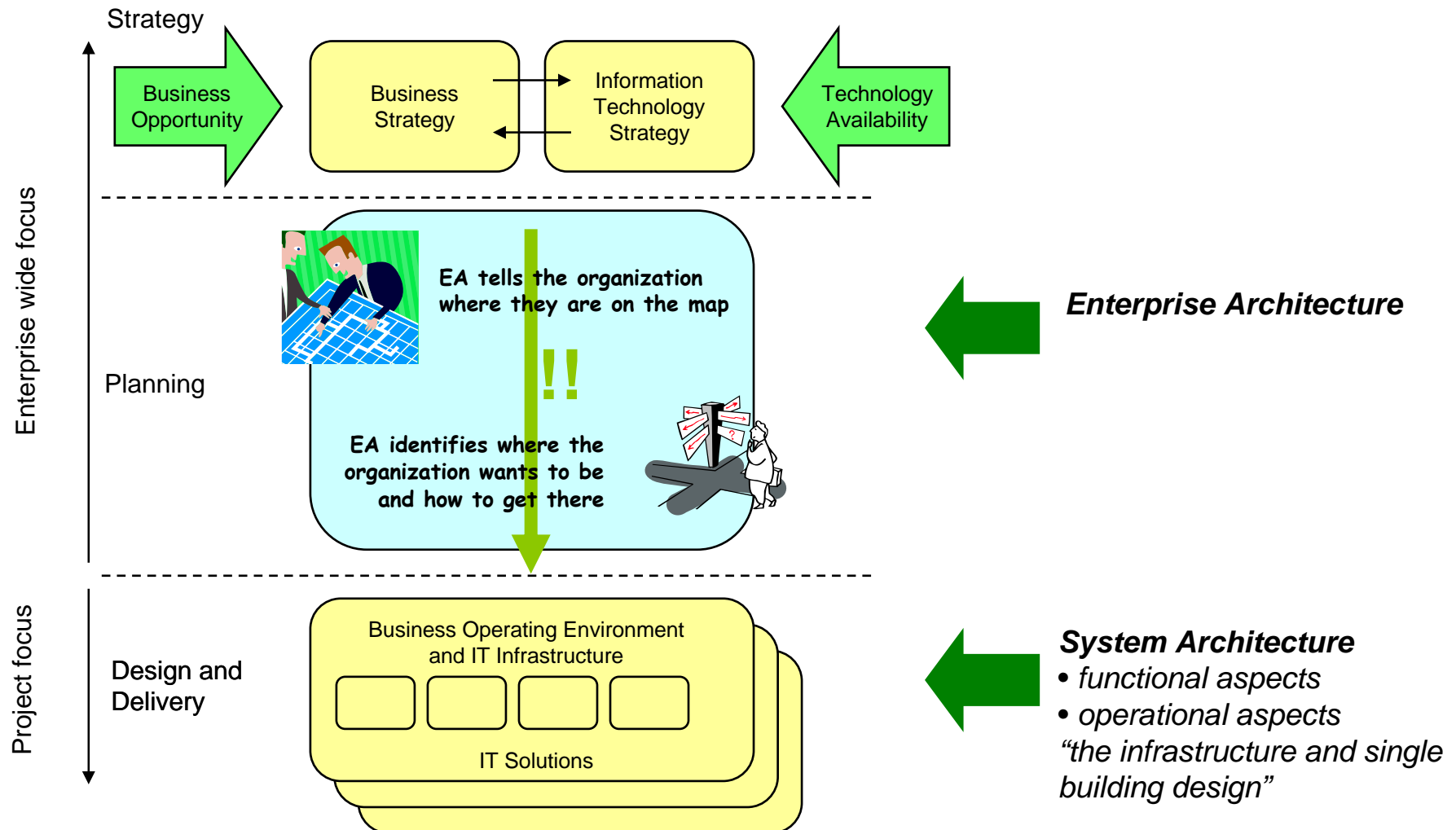
'If you don't know where you're going, any road will get you there.'

Lewis Carroll

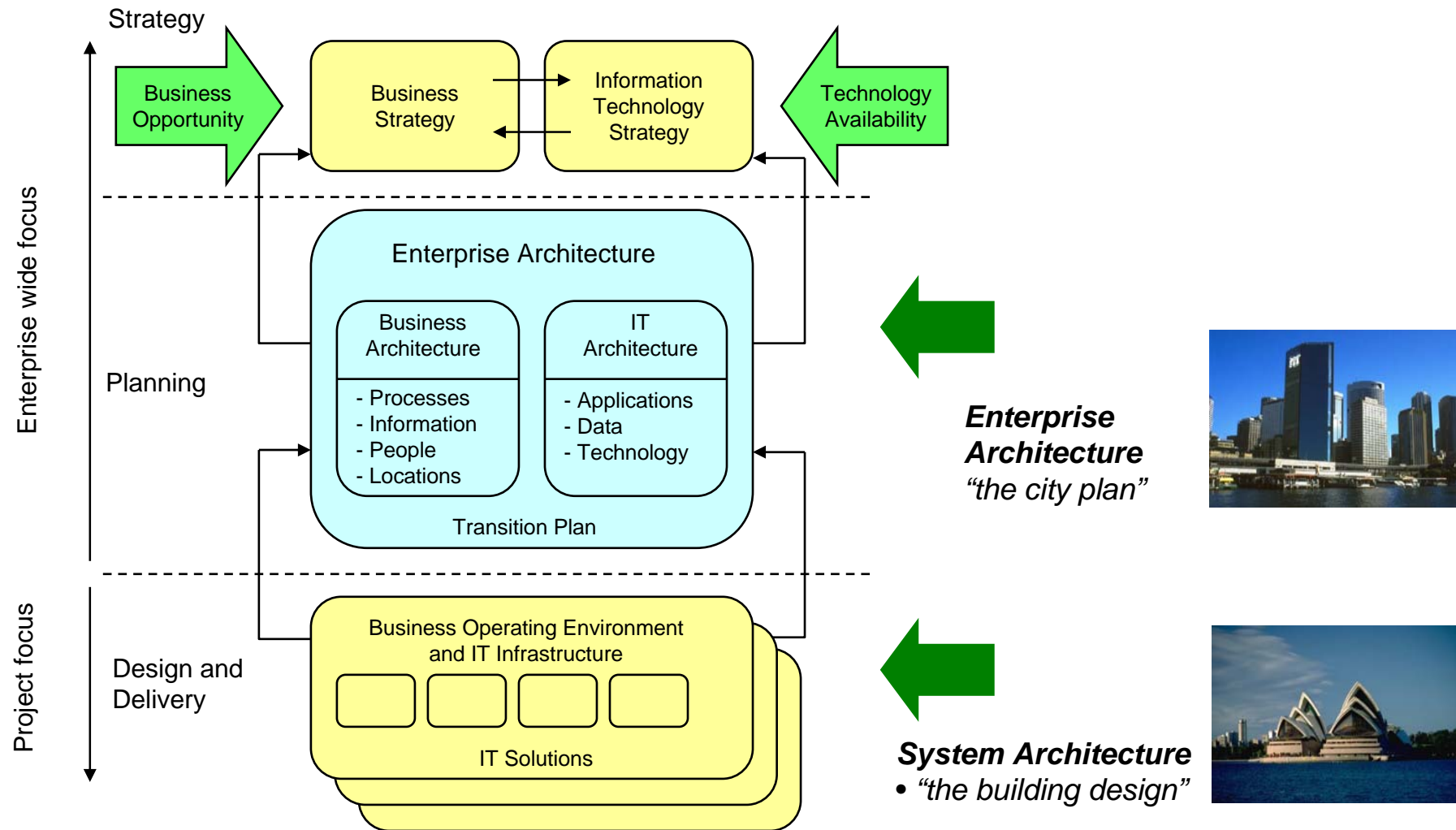
It can be a challenge to ensure IT based business solutions implement the business strategy...



Enterprise Architecture provides the vital linkages between “strategy” and “implementation”



Enterprise Architecture embraces both Business and IT Architectures, providing the “city plan” for “building projects”



Enterprise Architecture (EA) Definition – Architecture Models and Governance

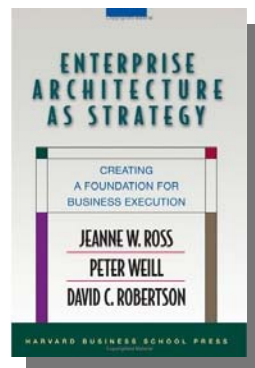
*“The **EA discipline** defines and maintains the **architecture models, governance and transition initiatives** needed to effectively co-ordinate semi-autonomous groups towards **common business and/or IT goals.**”*

EA Academy Study Team, Orlando Workshop, 12th-13th March 2004

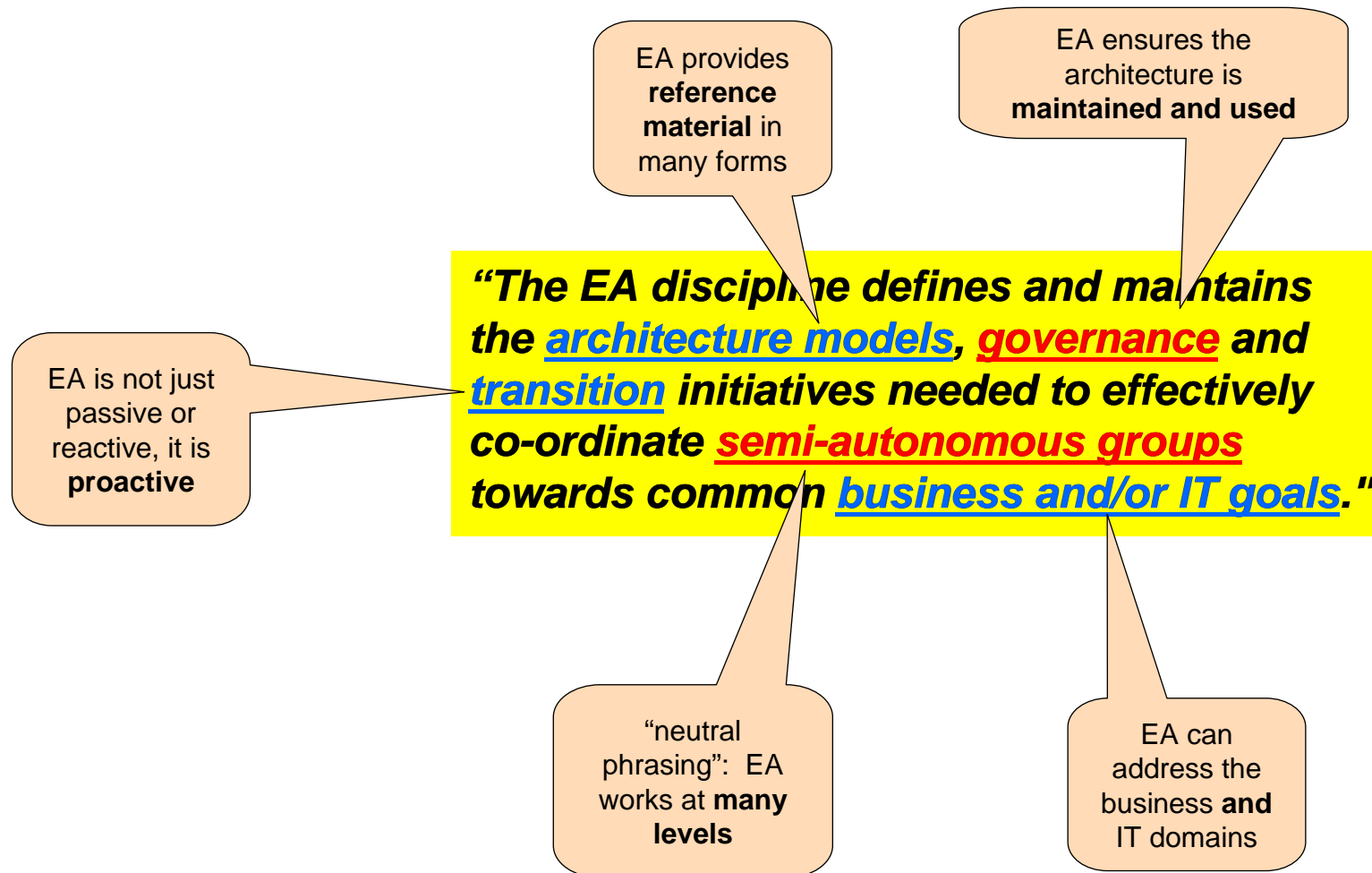
- Intended to capture the need for an EA to **link** an enterprise's business **strategy** to its **change programs**, through the definition of:
 - **Architecture models** to capture the business's intended structure (through a Business Architecture) and to provide a clear specification of how multiple projects and programs must exploit information technology (through common (explicit) IS and IT Architectures),
 - Mechanisms such as **Architecture Governance and Transition Planning** to help *plan, co-ordinate and control* all parts of the business – ensuring they all “pull in the same direction”.

A definition:

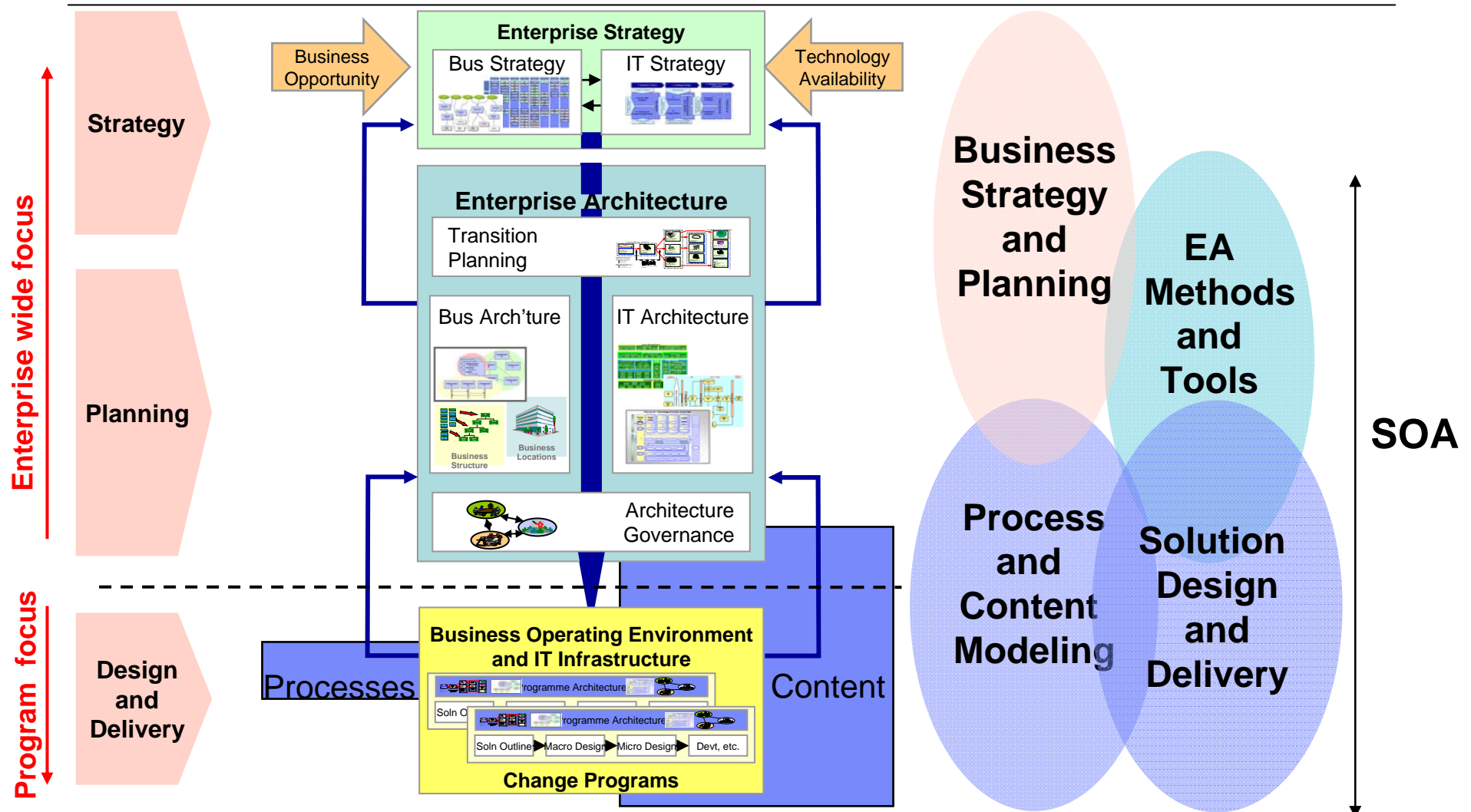
- “The **Enterprise Architecture** is the organising logic for business processes and IT infrastructure, reflecting the integration and standardisation requirements of the company’s operating model
- The **Enterprise Architecture** provides a long term view of a company’s processes, systems and technologies so that individual projects can build capabilities – not just fulfil immediate needs”
 - Ross et al, “Enterprise Architecture as Strategy”, 2006 (Harvard business press)



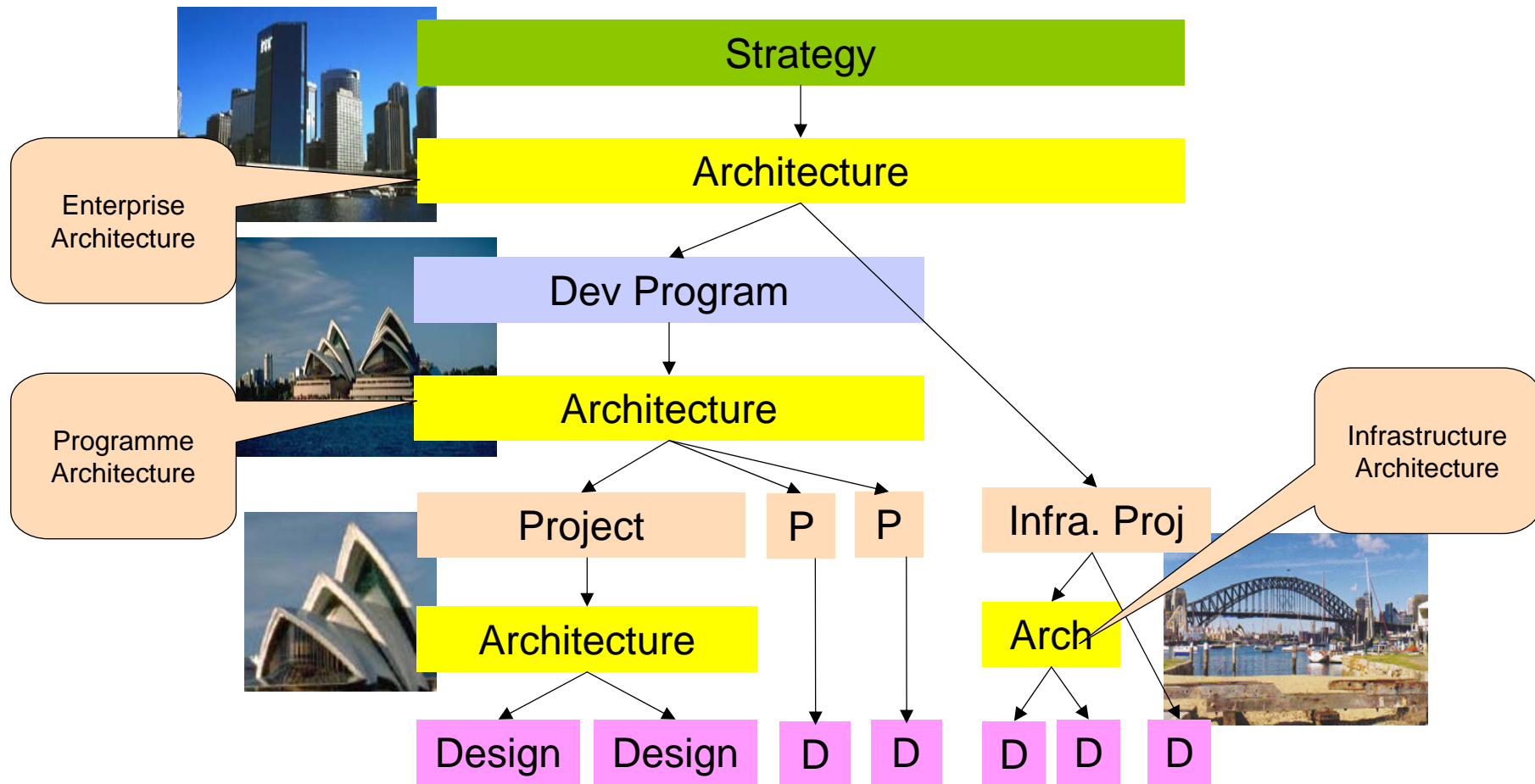
A second Definition: IBM's



Bridging the Gap Between Strategy and Delivery



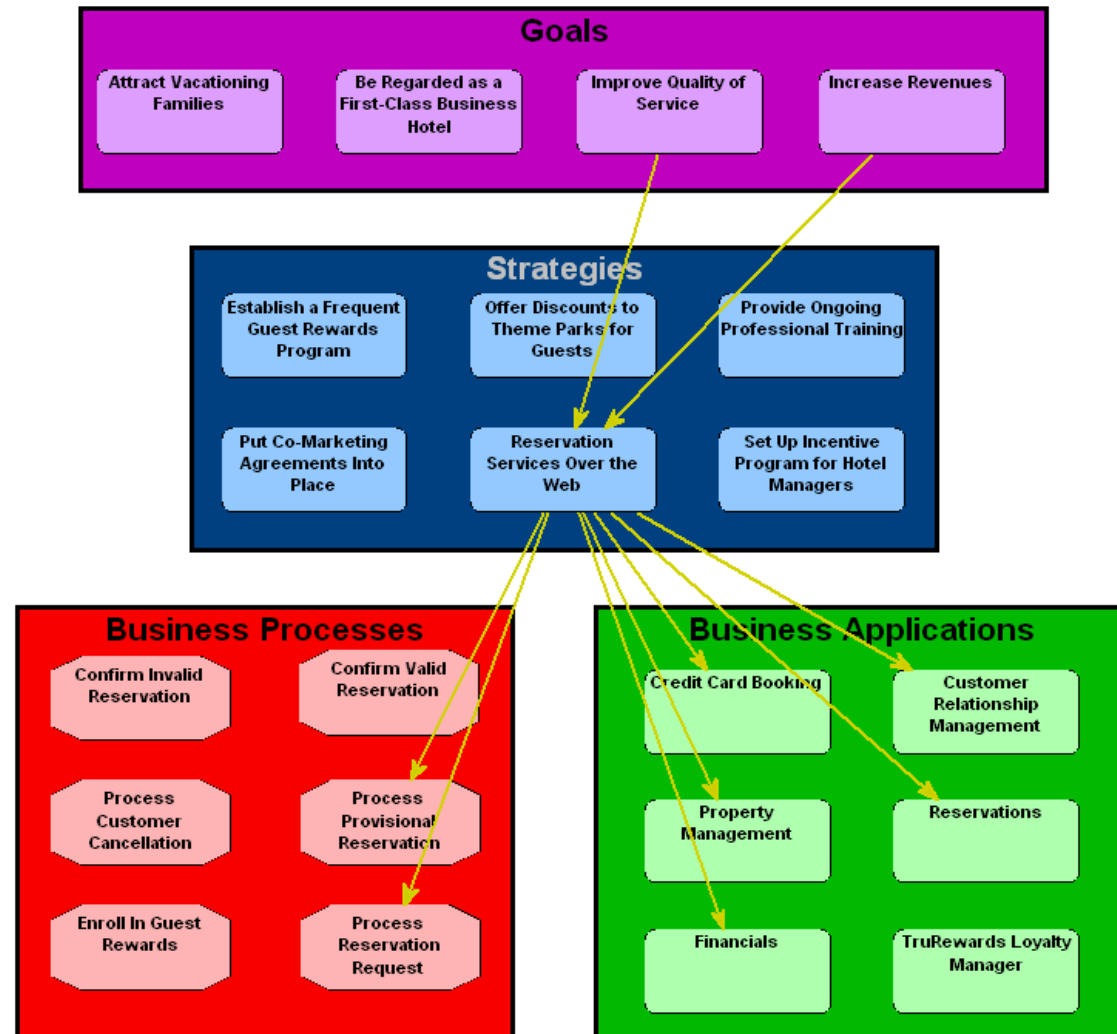
EA provides a context and guidance, keeping everyone “on the same road”



Benefits (1): Analyze the Linkage Between Technology and Business, Communicate Actionable Information

“How have we aligned technology investment with our business objectives?”

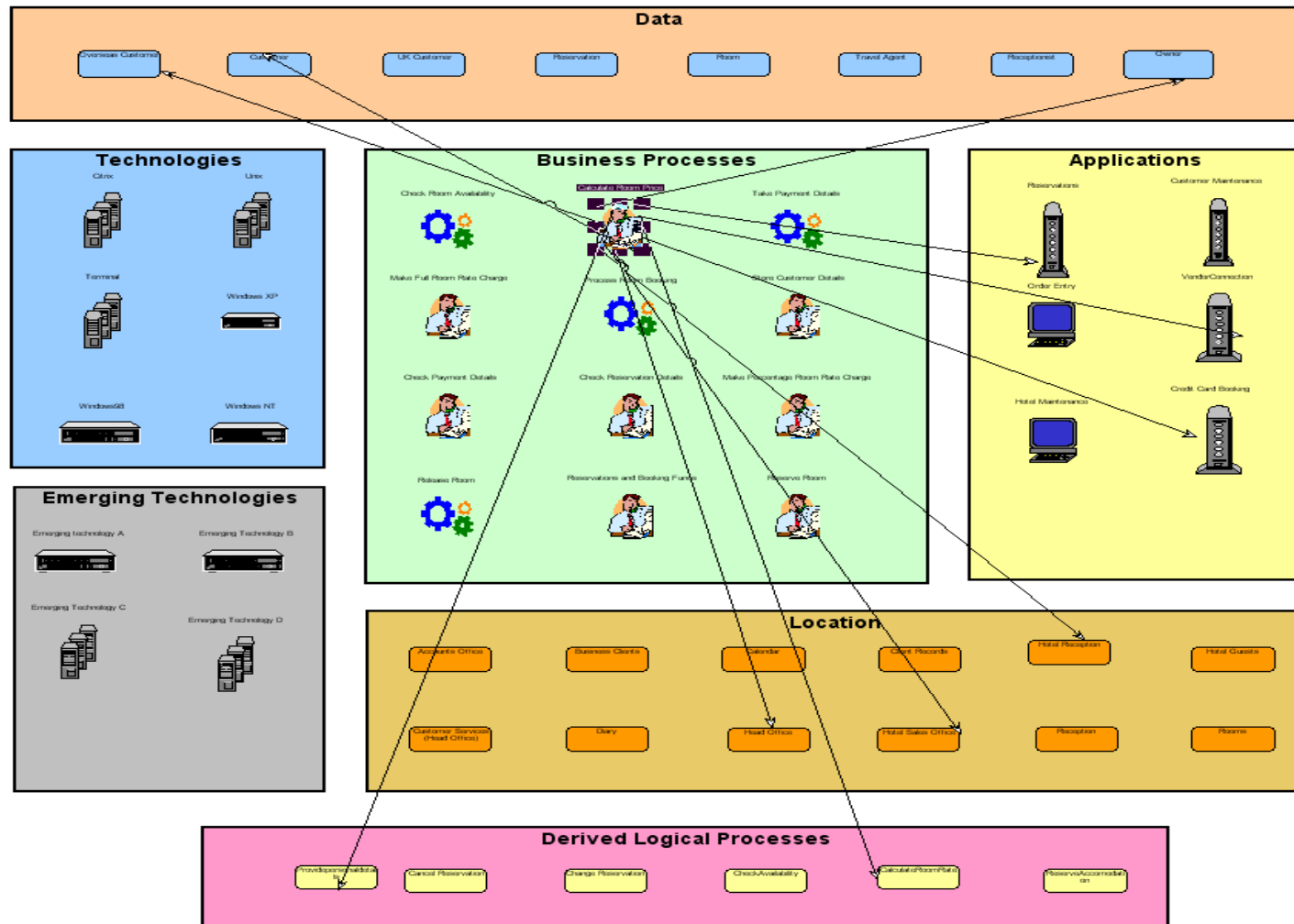
“If we change our technology stack, what applications and organizations will be effected?”



