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# *Enterprise IT Architectures*

## Enterprise Architecture

# Questions



## Agenda of this Session

- **Enterprise Architecture Introduction**
  - “Doing the right things right”
- **Enterprise Architecture Methodology**
  - Almost the same as IT Solutions Architecture
- **Enterprise Architecture Standard**
  - TOGAF (The Open Group Architecture Framework)
- **Business Architecture**
  - CBM (Component Business Model)

## EA – Introduction

## Enterprise Architecture

Doing the right things right

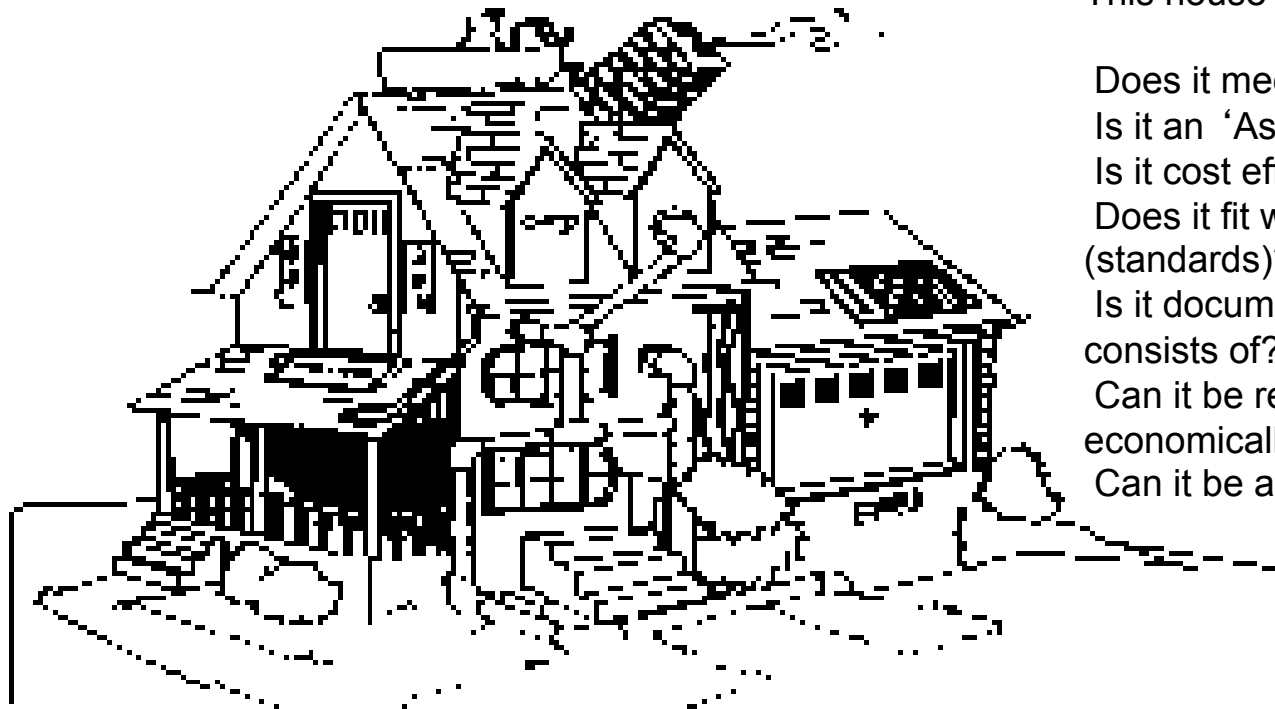
### Why EA – “Enterprise Architecture”

- ***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**
- **Enterprise Architects with a sense of what the enterprise needs to be and do, and how IT should be used in a wider sense**
- **Avoiding results like:**



