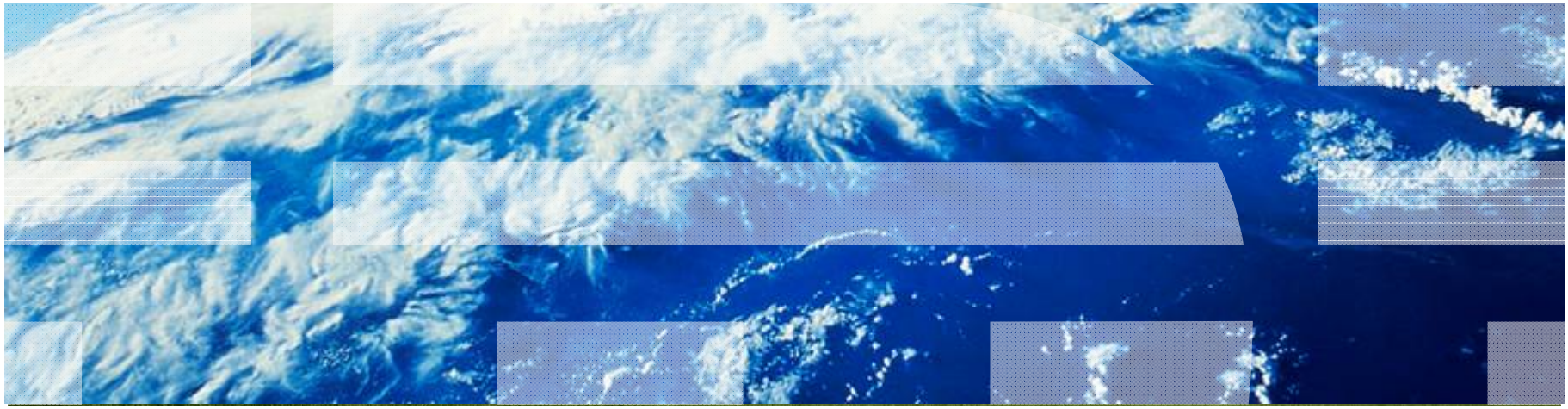
Dr. Hans-Peter Hoidn
Executive IT Architect, IBM Software Group
Global Business Integration "Tiger" Team

IBM

Enterprise IT Architectures

EA (Enterprise Architecture)



Agenda

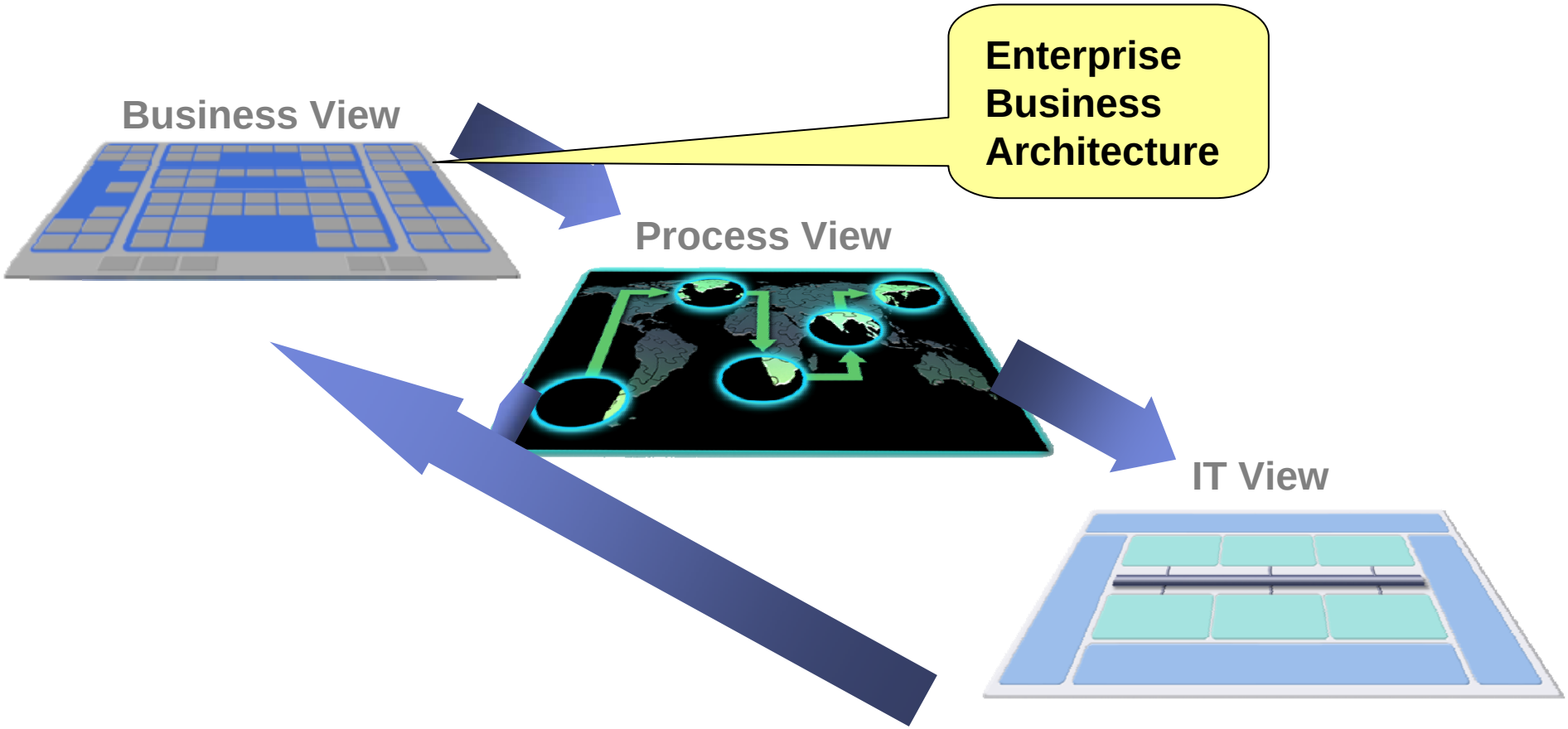
I. Positioning Enterprise Architecture (EA)

II. Enterprise Architecture – Main Aspects

III. Enterprise Architecture Methods

IV. Dynamic Infrastructure – Cloud Computing

Recap: Aligning Strategy with Business and IT Execution



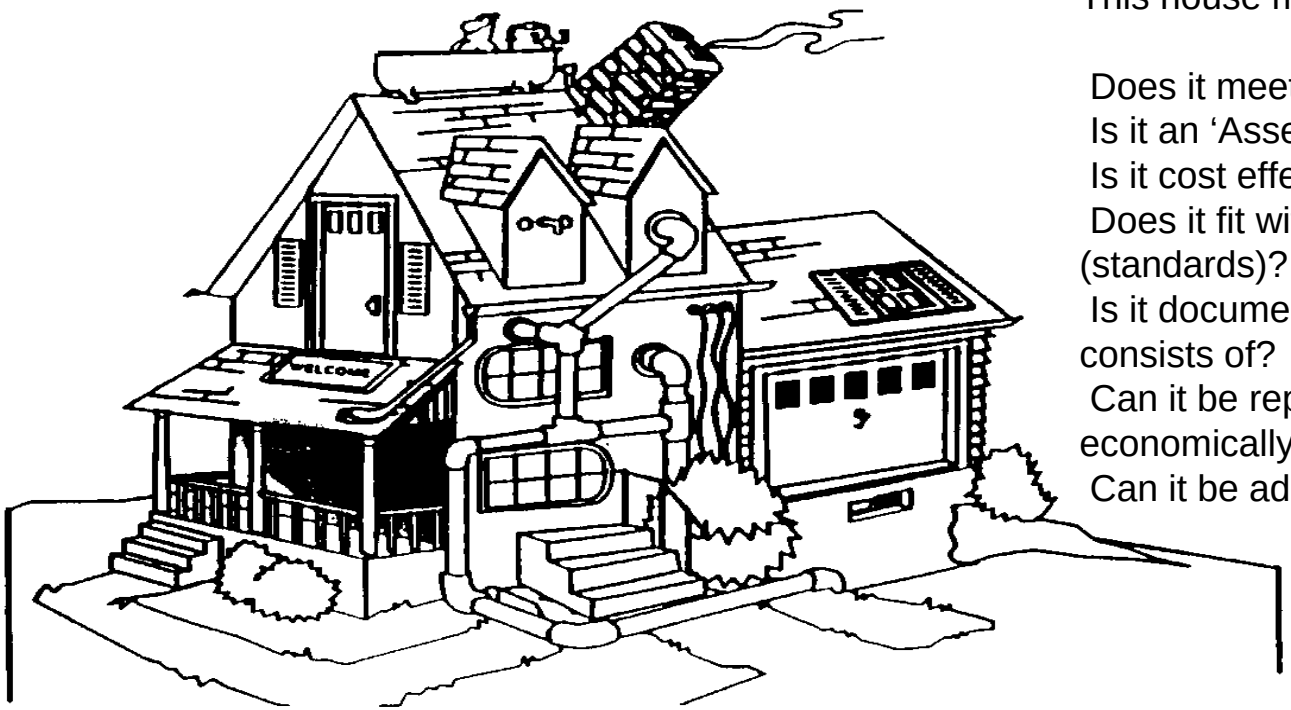
Positioning Enterprise Architecture (EA)

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.

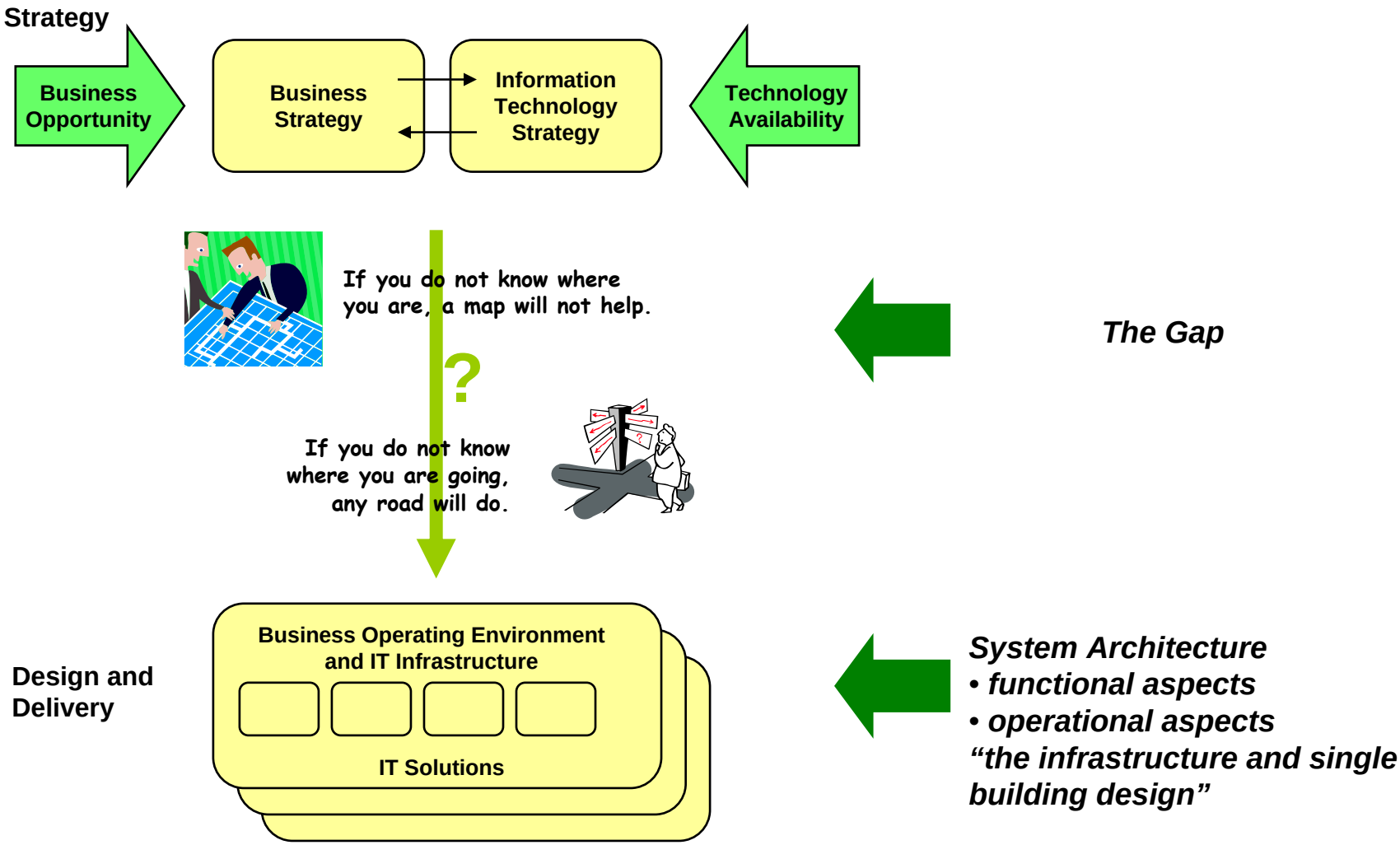


This house may function, but…

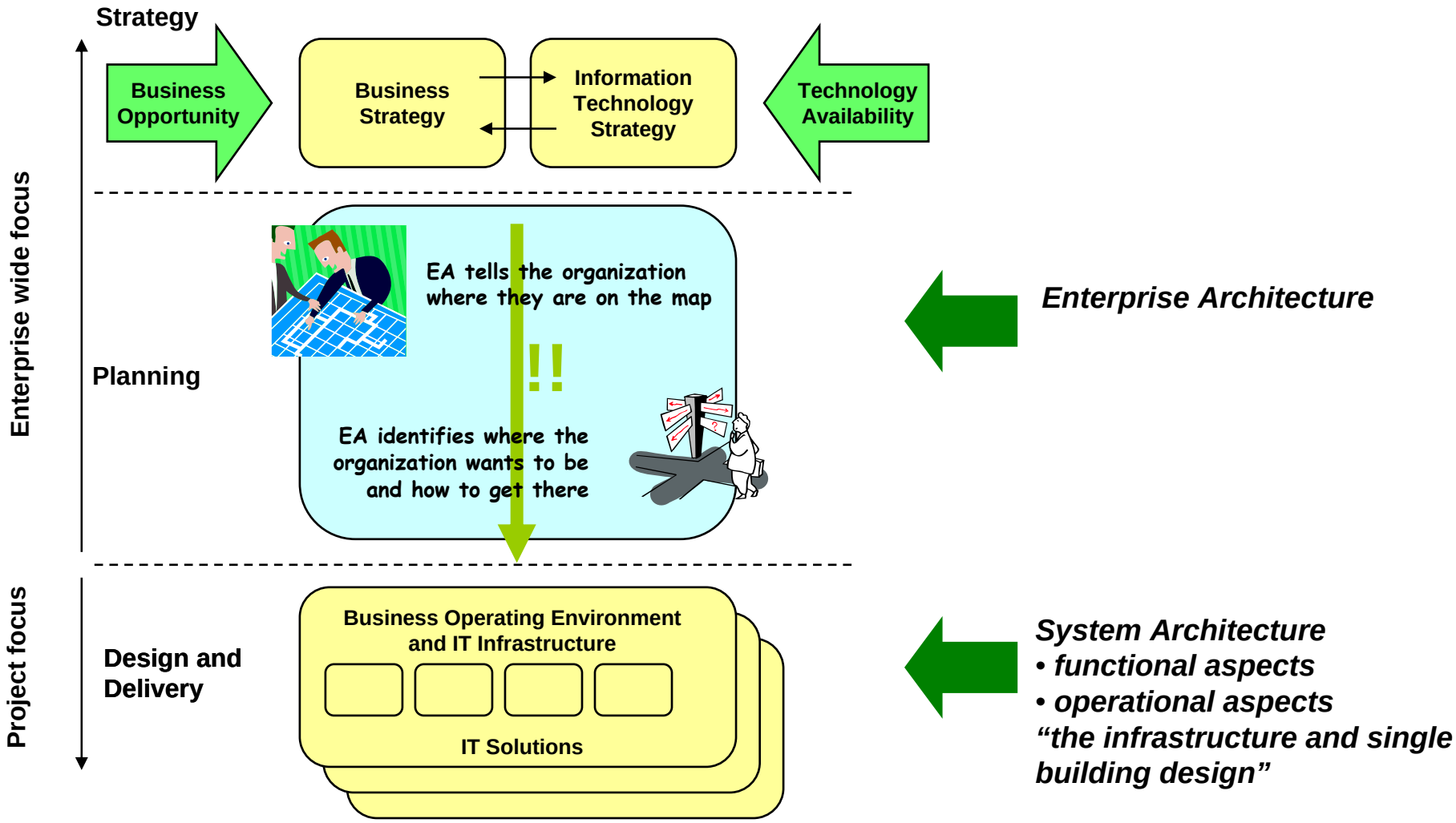
- Does it meet business objectives?
- Is it an 'Asset Junkyard'?
- Is it cost effective?
- Does it fit with the community (standards)?
- Is it documented - who knows what it consists of?
- Can it be repaired easily or economically?
- Can it be adapted to changing needs?