Benefits (2): Analyze Change to Processes...

What Happens If....?

Focus on Information needed to make a decision



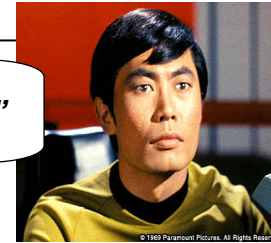
II. Enterprise Architecture Purpose

Main aspects of an Enterprise Architecture

- **Enterprise Architecture** is between the Business and IT Strategy and the programs and projects to be carried out
- Enterprise Architecture includes **Business Architecture** as well as **IT Architecture** (which is **IS Architecture** – Information System – and **Technology Architecture**)
- Enterprise Architecture **guides** the programs and projects

EA helps us “upstream” (to do the right things) and “downstream” (doing things right)

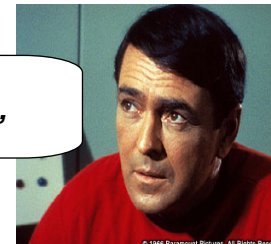
“good navigation”



■ Upstream: Doing the right things

- Identifying, funding & resourcing the most important programmes, in line with the business strategy and within the investment budget, in the right sequence, and with effective programme management and control.

“good engineering”

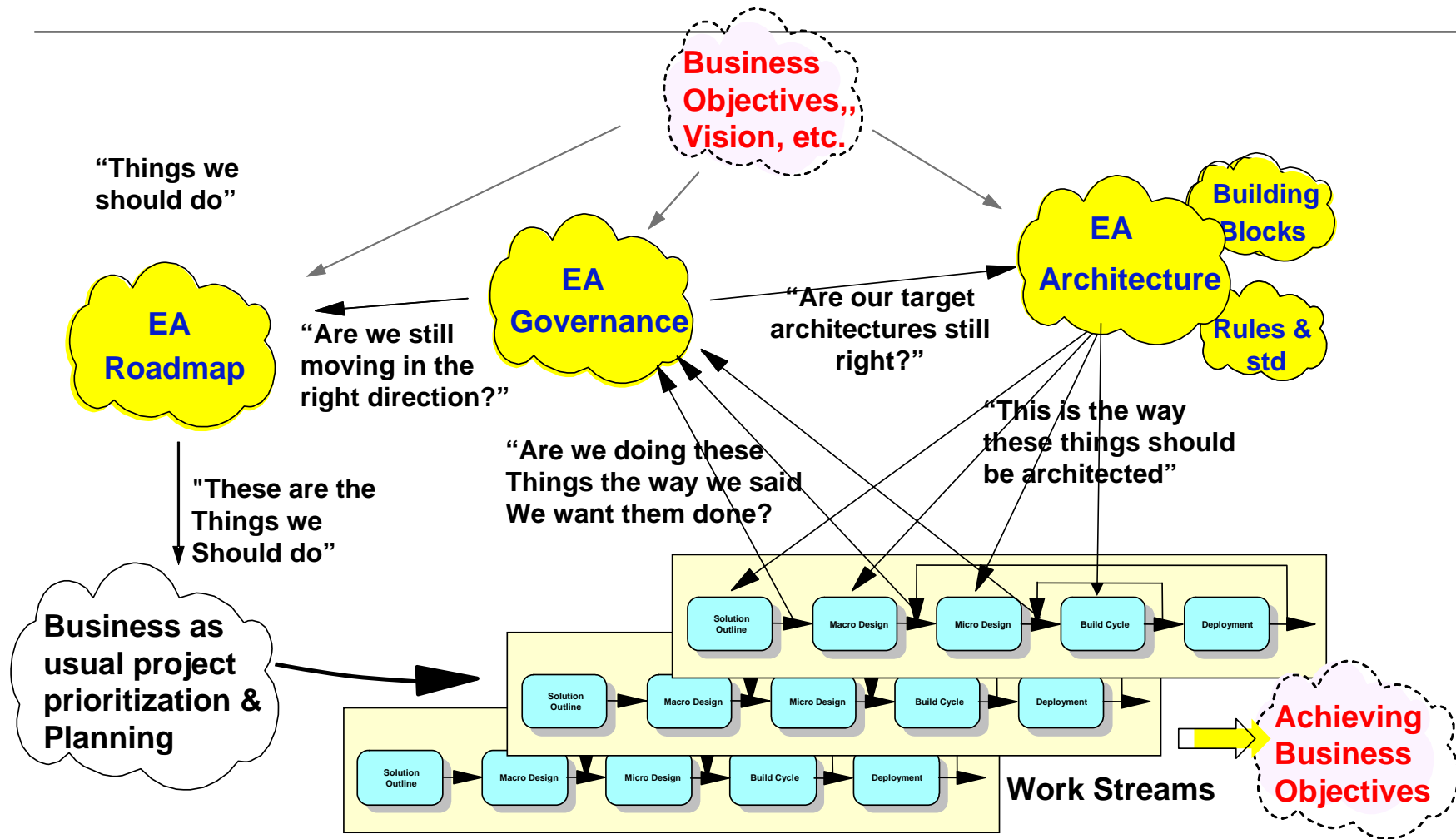


■ Downstream: Doing things right

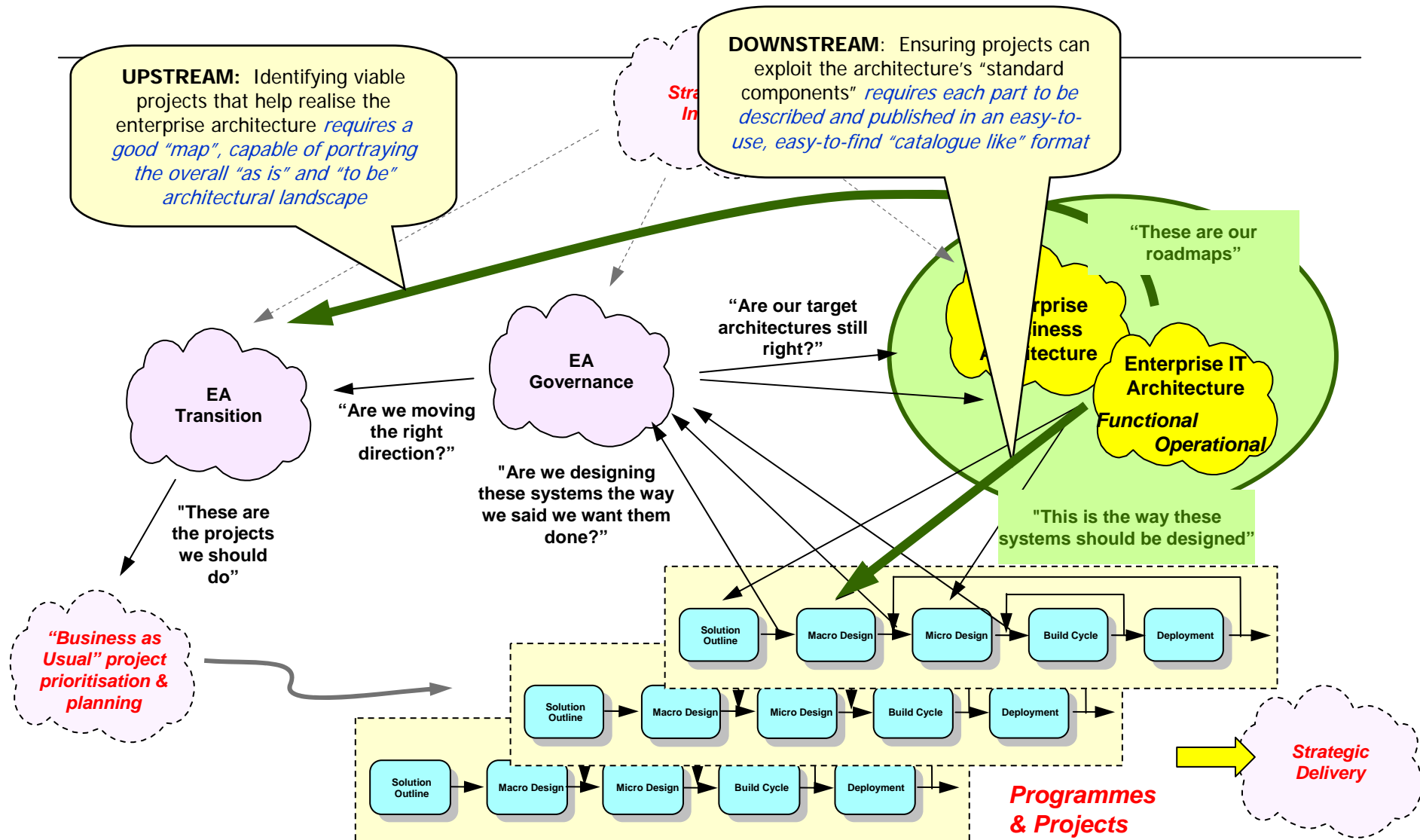
- Ensuring the solutions delivered by these programmes meet the needs of the business, work within the existing IT environment and contribute towards the realisation of the enterprise’s IT strategy.



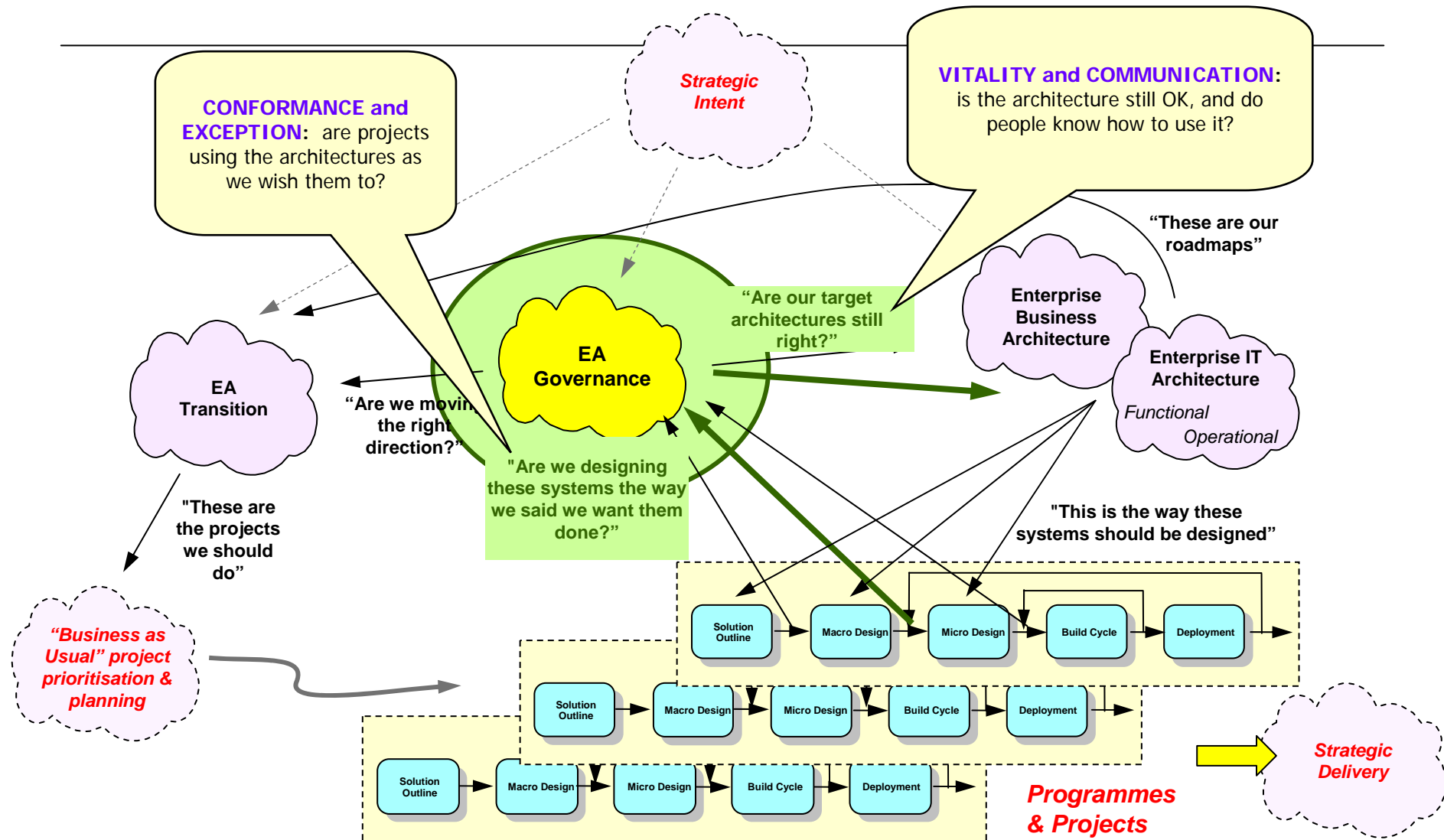
EA is More than Architecture



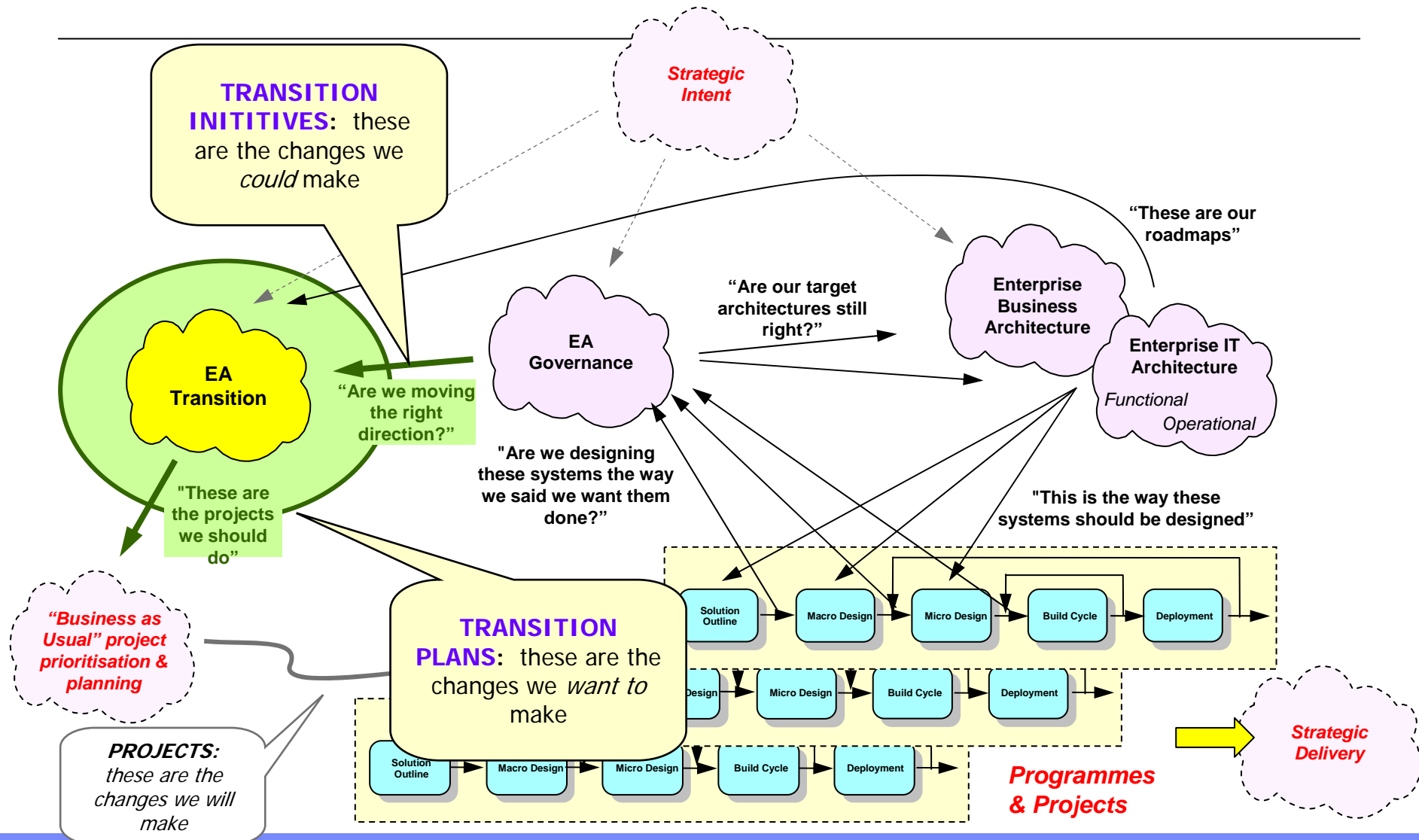
There are three parts to EA – part 1: Architecture



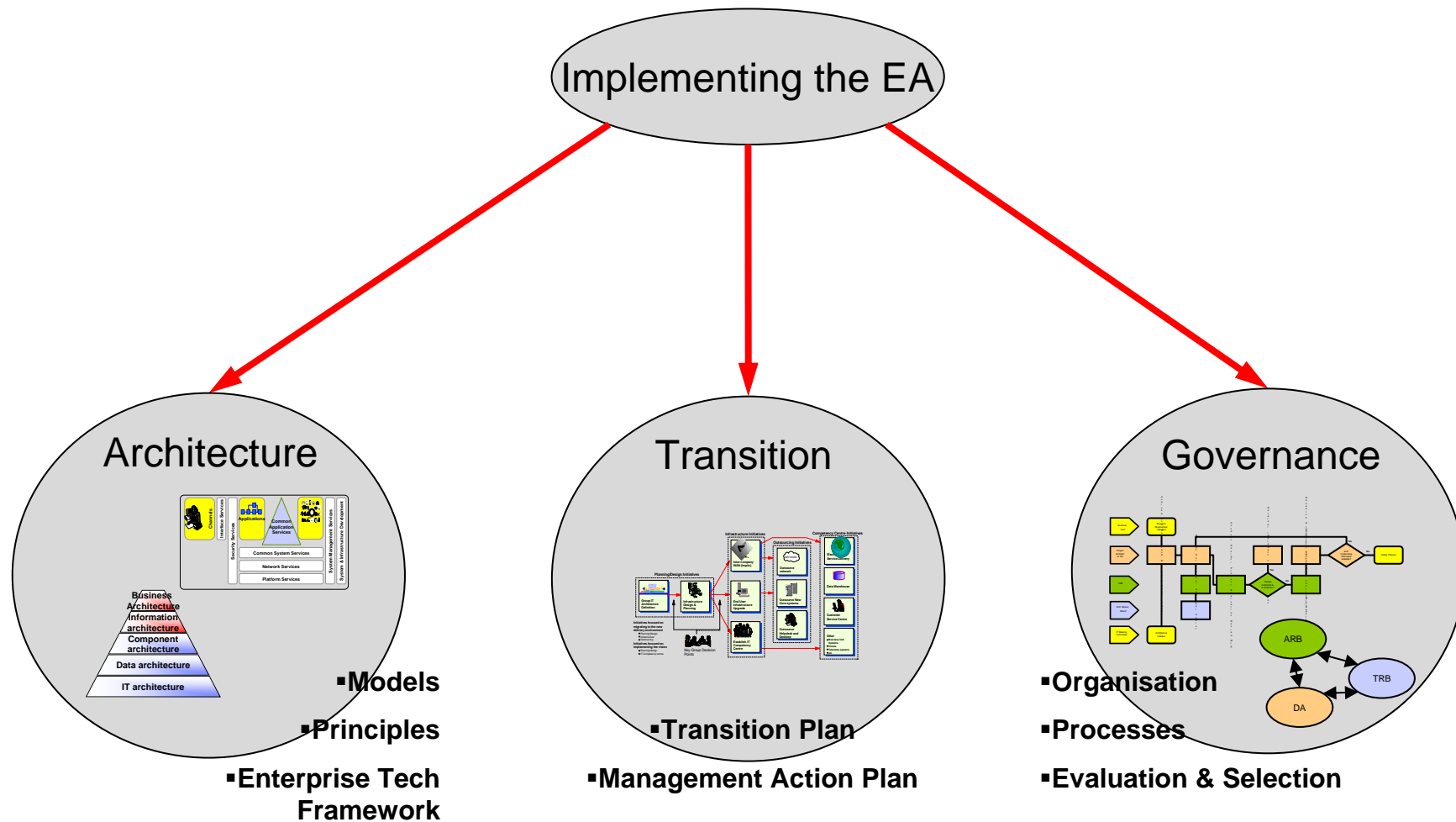
There are three parts to EA – part 2: Governance



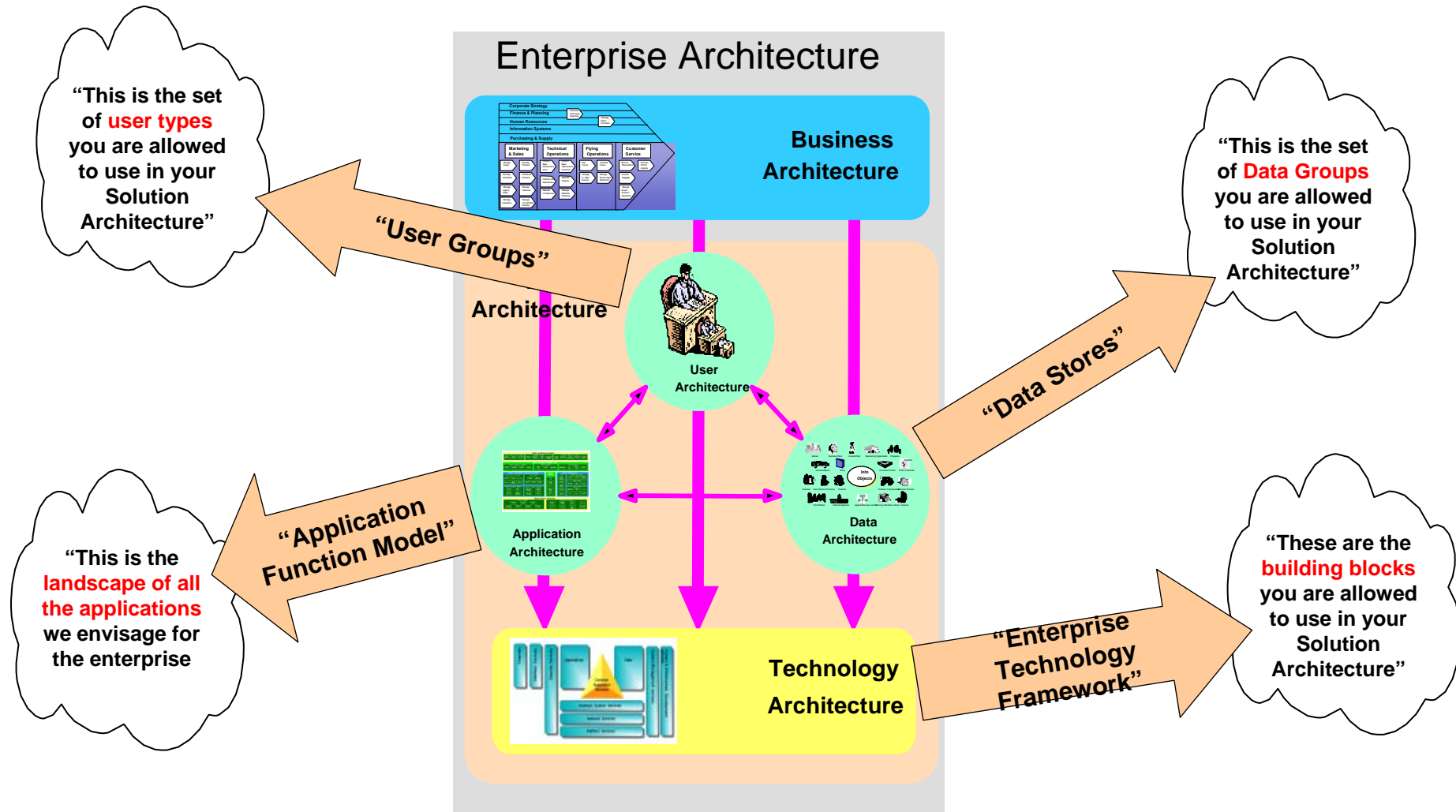
There are three parts to EA – part 3: Transition



Therefore there are three aspects to implementing an Enterprise Architecture



There is a relatively simple mapping from EA to solution ...