## 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?

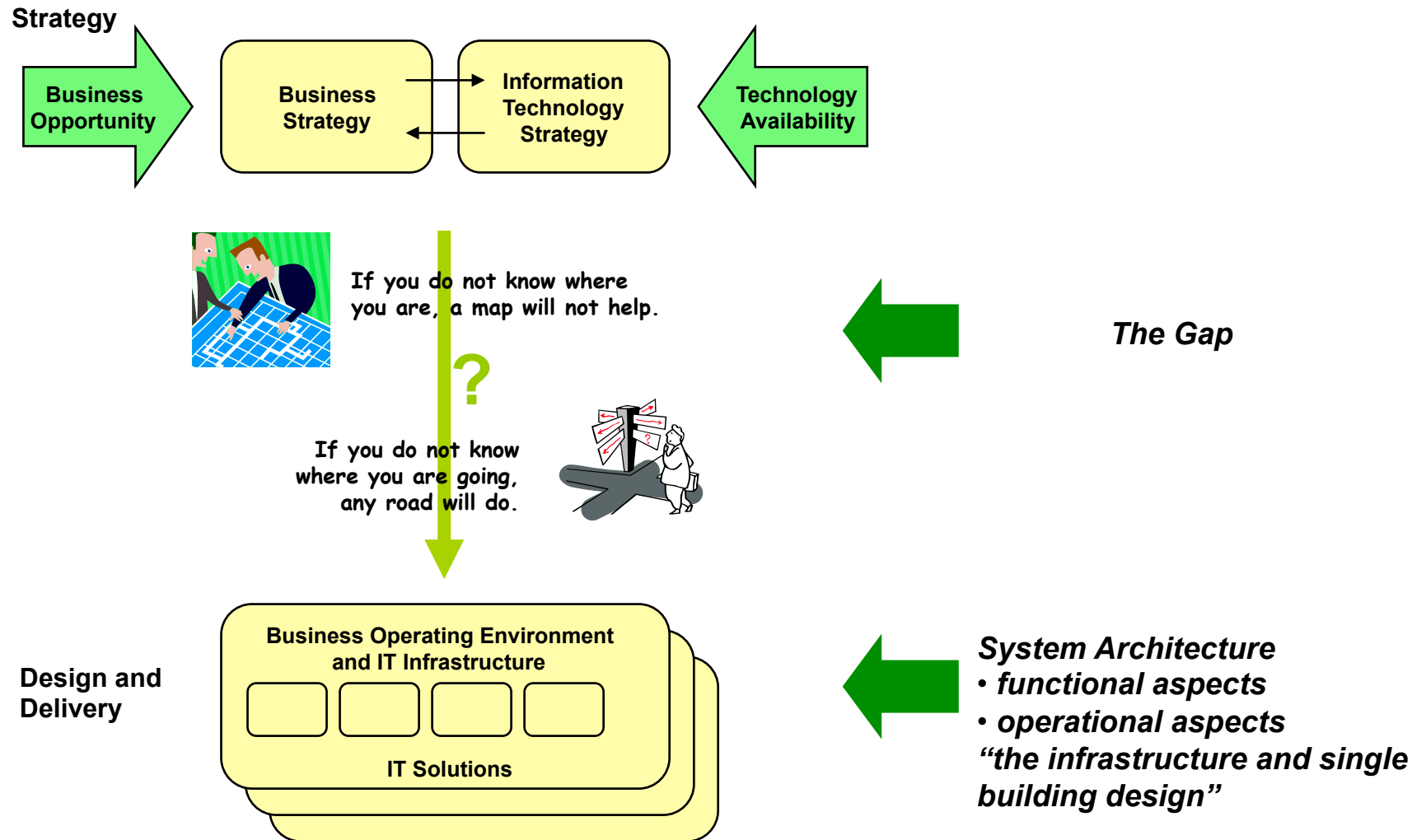
Can it be repaired easily or economically?

Can it be adapted to changing needs?