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

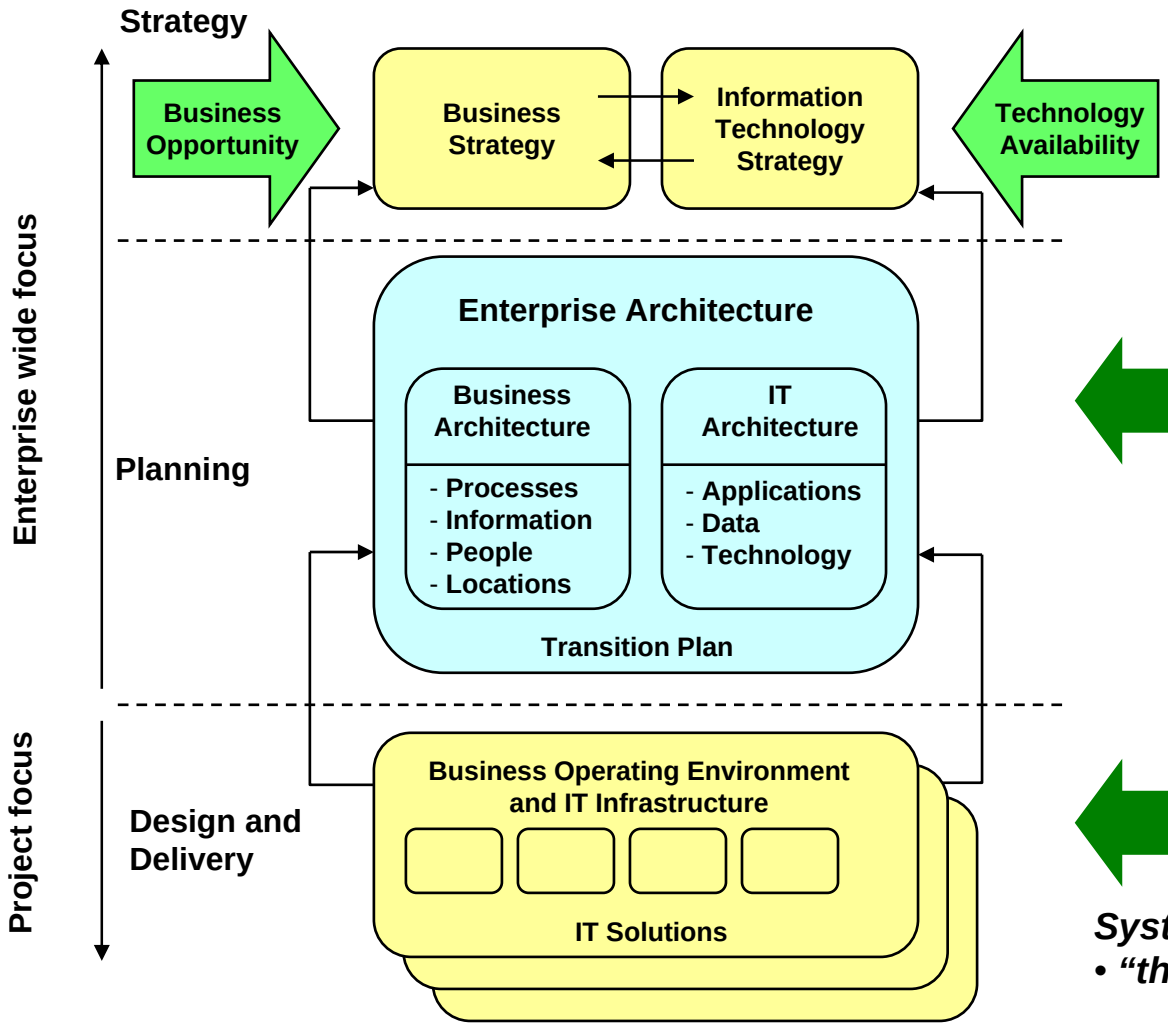
It can be a challenge to ensure IT based business solutions implement the business strategy…



Enterprise Architecture provides the vital linkages between "strategy" and "implementation"



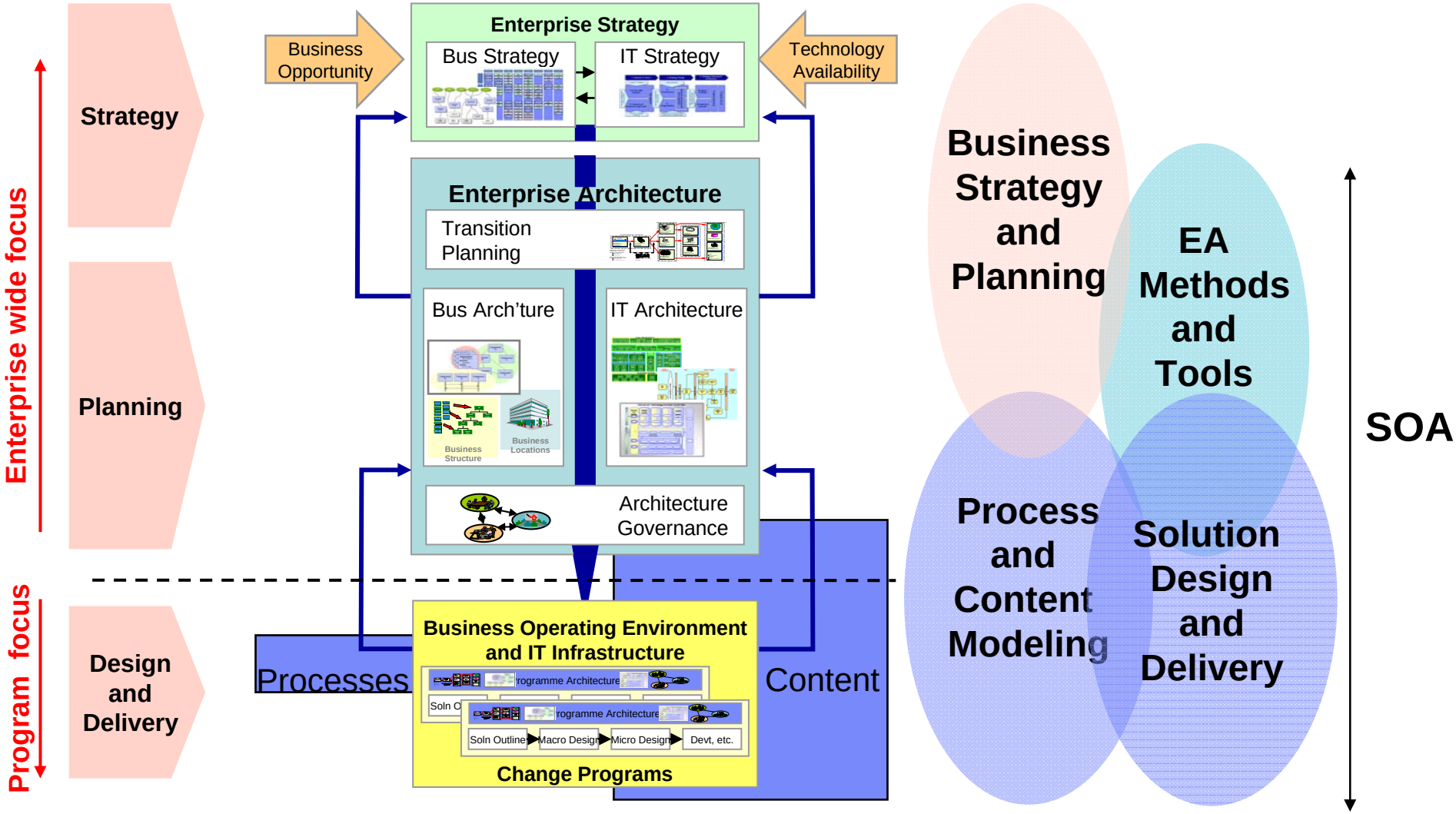
Enterprise Architecture embraces both Business and IT Architectures, providing the "city plan" for "building projects"



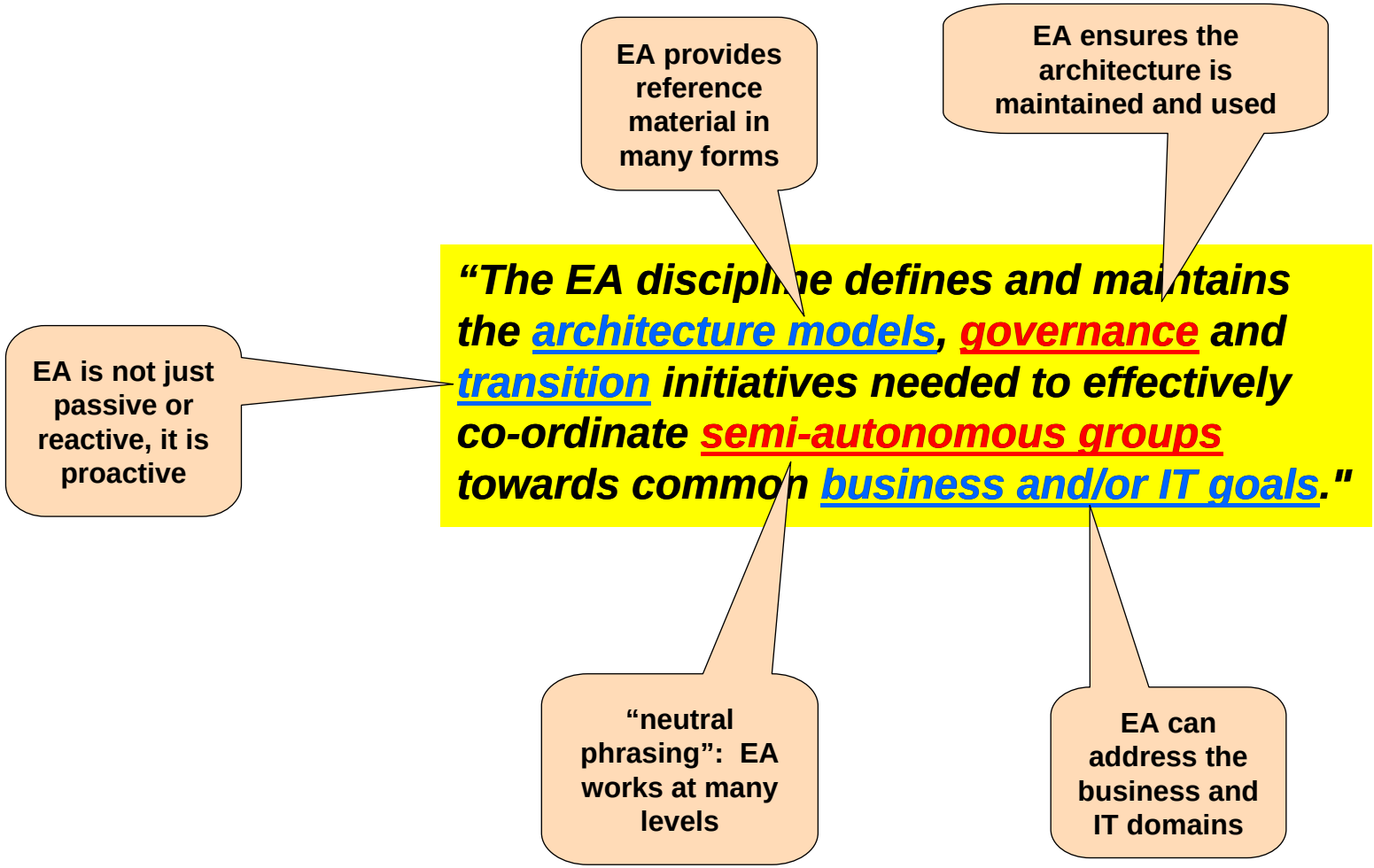
Enterprise Architecture "the city plan"

System Architecture
• "the building design"

Bridging the Gap Between Strategy and Delivery

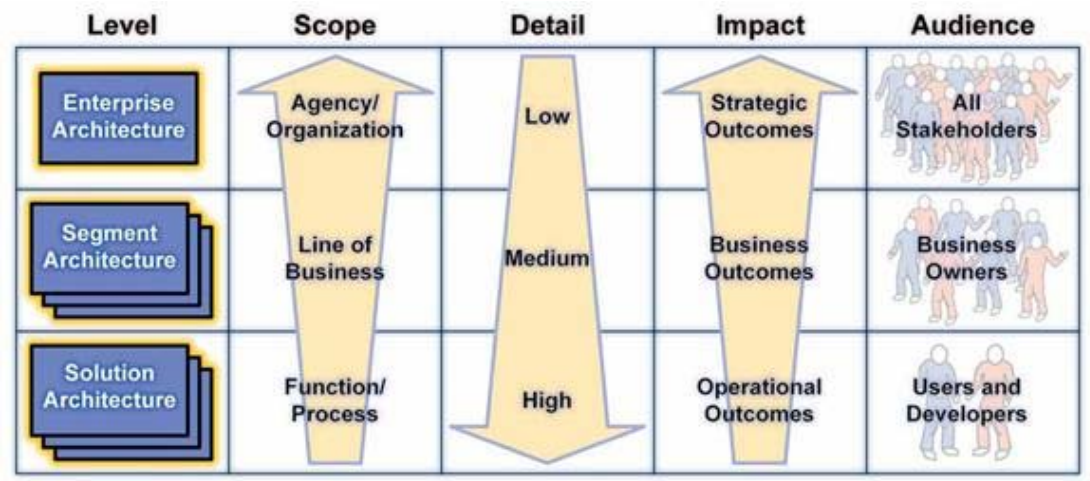


Definition "Enterprise Architecture"



Enterprise Architecture vs. Solution Architecture

Enterprise Architecture is the formal organization (design or layout) of the components, structures and processes required or relevant to the attainment of the goals and visions invested or envisioned in an enterprise.



From US OMB 2006 FEA Practice Guidance

Solution architecture aims to address specific problems and requirements, usually through the design of specific information systems or applications.

So we recognise two different types of IT Architect…

- **…Are responsible for ensuring the design of IT based business solutions meet the functional and non-functional requirements, within the constraints of budget, time, skills and other givens (such as IT Standards)**

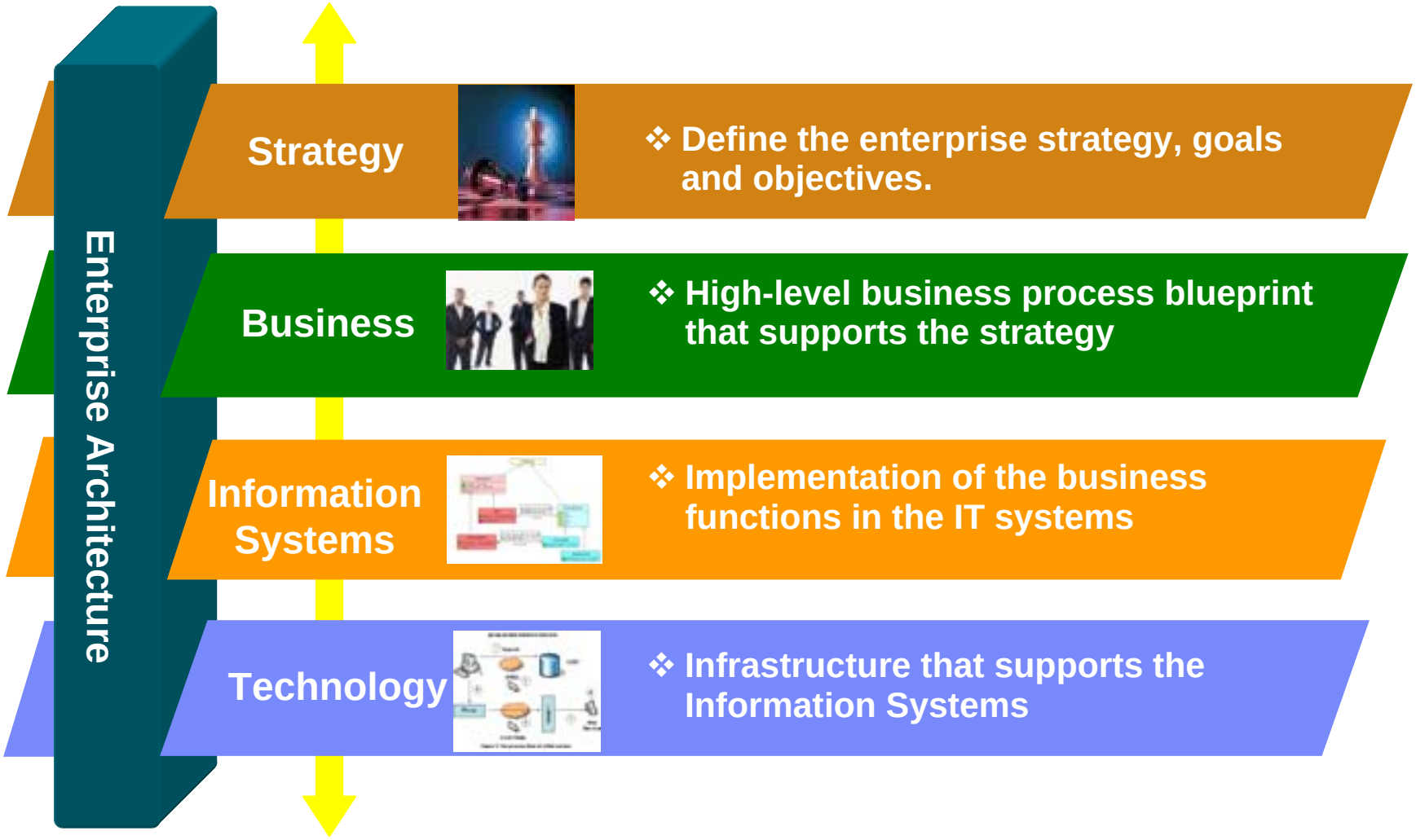
  "Solution Architects"