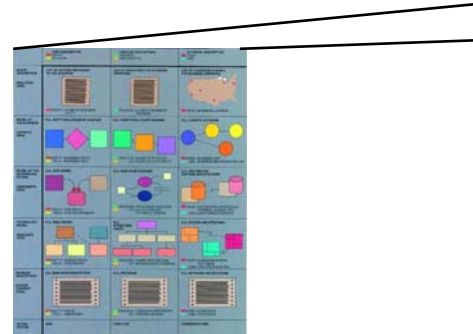


III. Enterprise Architecture Methods

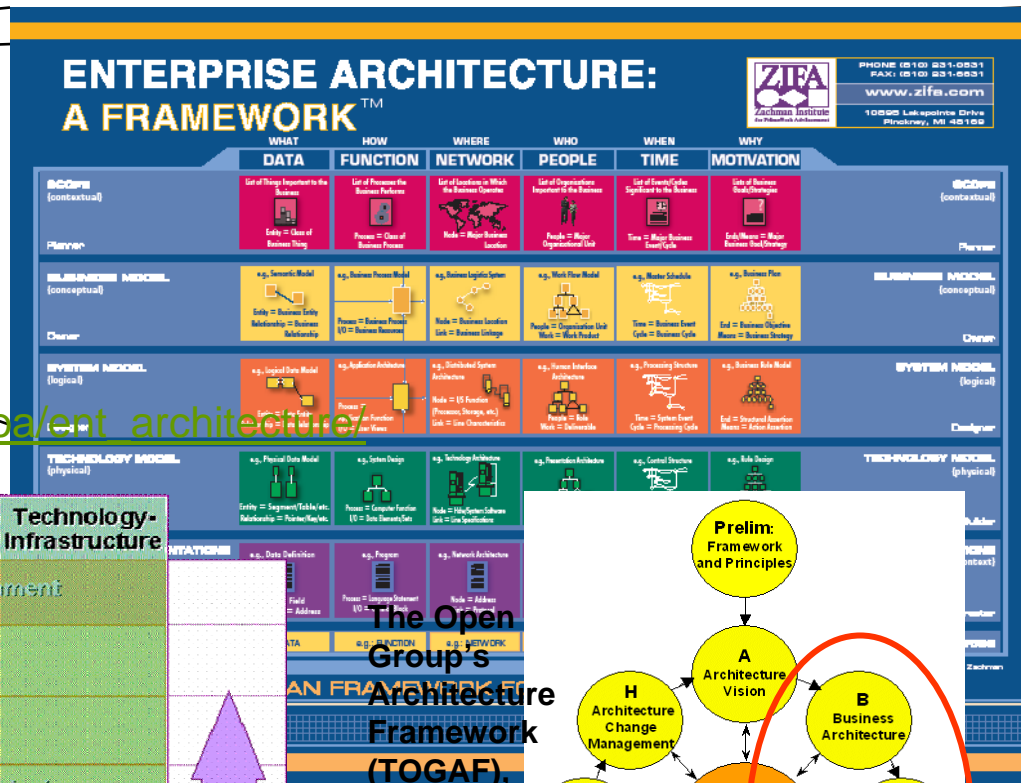
Enterprise Architecture Methods

- Enterprise Architecture methods provide **guidelines** and **templates** for the definition of an Enterprise Architecture
- Templates are available for **Work Products / Artifacts** – most of them as described in Architecture Methods
- Most popular Enterprise Architecture Methods
 - IBM
 - Zachman (www.zifa.com)
 - TOGAF (www.opengroup.org)

All EAs have a “framework” – a means of organizing, managing and communicating the architecture (1)



http://www.capgemini.com/services/soa/ent_architecture/

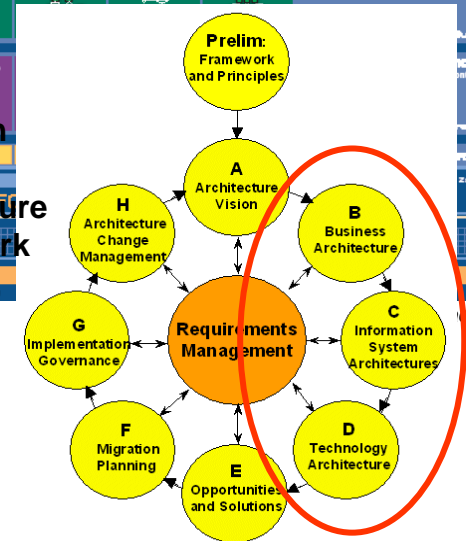


	Business	Information	Information-Systems	Technology-Infrastructure
Why? Contextual	The Future, the Organisation & Environment			
What? Conceptual	The concepts, what do we want?			
How? Logical	Logical directions & solutions			
With What Physical	Physical solutions based on change, redesign, products or techniques			
When Transformational	Change from the existing to a future situation			
	Security & Governance		Viewpoints	

Optional 5th layer

© CapGemini, 2005

The Open Group's Architecture Framework (TOGAF), UK



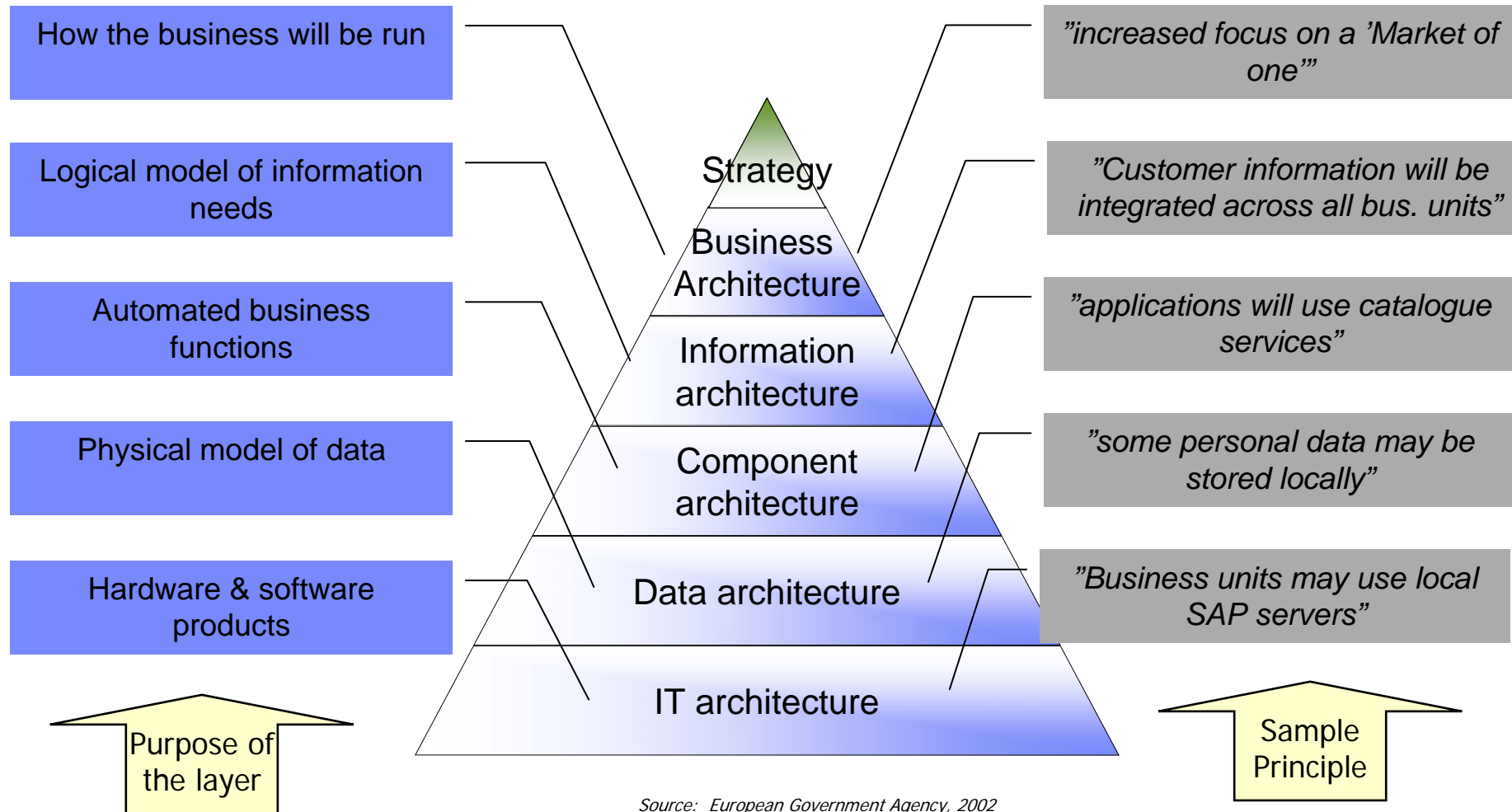
The EA environment consists of:

Enterprise Architecture Elements	
Strategy	Strategic Alignment - Explicit linkages to IT and Business Strategies in order to support and implement those strategies
	Principles – Fundamental rules upon which the Enterprise Architecture is based
	Architecture Vision – Represents the governing ideas and directions for a target Enterprise Architecture
	Measurements - Measuring the EA benefits and return on investment to prove its value
Artifacts	Framework – Structure of the EA, set of conventions for ensuring consistent notation, terminology and semantics to describe EA
	Models / Patterns - Overall EA context, diagrams and views; Assemblies of Components for communications and guidance
	Components / Standards – Basic Architecture building blocks, defining reusable functionality or services
Governance	Management Processes - Processes required to manage, use and update the Enterprise Architecture
	Roles – Key roles and responsibilities necessary to effectively manage and use the Enterprise Architecture
	Organization – Position and reporting structure of the EA Roles
Roadmap	Current Environment - An understanding of the organization's current operating environment
	Gap Analysis - An assessment of the gaps between the Current installed IT environment, and the Target IT environment
	Transition Plan - Transition initiatives required to effect transformation from the Current state to the Target state

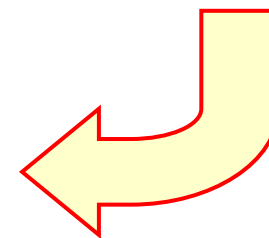
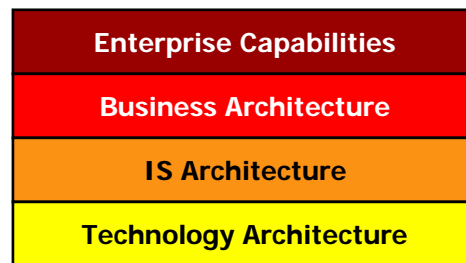
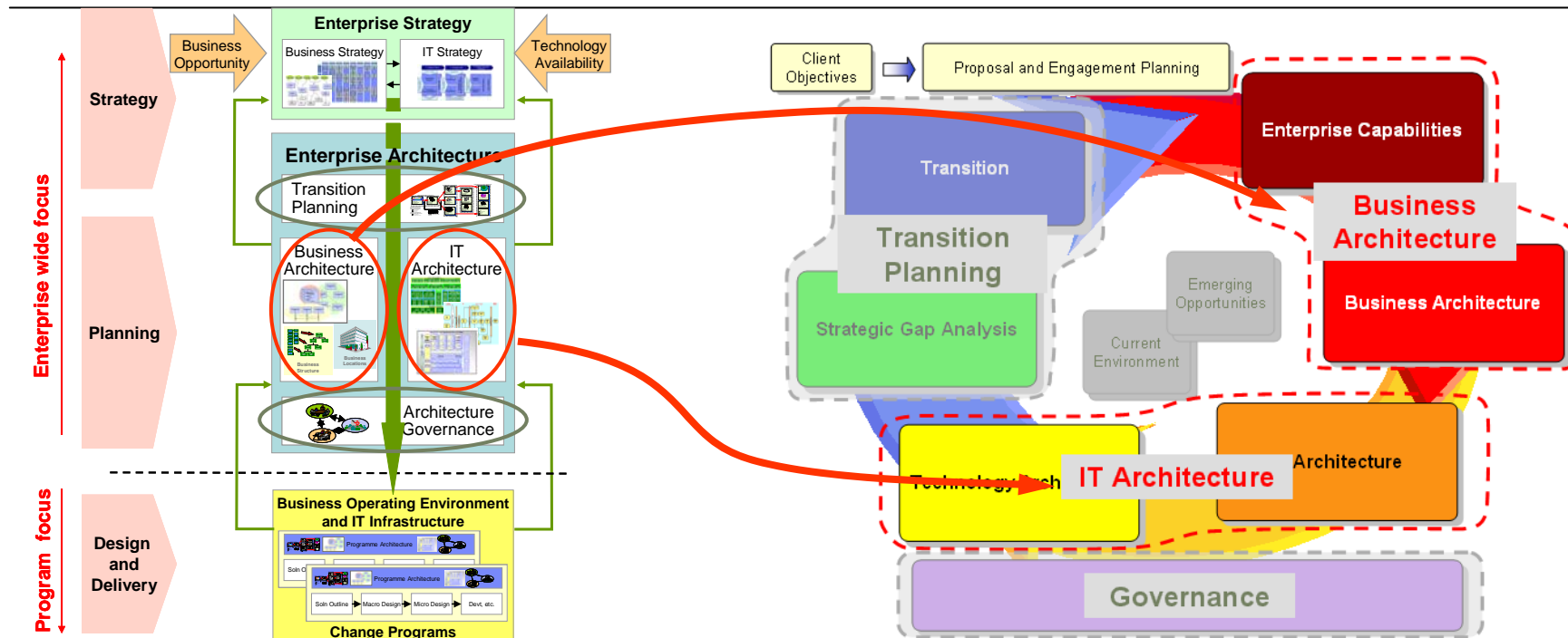
Key terms and phrases used in EA Methods

Architecture framework	A structured approach to the management and use of an enterprise architecture's various architectural assets, commonly called architecture building blocks (ABBs)
Architecture layer	A slice of the EA architecture framework, generally drawn horizontally, that separates out the business, IS and technology assets.
Architecture aspect	A slice of the EA architecture framework, generally drawn vertically, that separates out common themes or topics across the layers.
Architecture Building Block	An elemental part of an EA's architecture. ABBs are used as standard parts across an enterprise in the design and construction of its many and varied business and IT systems, as well as being a useful categorisation of stuff in transition planning. An ABB category may be associated with a specific aspect of a specific layer of an Architecture framework
Framework cell (or "cell")	The intersection between a layer and an aspect. Typically occupied by one or more of the EA Method's architecture related work products
Solution Architecture	The IS and IT architectures created for a specific business solution. Sometimes called IT Architecture (particularly by IT Architects), or Solution Design (often by our clients)

A popular way of structuring an EA's architecture framework: is to adopt a simple layered approach

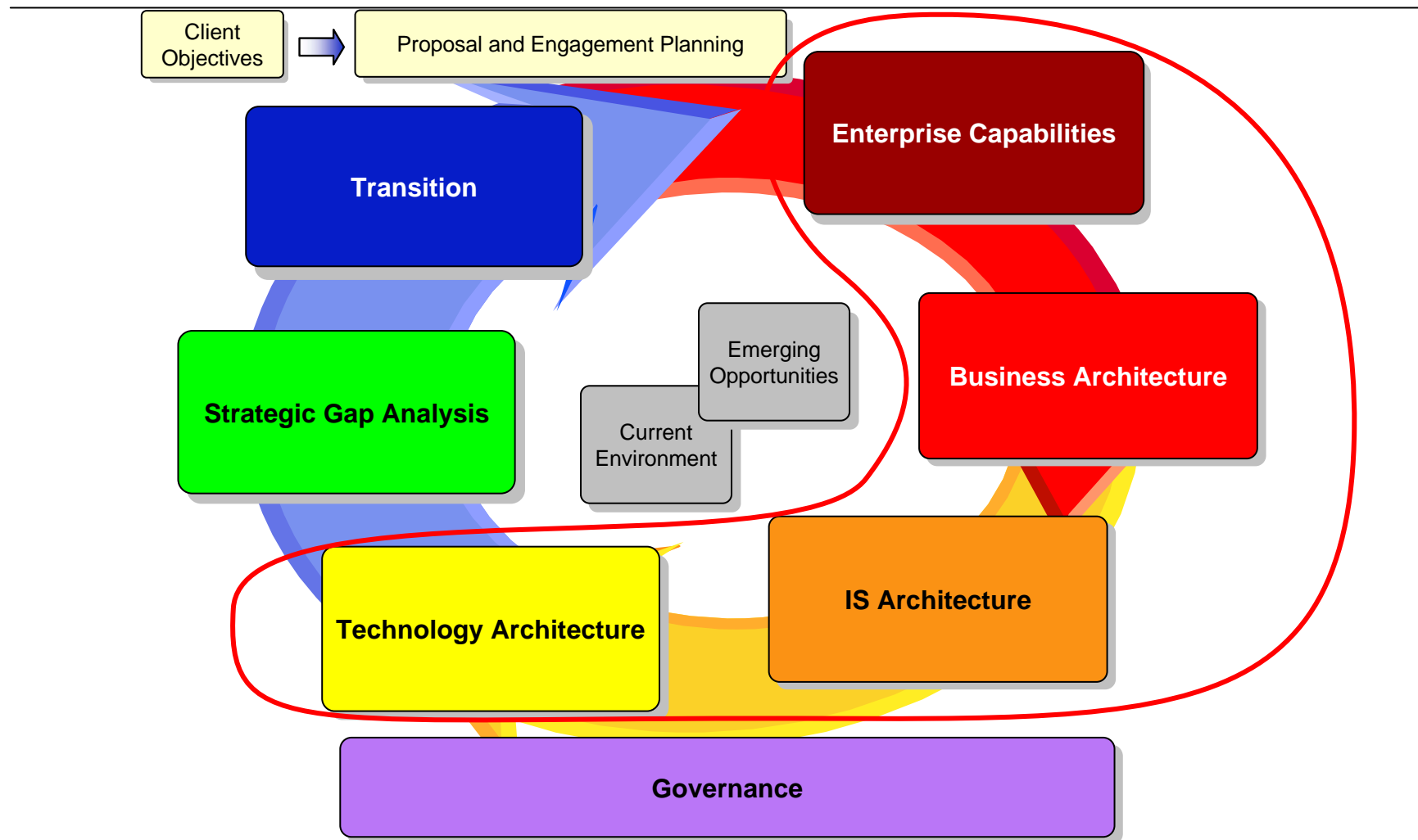


All EAs have a “framework” – a means of organizing, managing and communicating the architecture

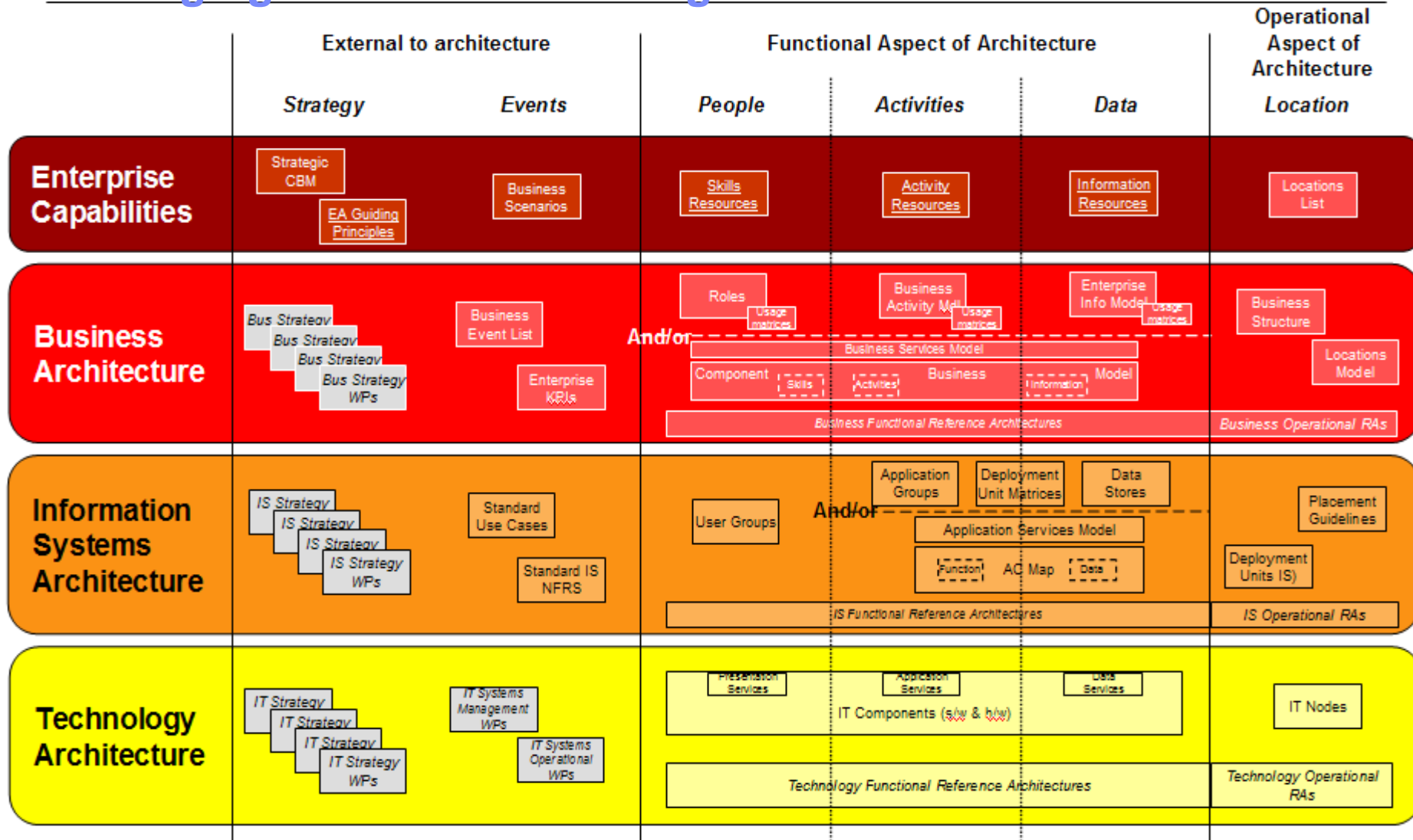


The EA Consulting Method's architectural layers

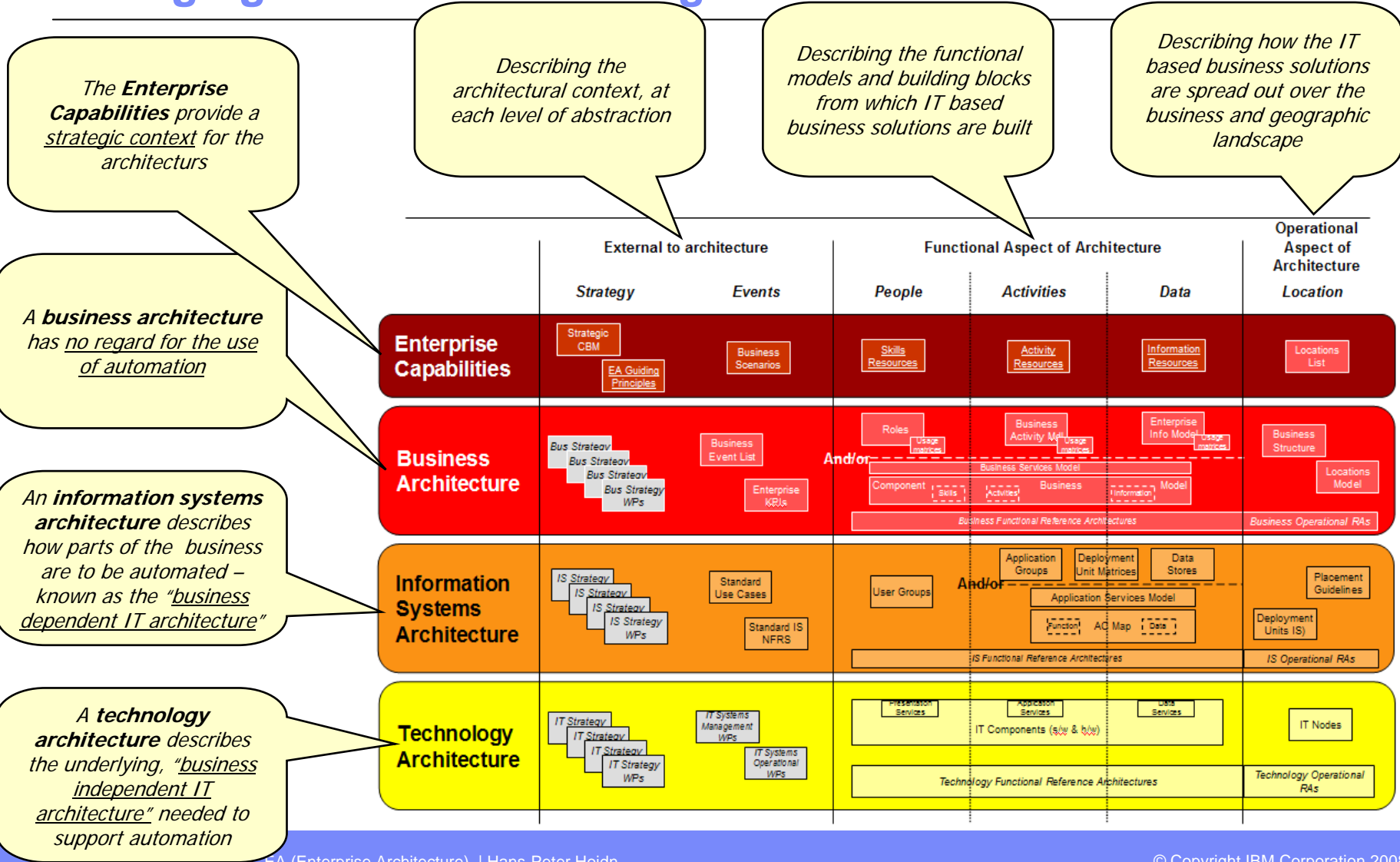
EA Method Overview



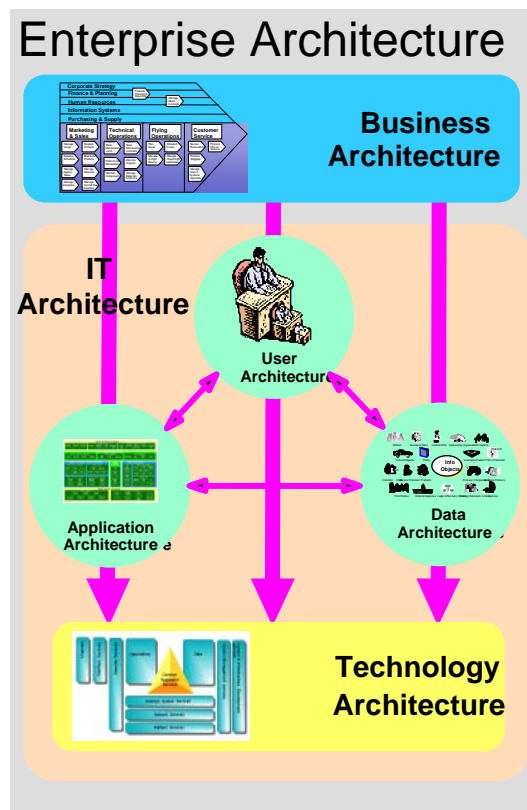
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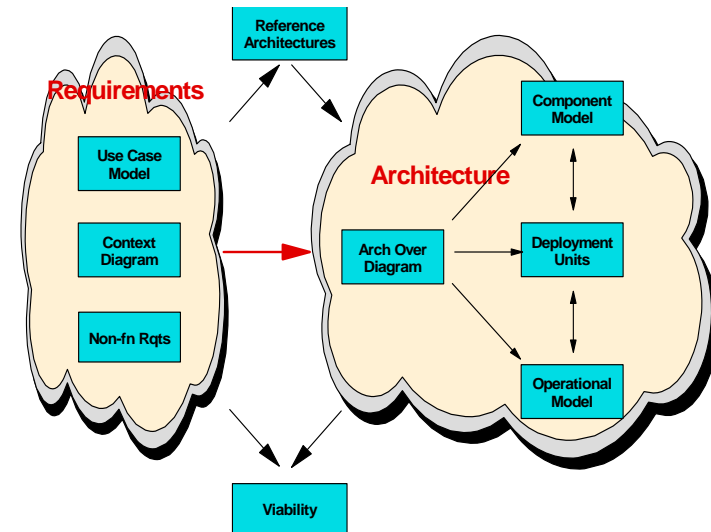
All EAs have a “framework” – a means of organizing, managing and communicating the architecture



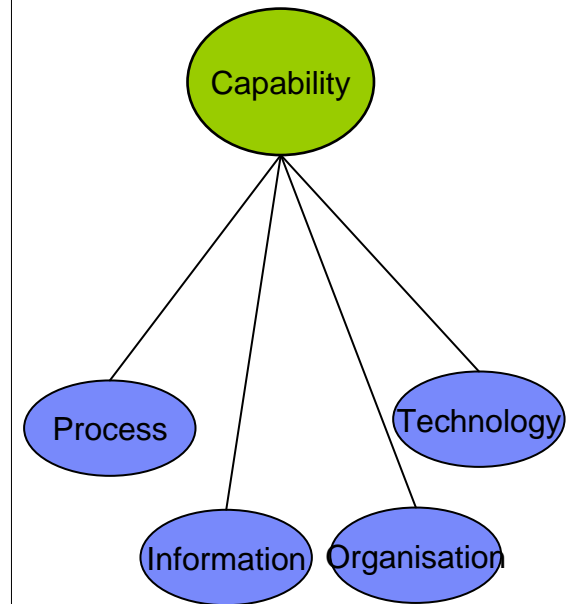
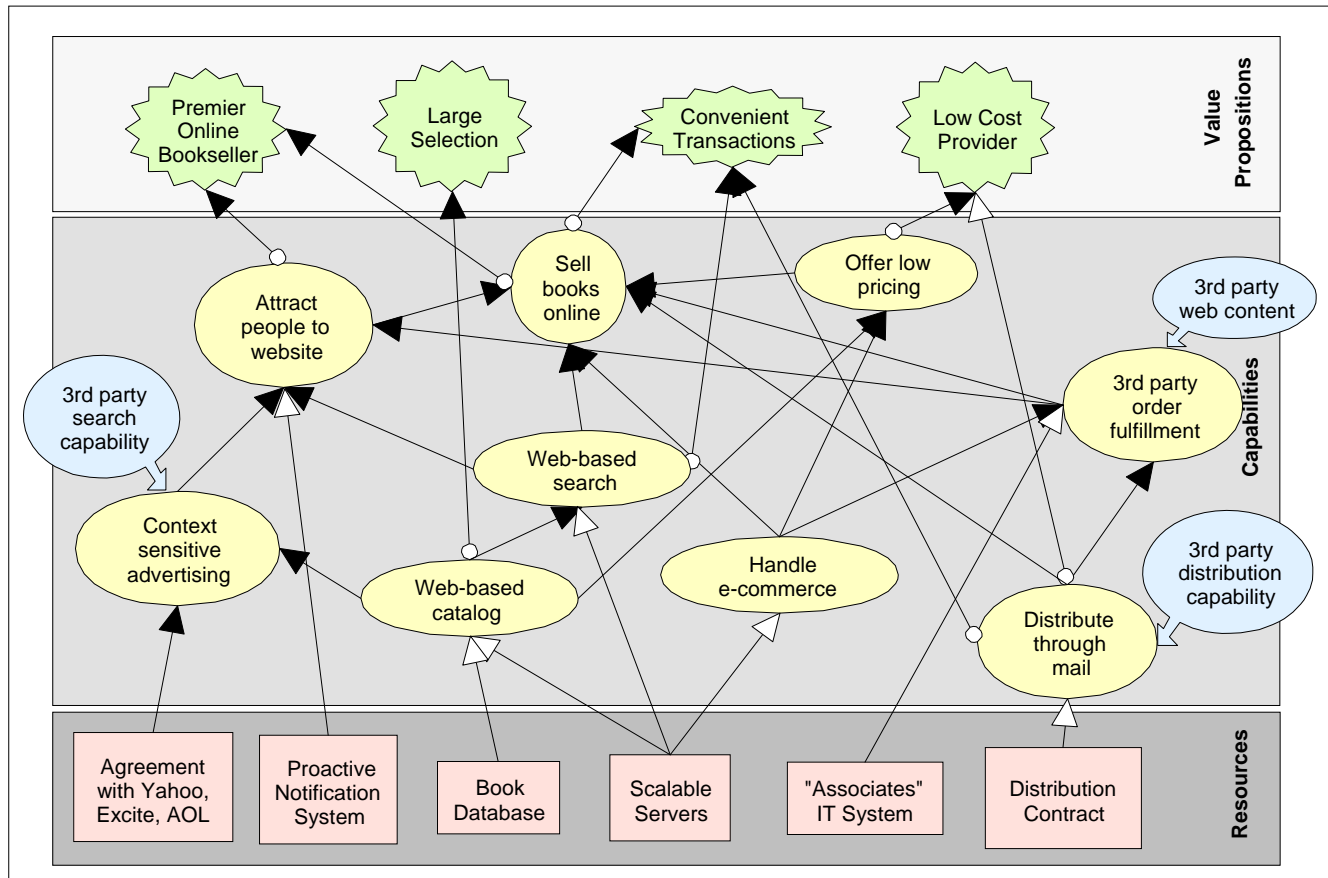
EA Work Products guide and govern how solution Work Products are constructed