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

**Lewis Carroll**

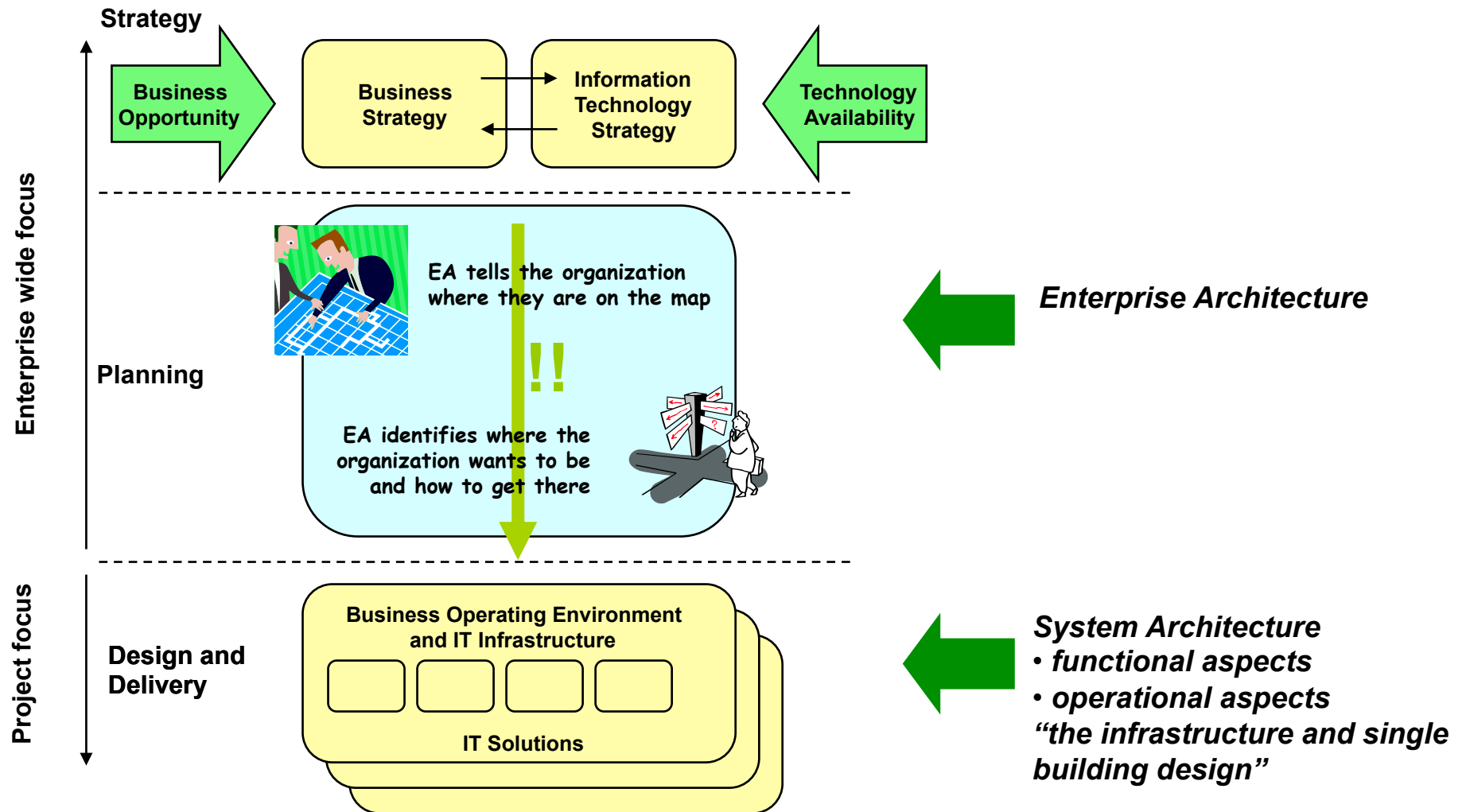
It can be a challenge to ensure IT based business solutions implement the business strategy...