- **…Are responsible for ensuring an IT Organisation approaches the identification, specification and implementation of these IT based business solutions in a co-ordinated and standardised manner, aligned to the Enterprise's Business and IT Strategies.**

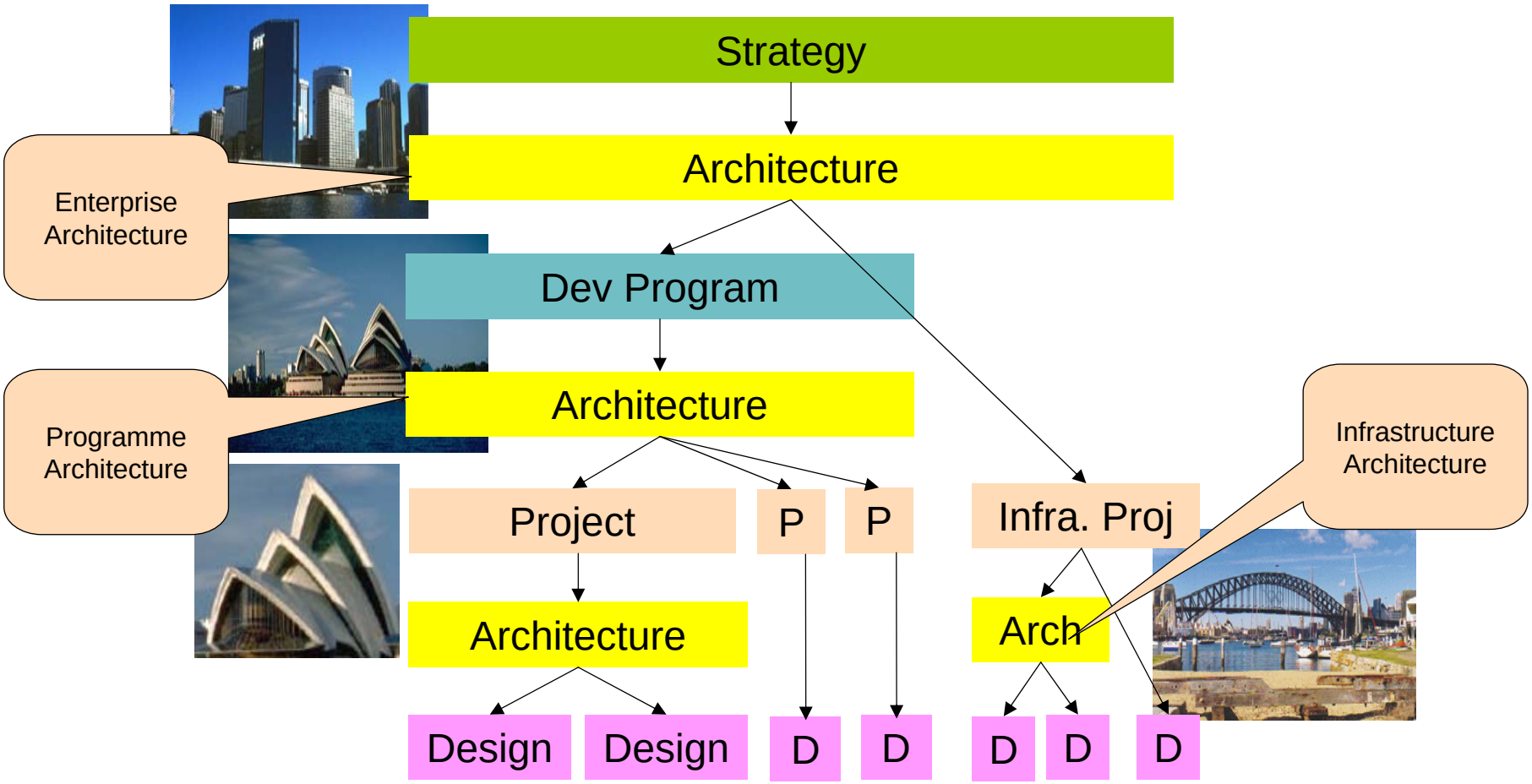
  "Enterprise Architects"

- **…Are generally *not* product specialists, although they must be able to work at a sufficient level of technological detail to be sure their architectures can be implemented.**

Enterprise Architecture Defined



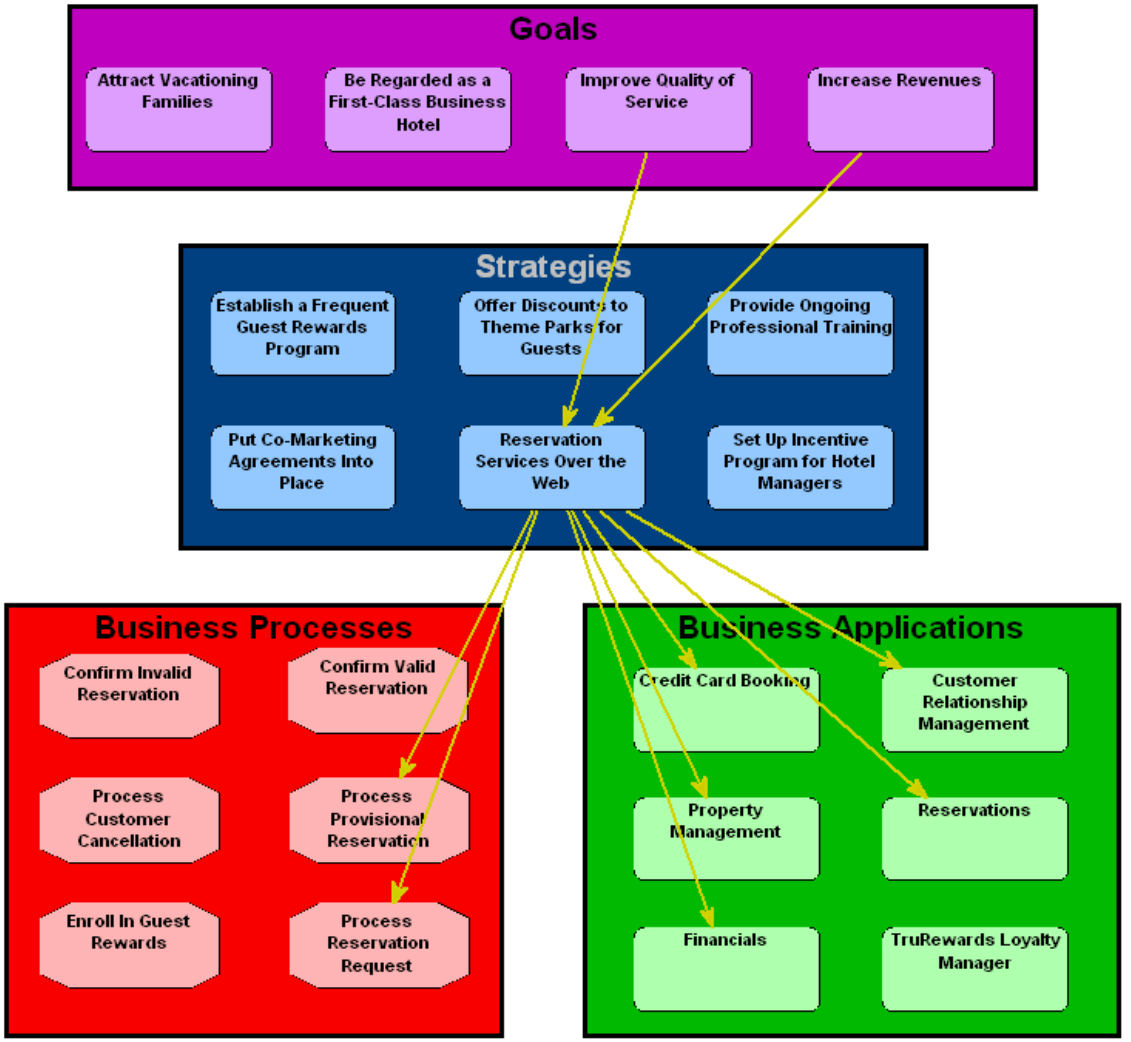
EA provides a context and guidance, keeping everyone “on the same road”



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

"How have we aligned technology investment with our business objectives?"

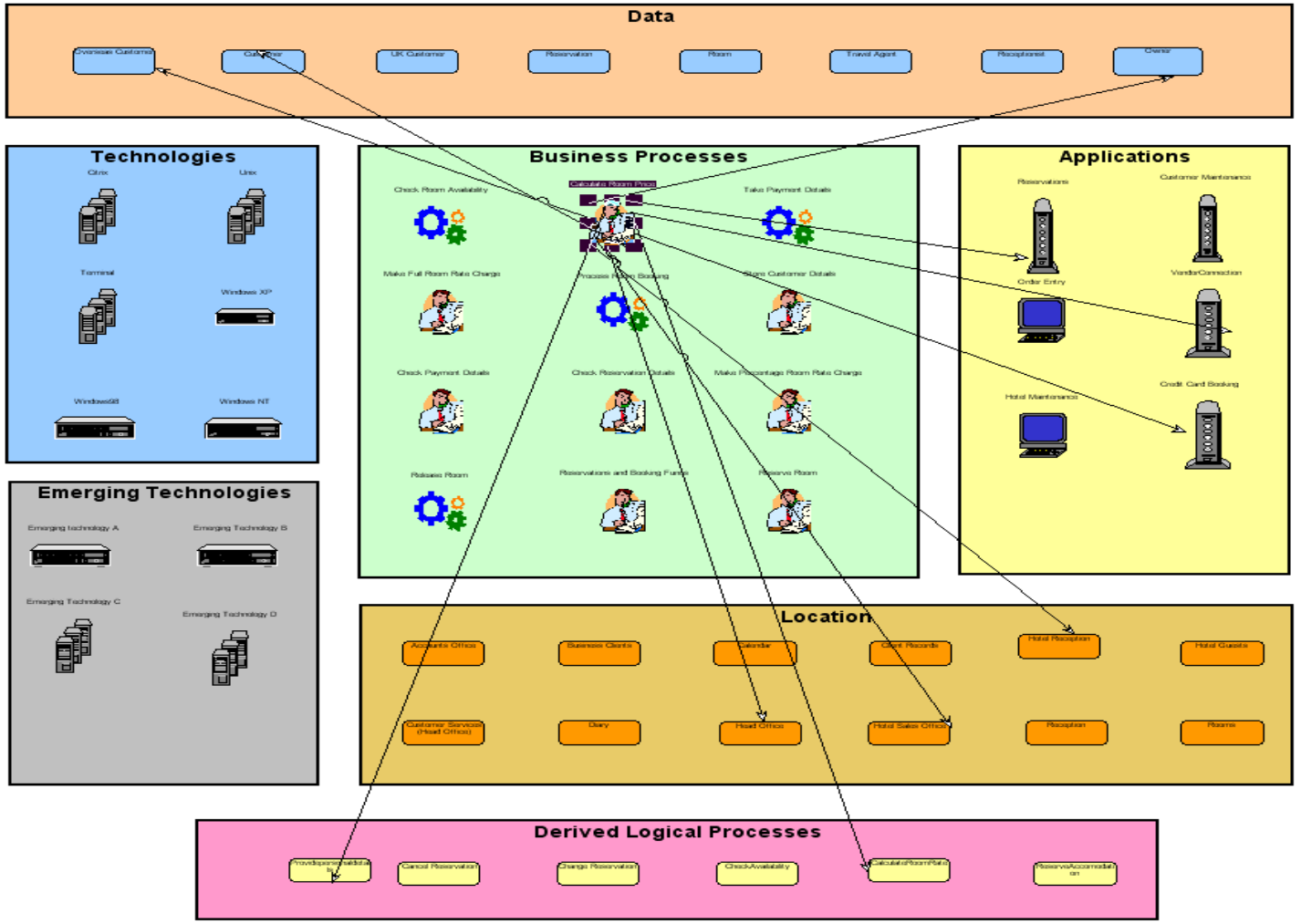
"If we change our technology stack, what applications and organizations will be effected?"



Benefits (2): Analyze Change to Processes…

What Happens If….?

Focus on Information needed to make a decision



Enterprise Architecture – Main Aspects

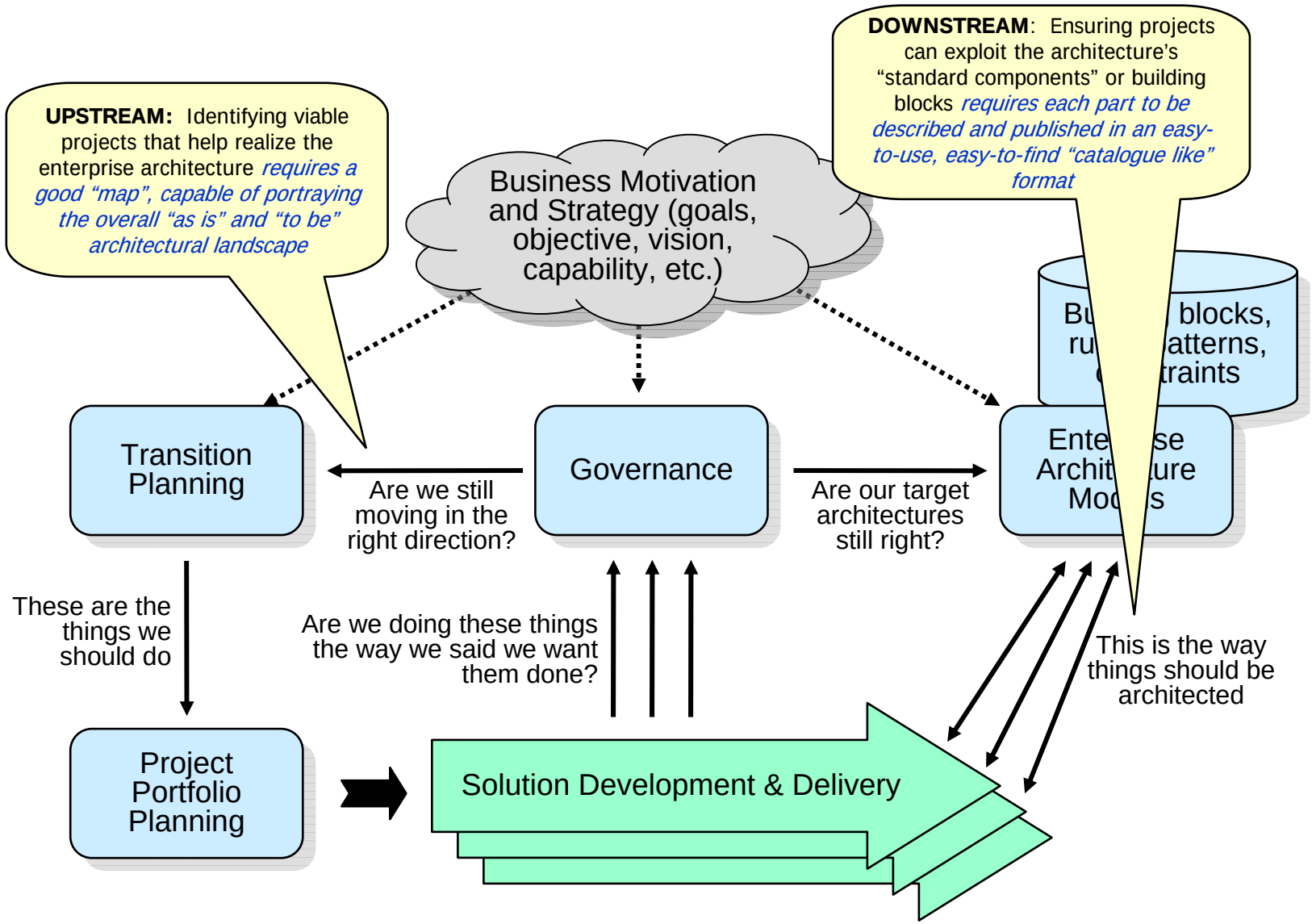
Main aspects of an Enterprise Architecture

- Enterprise Architecture **is between the Business and IT Strategy and the programs and projects to be carried out**