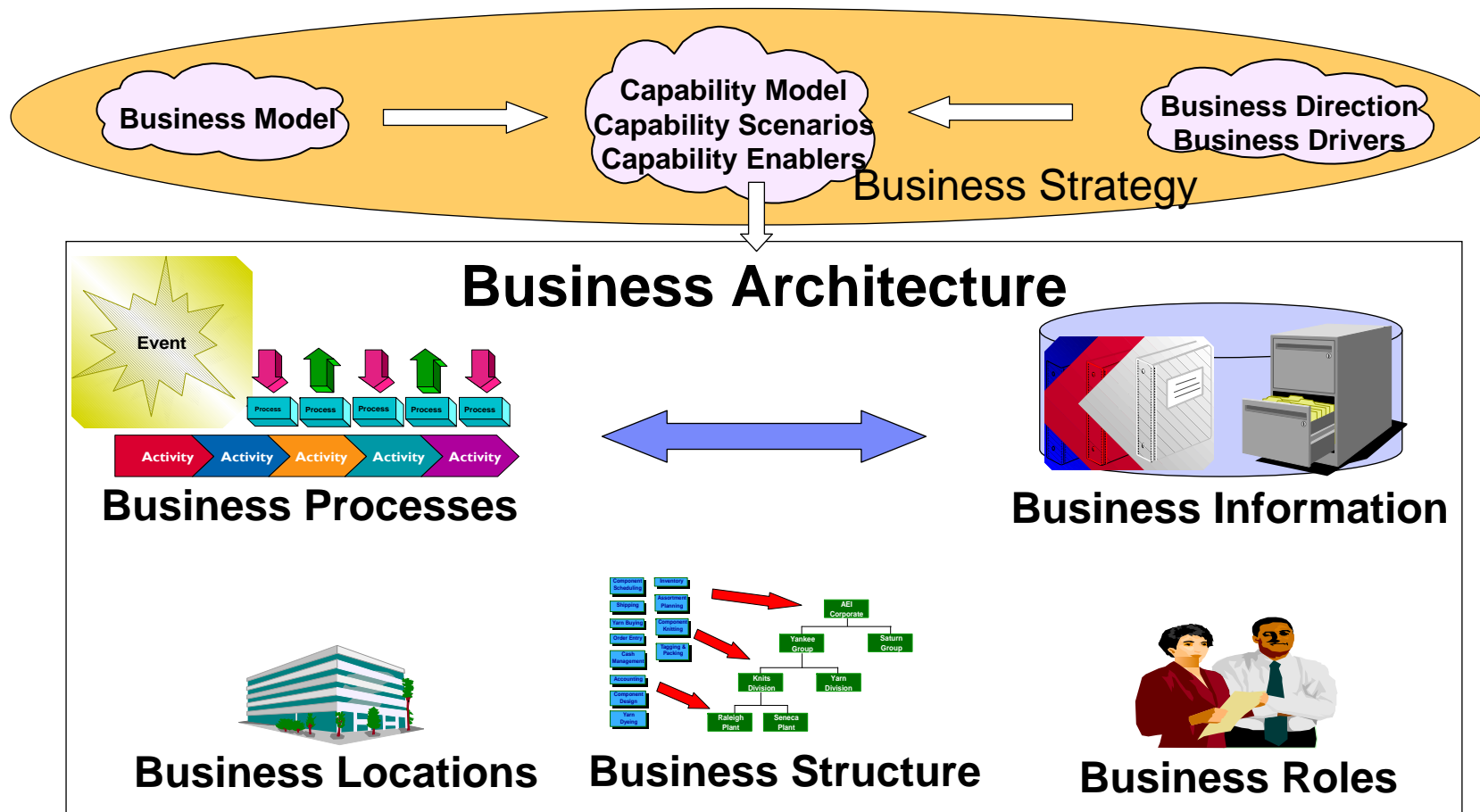
“EA
constrains
and
co-
ordinates
the
construction
of IT based
business
systems”



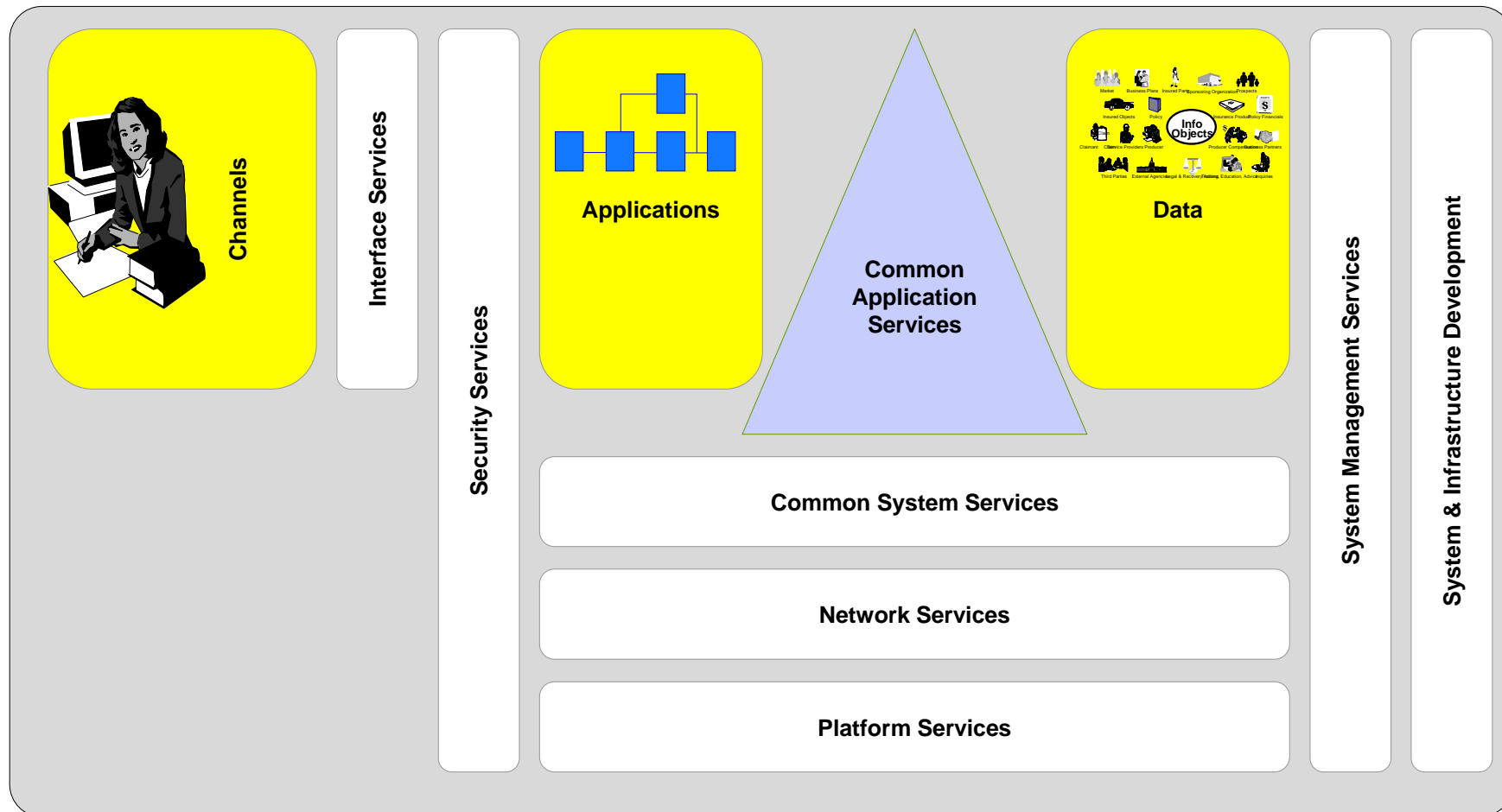
Enterprise Capabilities: Linking Strategy to Architecture (Example Amazon)



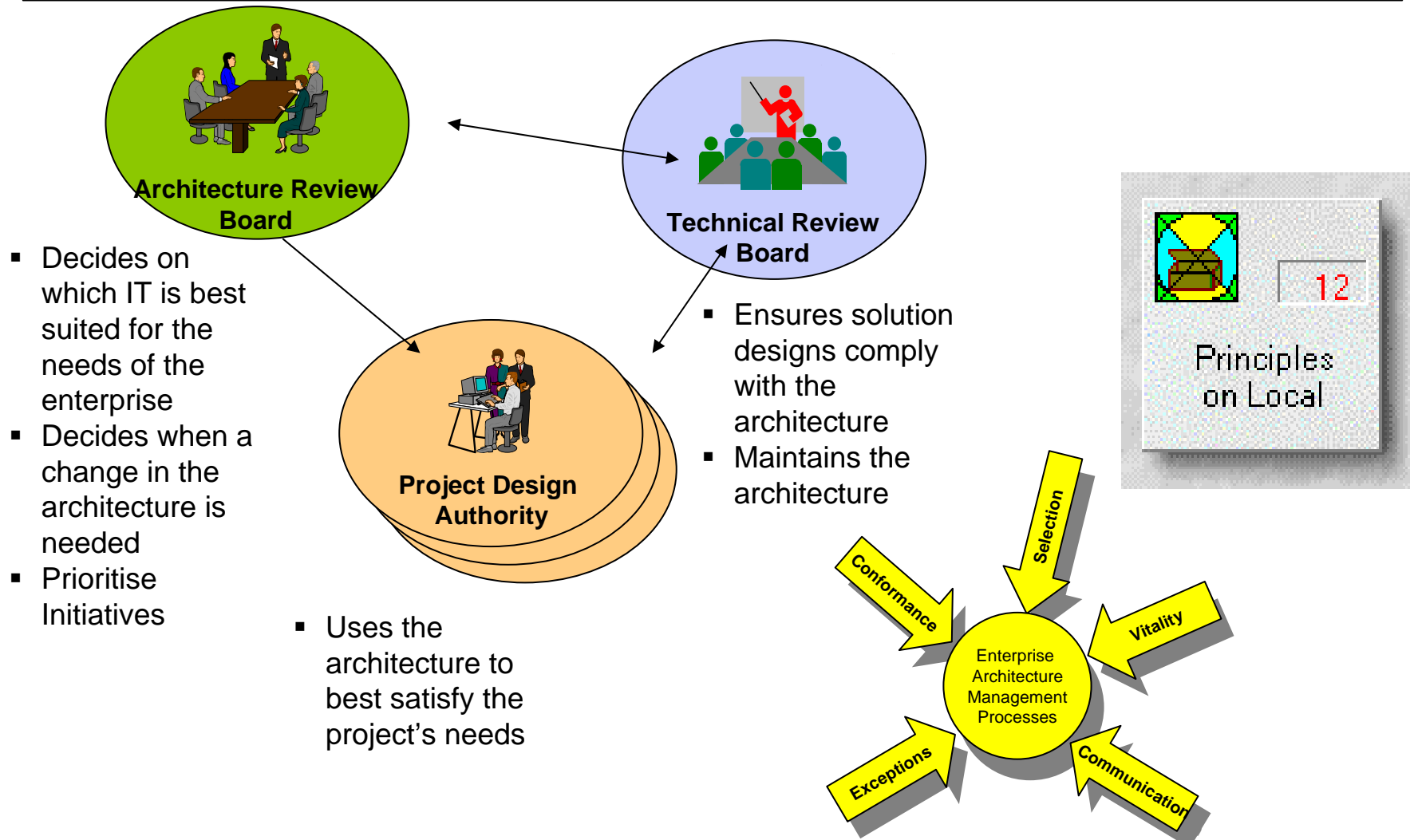
Business Architecture: Organization and co-operation



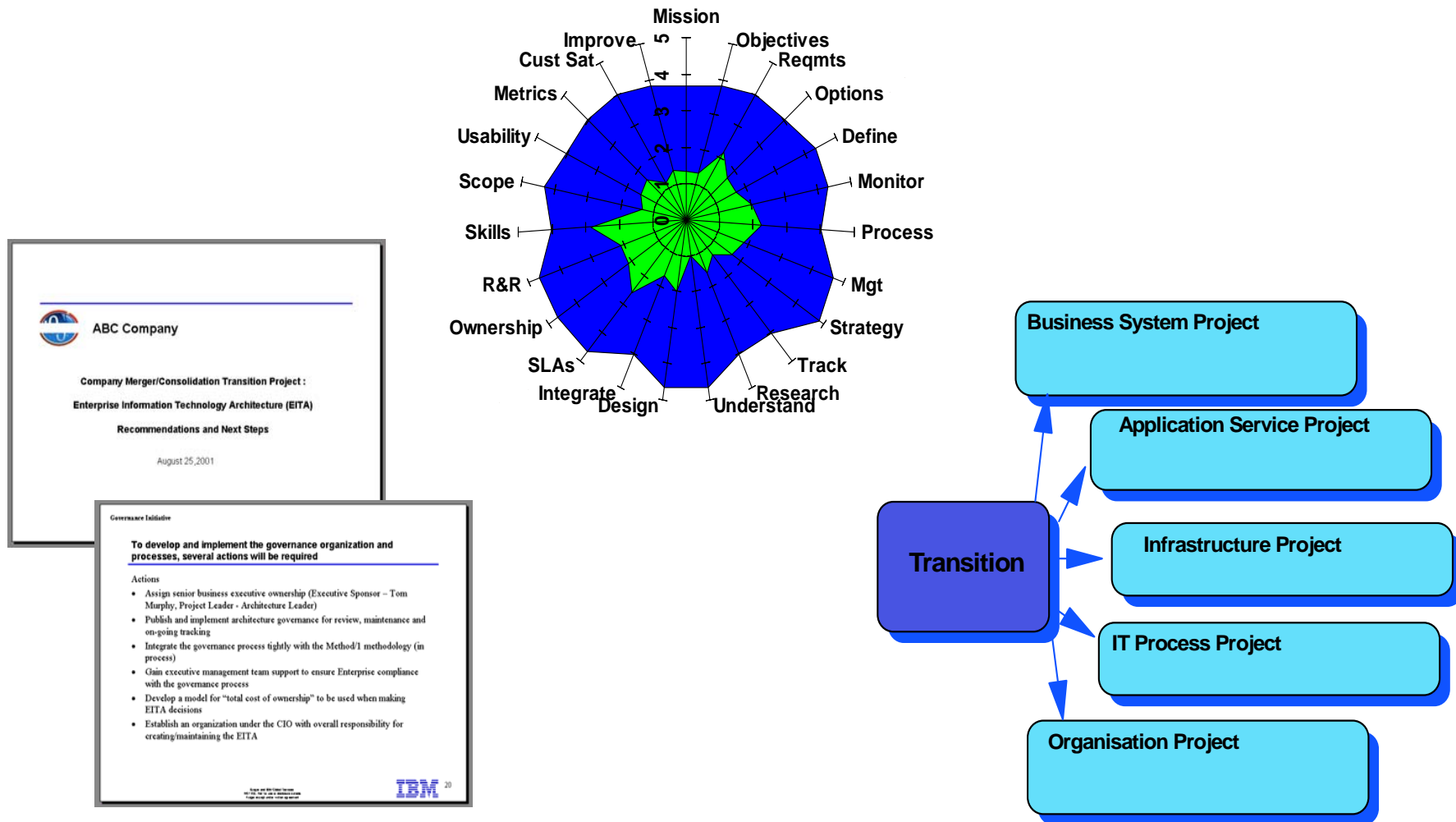
IS Architecture: Shape and Structure for ALL IT projects



Governance: Keeping it all together – day in, day out



Gap Analysis and Transition: From AS-IS to TO-BE



IV. Enterprise Capabilities & Principles

Enterprise Capabilities & Principles

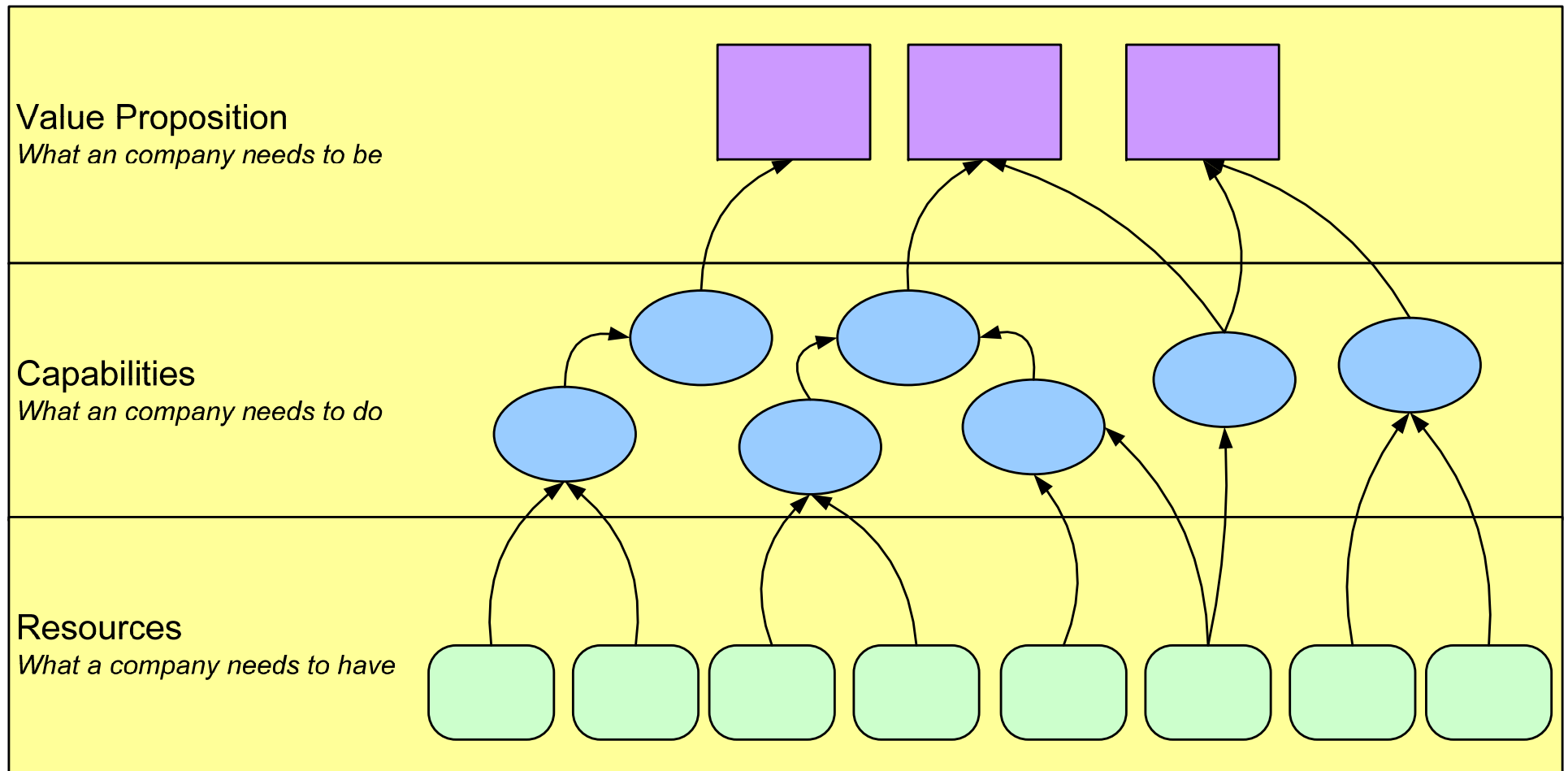
- Enterprise Capability Model
 - This linkage between strategy and architecture can be represented using three key concepts. The network of these 3 concepts is referred to as the **Strategic Capability Network (SCN)**.

- Enterprise Architecture **Principles, Policies & Guidelines**

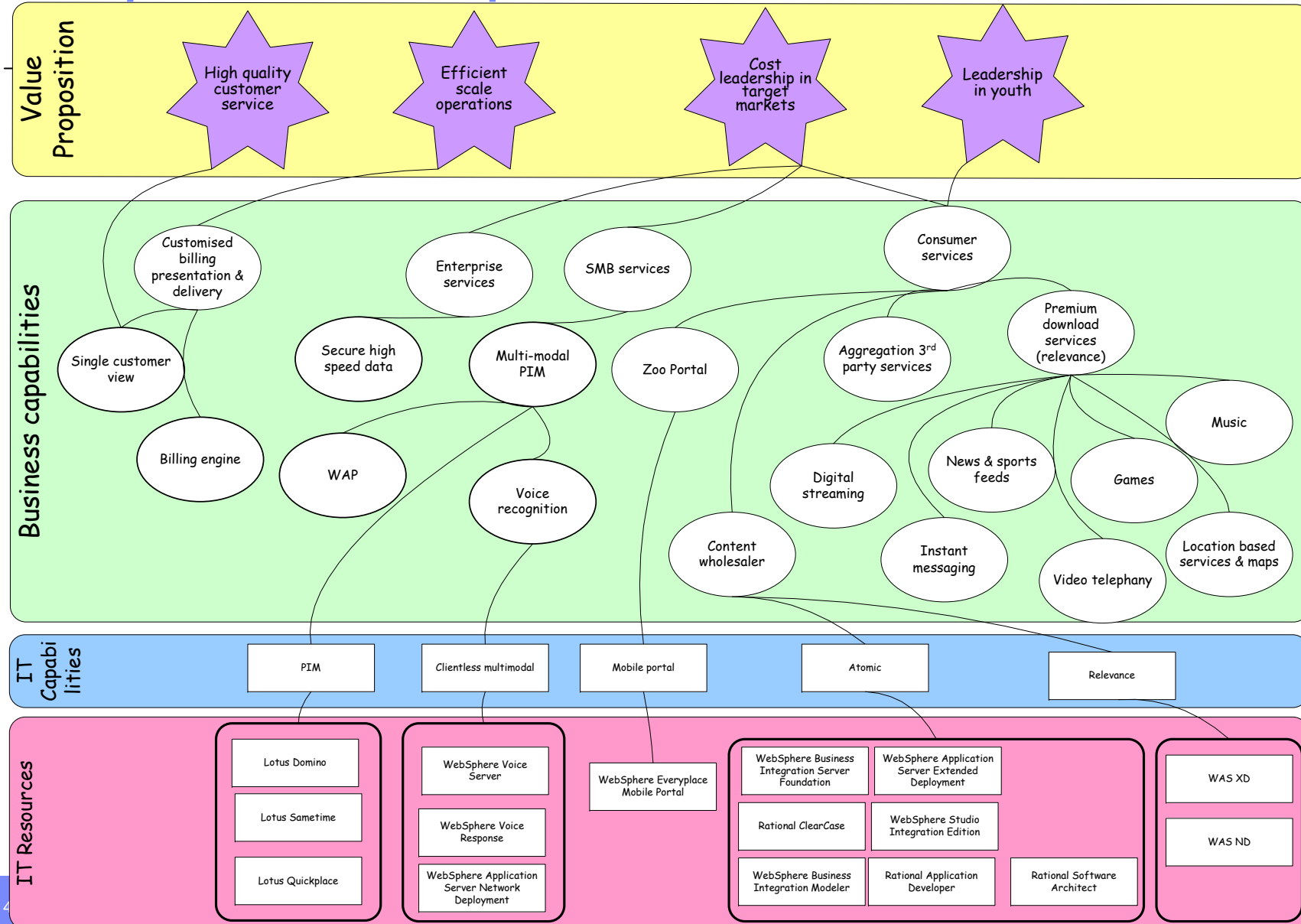
- Enterprise Architecture **Overview** Diagram

Enterprise Capabilities & Principles

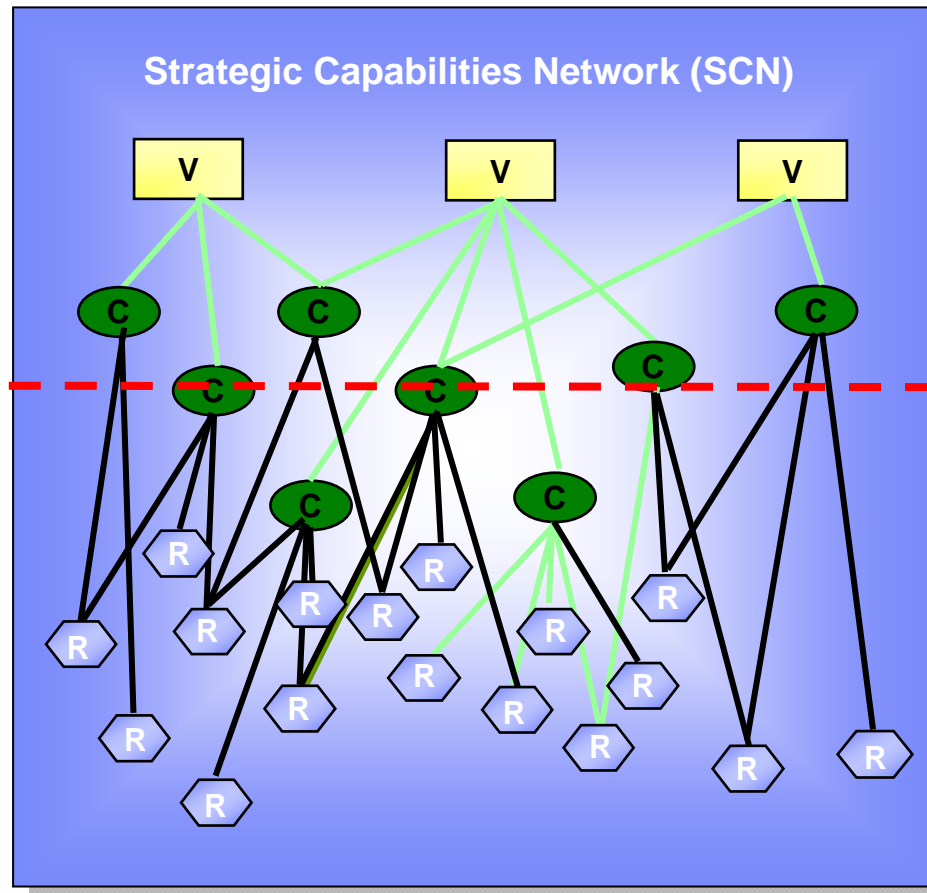
Strategic Capability Network (SCN) – Overview



Example: Business Capabilities for Telco 3G



The SCN is created and developed in Strategy engagements and Enterprise Architecture engagements

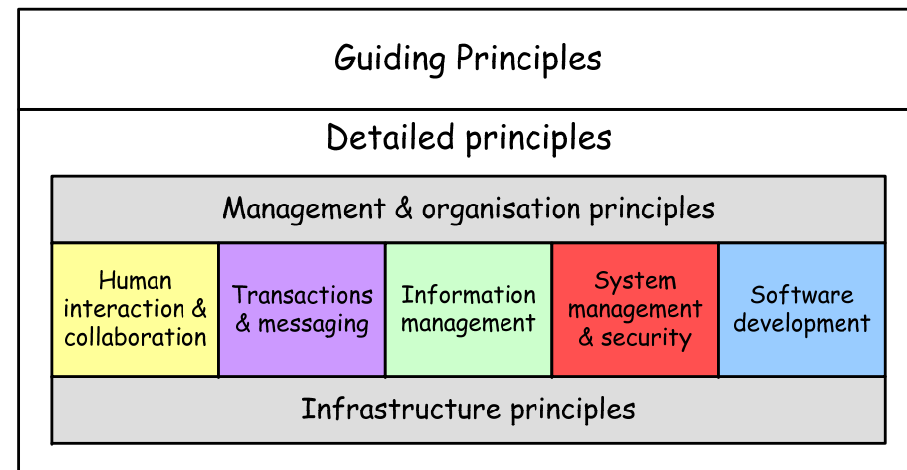


Strategy Engagement: During strategy activities the focus is on understanding the client's existing capabilities, evaluating their strengths and weaknesses and identifying new capabilities required.