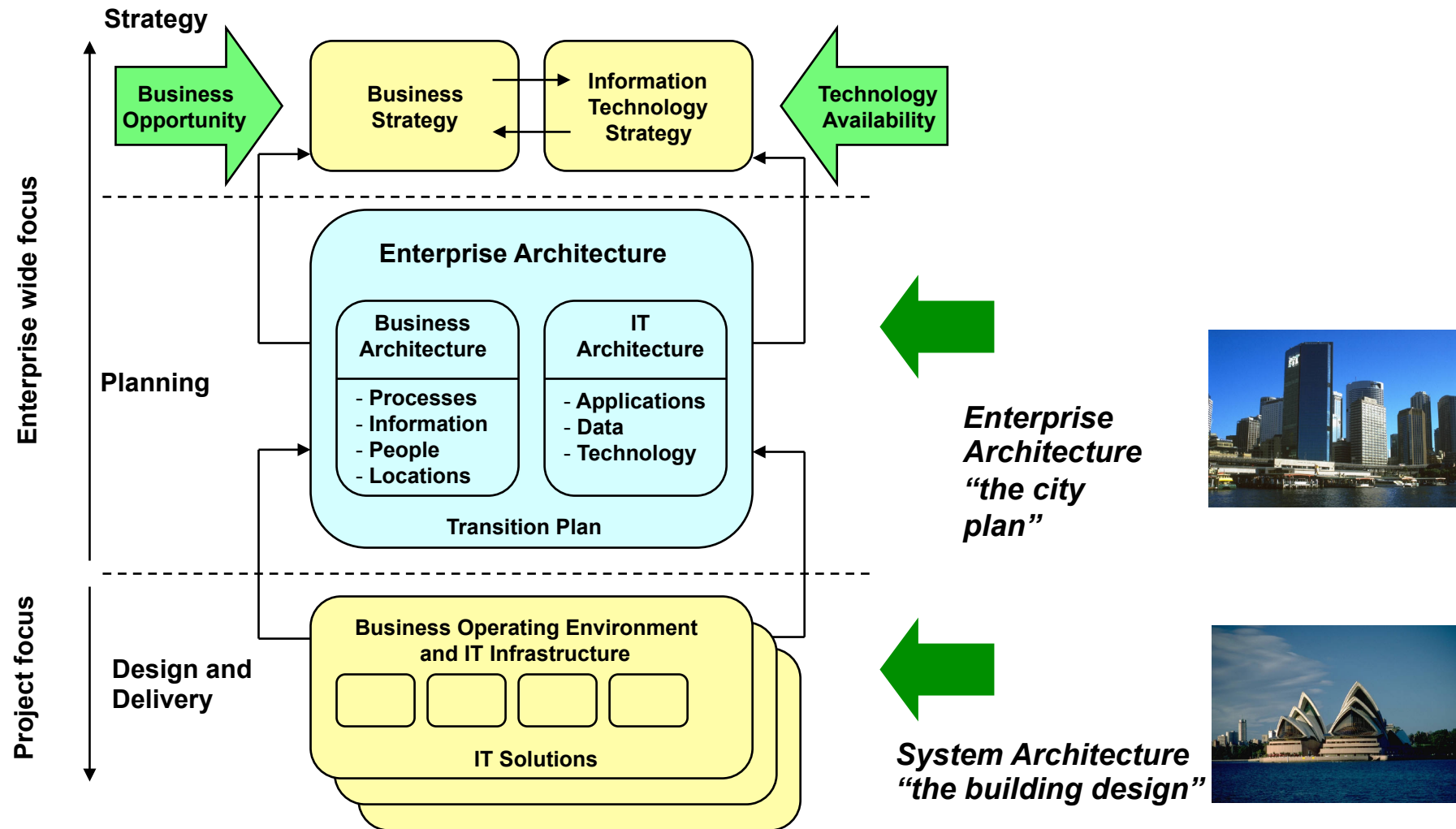
# Enterprise IT Architectures

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