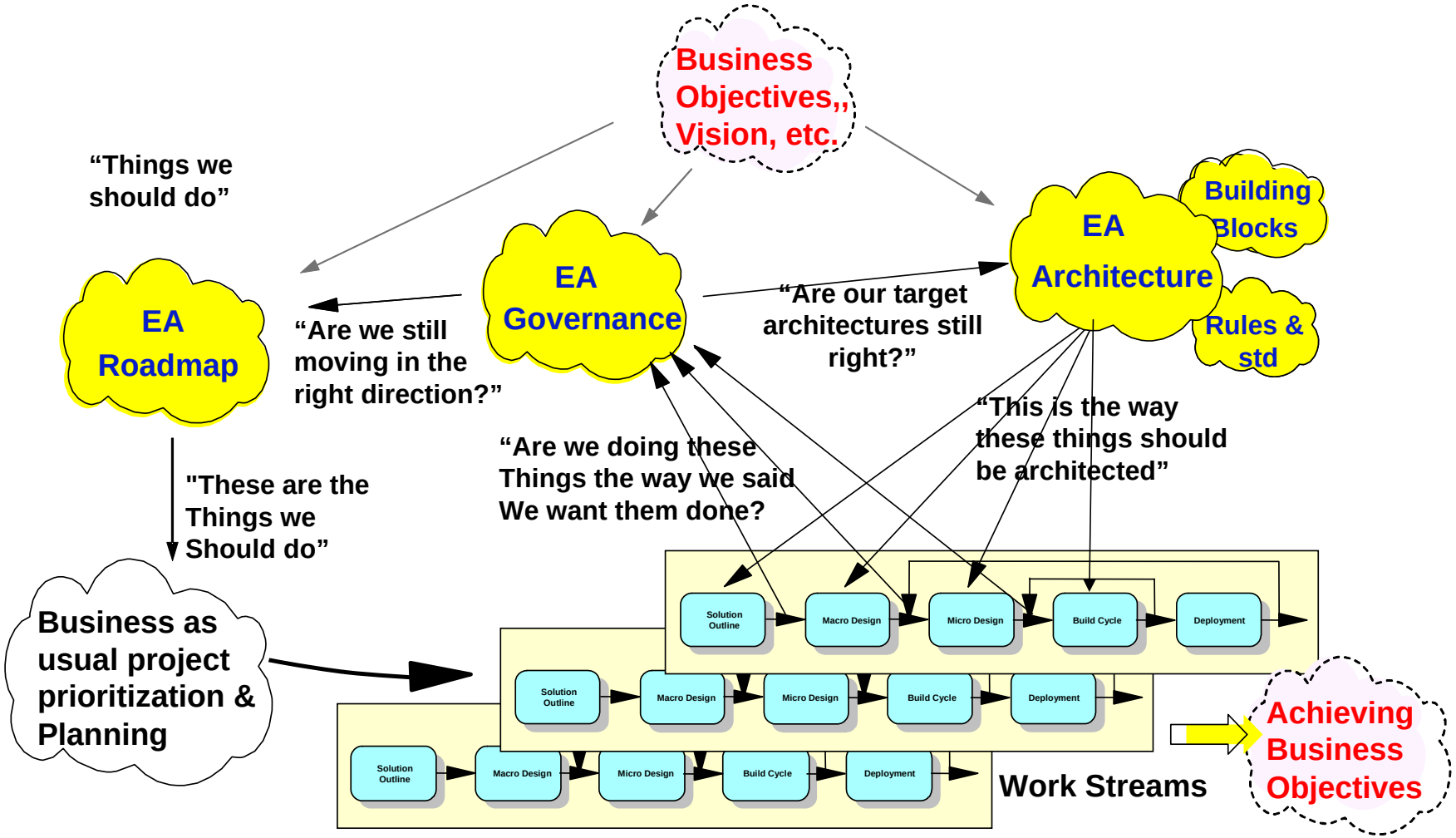
- **Enterprise Architecture includes** Business Architecture **as well as** IT Architecture **(which is** IS Architecture **– Information System – and** Technology Architecture**)**

- **Enterprise Architecture** guides **the programs and projects**

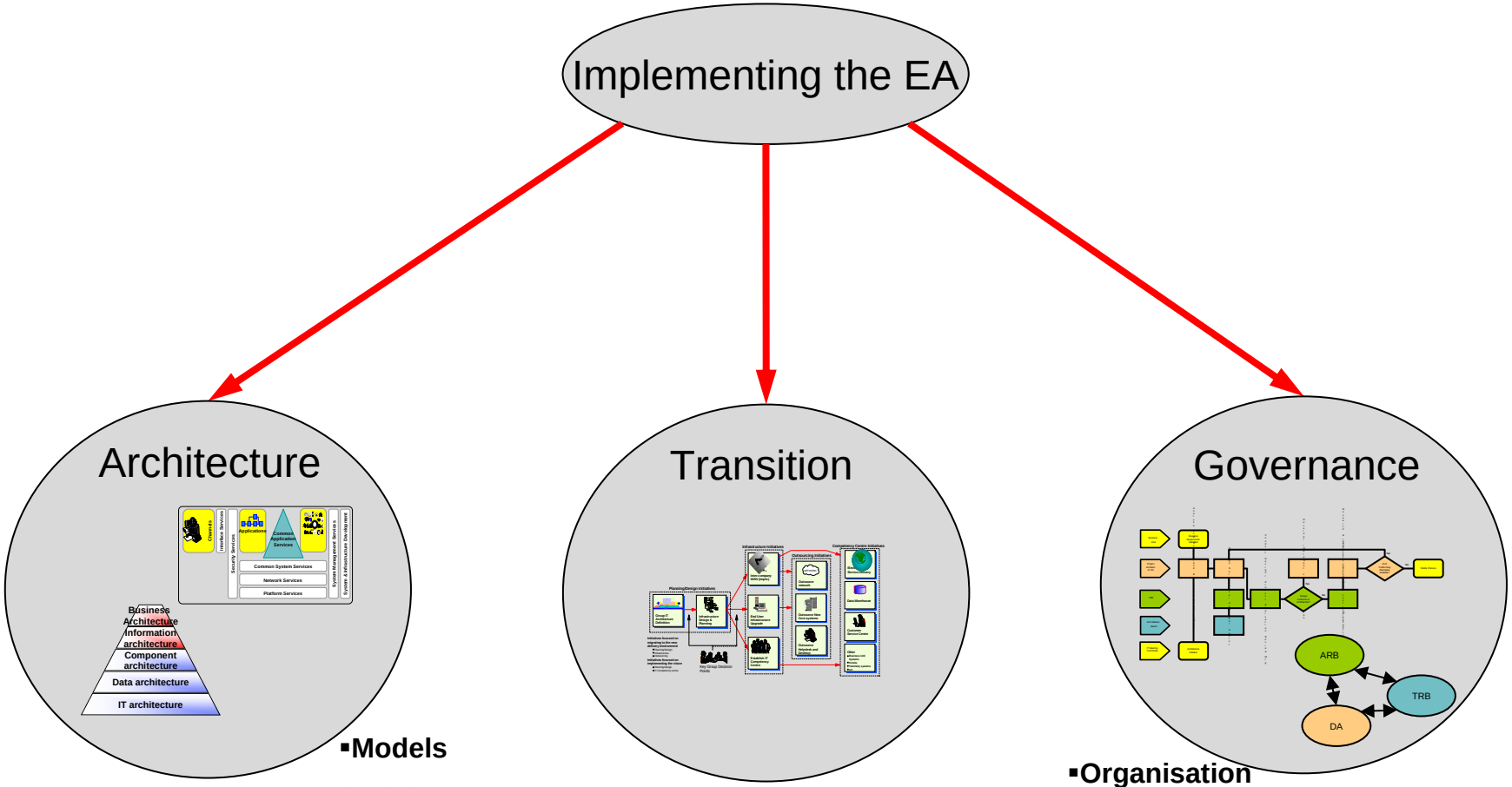
"Do the right things right"



EA is More than Architecture



Therefore there are three aspects to implementing an Enterprise Architecture



- Models
- Principles
- Enterprise Tech Framework

- Transition Plan
- Management Action Plan

- Organisation
- Processes
- Evaluation & Selection

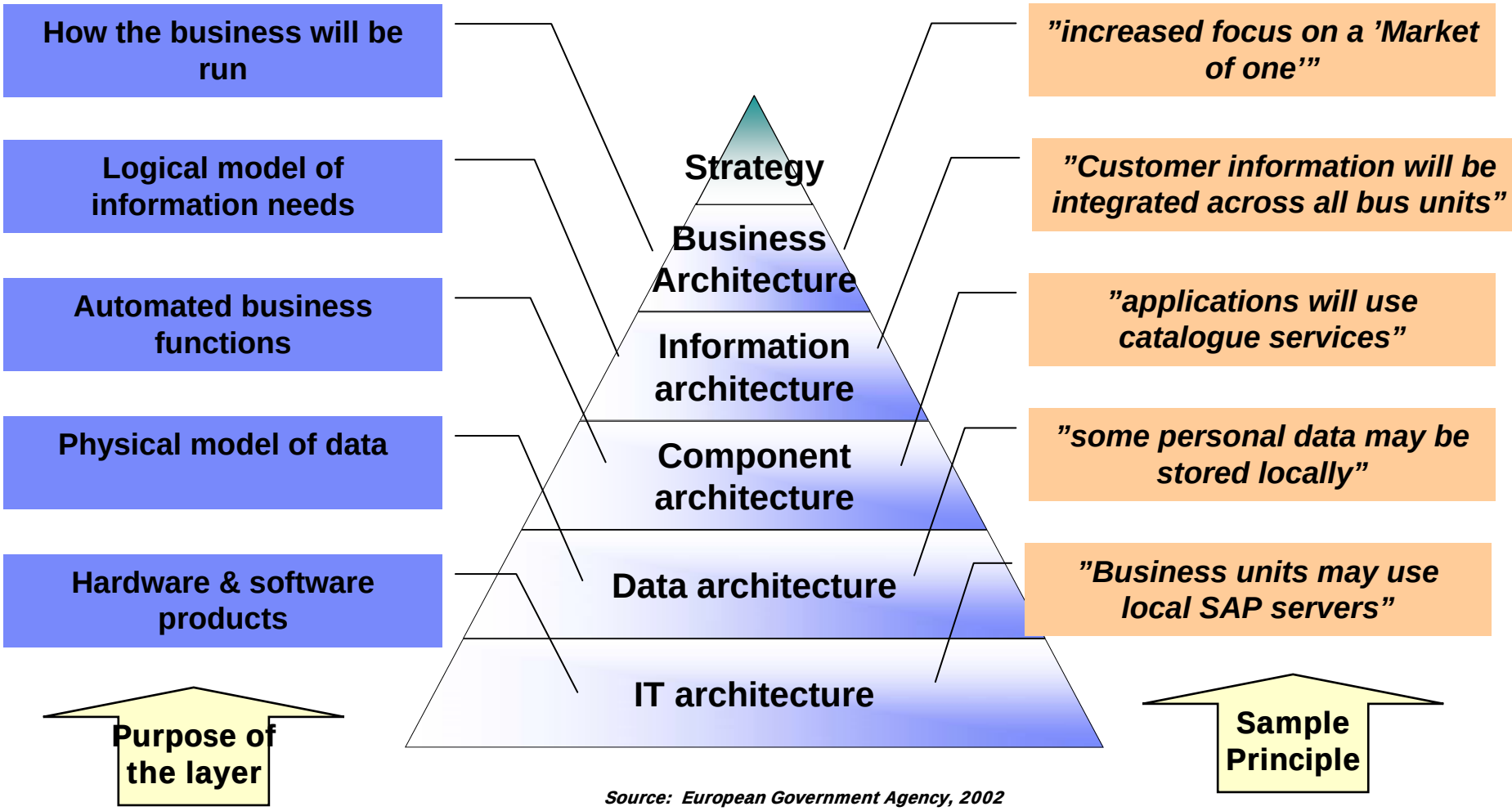
Enterprise Architecture Methods

- **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**

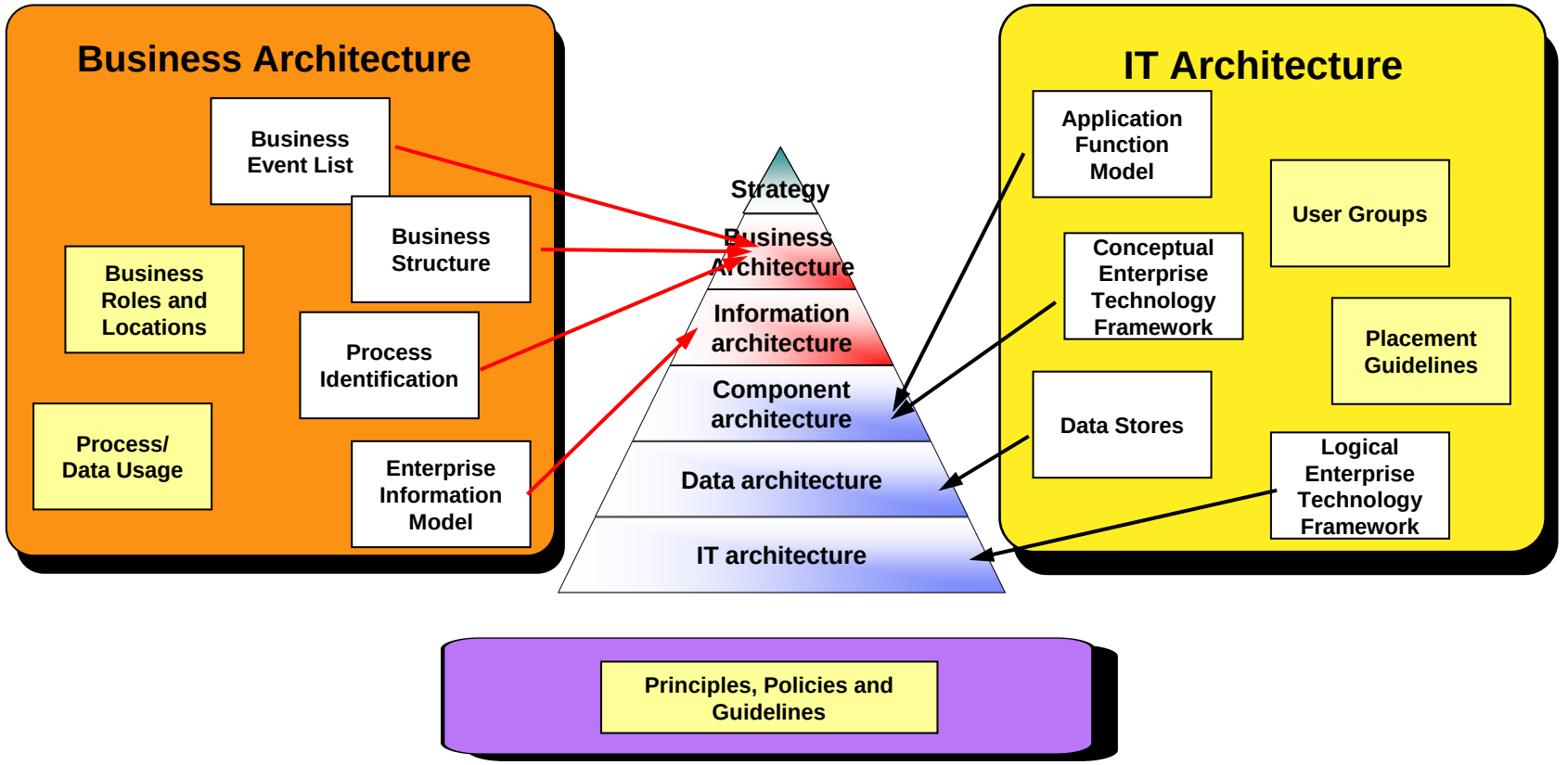
- **Most popular Enterprise Architecture Methods**
  - **IBM**
  - **Zachman (www.zifa.com)**
  - **TOGAF (www.opengroup.org)**

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

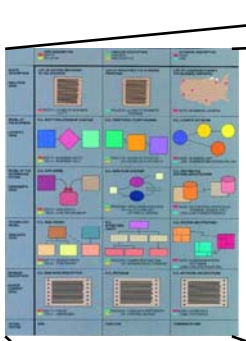


Source: European Government Agency, 2002

And this structuring is closely followed in IBM's EA Method through "architecture neighbourhoods"



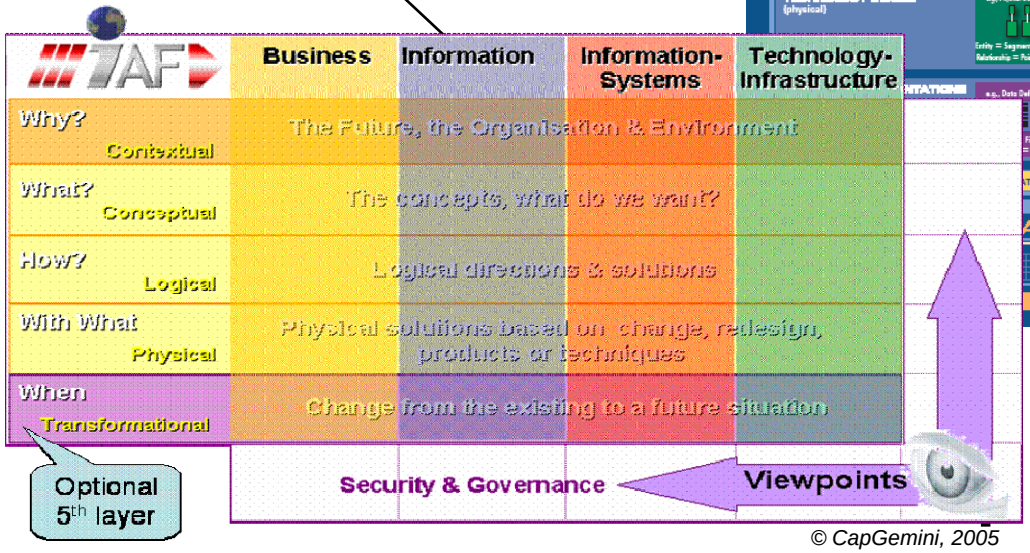
All EAs have a “framework” – a means of organizing, managing and communicating the architecture