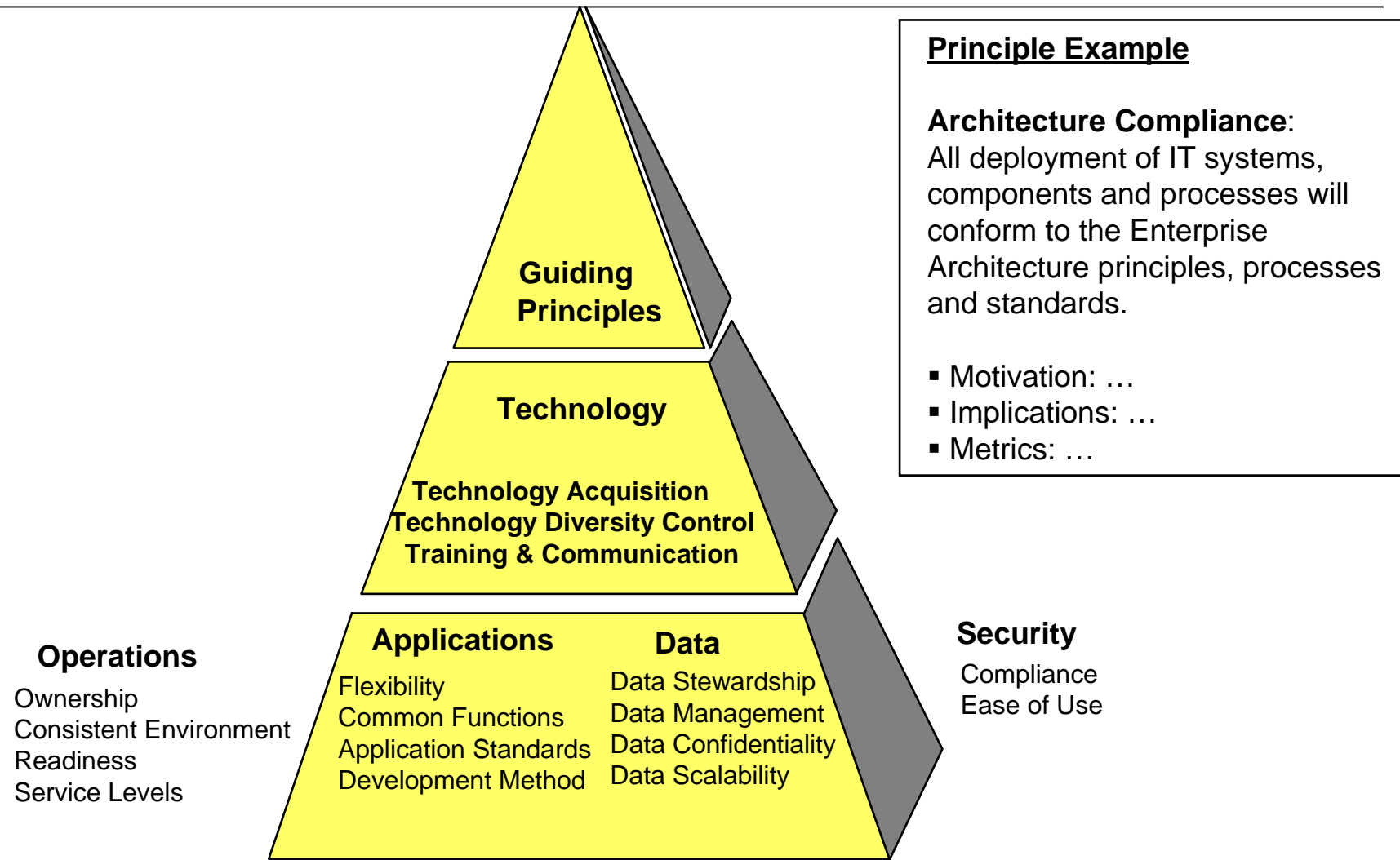
EA Engagement: During enterprise architecture activities, we focus on refining the needed capabilities and identifying the resources (capability enablers) the client needs to meet its strategic objectives.

Enterprise Architecture Principles

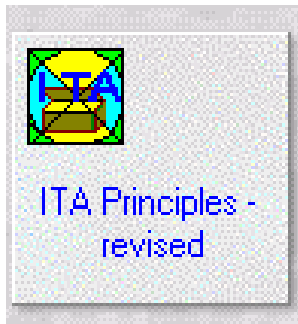
Principle <i>Description</i>
Motivation <i>Why the company needs to do this?</i> <i>Business benefits</i> <i>Link back to business capabilities</i>
Implication <i>What will be the impact of this?</i> <i>Business & IT resource, cost, activities</i>



Architecture Principles, Policies & Guidelines are key governance mechanisms



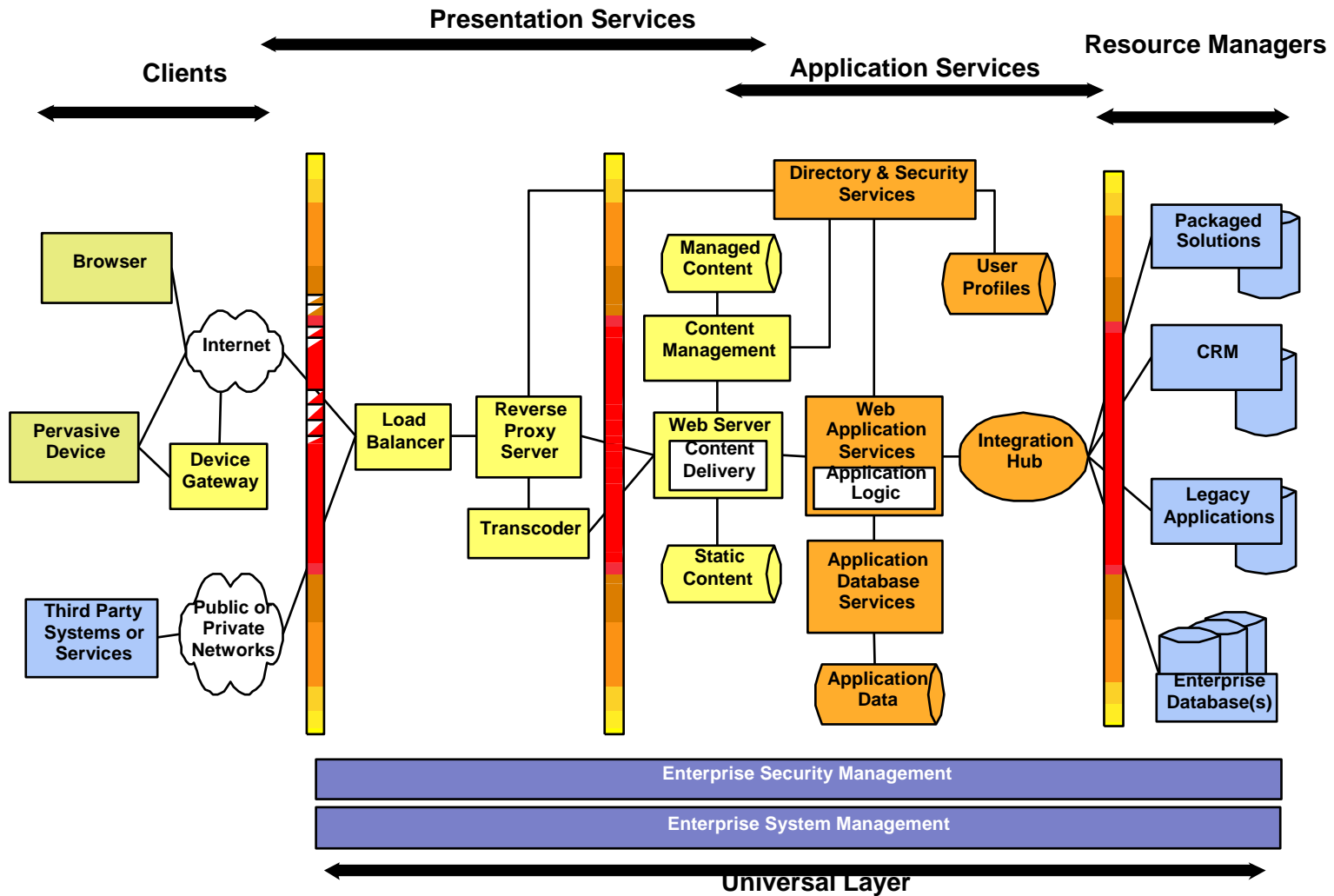
Example: Guiding principles



- **IT Systems will be designed to allow rapid implementation of changes to business rules - to reflect changes in business requirements.**
- **Motivation:**
 - Increased flexibility to rapidly implement changed business requirements
 - Reduced costs associated with making and implementing system changes
 - Allows the parameterization of business rules to minimize IT development
- **Implication:**
 - Systems need to be designed such that business rules are held externally from processing logic
 - Increased cost of initial application development to make use of parameterised business rules
 - Need to define the business rules which will be parameterised and how they will be accessed
 - Imposes an additional non-functional requirement on the selection of ready-built solutions
- Need to review and revise testing standards to ensure changes to external parameters do not impact system characteristics, e.g. performance

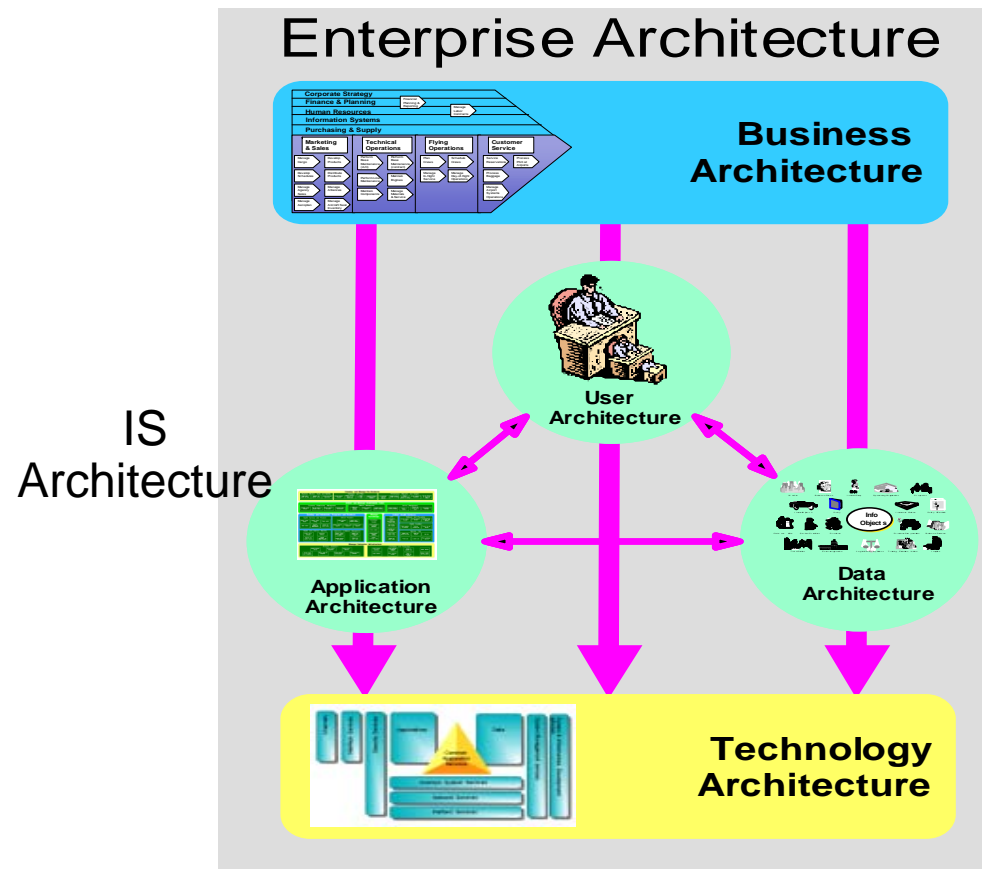
- **ANYbank will be proactive and innovative in its use of technology while minimizing the risk from being at the leading edge.**
- **Motivation:**
 - Increases competitive advantage by implementing systems that provide better customer service and enable new products to be brought to market more effectively
 - Reduces costs by exploiting effective, proven technologies
 - Contains risk by not being at the leading edge of technological advance
- **Implication:**
 - Some competitive advantage may be lost through not exploiting new technology when it first becomes available
 - Resources are required to monitor, evaluate, trial and assess business opportunities arising from new technologies

Enterprise Capabilities & Principles Architecture Overview Diagram

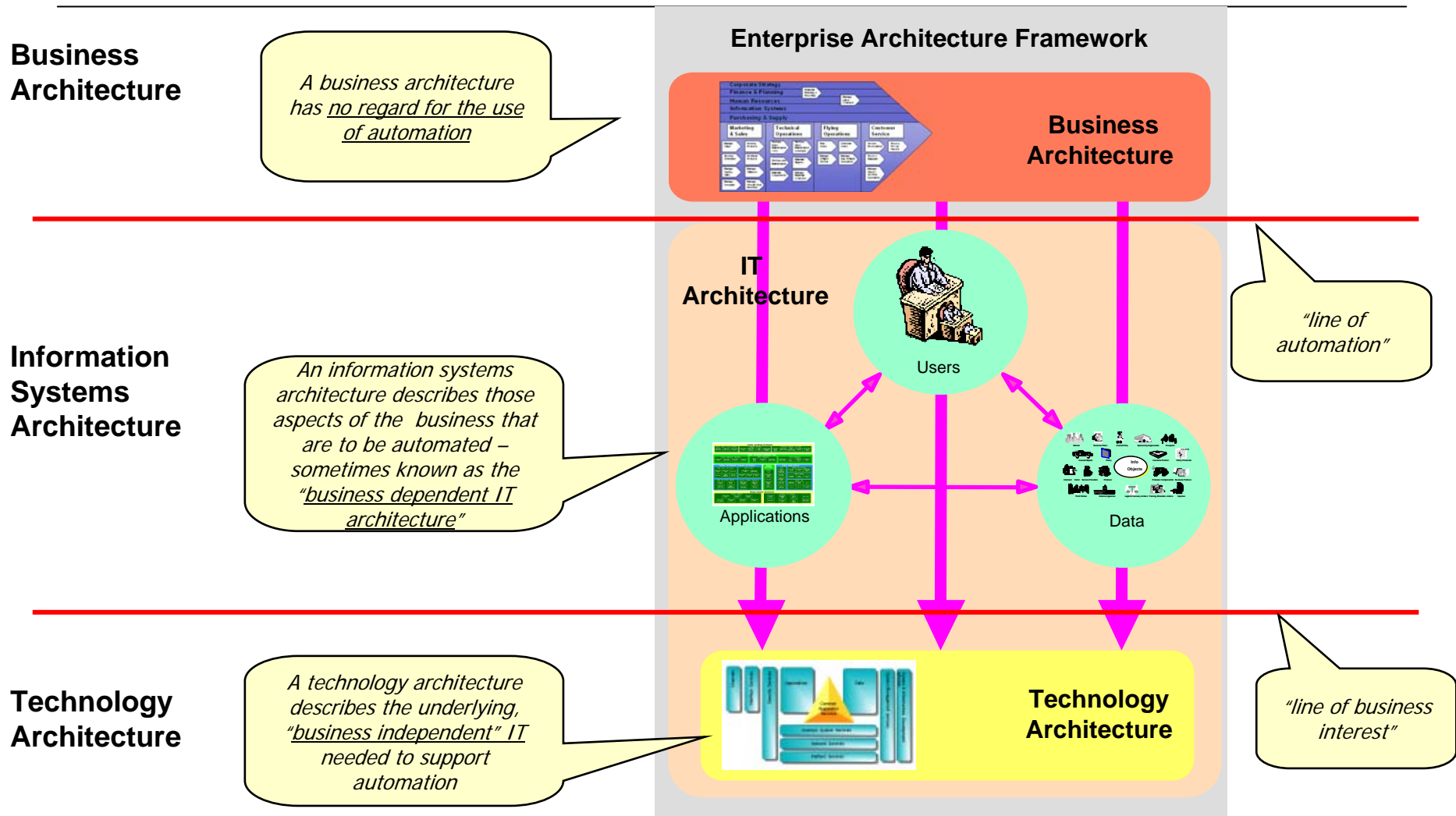


V. EA Architecture - Architectures

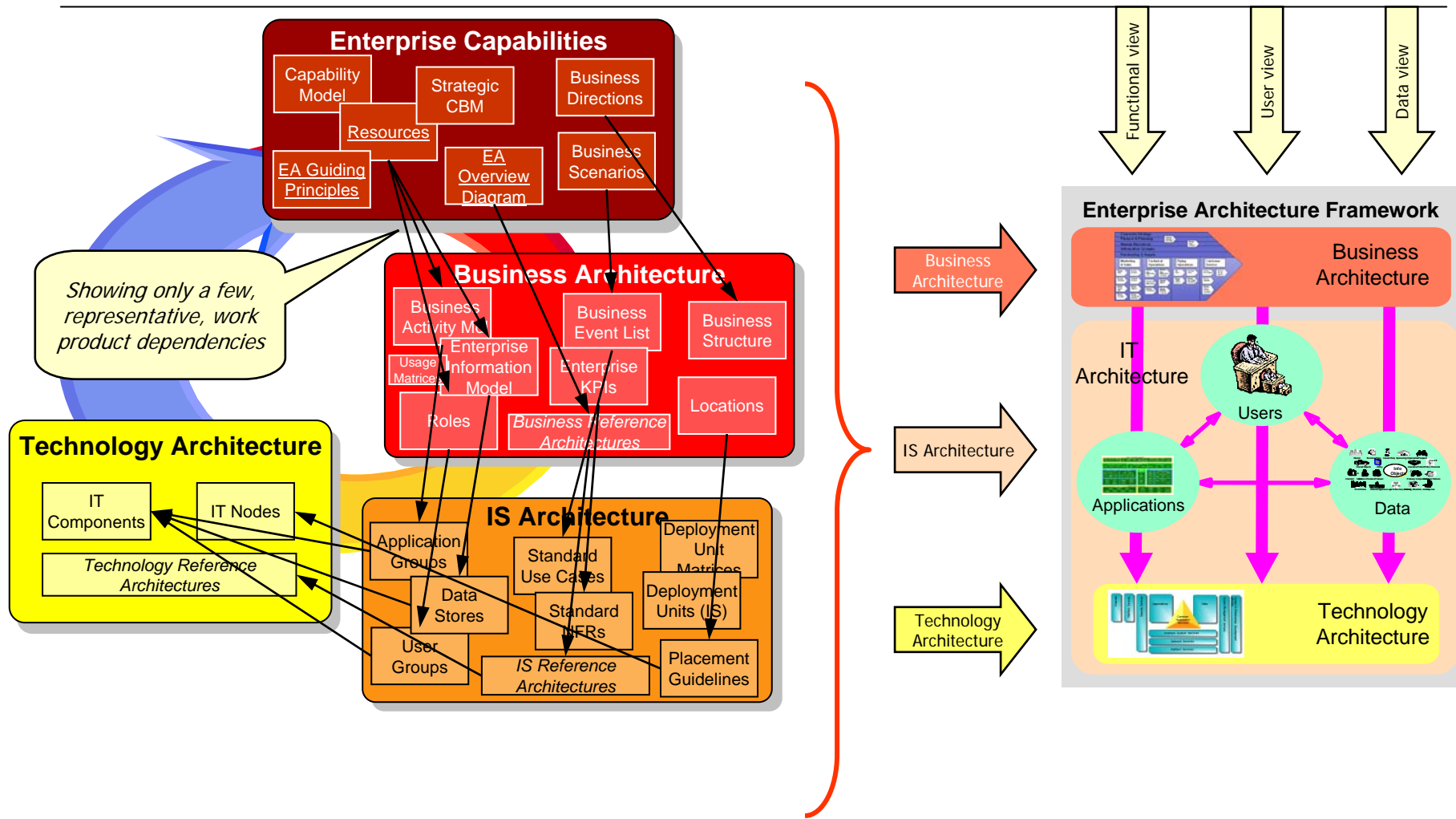
Enterprise Architecture Decomposition



EA architecture framework – Layers



EA's architecture framework – Use of work products and the notion of work product dependencies



Business Architecture – Purpose

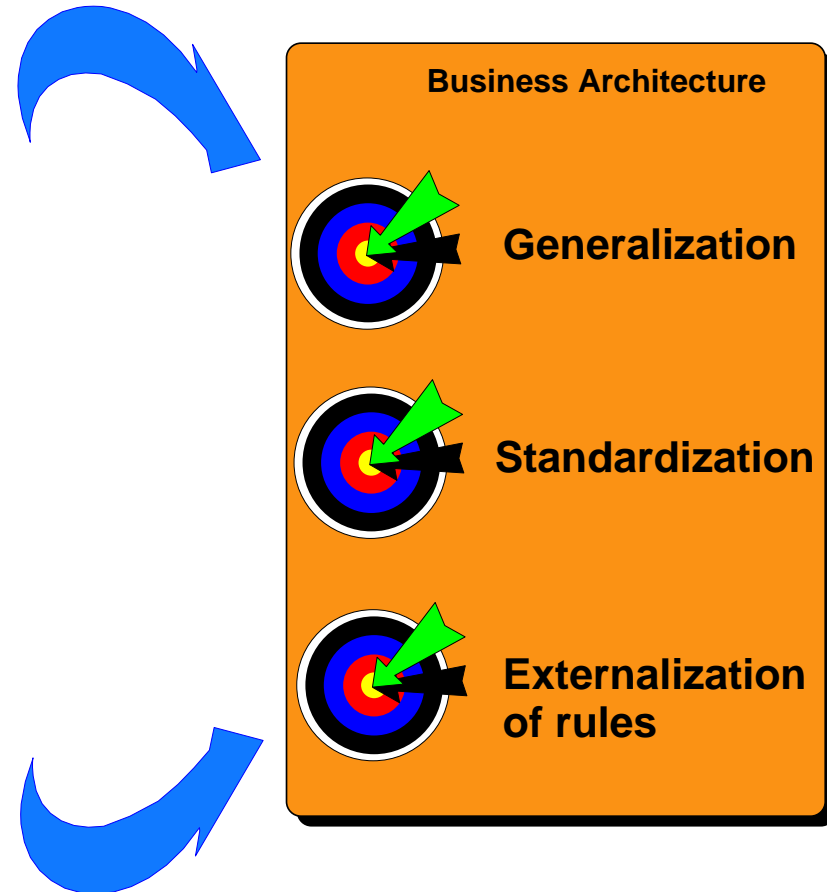
- A **Business Architecture** (BA) provides a framework which reflects both current and future business environments and guides future IT investment and implementation decisions.
- It ensures that any **tactical decision** making is aligned with the overall business goals and objectives.
- It provides a **transformation vehicle** that allows a business strategy to be effectively translated into an implementation plan which uses process, information/knowledge, organization and technology resources.

Business Architecture – Definitions

Business Activity	An activity may be a manual or automated operation that completes a unit of work. A "leaf level" activity is the lowest level of activity that cannot be decomposed further without considering how to implement them.
Business Process	Activities are combined to create a business process — a structured, measured set of activities, that takes input and creates output of value to a customer. A "leaf level" activity can occur in many different business processes.
Business Event	A stimulus or trigger which initiates one or more processes. A set of conditions which cause a process to be performed.
Information Entity	A person, place, thing, concept, or event that the business needs to manage and about which it may need to keep data.
Business Role	Business roles are logical, categories of job that perform the business activities of the enterprise — e.g. Underwriter, Claims Assessor, Regulator, Loan Recipient, Sales Person. As such, they combine business activities into a recognisable relationship.
Business Location	Business locations identify both the physical and logical places, or sites, where the activities of the business are carried out. The physical locations are simply the geographical places where the business has a presence; the logical locations are classifications, or categories, of these physical sites, based on the types of business activities that are performed at them.

Business Architecture – Reducing Variation

- Client orientation and role recognition
- Available, consistent, accurate client information
- Reduced duplication
- Flexible, reusable components
- Lower maintenance costs
- Accurate marketing information
- Cross-marketing, target-marketing
- Faster time-to-market
- Ability to add or assimilate channels

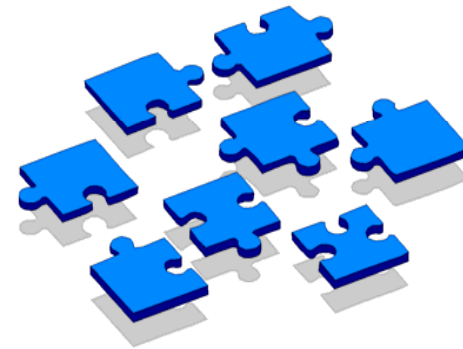


A good Business Architecture incorporates a model of how the company wants to do business in future

A Business Model is a **structured abstraction** of important features of "the real world" for solving business problems. It is built within the Business Architecture to represent what the business cares about.