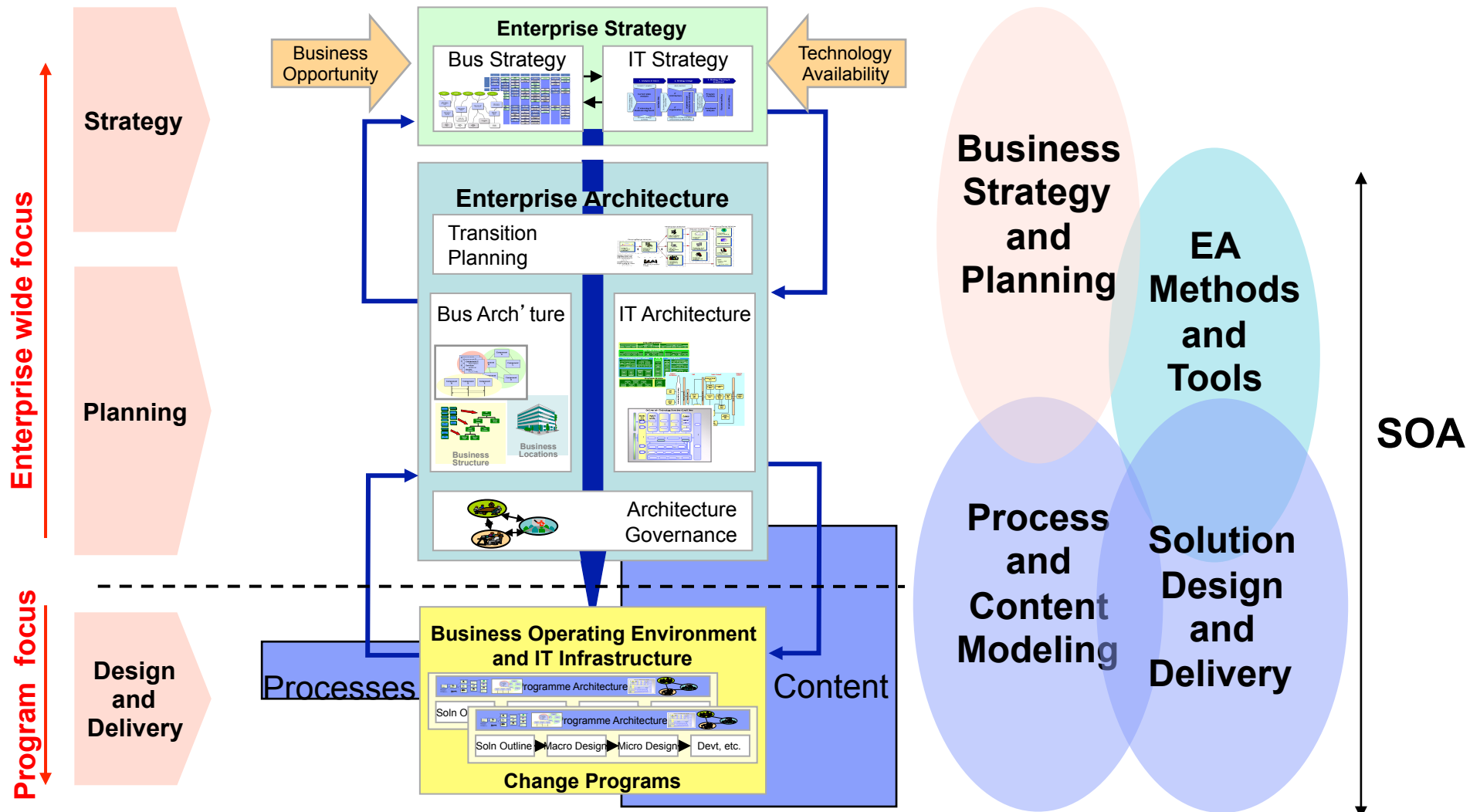
# Enterprise IT Architectures