ENTERPRISE ARCHITECTURE:
A FRAMEWORK™

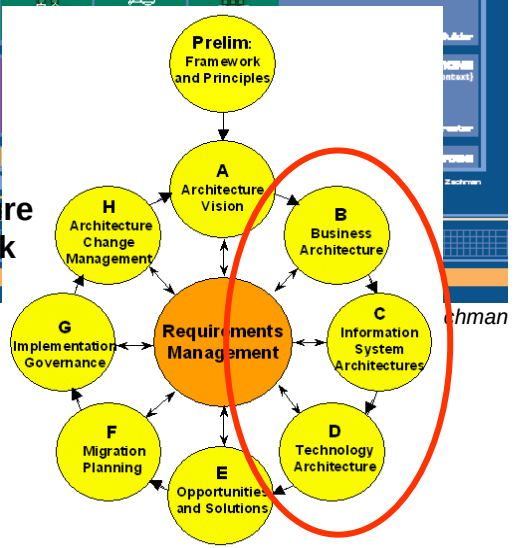
	WHAT	HOW	WHERE	WHO	WHEN	WHY
	DATA	FUNCTION	NETWORK	PEOPLE	TIME	MOTIVATION
SCOPE (contextual)						
BUSINESS MODEL (conceptual)						
SYSTEM MODEL (logical)						
TECHNOLOGY MODEL (physical)						

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

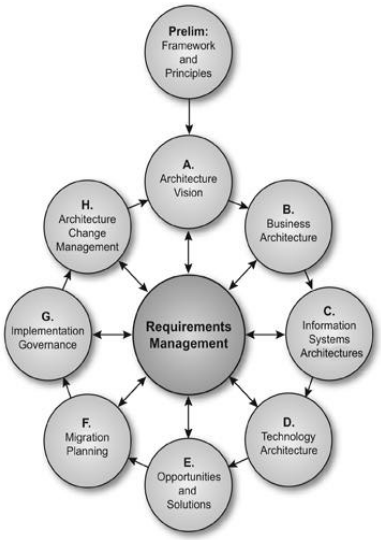


© CapGemini, 2005

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

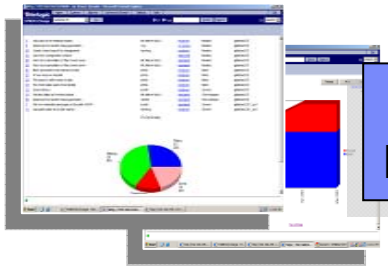


What is TOGAF



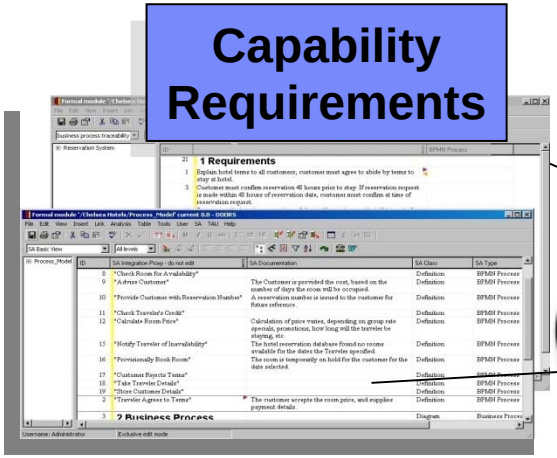
- **TOGAF consists of the following :**
  - **Architecture Development Method (ADM)**
  - **Enterprise Continuum**
  - **Resource Base**
- **The ADM is depicted as the 'crop-circle' and represents the core of the TOGAF specification. It is a method for deriving a specific enterprise architecture.**
- **The Enterprise Continuum is a model for structuring a 'virtual repository' of architectural assets such as patterns, models, & architecture descriptions.**
- **The Resource Base is a set of 'good practice' resources such as guidelines, checklists and templates provided to assist the architect when using TOGAF ADM.**

Standard TOGAF (currently Version 9)

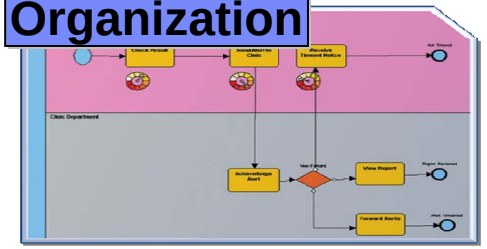


Change Management

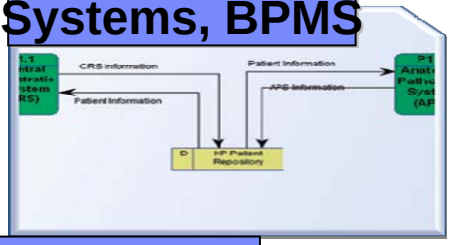
Strategy and Direction



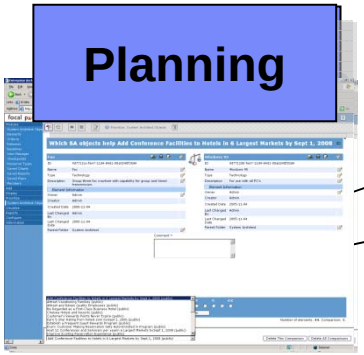
Capability Requirements



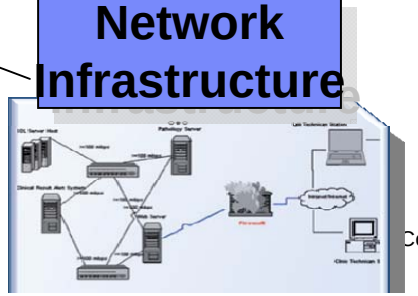
Processes, Organization



Application, Systems, BPMS

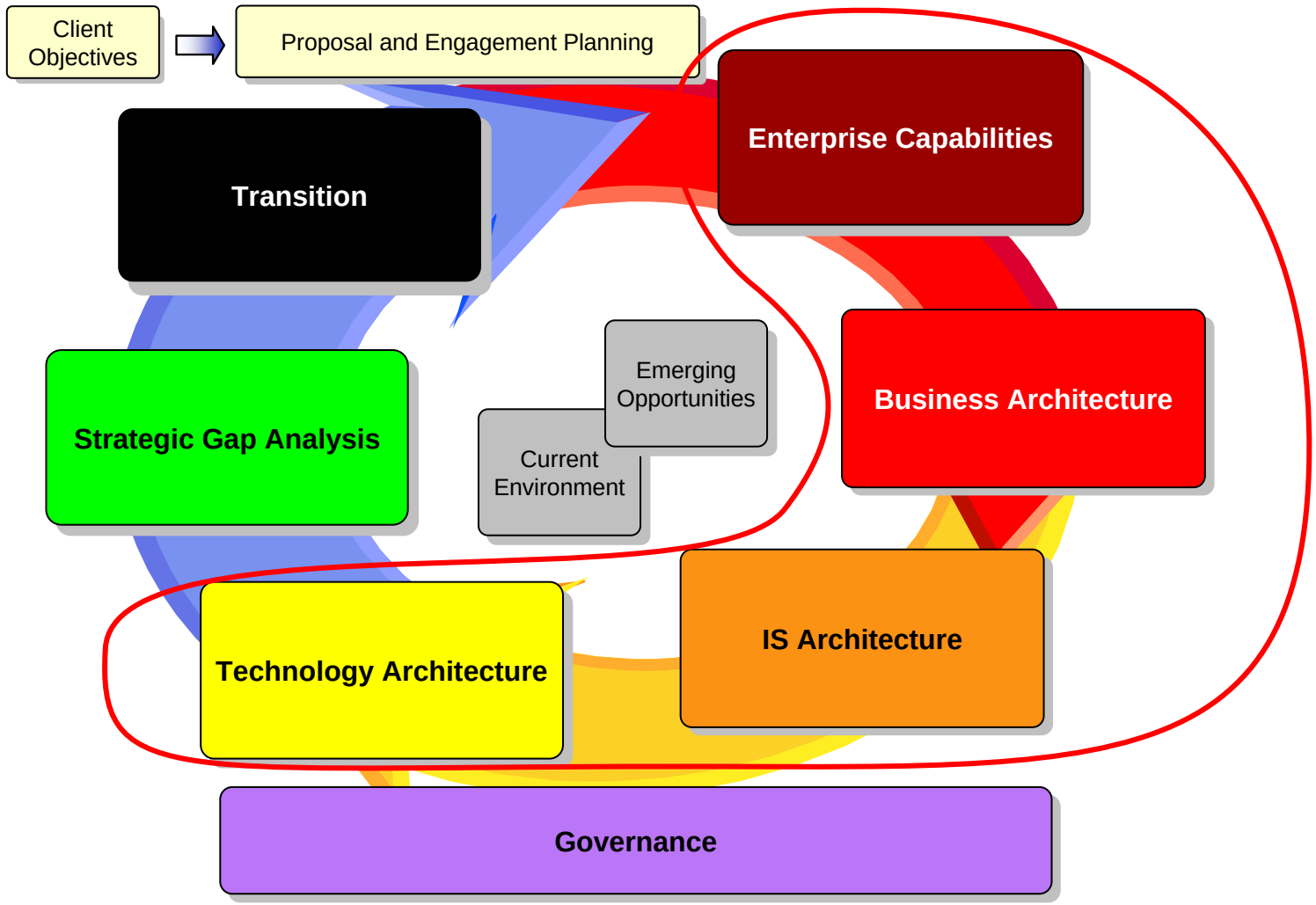


Planning



Network Infrastructure

EA Method Overview – Emphasizing Iterative Approach



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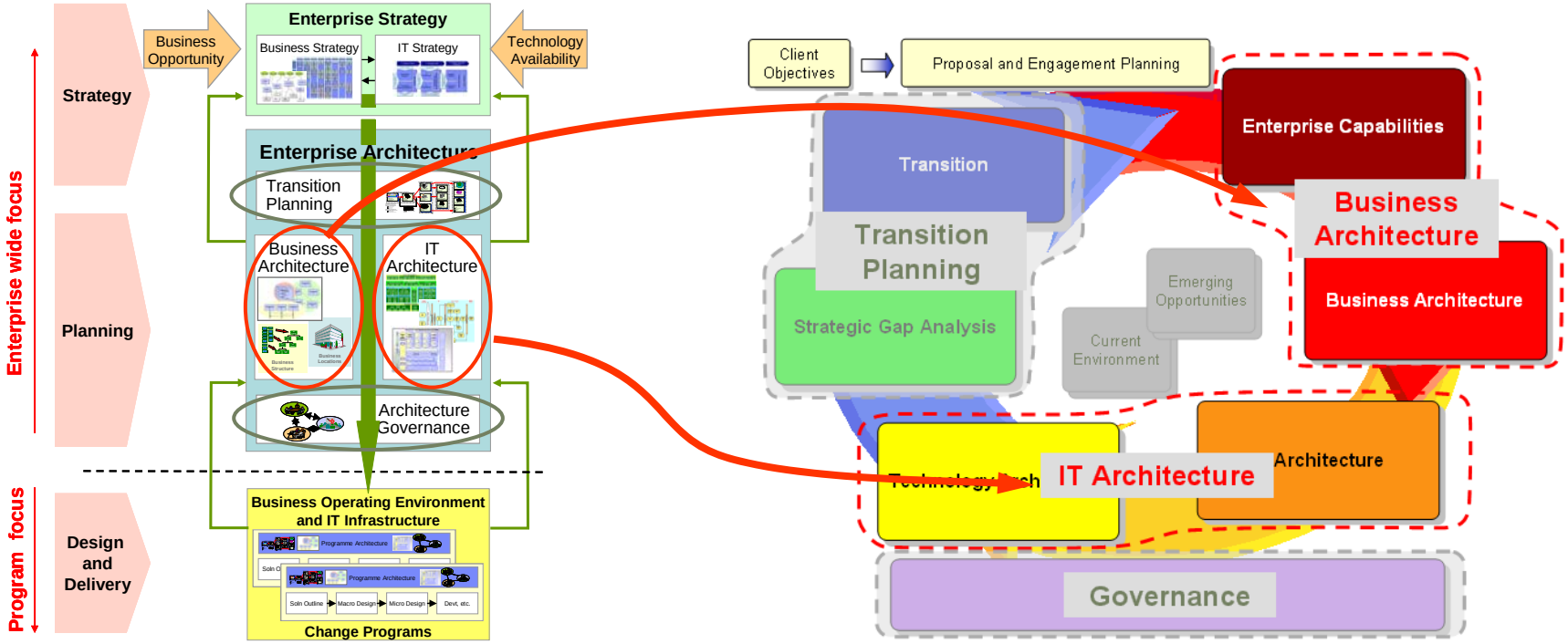
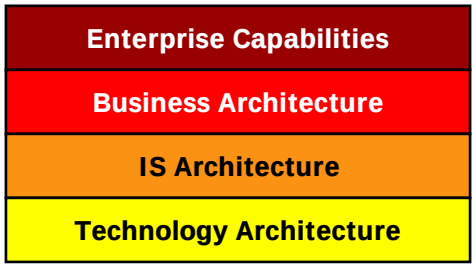
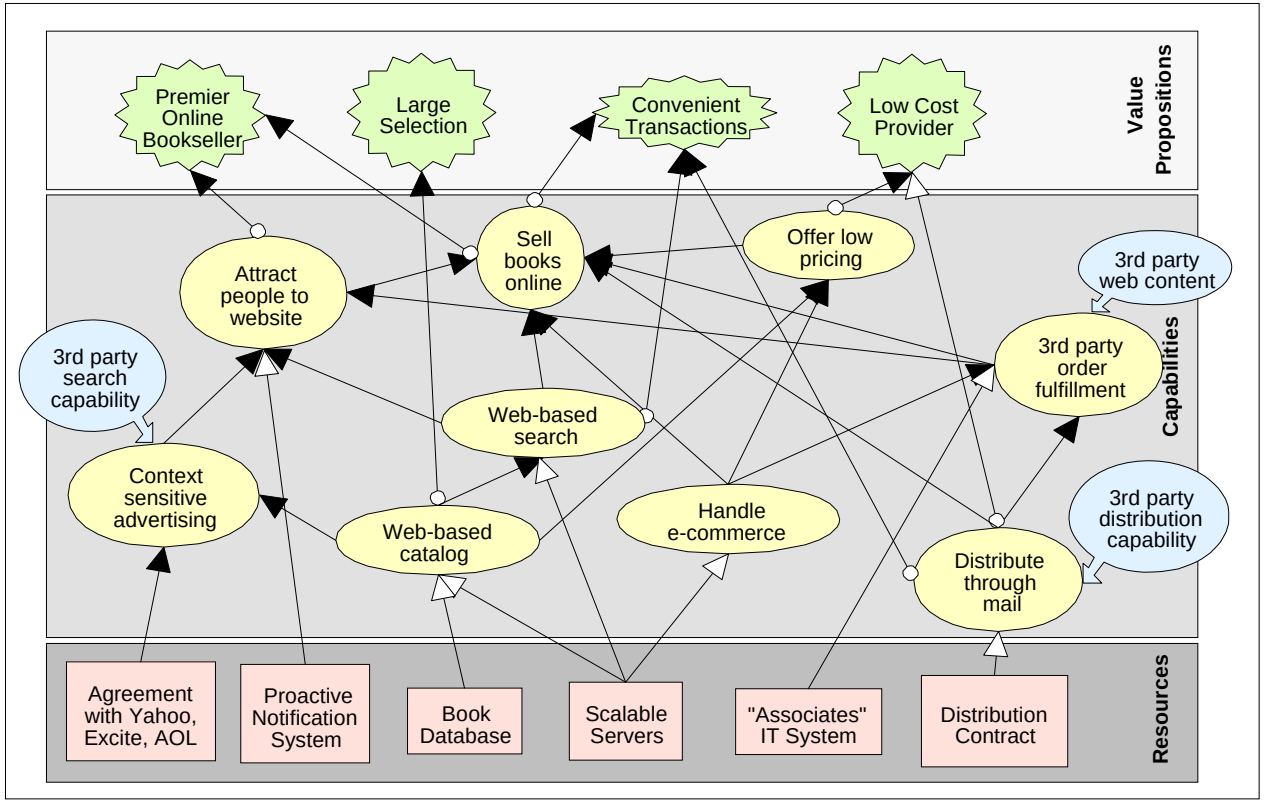
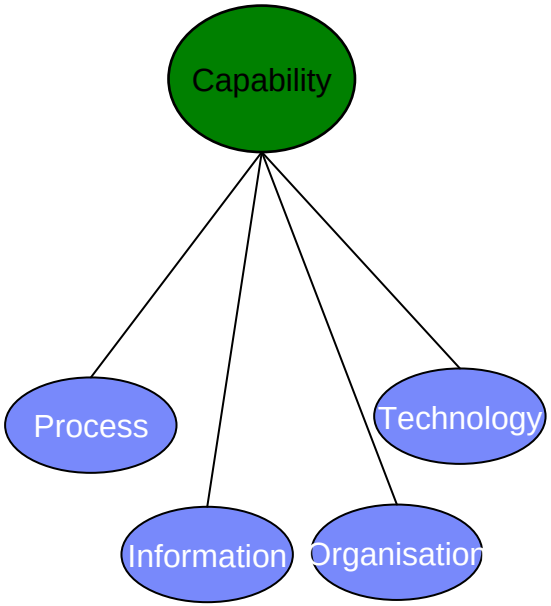