Business models are built for the purpose of:

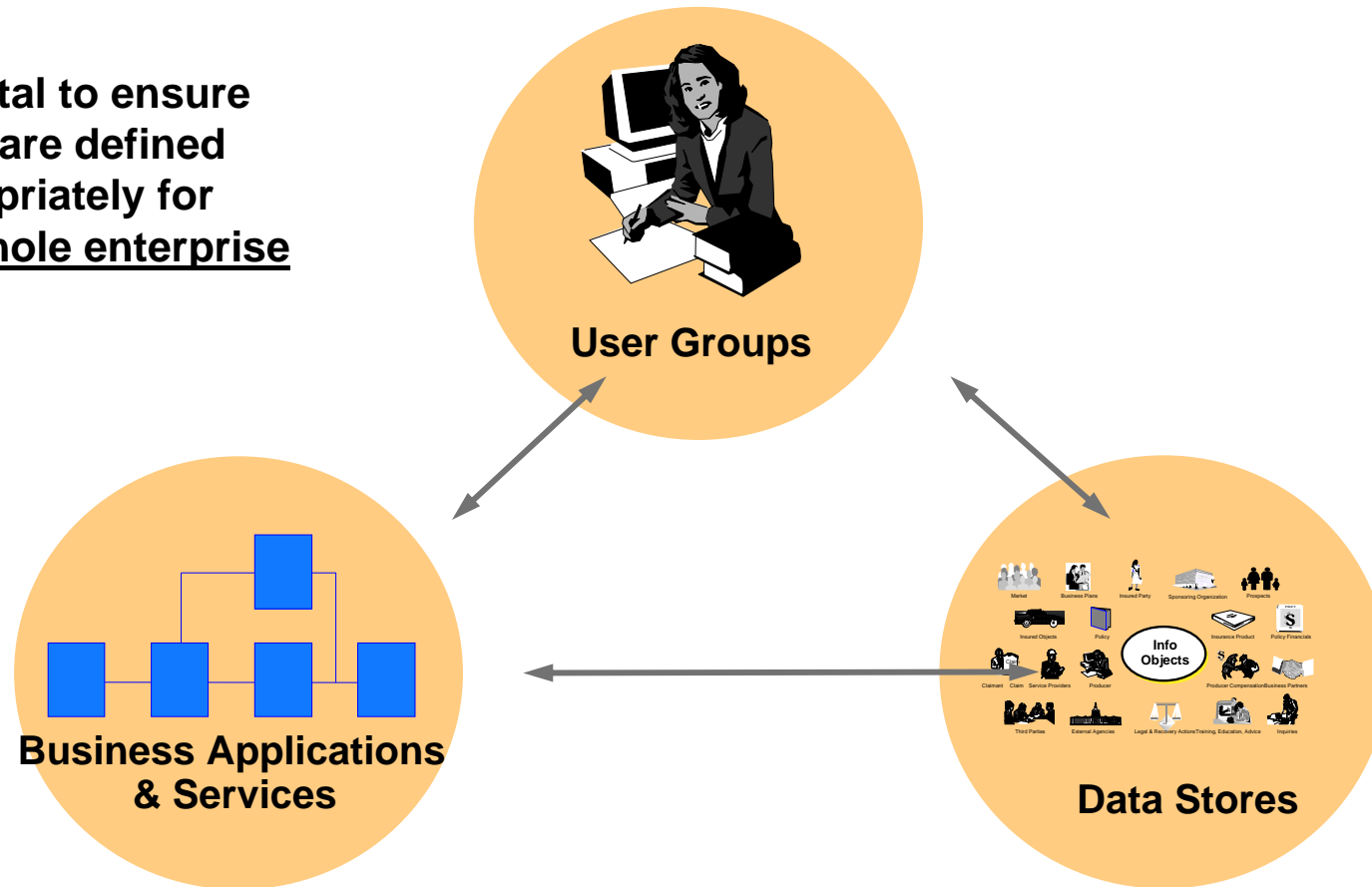
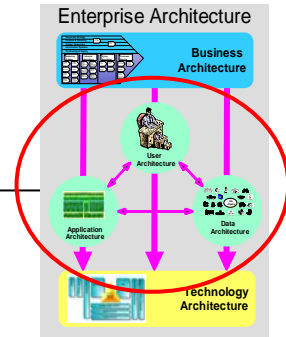
- Common understanding
- Communication
- Requirements definition
- Optimal process definition
- Problem resolution
- Reduced variation and greater reuse
- Alignment of projects to business strategy and priorities



A Business Model does **not** include implementation considerations.

The IS Architecture is centered on an enterprise wide specification of the business drivers

- It is vital to ensure these are defined appropriately for the whole enterprise

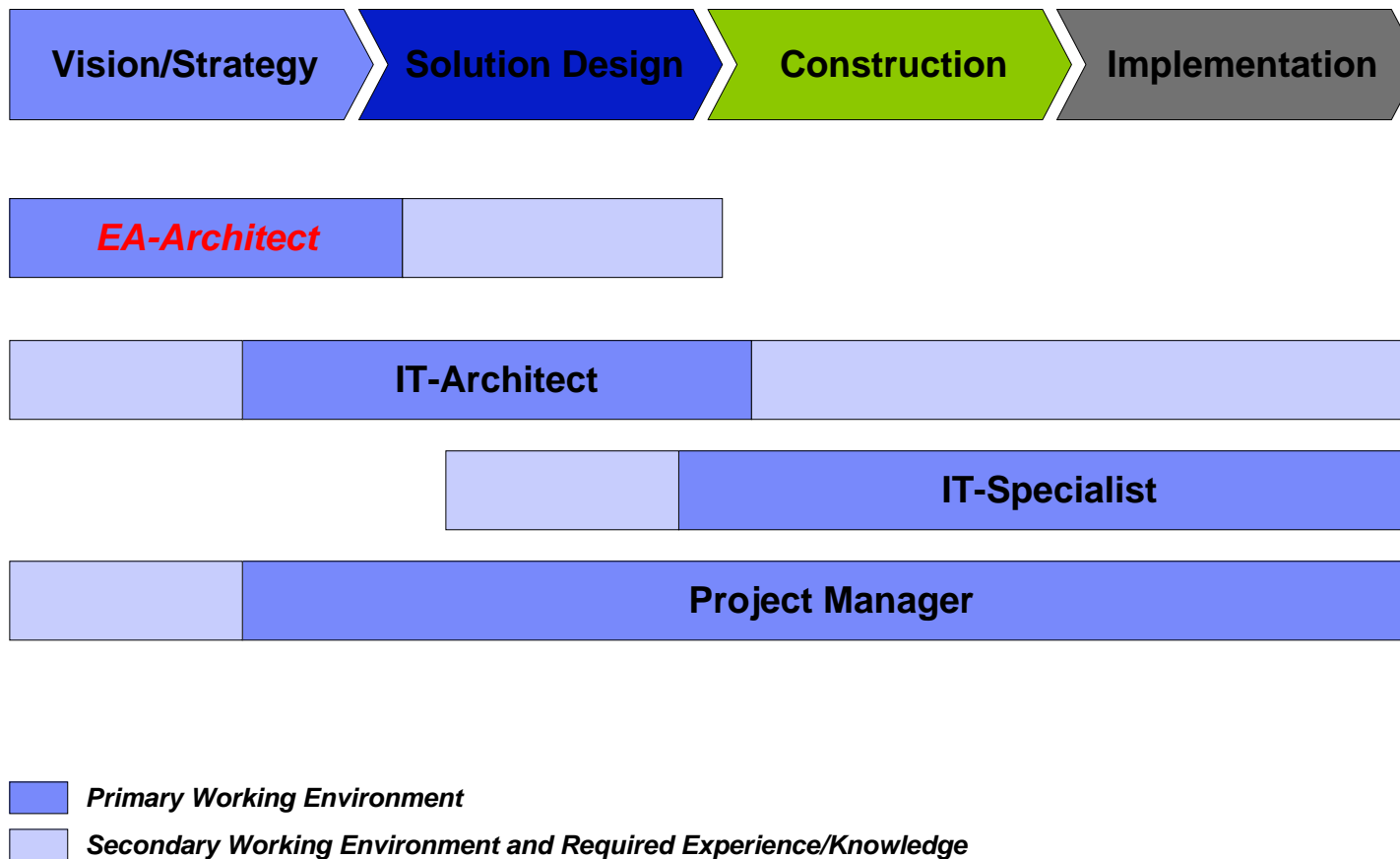


VI. EA Governance, Transition

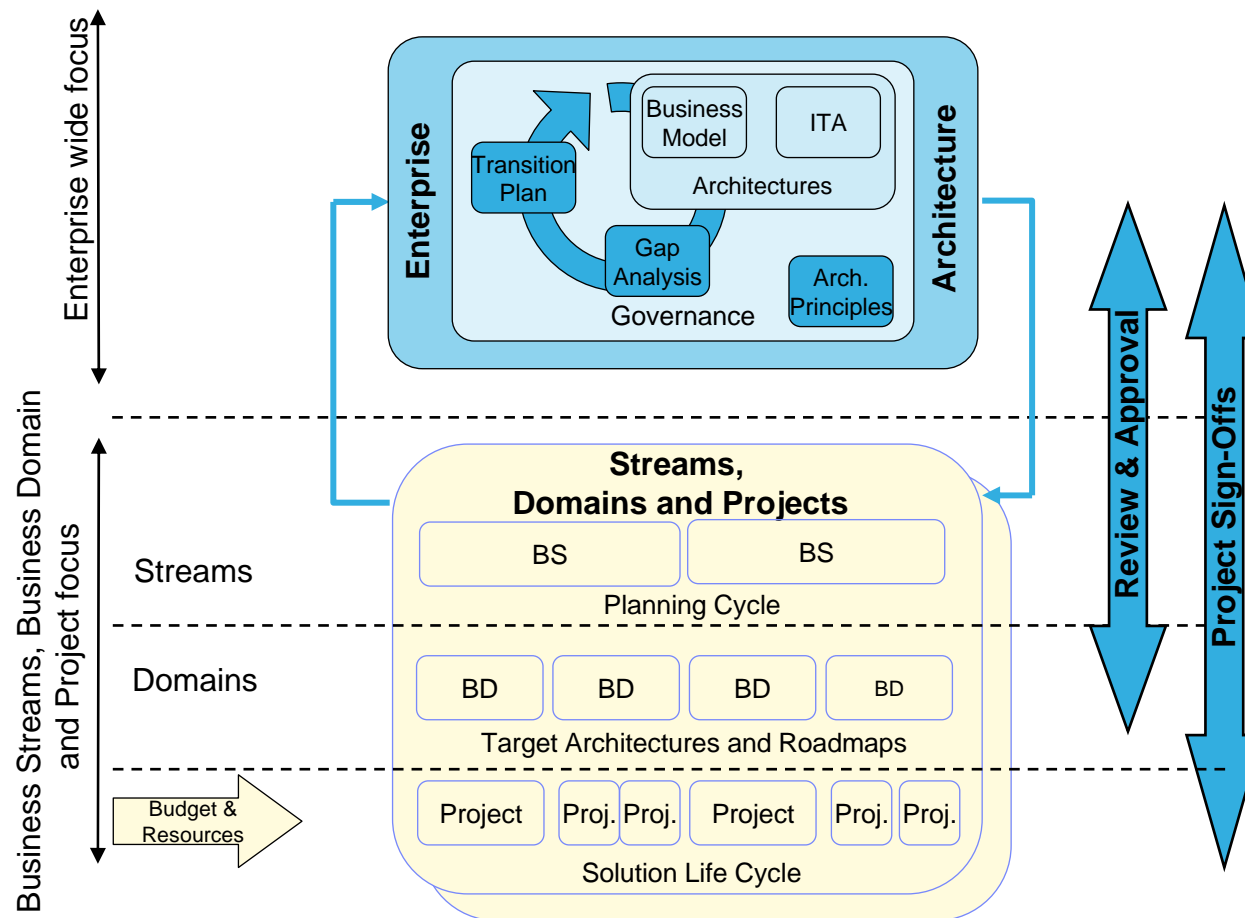
A Typical Scenario



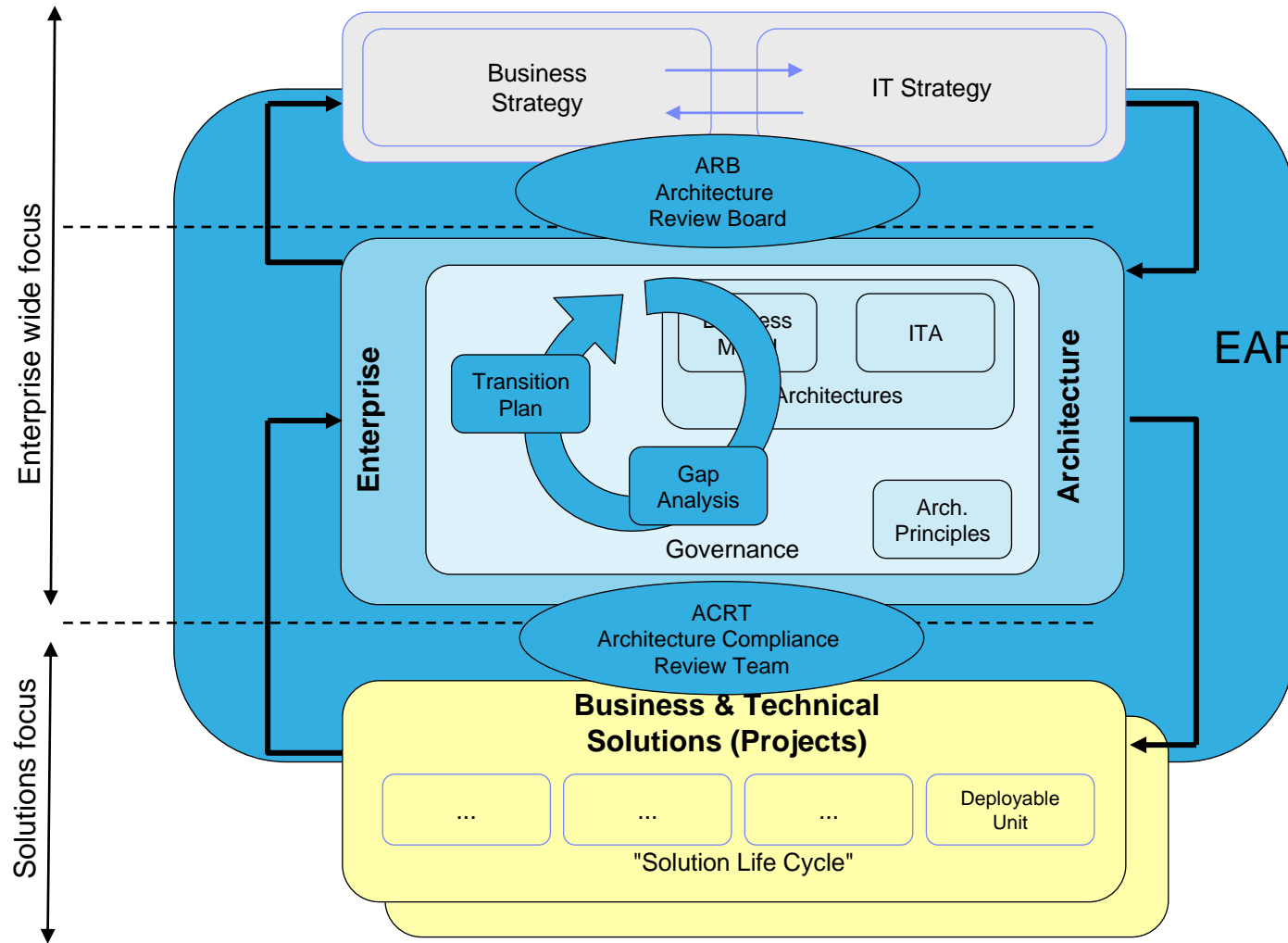
EA Architects are primarily involved in strategy and solution design stages



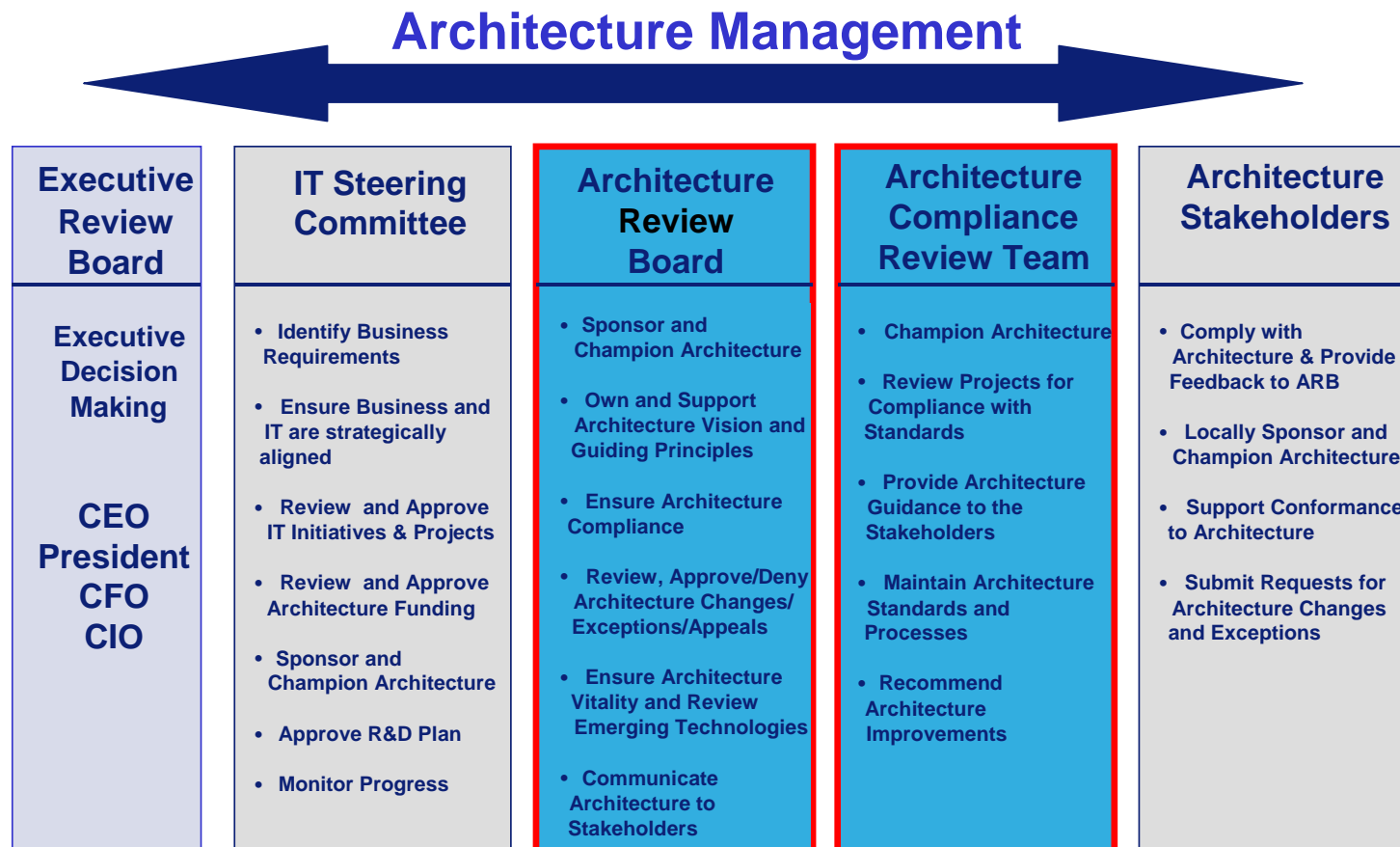
Enterprise Architecture and Gap Analysis & Transition



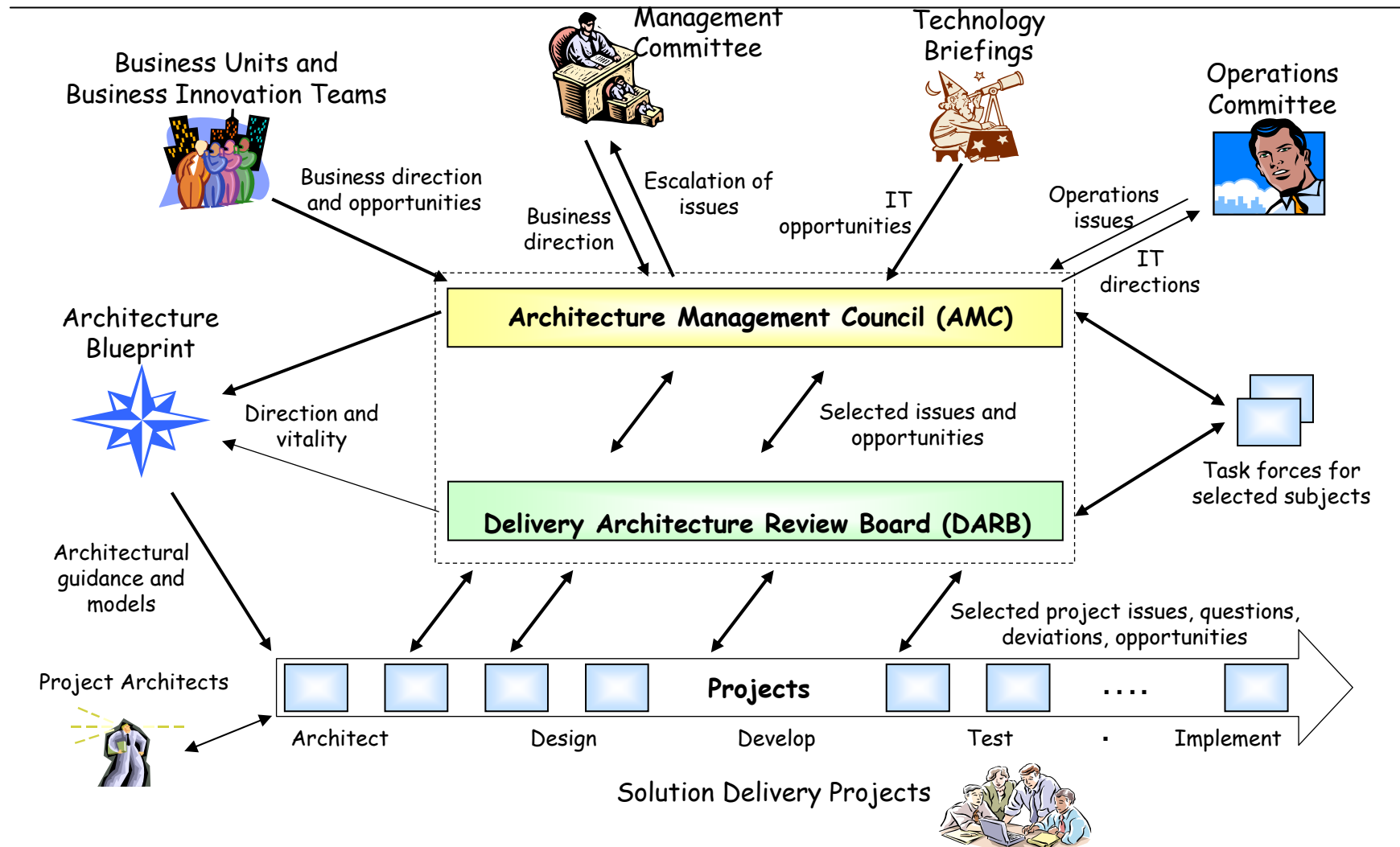
Committees for ensuring Enterprise Architecture



EA Governance – Overview of the boards/committees



Example Architecture Organizational Model



Transition initiatives need to be prioritised and approved as part of the overall IT Operating Plan for the enterprise

- EA inspired initiatives should be considered alongside all requests for IT resource (development and implementation):
 - Business driven
 - Technology driven
 - Architecture driven



So as well as guiding development, the EA framework must also provide transition “roadmaps”

TA Product/Service Evaluation Summary

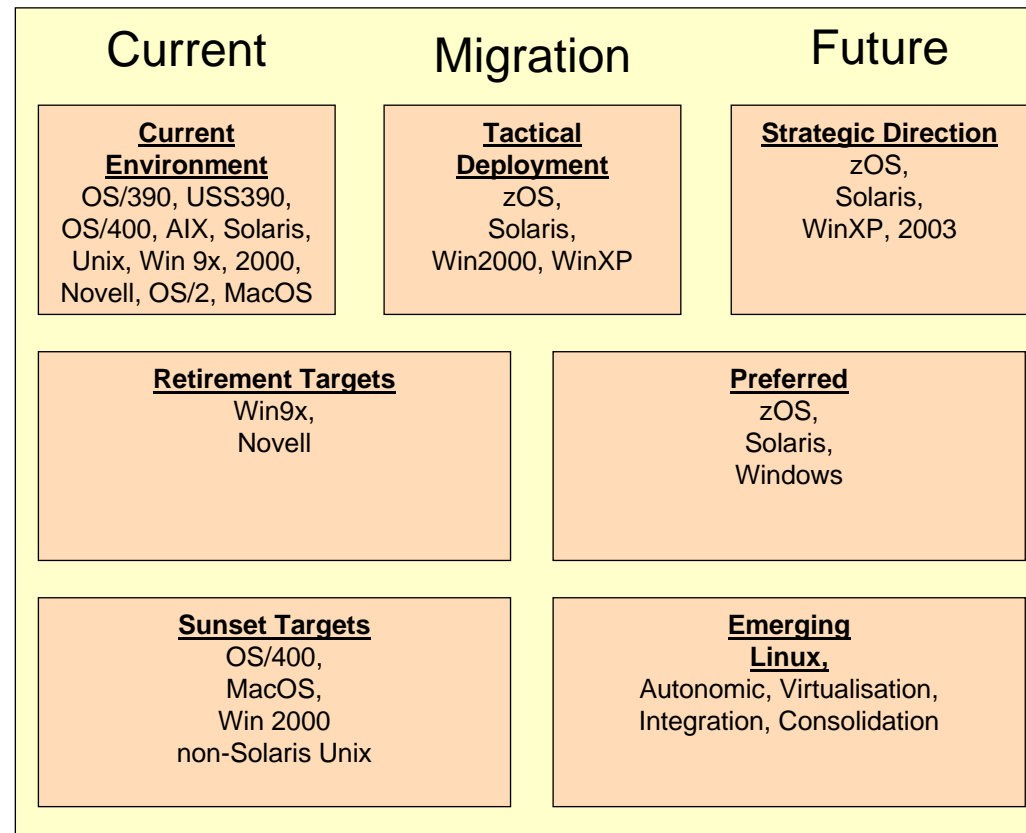
New Technology (Product/Service) Evaluation

Evaluation Percentages Definition	%	Overall		%	Weight	Weight	%	Raw	Raw
		Score	Max						
Evaluation Totals	80%	4.0	5.0	100%					
Business Functionality Requirements	90%	1.3	1.5	30%	8%	4.5	5.0	100%	88% 13.3 15.0
Met New Attributes	100%	0.5	0.5	30%	100%	5.0	5.0	100%	5.0 5.0 5.0
Required Attributes	88%	3.3	3.5	20%	90%	4.7	5.0	90%	4.7 5.0 5.0
Change Attributes	75%	0.7	1.0	20%	75%	3.7	5.0	75%	3.7 5.0 5.0
Business Cost of Ownership	61%	0.9	1.5	30%	6%	3.1	5.0	100%	64% 12.8 20.0
Purchase/Upgrade Costs	28%	0.5	1.5	20%	28%	1.7	5.0	30%	\$204.0K \$1,200.0K
Installation Costs	80%	0.8	1.5	20%	80%	3.0	5.0	50%	\$1,004.0K \$1,004.0K
Maintenance/Service/Support Costs	73%	0.6	1.5	20%	73%	3.7	5.0	50%	\$275.0K \$1,000.0K
Training/Documentation Costs	80%	0.9	1.0	20%	80%	4.5	5.0	50%	\$64.0K \$200.0K
Disposal Costs	0%	0.0	0.0	0%	0%	0.0	0.0	0%	\$0 \$0
Technical Architecture Conformance	100%	1.0	1.0	20%	100%	5.0	5.0	100%	100% 30.0 30.0
Presentation Services	100%	0.8	0.8	15%	100%	5.0	5.0	50%	5.0 5.0 5.0
Application Services	100%	1.0	1.0	20%	100%	5.0	5.0	50%	5.0 5.0 5.0
Data	100%	1.0	1.0	20%	100%	5.0	5.0	50%	5.0 5.0 5.0
Hardware	100%	0.8	0.8	15%	100%	5.0	5.0	50%	5.0 5.0 5.0
Operating System	100%	0.8	0.8	15%	100%	5.0	5.0	50%	5.0 5.0 5.0
Communication	100%	0.8	0.8	15%	100%	5.0	5.0	50%	5.0 5.0 5.0
Usability/Manageability	79%	0.4	0.5	10%	79%	4.0	5.0	100%	88% 23.9 30.0
Presentation Services	84%	0.6	0.8	15%	84%	4.2	5.0	50%	4.2 5.0 5.0
Application Services	88%	0.7	1.0	20%	88%	3.4	5.0	50%	3.4 5.0 5.0
Data	88%	0.5	1.0	20%	88%	4.3	5.0	50%	4.3 5.0 5.0
Hardware	78%	0.6	0.8	15%	78%	3.8	5.0	50%	3.8 5.0 5.0
Operating System	88%	0.6	0.8	15%	88%	4.3	5.0	50%	4.3 5.0 5.0
Communication	8%	0.6	0.8	15%	8%	4.0	5.0	50%	4.0 5.0 5.0
Vendor Viability	71%	0.4	0.5	10%	71%	3.8	5.0	100%	74% 14.7 20.0
Financial Performance	72%	1.1	1.5	30%	72%	3.6	5.0	50%	3.6 5.0 5.0
Delivery Performance	50%	0.8	1.5	20%	50%	2.5	5.0	50%	2.5 5.0 5.0
Support Services	72%	0.7	1.0	20%	72%	3.6	5.0	50%	3.6 5.0 5.0
Training Services	100%	1.2	1.0	20%	100%	5.0	5.0	50%	5.0 5.0 5.0

Category Weighting: Relative Percentage of overall importance to the business of the specific Category. The sum of all relevant categories must total 100%.