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

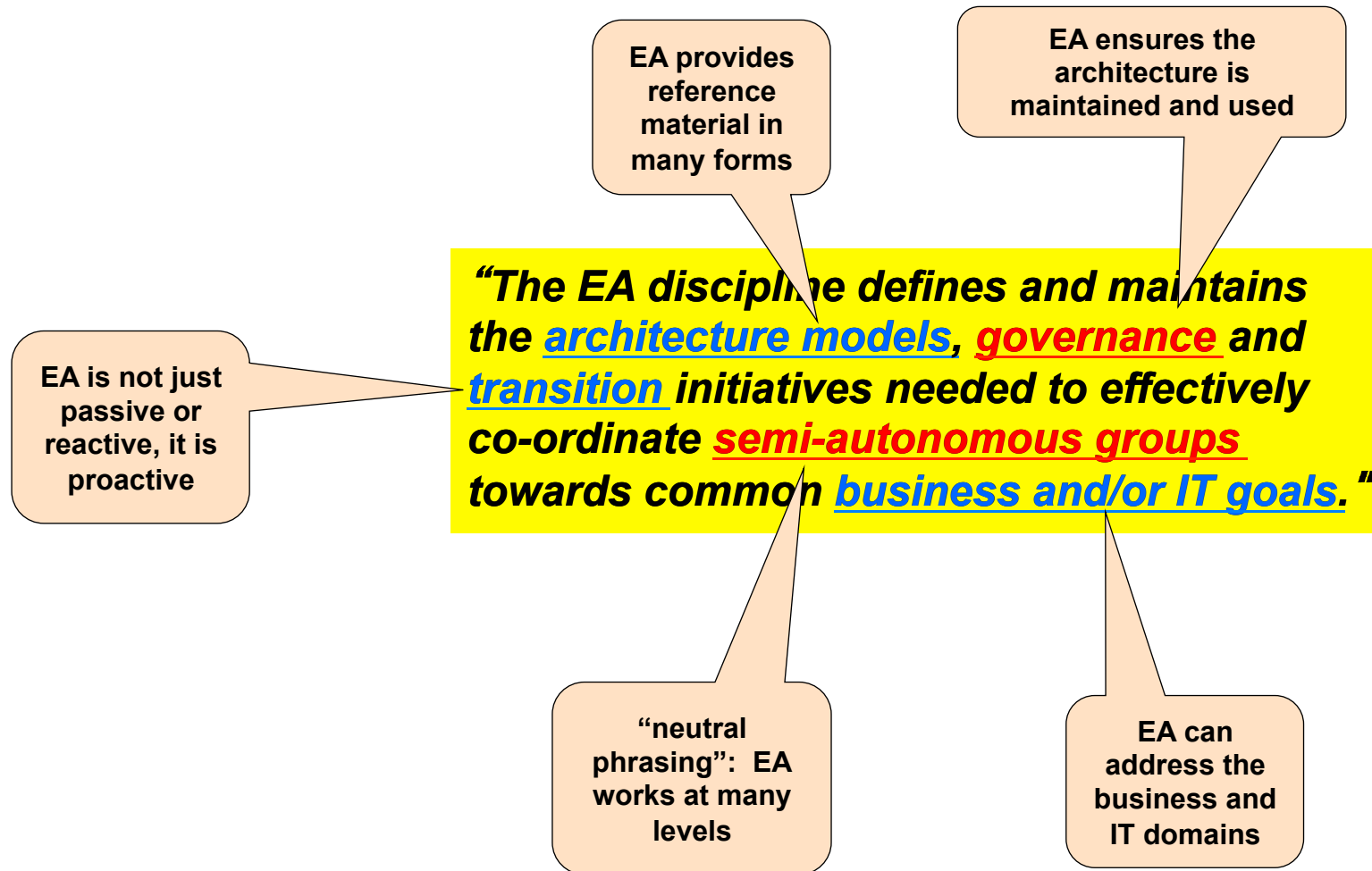


# Enterprise IT