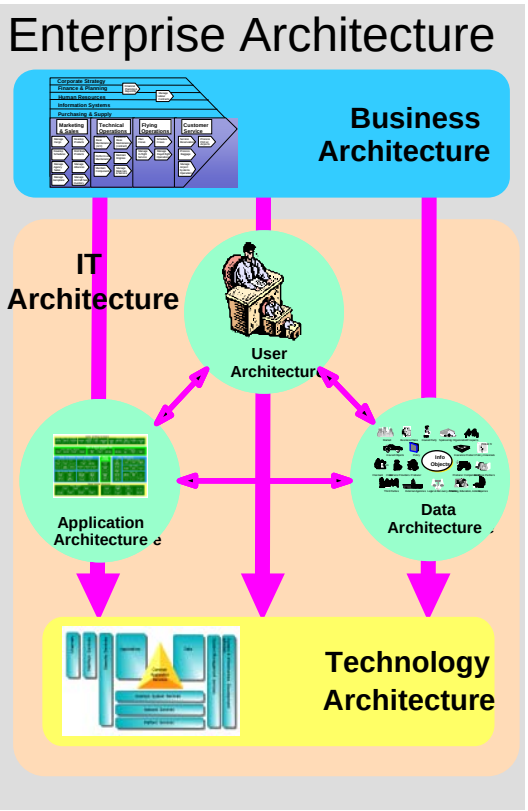
The EA Consulting Method's architectural layers

Enterprise Capabilities: Linking Strategy to Architecture (Example Amazon)

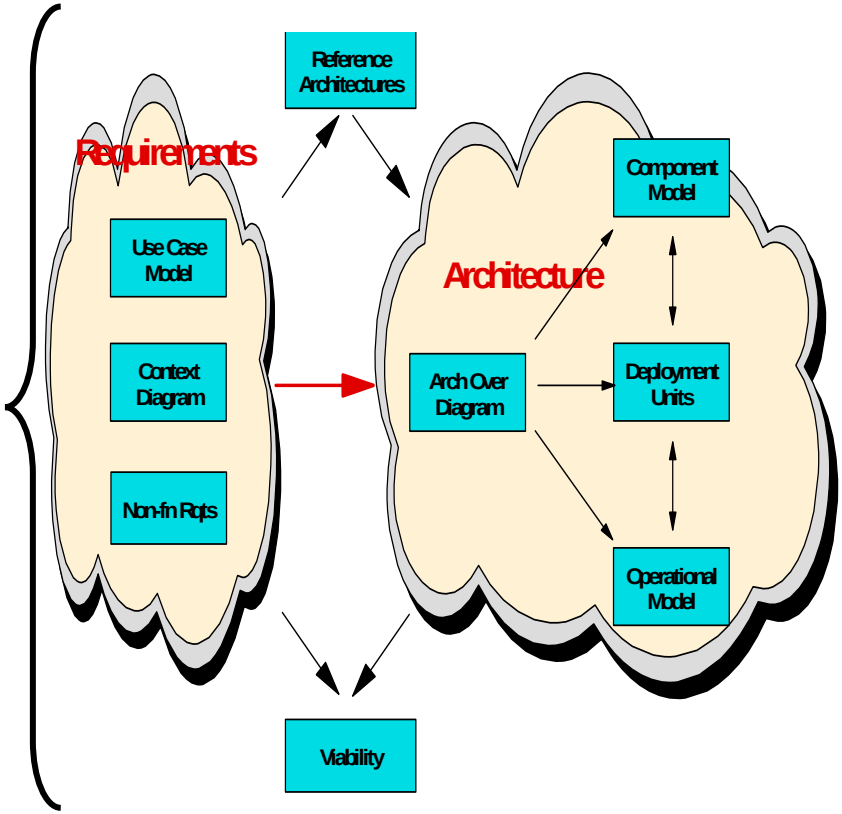




EA Work Products guide and govern how *Solution* Work Products are constructed (Same Types of Work Products)

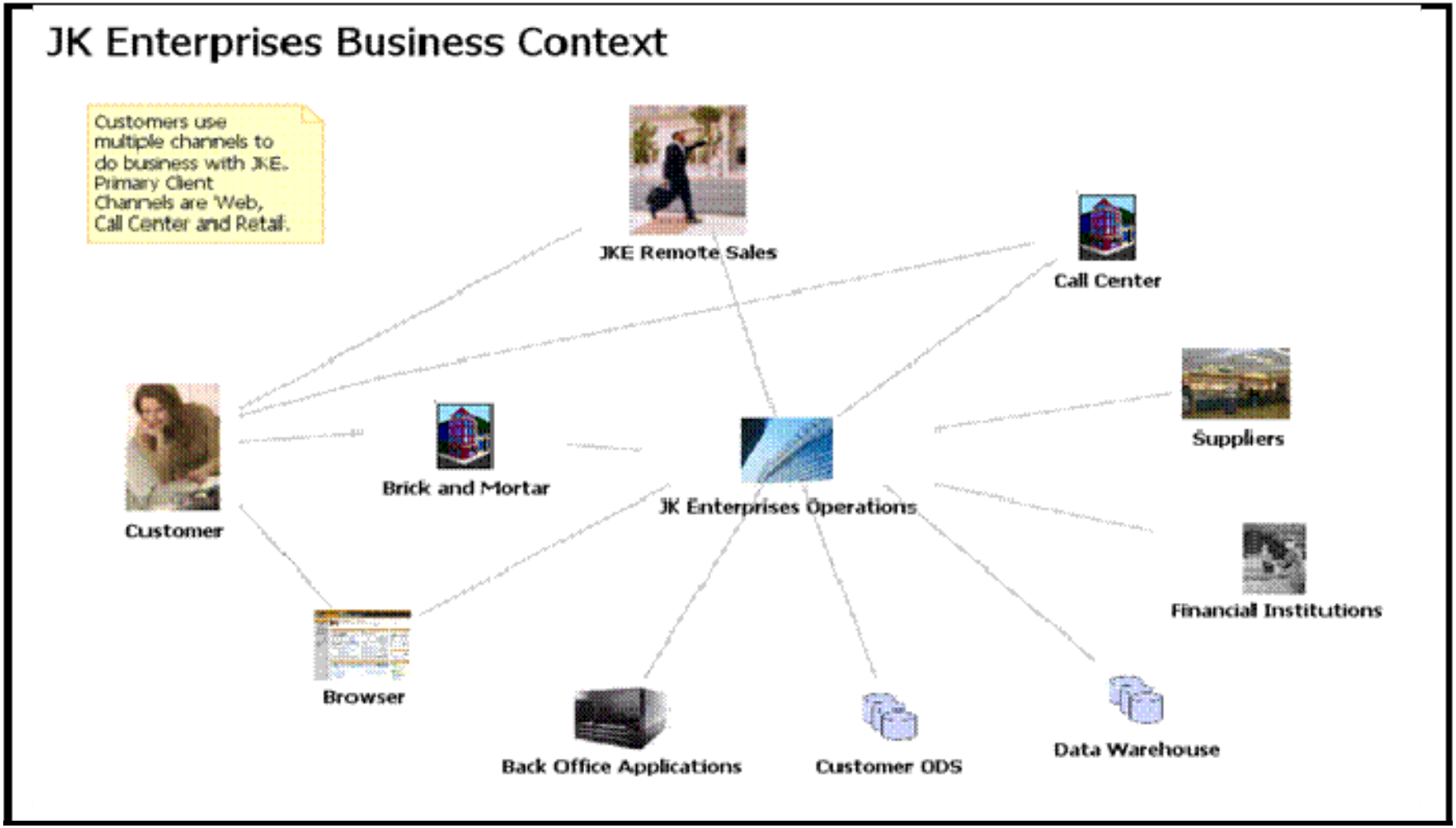


"EA constrains and co-ordinates the construction of IT based business systems"

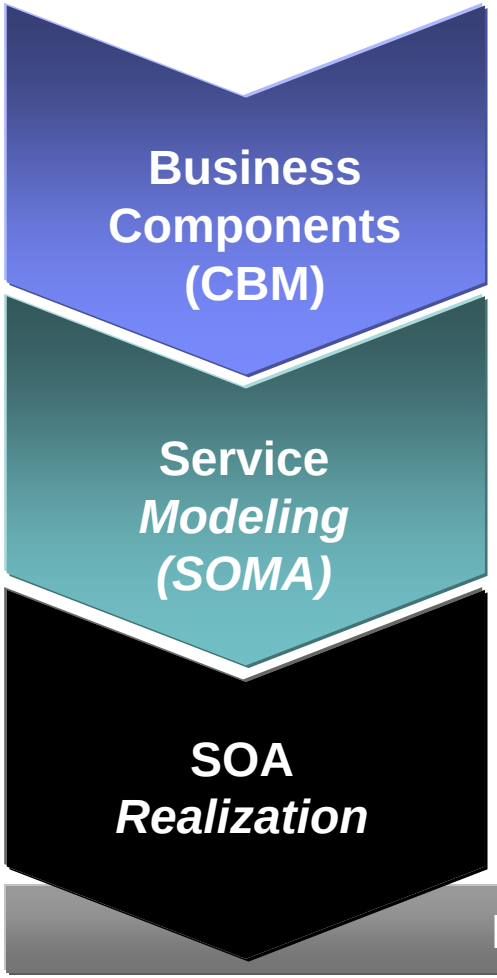


Enterprise Architecture – Business View

Example Business Context



Recap: Approach for SOA



Step 1: Break down your business into components

- **Decide what is strategically important, and what is just operations in the value chain domains**
- **Analyze the different KPIs attached to these components**
- **Prioritize and scope your transformation projects**

Step 2: Define a Service Model

- **Identify your services based on your business components**
- **Specify the services and components accordingly**
- ***Make SOA realization decisions based on architectural decisions***

Step 3: Implement a Service Model

- **Develop a service-oriented architecture to support the Componentized Business**
- **Implement service based scoping policy for projects**
- **Implement appropriate governance mechanism**

Business-Aligned IT Architecture

Component Business Model (CBM) – Definition (1)

A **Business Component** is a part of an enterprise that has the potential to operate autonomously, for example, as a separate company, or as part of another company.

Columns are Business Competencies, defined as large business areas with characteristic skills and capabilities, for example, product development or supply chain.

An **Operational Level** characterizes the scope of decision making. The three levels used in CBM are direct, control and execute.

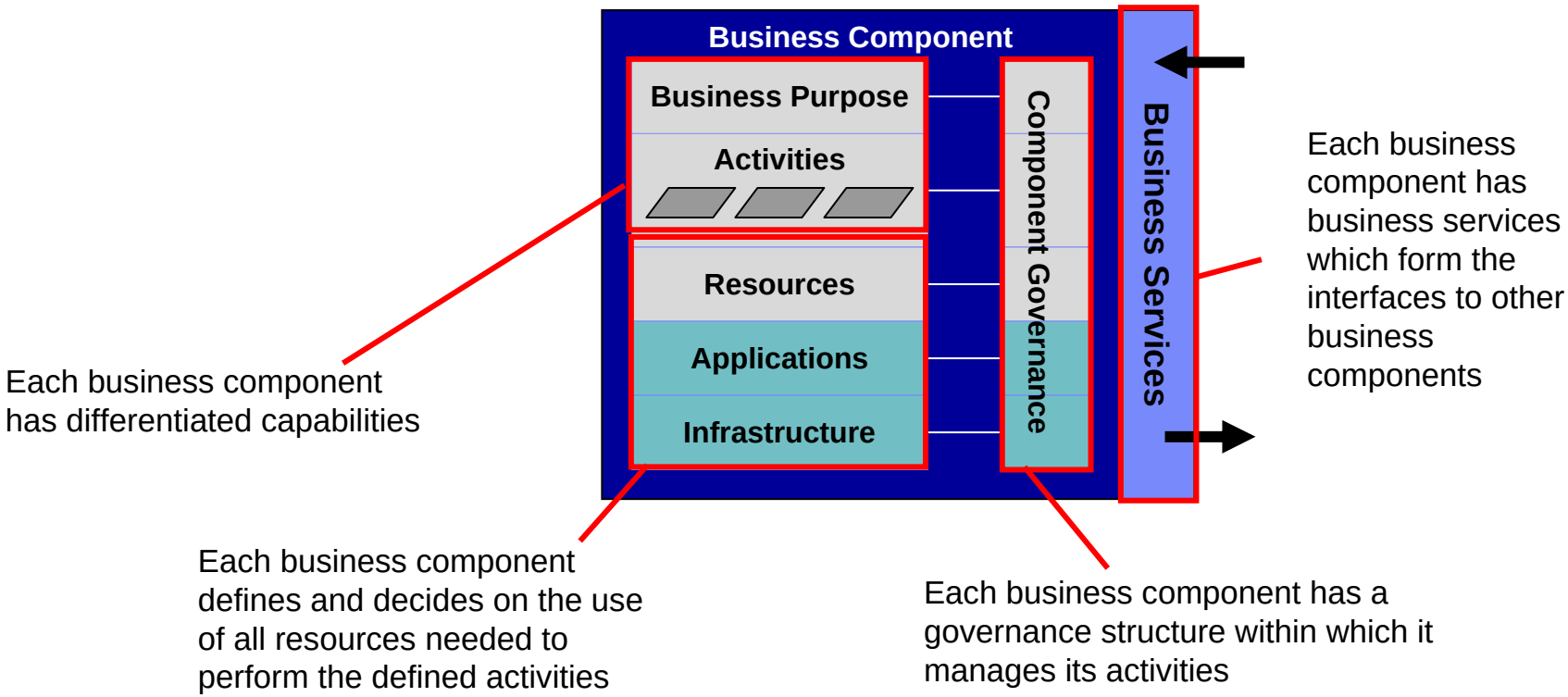
- Direct is about strategy, overall direction and policy.
- Control is about monitoring, managing exceptions and tactical decision making
- Execute is about doing the work

	Business Administration	New Business Development	Relationship Management	Servicing & Sales	Product Fulfillment	Financial Control and Accounting
Direct	Business Planning	Sector Planning	Account Planning	Sales Planning	Fulfillment Planning	Portfolio Planning
Control	Business Unit Tracking	Sector Management	Relationship Management	Sales Management	Fulfillment Planning	Compliance
	Staff Appraisals	Product Management	Credit Assessment			Reconciliation
Execute	Staff Administration	Product Directory	Credit Administration	Sales	Product Fulfillment	Customer Accounts
	Production Administration	Marketing Campaigns		Customer Dialogue	Document Management	General Ledger
				Contact Routing		