Preferred Product Analysis: Selection Criteria

Building Block: Operating System



VII. Example - JKE

Example – JKE: a retail company

- In the business since a long time
 - Has grown by acquisition
 - Has ambitious goals
 - But not yet the appropriate infrastructure

- Case Study
 - Work out early drafts of Enterprise Architecture Work Products
 - Mainly
 - Define Enterprise Architecture Principles
 - Develop an Enterprise Architecture Overview Diagram

1) Define Enterprise Architecture Principles

- Points to consider:
 - Cost-sensitive
 - Review Context Document
 - Business (and IT) Pain Points

- Template
 - Principle:
 - Motivation:
 - Implication:

2) Rework Architecture Overview Diagram (from AS-IS to TO-BE)

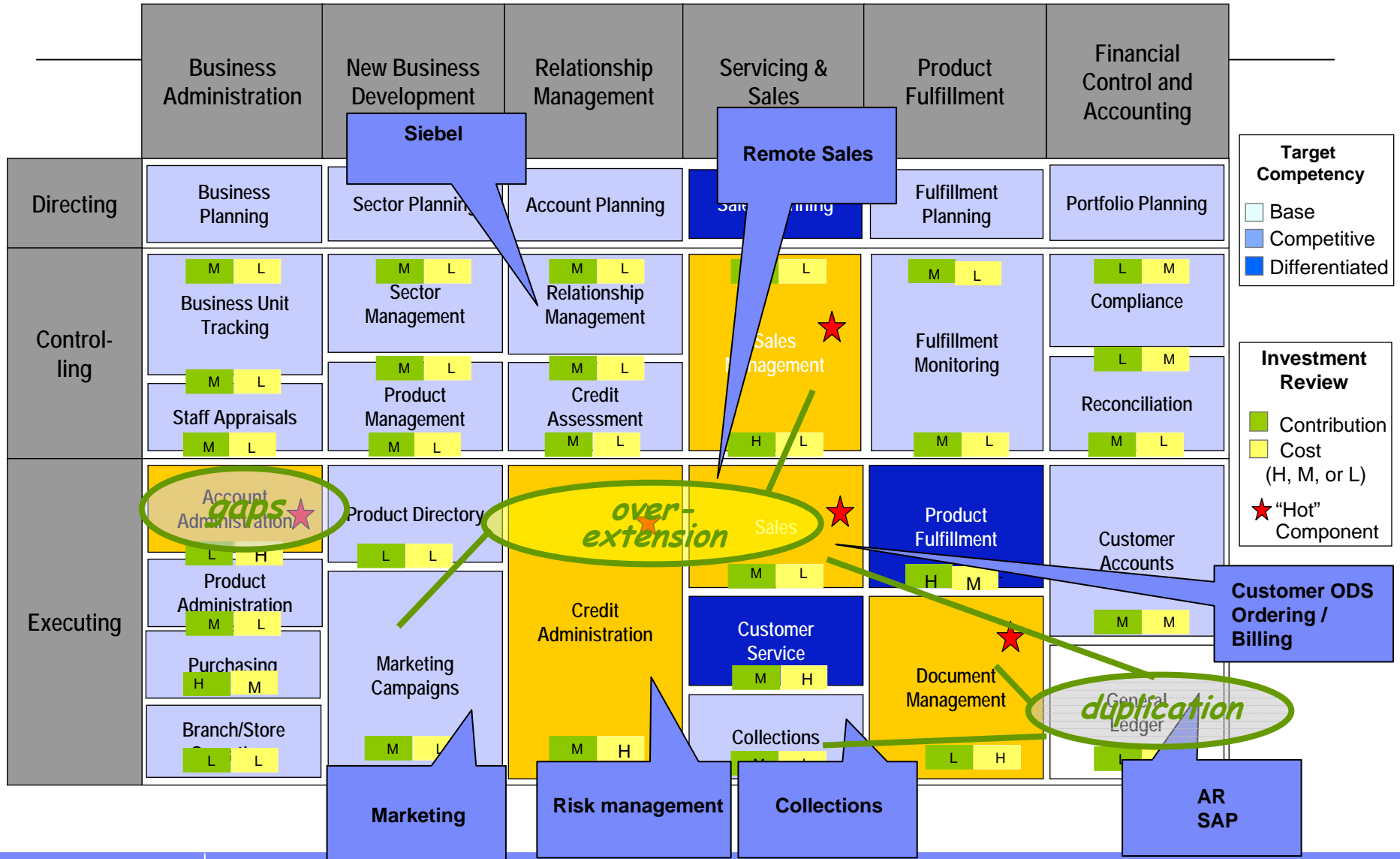
- Points to consider:
 - Needs new functionality
 - Business
 - IT
 - SOA Support

- Use results from
 - Pilot project “Account Opening”
 - CBM
 - SOMA

Key Performance Indicators

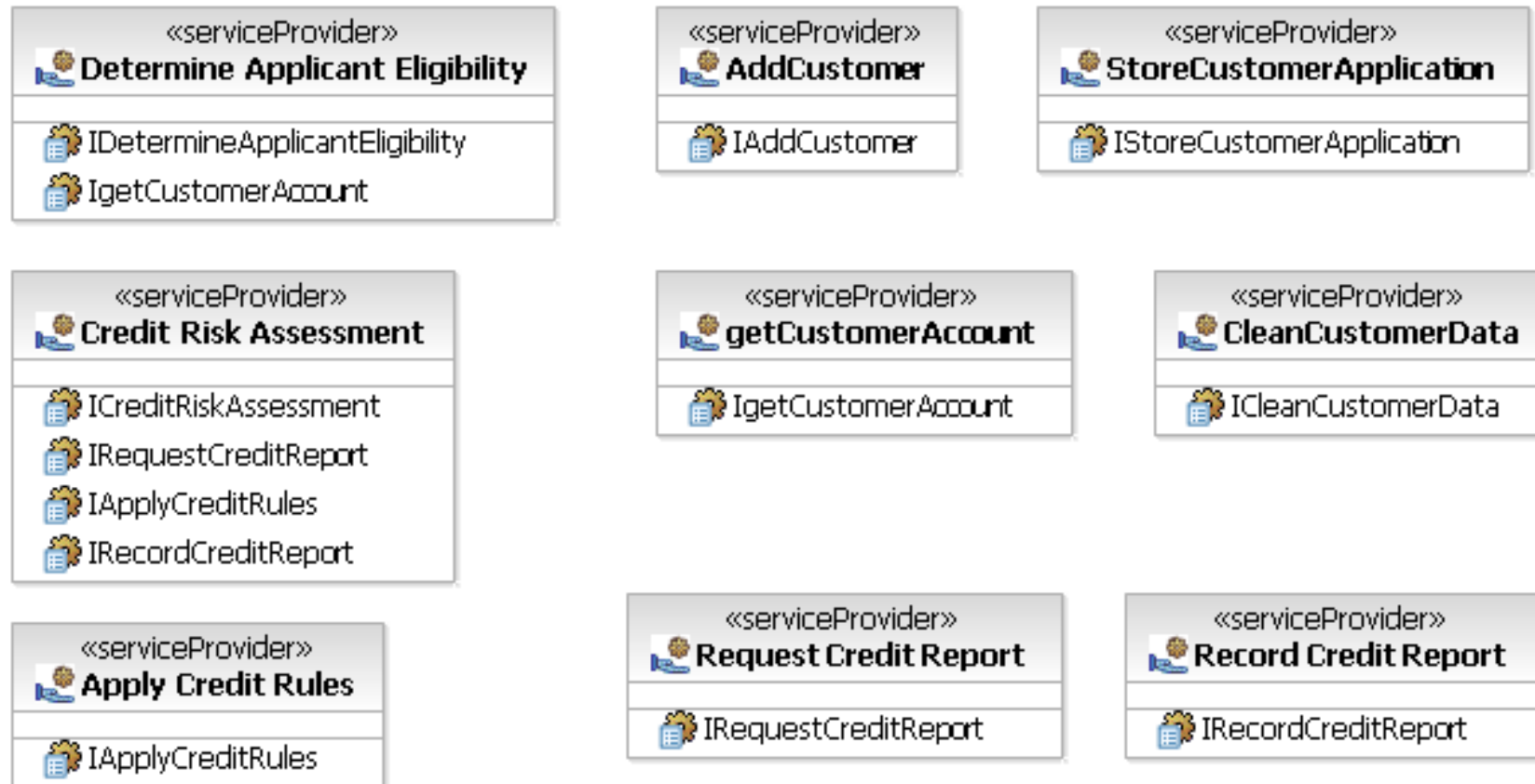
- For each of the hot components identified create a list of potential improvement/innovation opportunities
 - **Account Administration**
 - Automate the manual tasks for creating and administering accounts
 - Decrease cost of account activation by 50%
 - **Credit Administration**
 - Design and build optimized services to support converged organization
 - Negotiate better prices with our vendors taking advantage of our combined size
 - Decrease negotiated cost (Vendor volume discounts) of credit report retrieval by 20%
 - Automate 75% of all credit report retrievals
 - Implement consistent business rules to manage risk
 - Decrease number of credit report retrievals by 10%
 - **Document Management**
 - Decrease number of paper documents processed by task automation
 - Increase electronic applications by 25%
 - **Sales**
 - Converged on optimized cross channel account application process
 - Reduce number of call center calls by sales force and offices (stores) by 30% (account inquiry)

Domain Decomposition: CBM for JKE



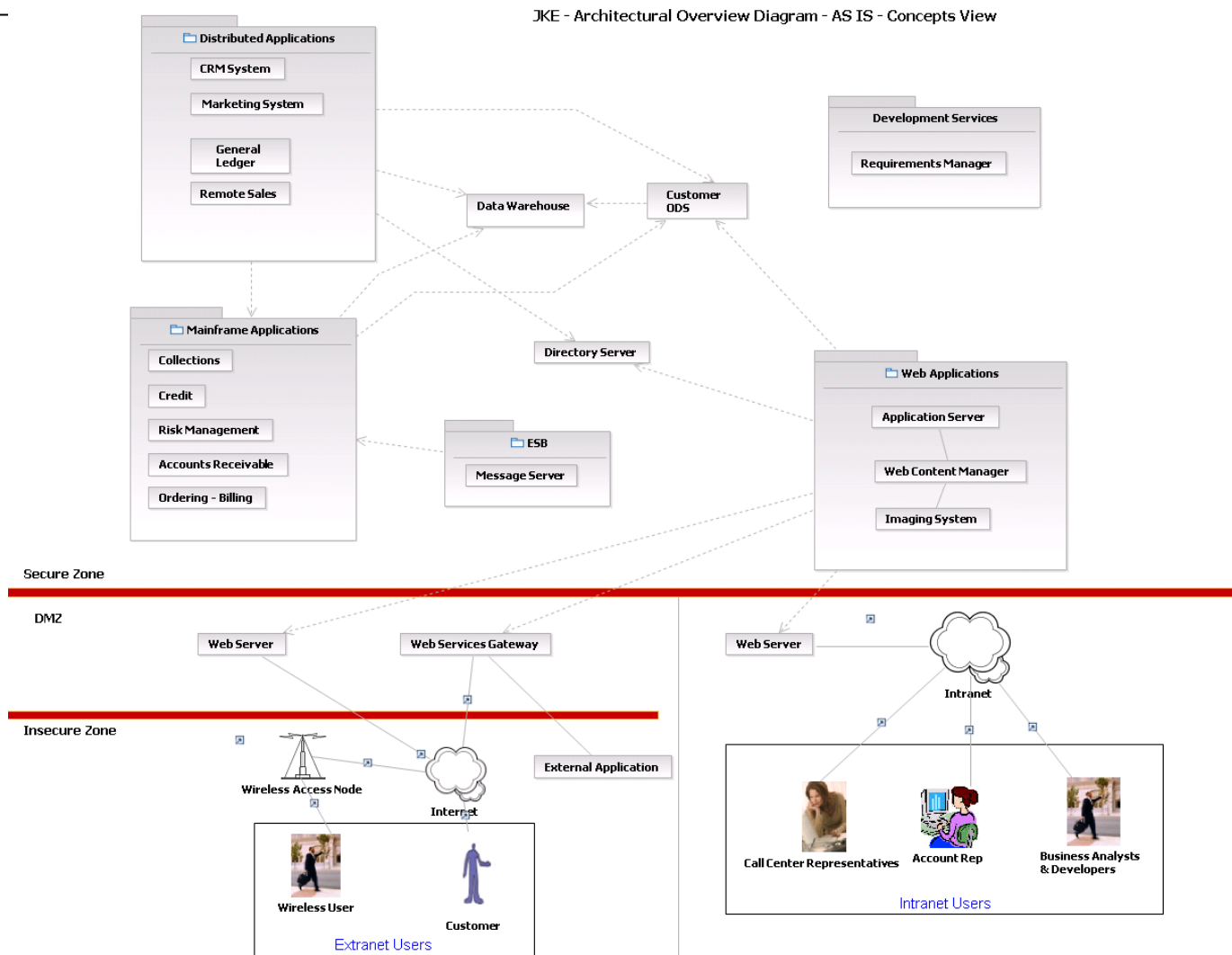
Service Specification: Service Component Model -- JKE

JKE Service Component Diagram



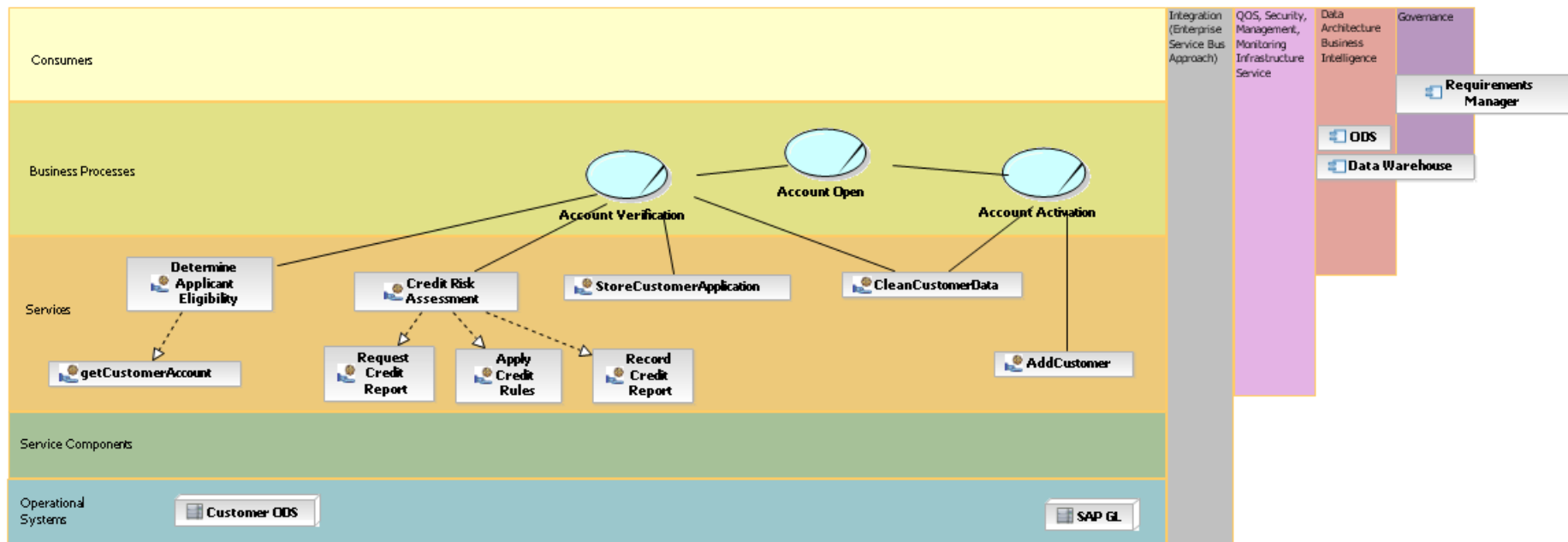
- Shows service specification as Service Interface
- Can add to this diagram, the service realization as those decisions are made

Case Study Input – As-Is Architectural Overview Diagram



Case Study Input – Begin of TO-BE SOA Solution Layer Perspective

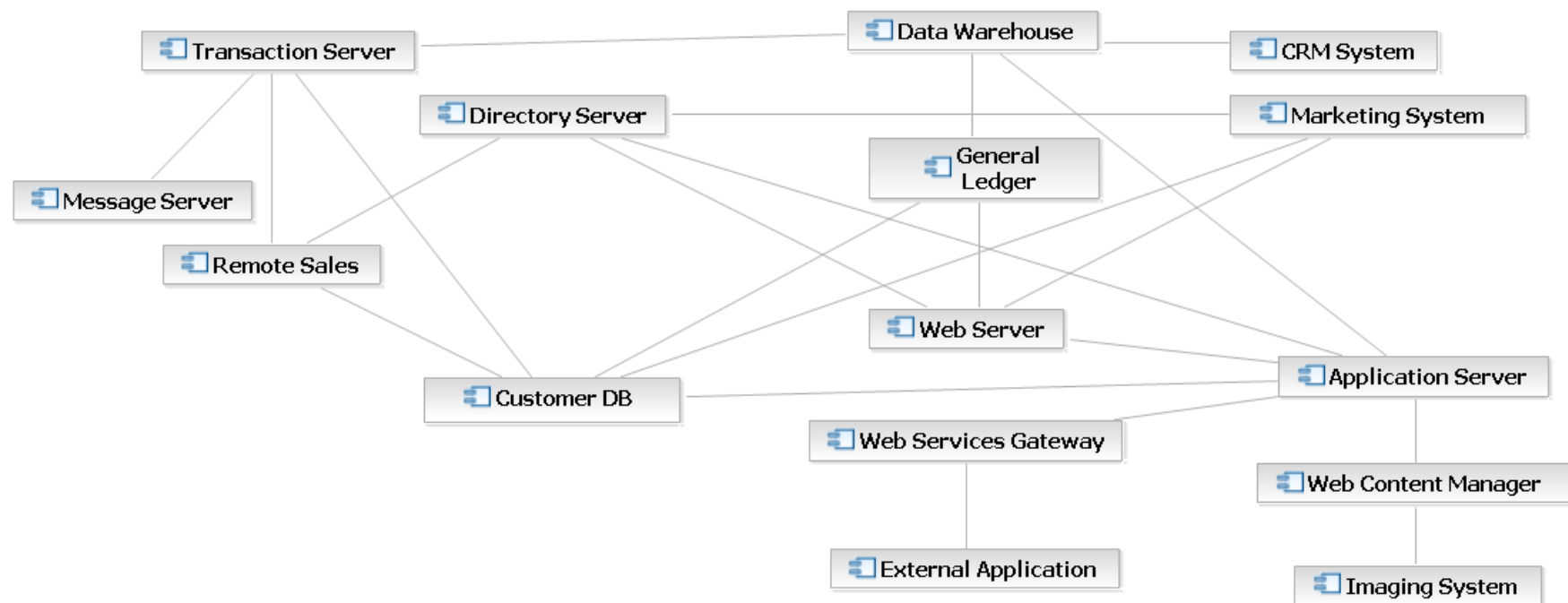
JKE SOA Solution Layer Perspective - AS IS



- Among the missing artifacts from this diagram, the Service Components (service realization)
- Also missing are To-Be supporting operational systems

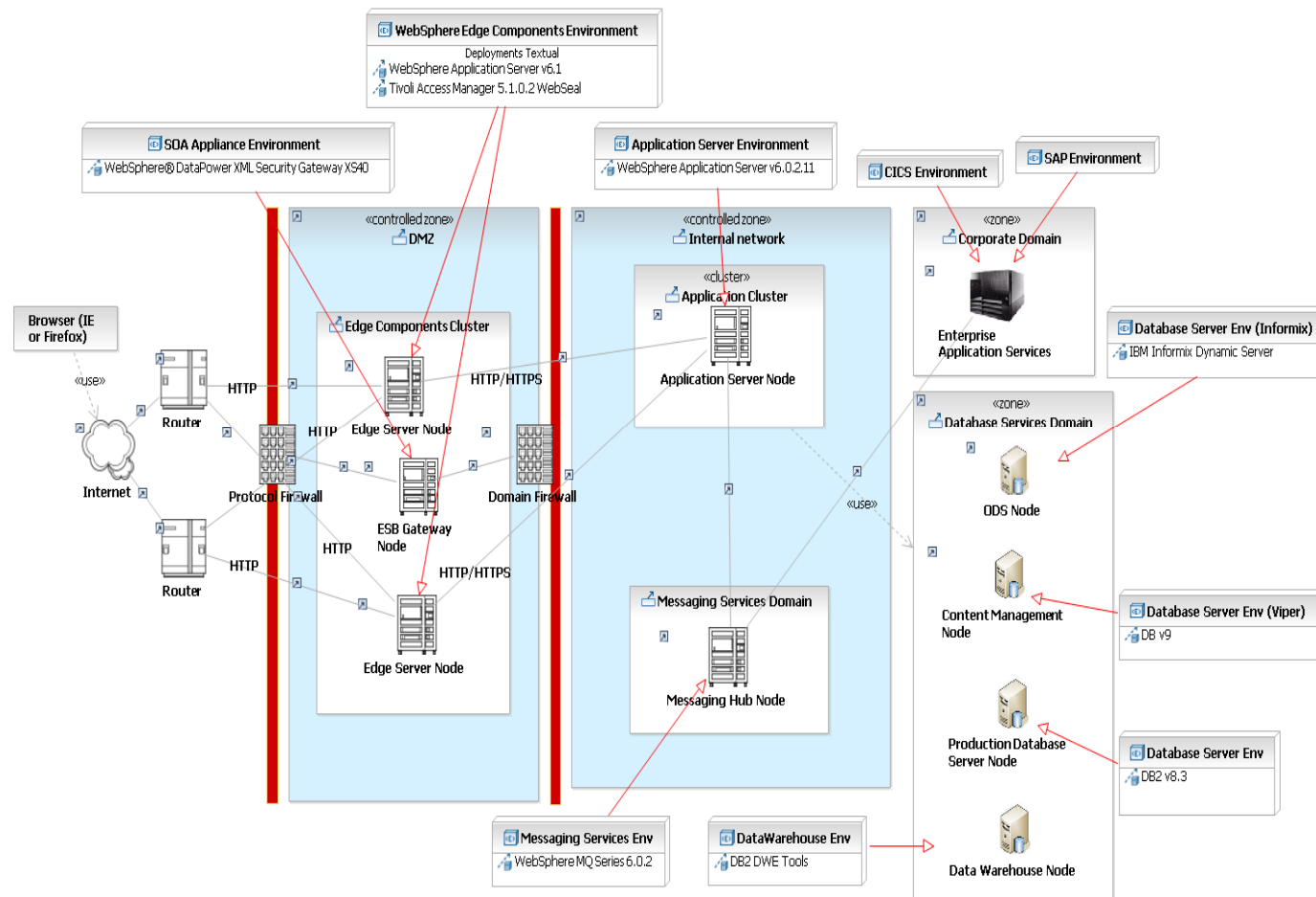
Case Study Input – As-Is Component Model

JKE Component Model - Case Study 2 - AS IS



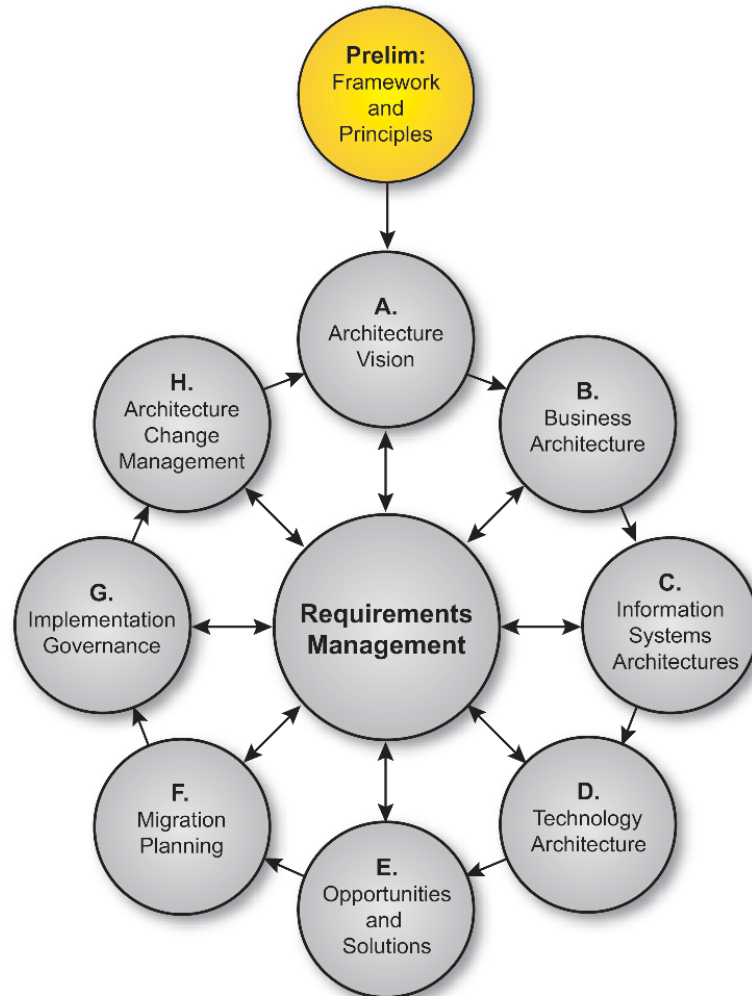
Case Study Input – AS-IS JKE Operational Model