Architectures

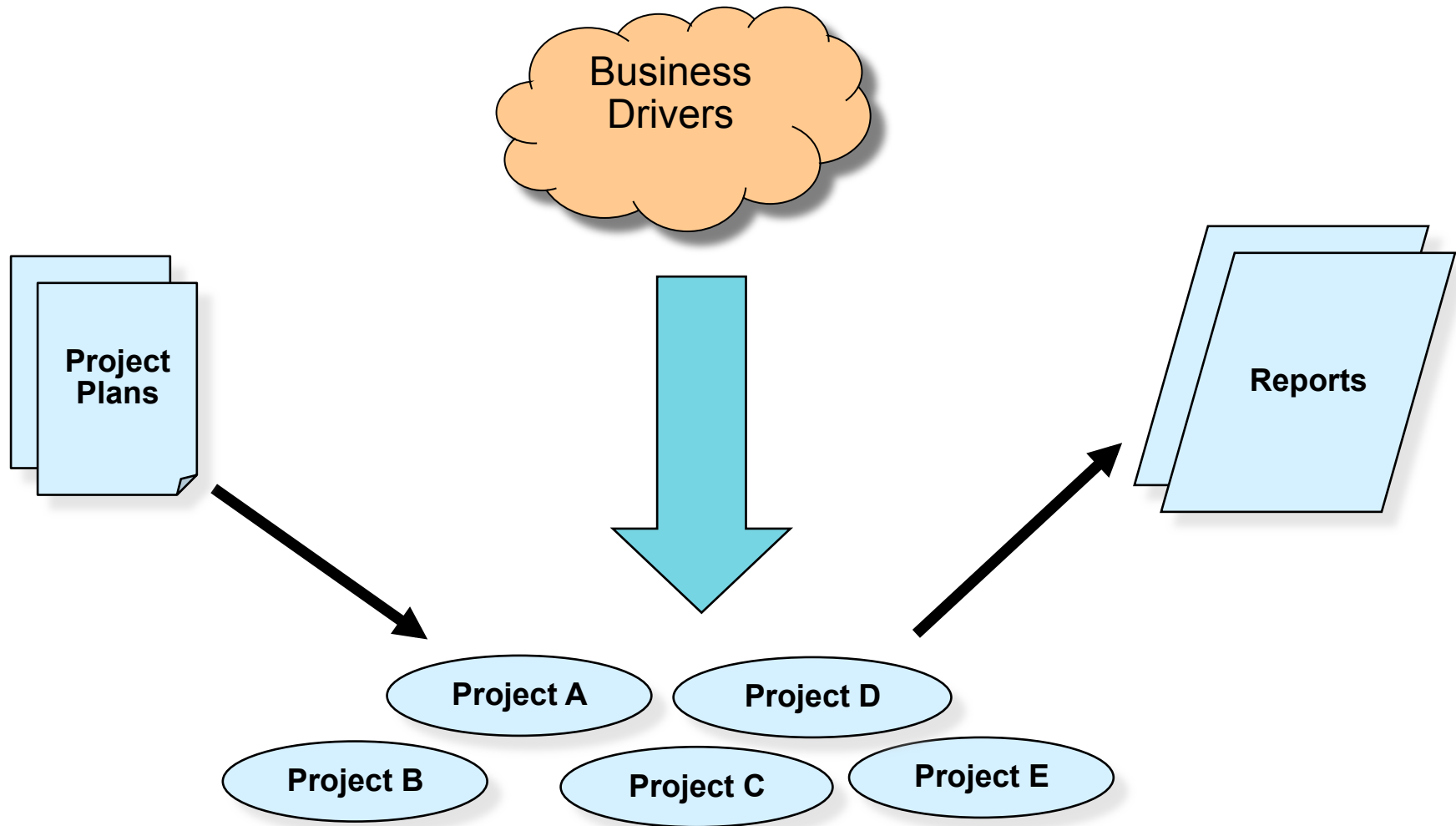
## Bridging the Gap Between Strategy and Delivery