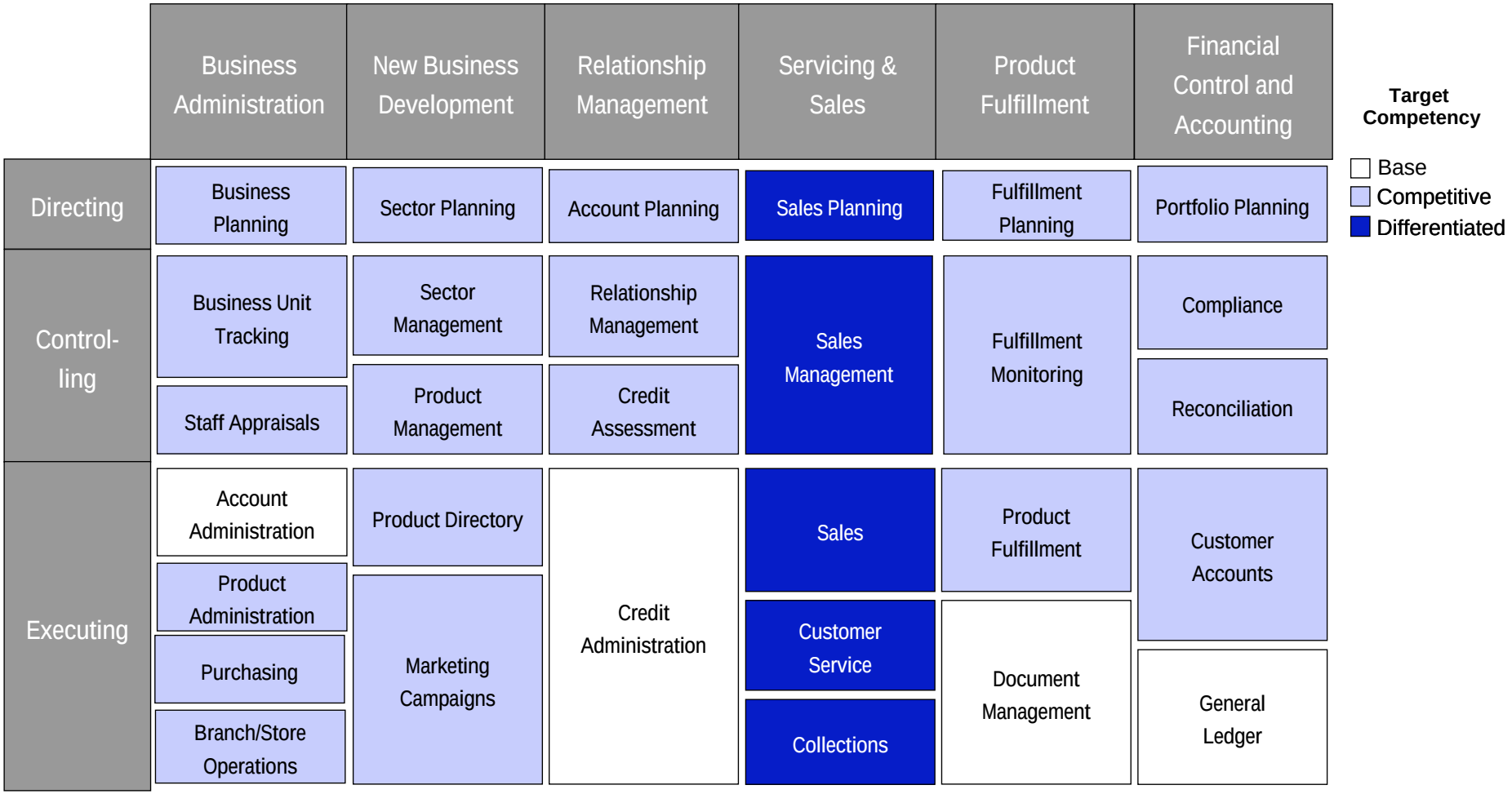
CBM – Definition (2): The building block of a component business model is a 'business component'

A component is a business in microcosm. It has activities, resources, applications, infrastructure. It has a governance model. It provides goods and services (business services)

Business Component Elements



Domain Decomposition– Component Business Modeling for JKE



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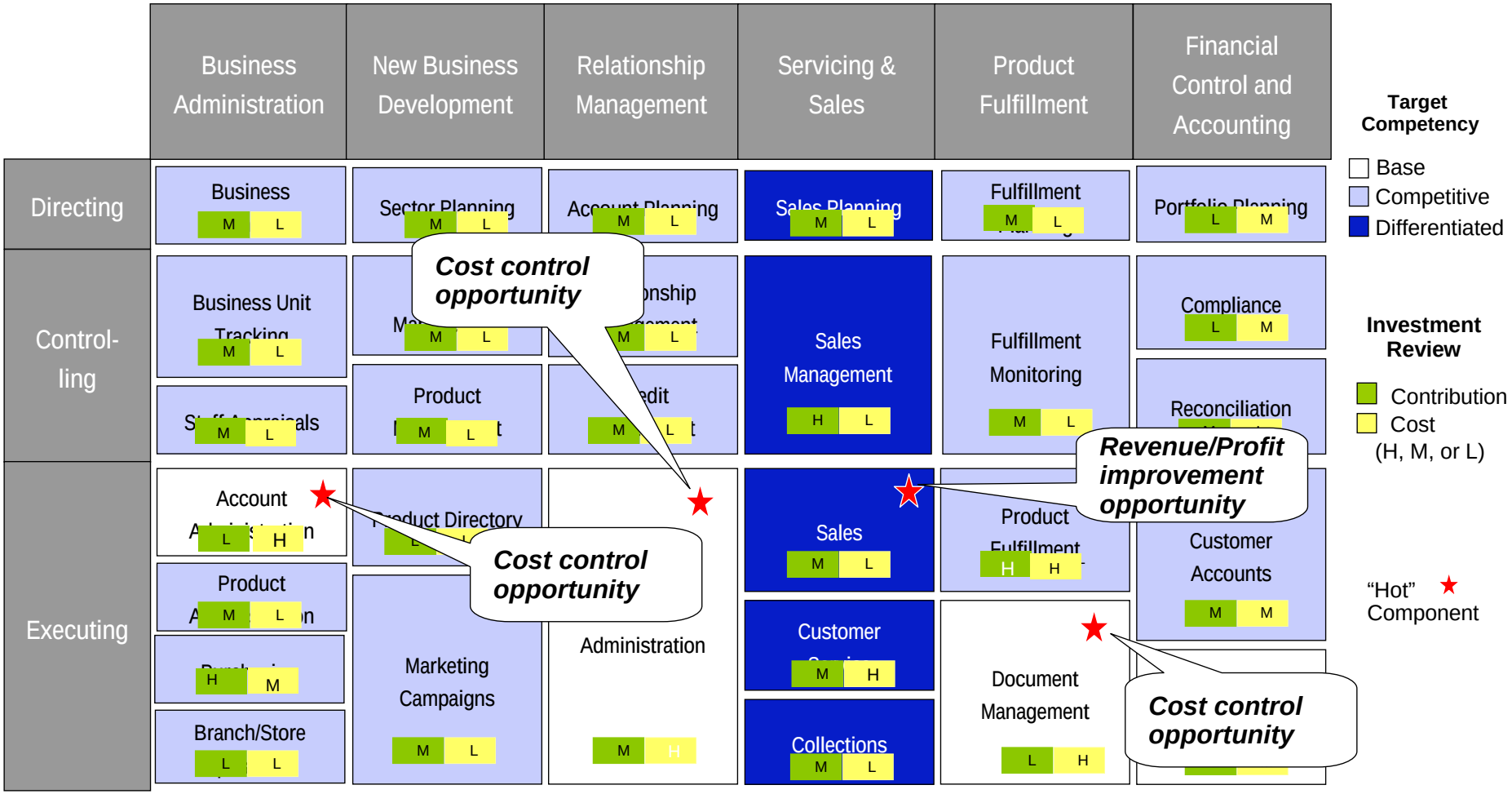
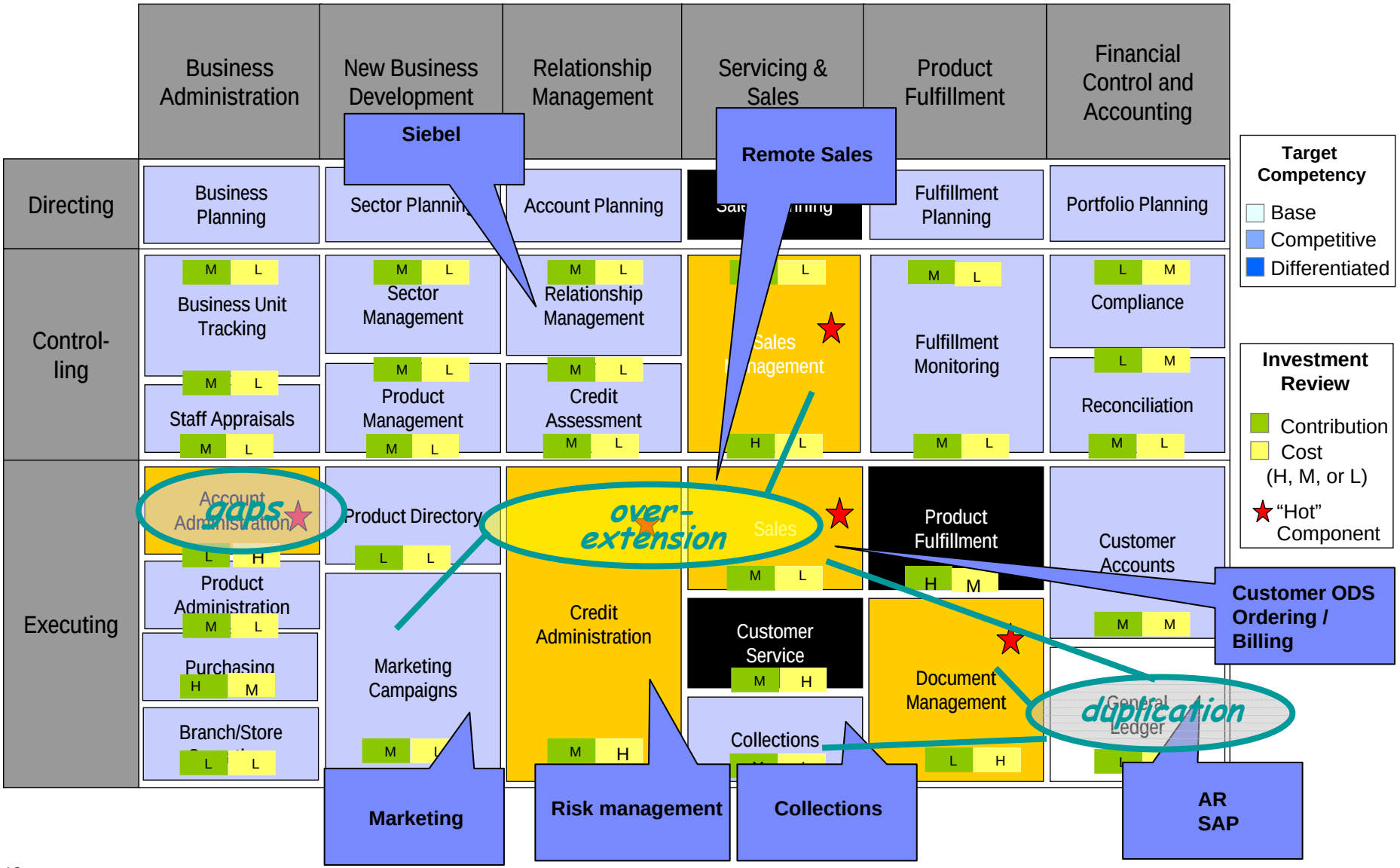


CBM and IT Systems Coverage for JKE



Key Performance Indicators for JKE

- 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%**
- …

Business Goals and Key Performance Indicators

Business Goals

Requirements:	ROI	Cost	Benefit	Priority
GOAL1: Cost Reduction Cost Reduction of 10% by 2007	1000000	20000	1020000	High
GOAL2: Increase Products Per Customer Increase Products Per Customer by 10% by 2007	250000	50000	300000	Medium
GOAL3: Increase Availability Increase Availability of On-Line Presence to 99.999%	25000	15000	40000	
GOAL4: Reduce Risk of Regulatory Non-Compliance Reduce Risk of Regulatory Non-Compliance	100000	20000	120000	
GOAL5: Increase Customer Self-Service Increase Customer Self-Service via Internet to 85% by 2006	50000	5000	55000	
GOAL6: Decrease Time to Market Decrease Time to Market for New Products by 10% by 2007	250000	30000	280000	

Key Performance Indicators

Requirements:	Priority	Status
KPI1: Decrease cost of account activation Decrease cost of account activation by 50%	Medium	Proposed
KPI2: Decrease negotiated cost of credit report retrieval Decrease negotiated cost (Vendor volume discounts) of credit report..	Medium	Proposed
KPI3: Automate credit report retrievals Automate 75% of all credit report retrievals	Medium	Proposed
KPI4: Decrease number of credit report retrievals Decrease number of credit report retrievals by 10%	Medium	Proposed
KPI5: Increase electronic applications Increase electronic applications by 25%	Medium	Proposed
KPI6: Reduce call center calls Reduce number of call center calls by sales force and offices (stores).	Medium	Proposed

- **Key Performance Indicators (KPIs) are used to define a metric (simple or composed measurable unit) that measures of much the service implementation fulfills the initial requirements (business goal)**
- **Each Business Goal that is going to be realized with a specific service implementation should have an associated KPI.**

Dynamic Infrastructure – Cloud Computing

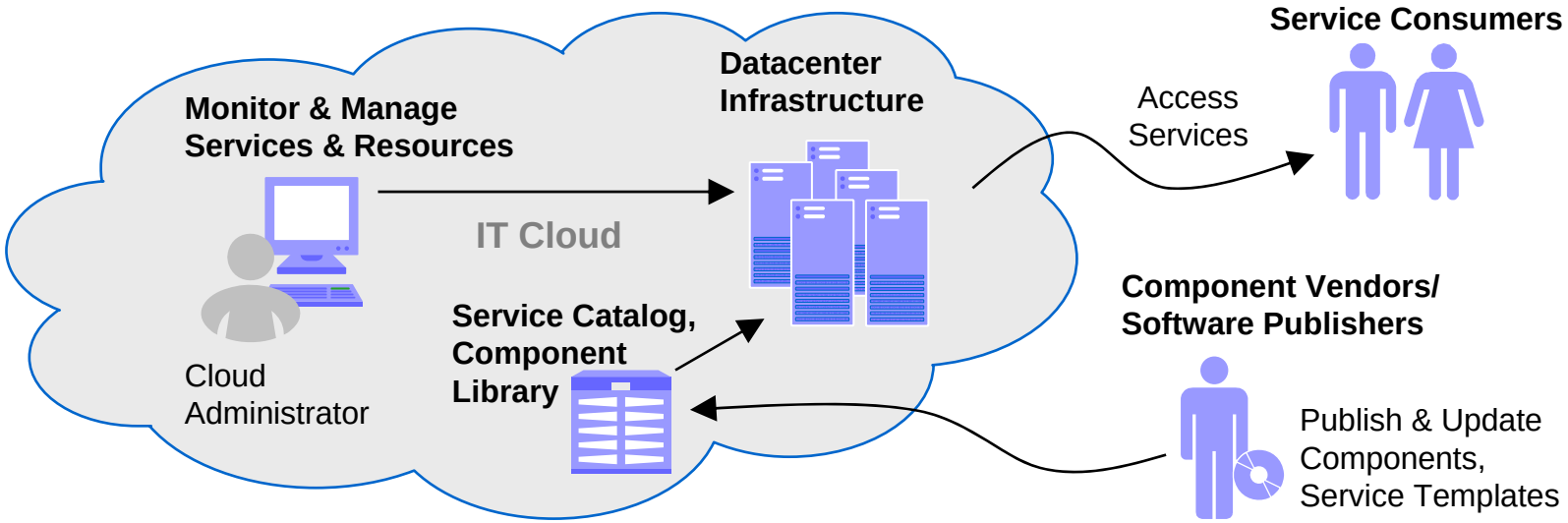
What is Cloud Computing?

A user experience and a business model

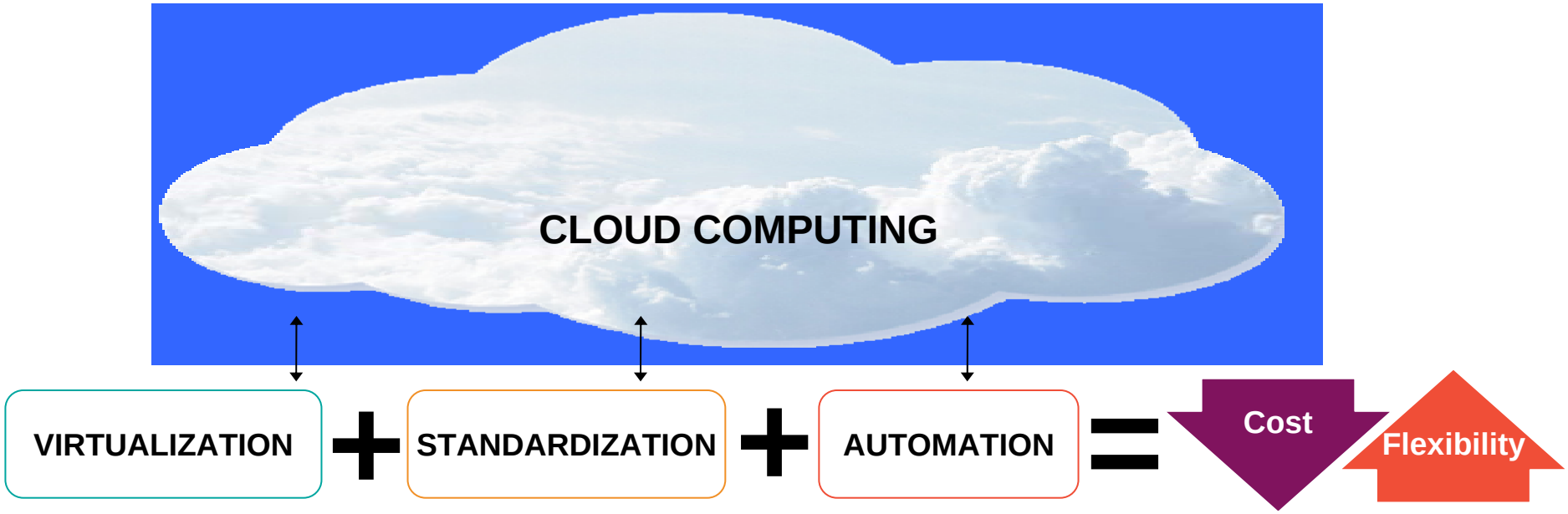
- Cloud computing is an emerging style of IT delivery in which applications, data, and IT resources are **rapidly provisioned** and provided as **standardized offerings** to users over the web in a **flexible pricing model.**

An infrastructure management and services delivery methodology

- Cloud computing is a way of **managing** large numbers of highly **virtualized resources** such that, from a management perspective, they resemble a single large resource. This can then be used to deliver services with **elastic scaling**.