JKE - Operational Model - Starting Point



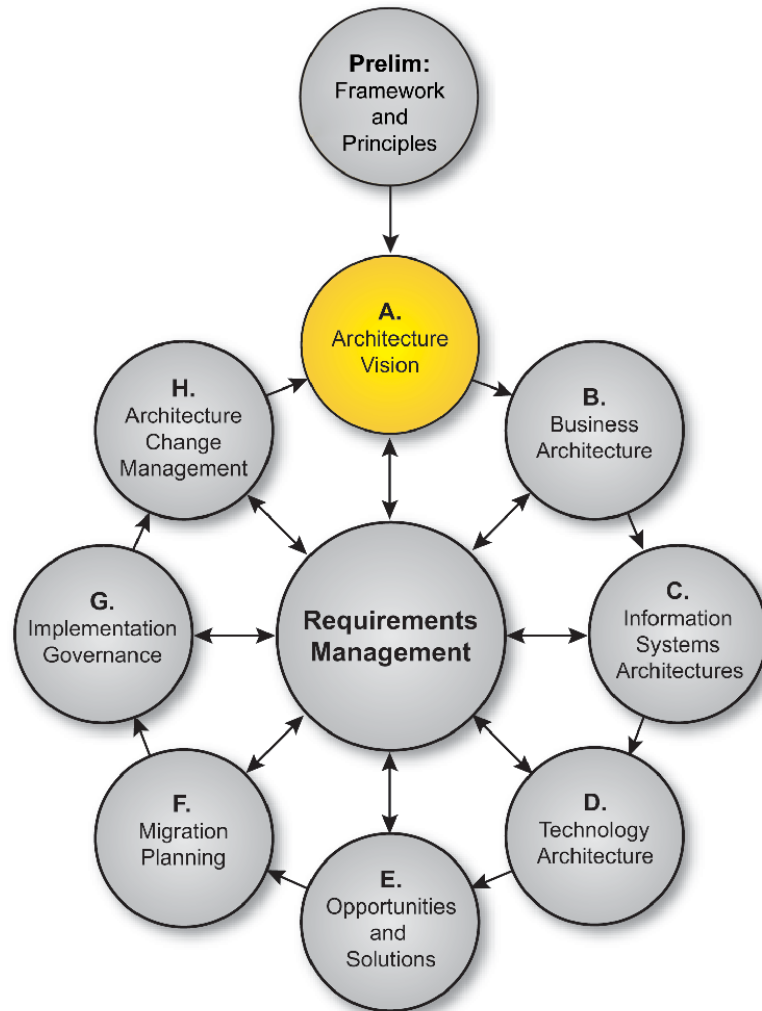
**Appendix
TOGAF Details**

Preliminary Phase: Frameworks & Principles



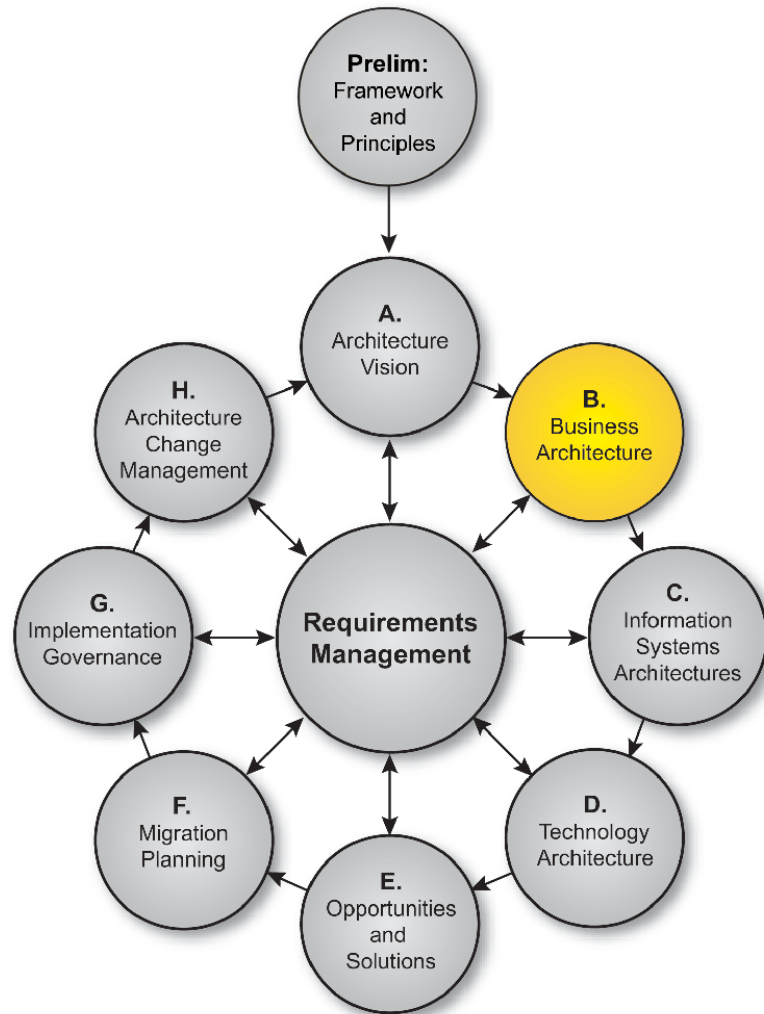
- This phase prepares the organization for undertaking Enterprise Architecture successfully
 - Understand business environment
 - High level management commitment
 - Agreement on scope
 - Establish principles
 - Establish governance structure
 - Agree method to be adopted

Phase A: Architecture Vision



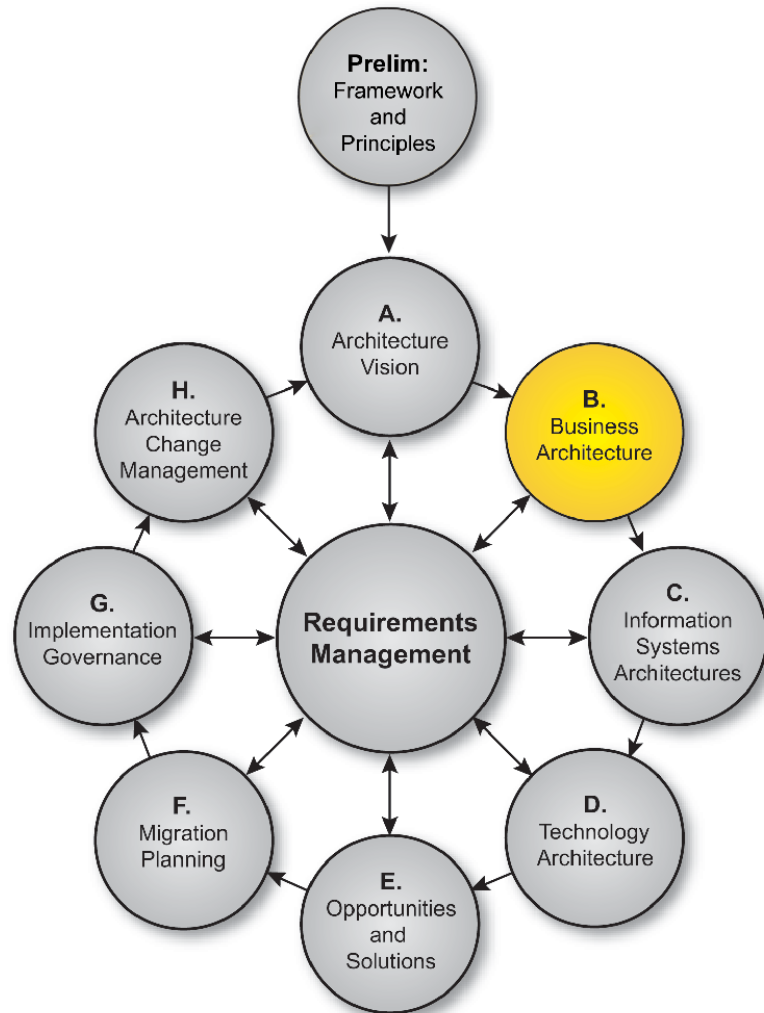
- Initiates one iteration of the architecture process
 - Sets scope, constraints, expectations
 - Required at the start of every architecture cycle
- Validates business context
- Creates Statement of Architecture work

Phase B: Business Architecture



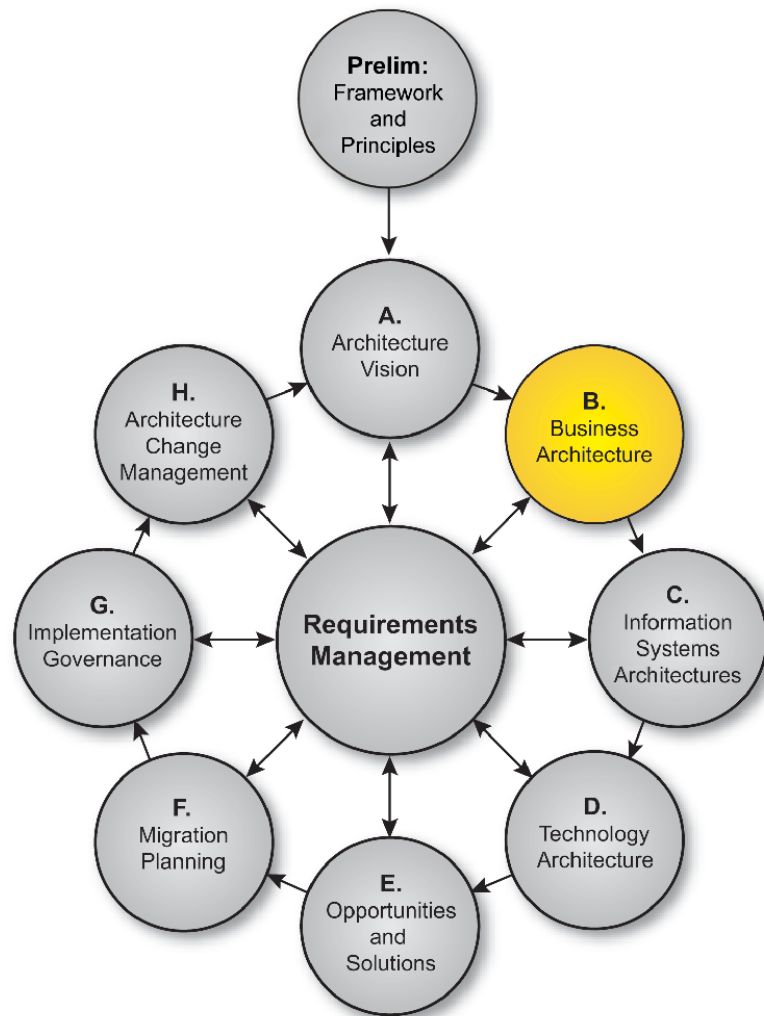
- The fundamental organization of a business, embodied in
 - its business processes and people,
 - their relationships
 - to each other and the environment,
 - and the principles governing its design and evolution
- Shows how the organization meets its business goals

Phase B: Business Architecture - Contents



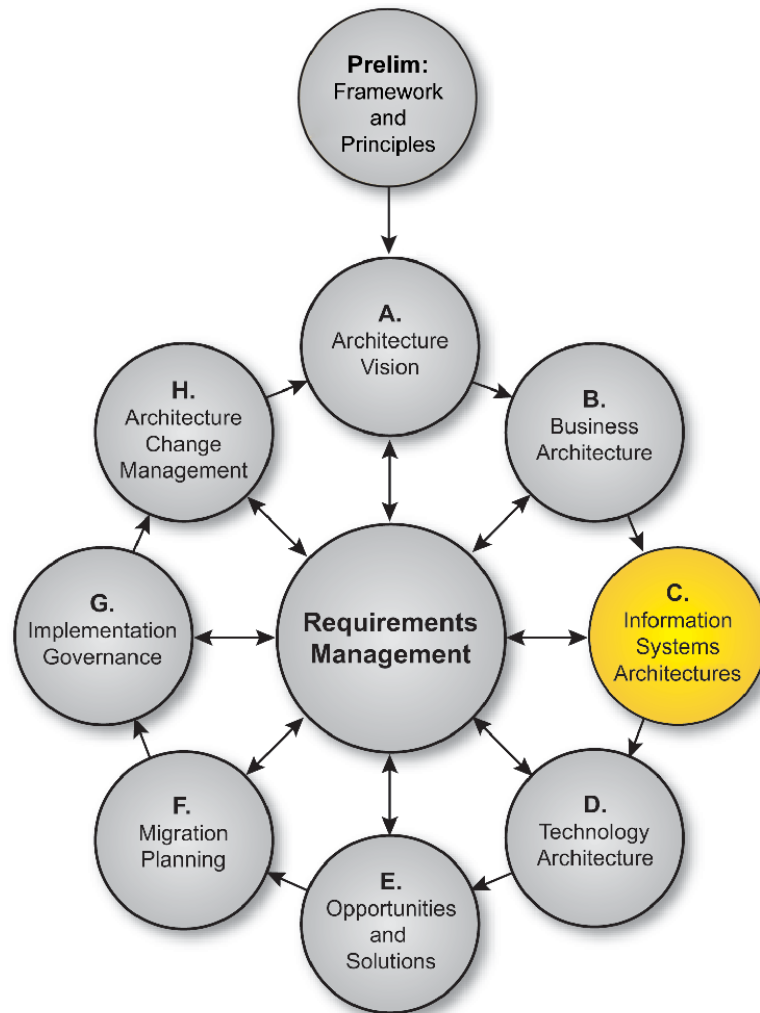
- Organization structure
- Business goals and objectives
- Business functions
- Business Services
- Business processes
- Business roles
- Correlation of organization and functions.

Phase B: Business Architecture - Steps



- Confirm context
- Define baseline
- Define target
 - Views are important
- Validate
 - Requirements
 - Concerns
- Perform Gap analysis
- Produce report

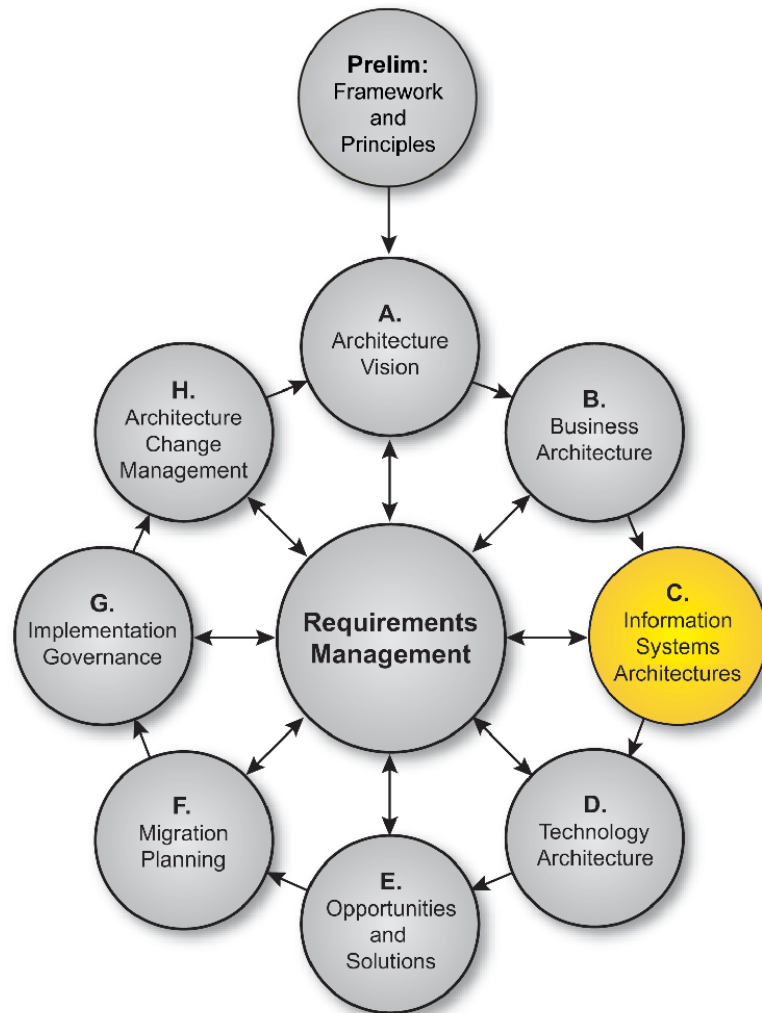
Phase C: Information Systems Architectures



- The fundamental organization of an IT system, embodied in
 - relationships to each other and the environment, and the principles governing its design and evolution
- Shows how the IT systems meets the business goals of the enterprise

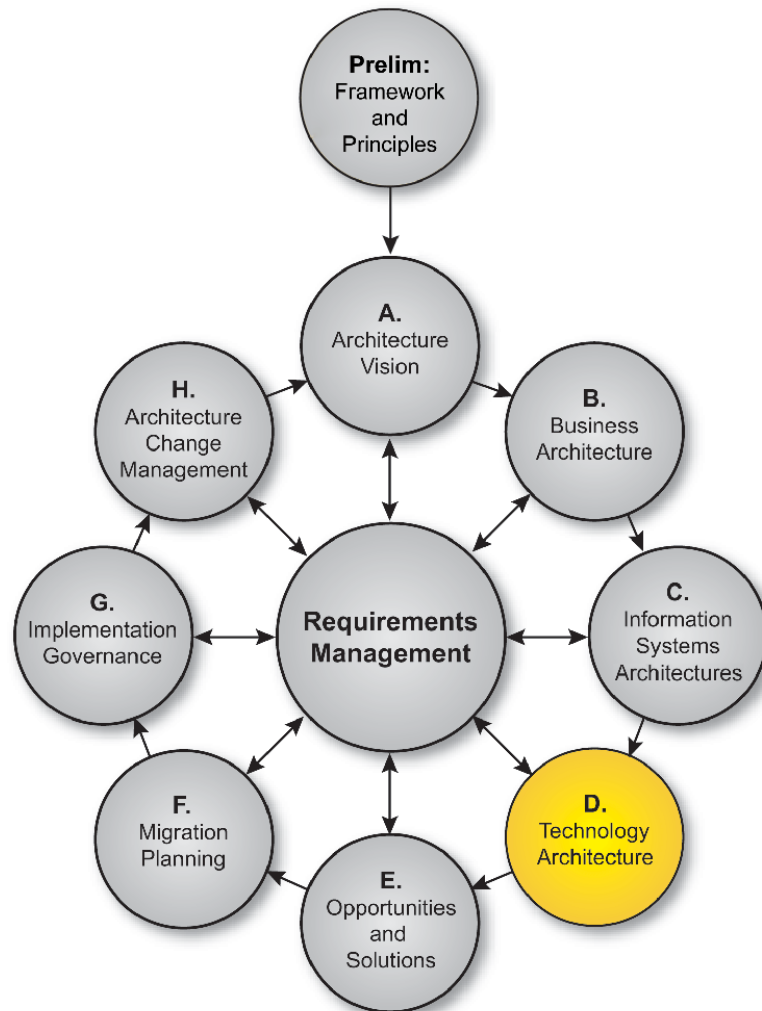
Continued

Phase C: Data or Applications first ?



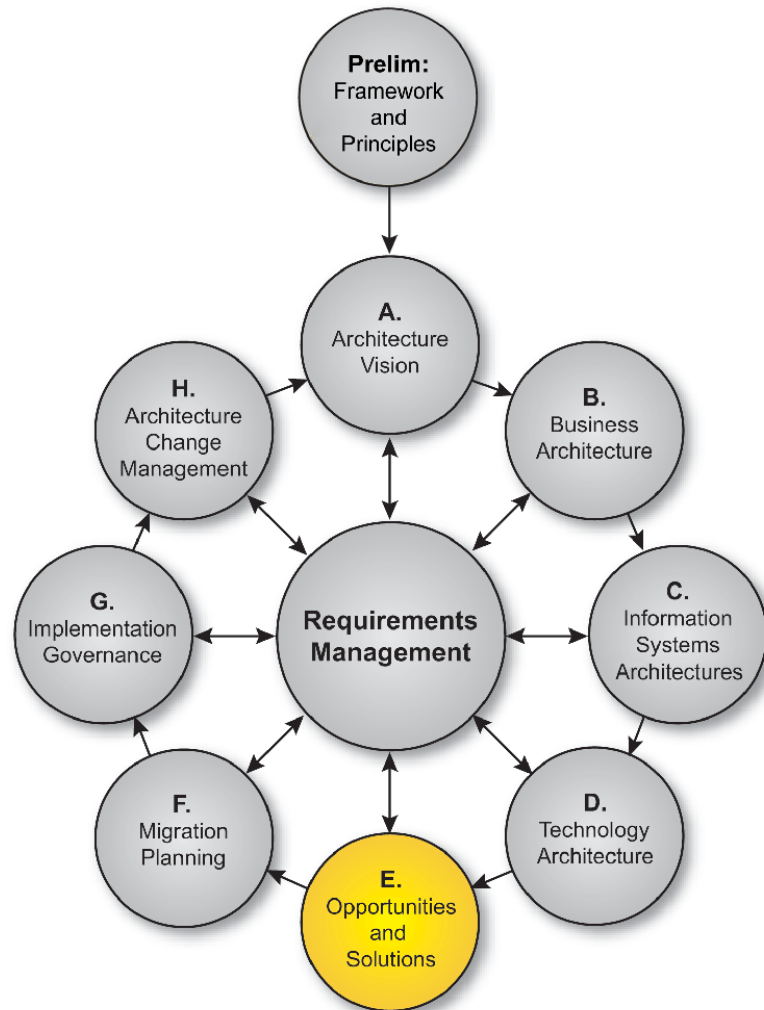
- It is usually necessary to address both
 - Not always the case, depending on project scope and constraints
- May be developed in either order, or in parallel
 - Theory suggests Data Architecture comes first
 - Practical considerations may mean that starting with Application Systems may be more efficient
- There will need to be some iteration to ensure consistency

Phase D: Technology Architecture



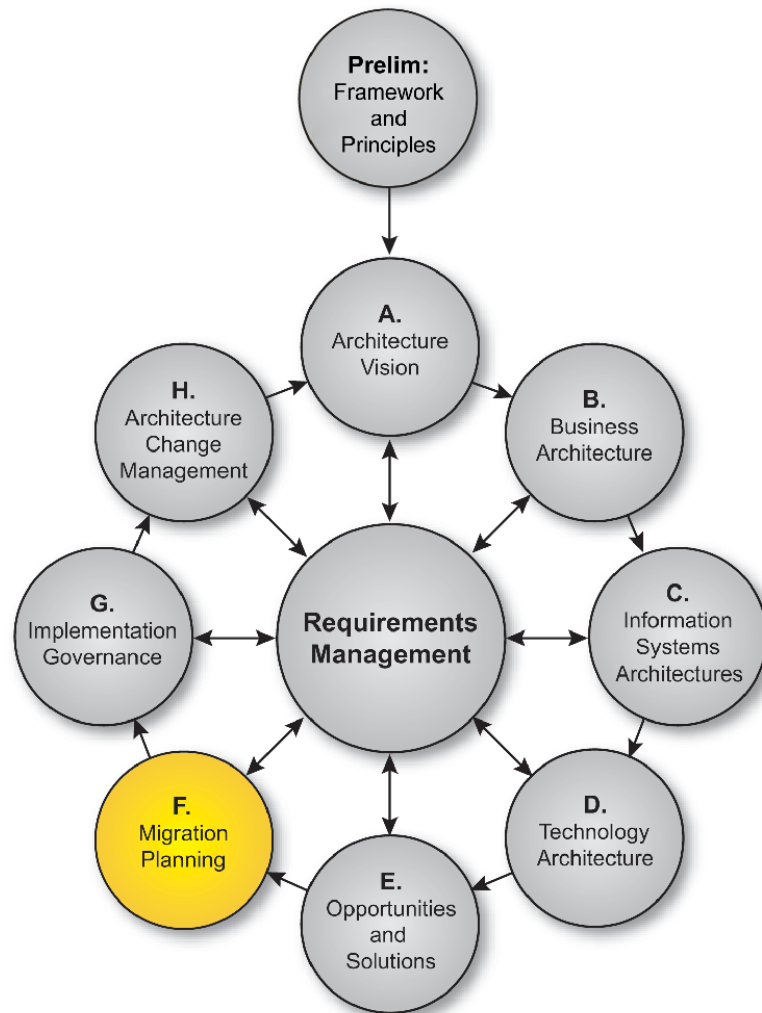
- The fundamental organization of an IT system, embodied in
 - its hardware, software and communications technology
 - their relationships to each other and the environment,
 - and the principles governing its design and evolution

Phase E: Opportunities and Solutions



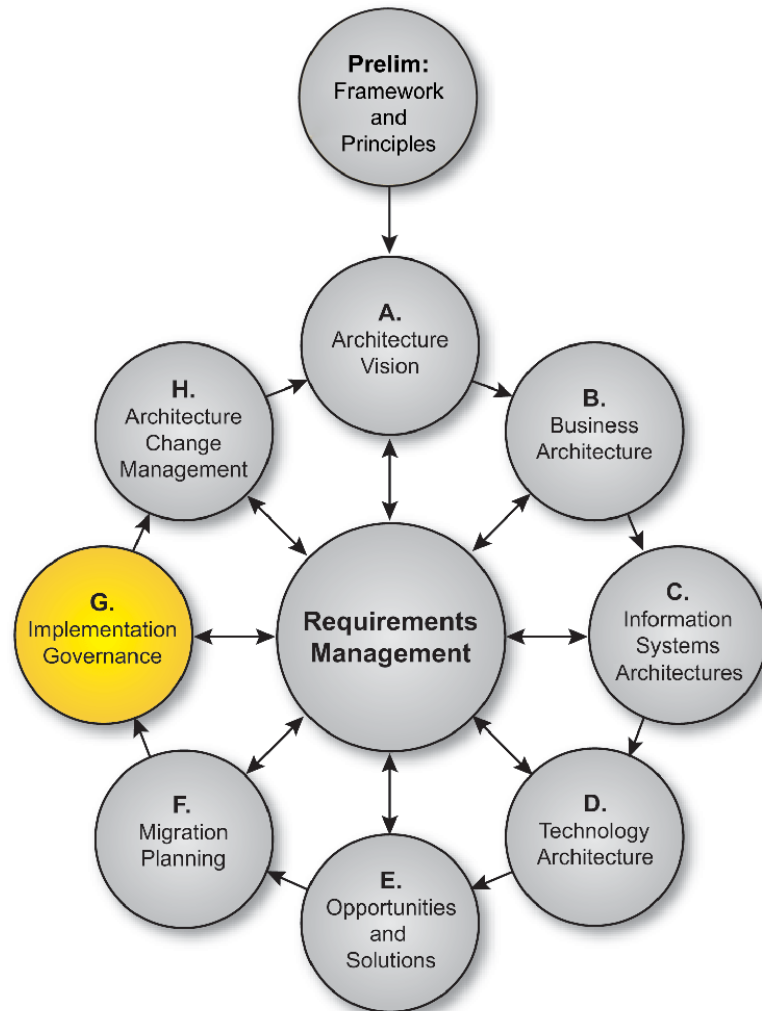
- Identify the major implementation projects
- Decide on approach
 - Make v Buy v Re-Use
 - Outsource
 - COTS
 - Open Source
- Assess priorities
- Identify dependencies

Phase F: Migration Planning



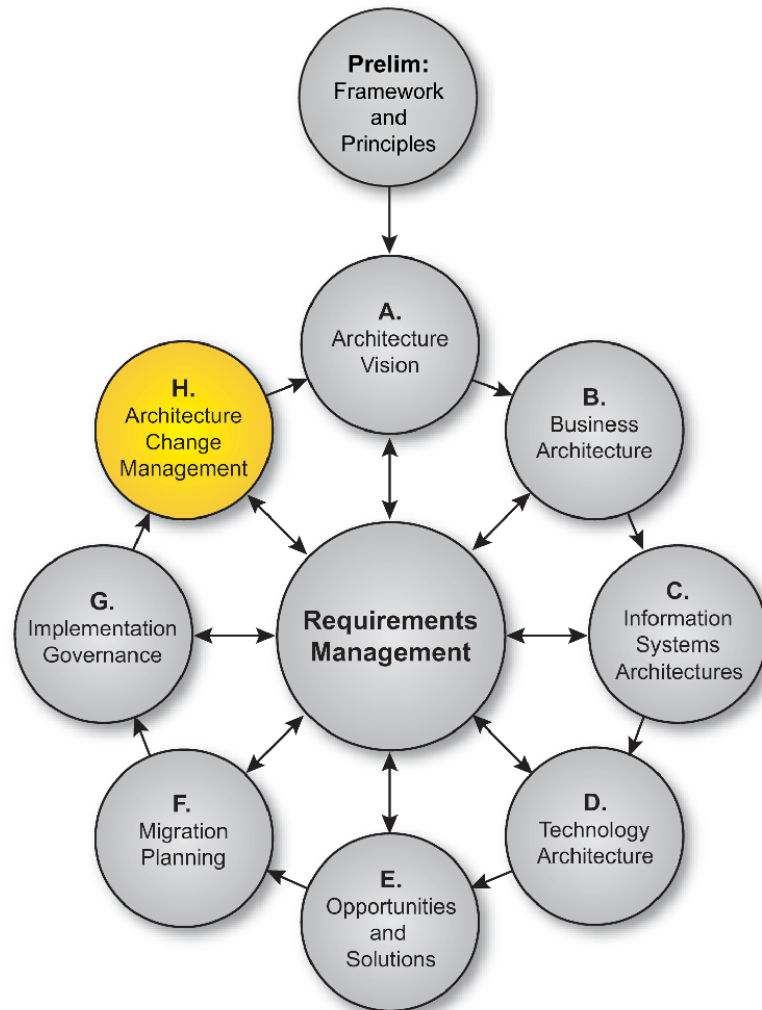
- For projects identified in Phase E perform
 - Cost/benefit analysis
 - Risk assessment
- Produce an implementation road-map

Phase G: Implementation Governance



- Defines architecture constraints on implementation projects
- Architecture contract
- Monitors implementation work for conformance

Phase H: Architecture Change Management



- Ensures that changes to the architecture are managed in a cohesive and architected way
- Establishes and supports the Enterprise Architecture to provide flexibility to evolve rapidly in response to changes in the technology or business environment