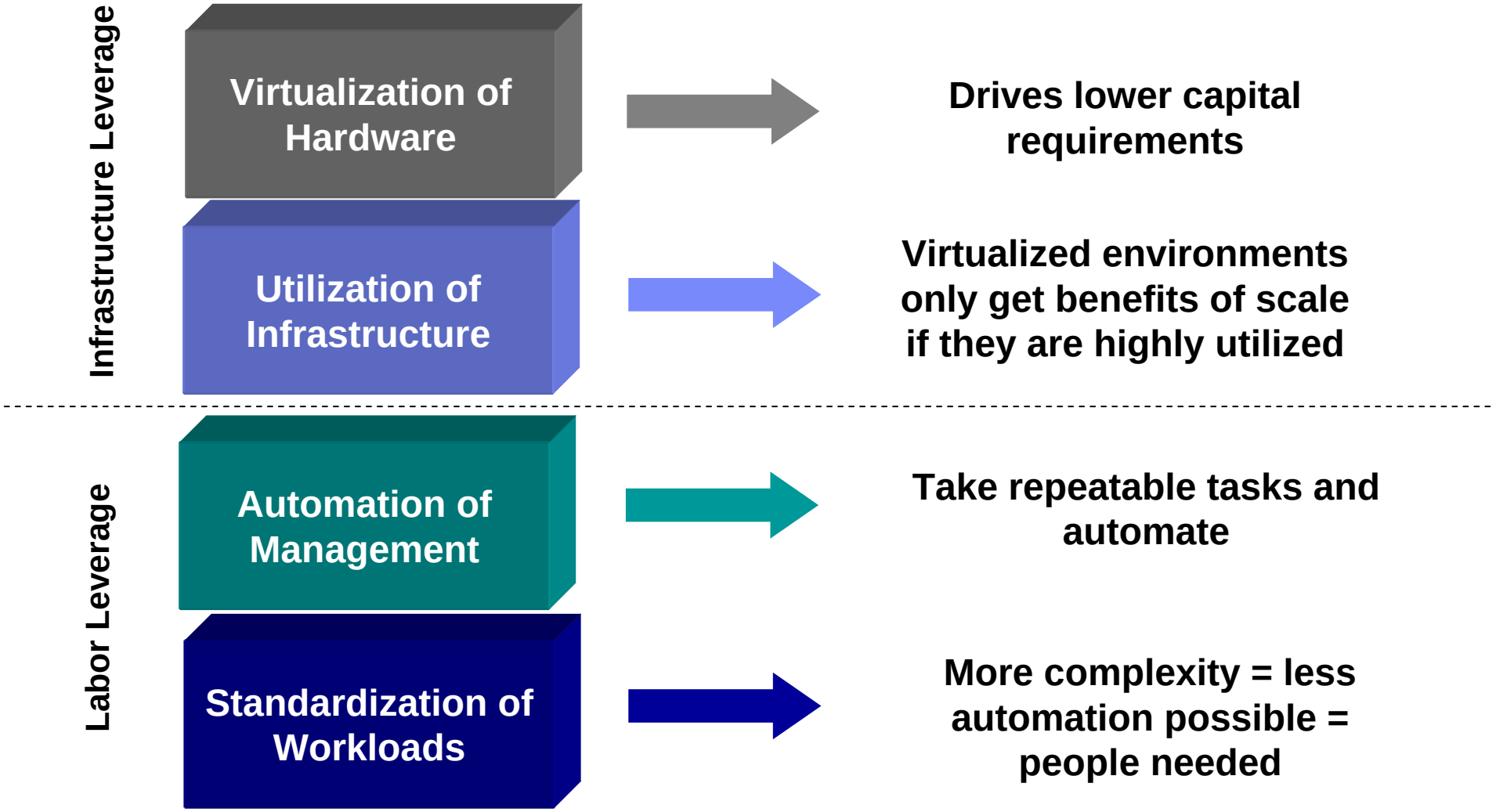


Cloud-onomics



…leveraging **virtualization, standardization and automation** to free up operational budget for new investment.

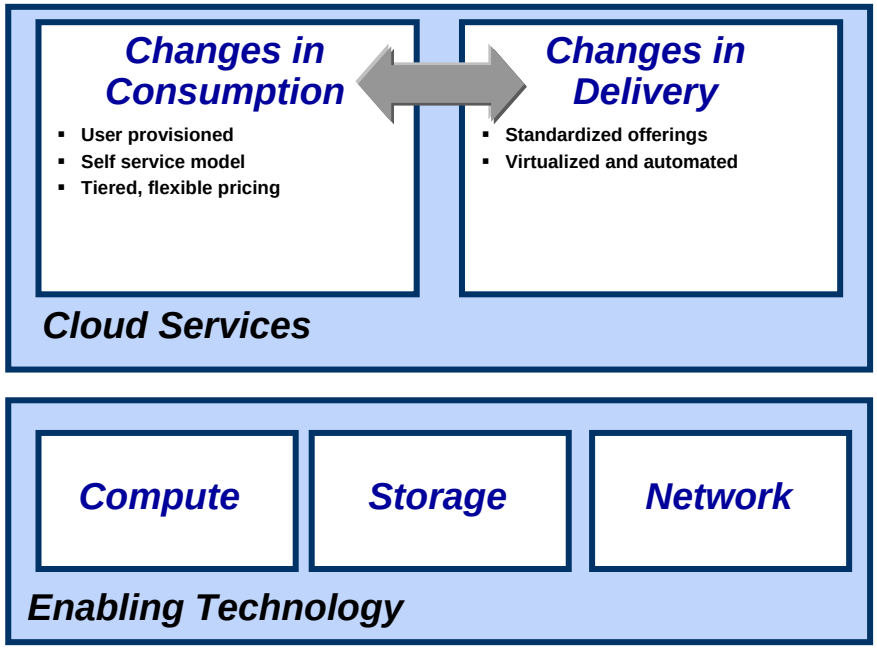
Major Factors Driving Cloud-onomics



The key ingredients of Cloud Computing

High Quality User Experience

- **Easy access to "best in class" functions**
- **Flexibility and choice**
- **Lower costs**
- **Enhanced security and reliability**
- **Rapidly Provisioned**



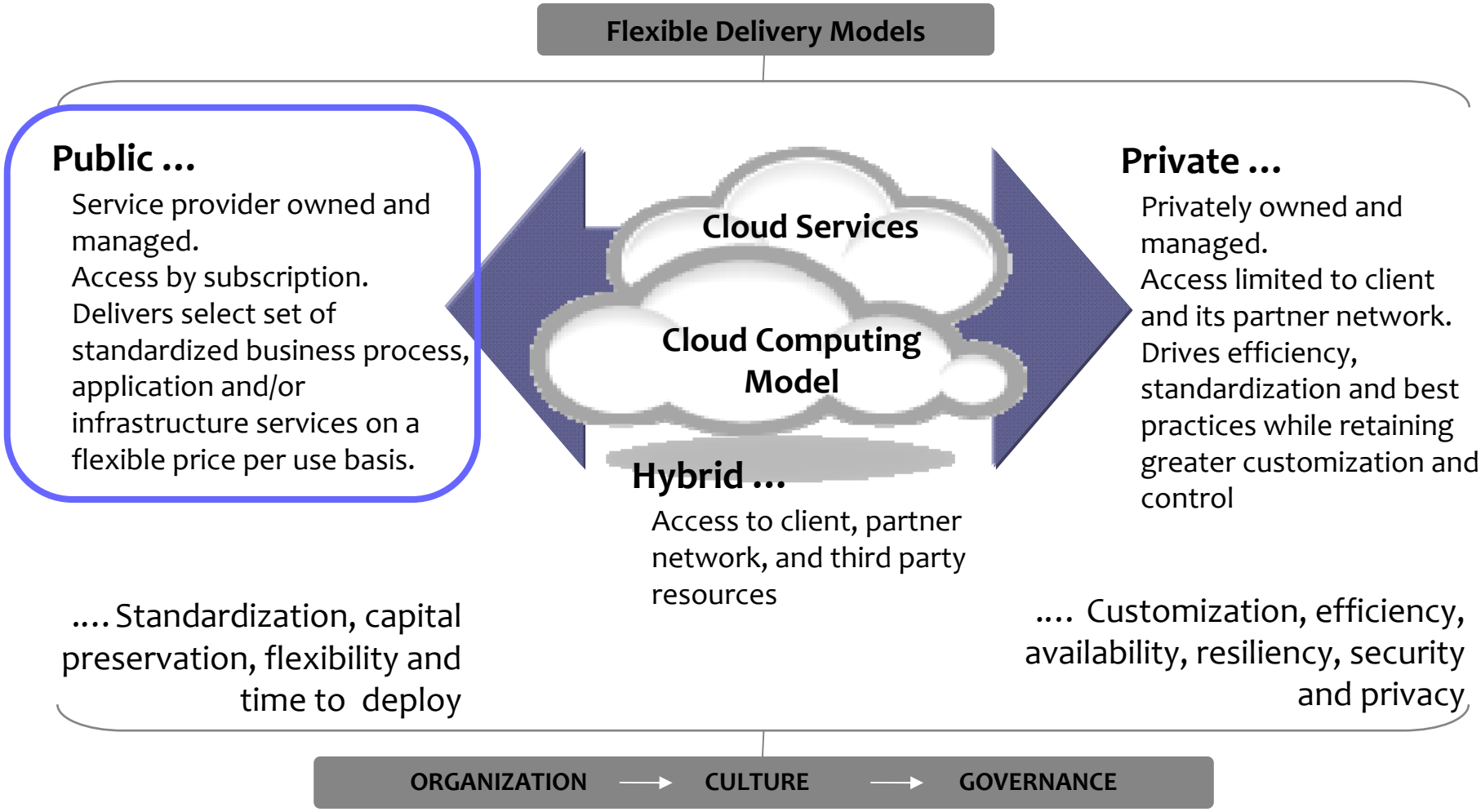
Enabled by dynamic Infrastructure

- **Open, standards-based**
- **Common components and processes**
- **Elastic scaling and fault recovery**

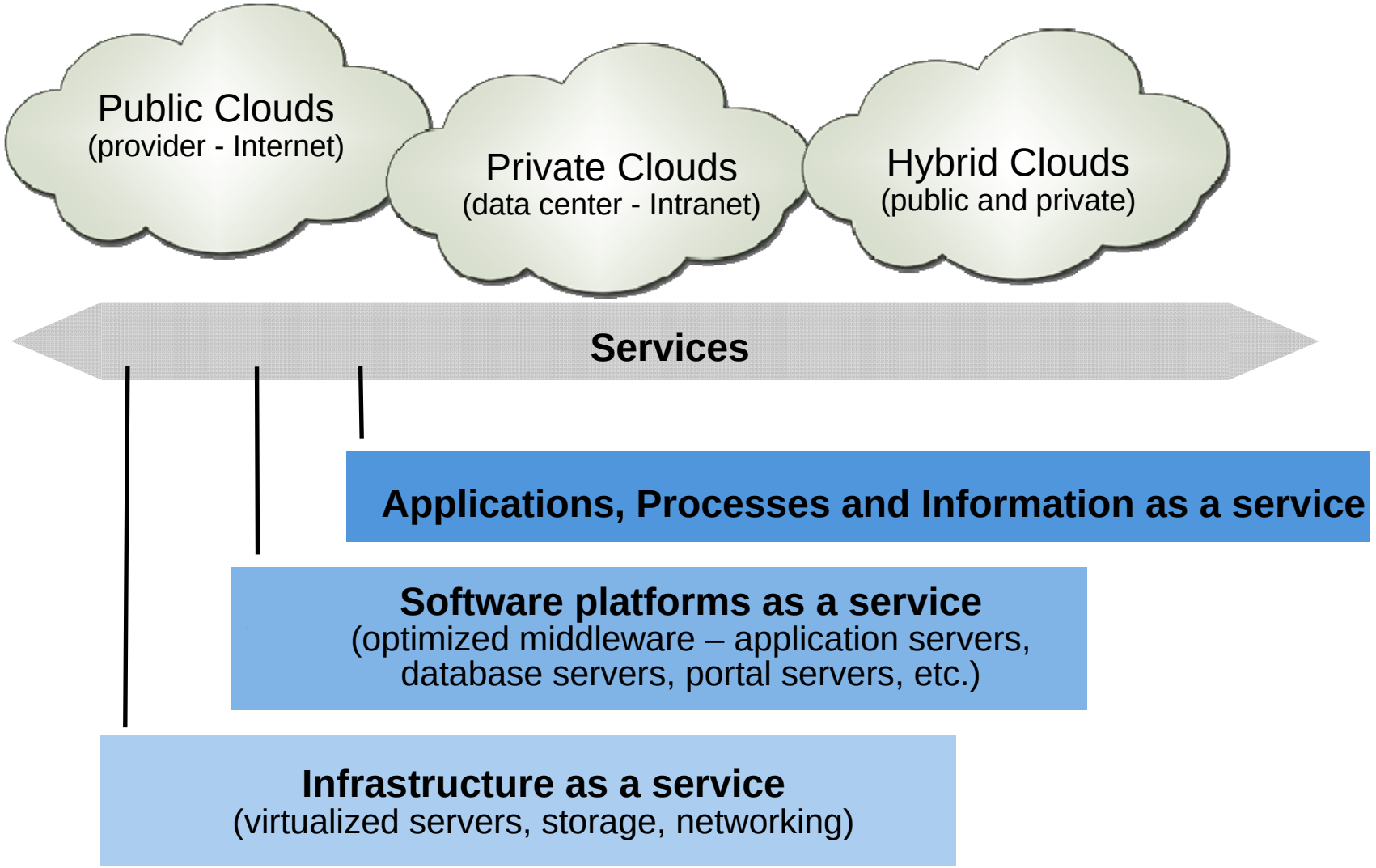
Significantly Improved Supply Economics

- **Lower operating costs via standards and automation**
- **Improved capital efficiency**
- **Rapid, flexible services enhancements**

Cloud Computing Delivery Models



Cloud Computing Deployments and Services Models



Lifecycle of a Cloud Service

Service Offering Subscription & Instantiation

•Select Service, specify parameters and SLA's
•Automatically instantiate the Service

Subscriber (e.g. Line of Business)

Service Offering Creation & Registration

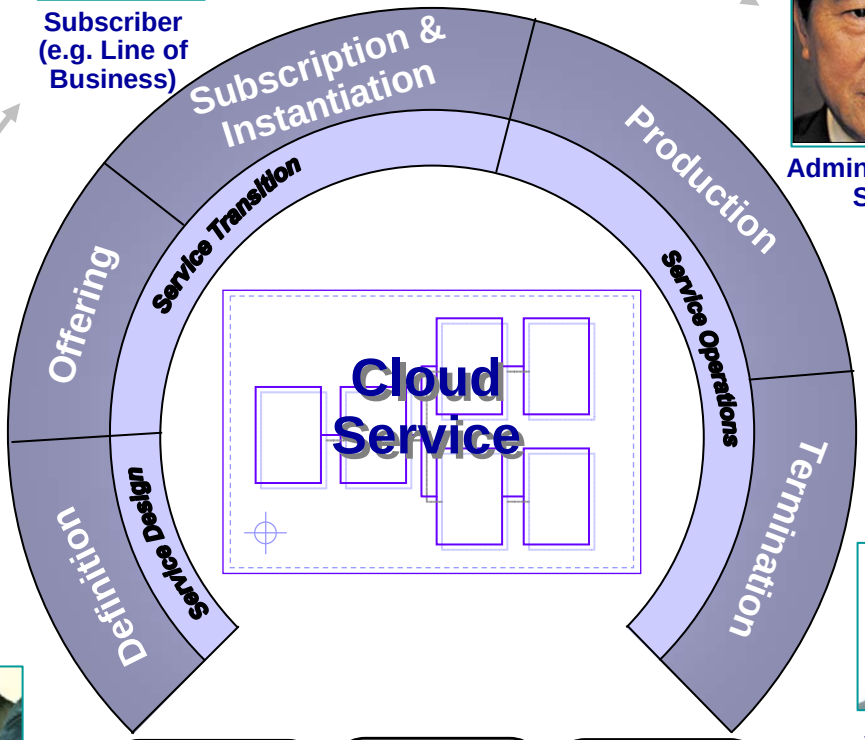
•Define Service based on Template and register it in the Catalog

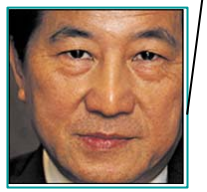
Service Catalog Manager

Service Template Definition

•Create Build- and Management Plans for Service

IBM / ISV / IT Dept





Administrator / SLM

Manual or Autonomic Execution of Management Plans leveraging Automation and Virtualization

Ensure SLA Conformance

Subscriber (e.g. Line of Business)

Service Instance Termination

Destroy Service and free up resources

Architectural Model for Cloud Computing