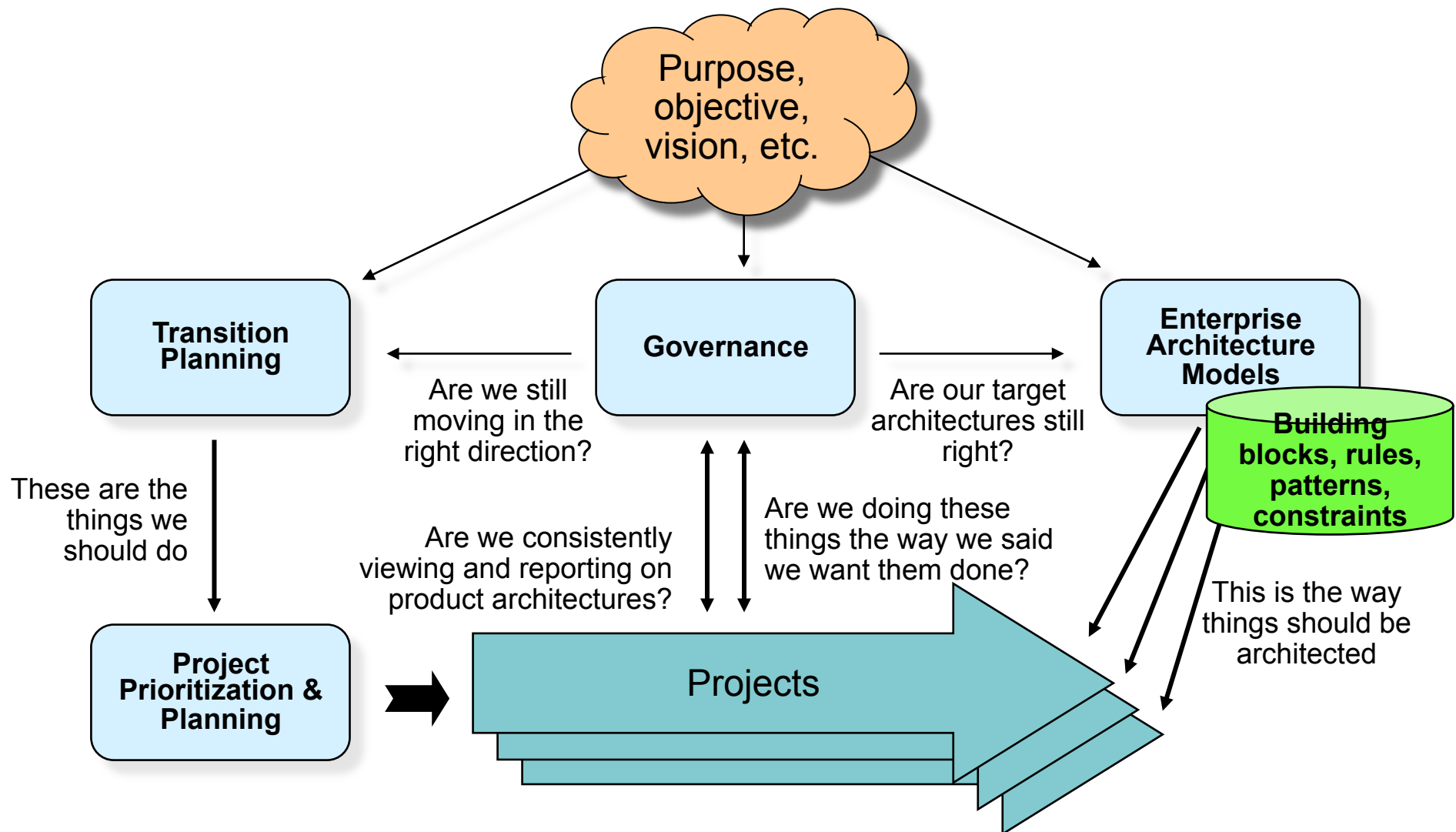
**Enterprise Architecture:** defines the building blocks needed to underpin the portfolio of programs



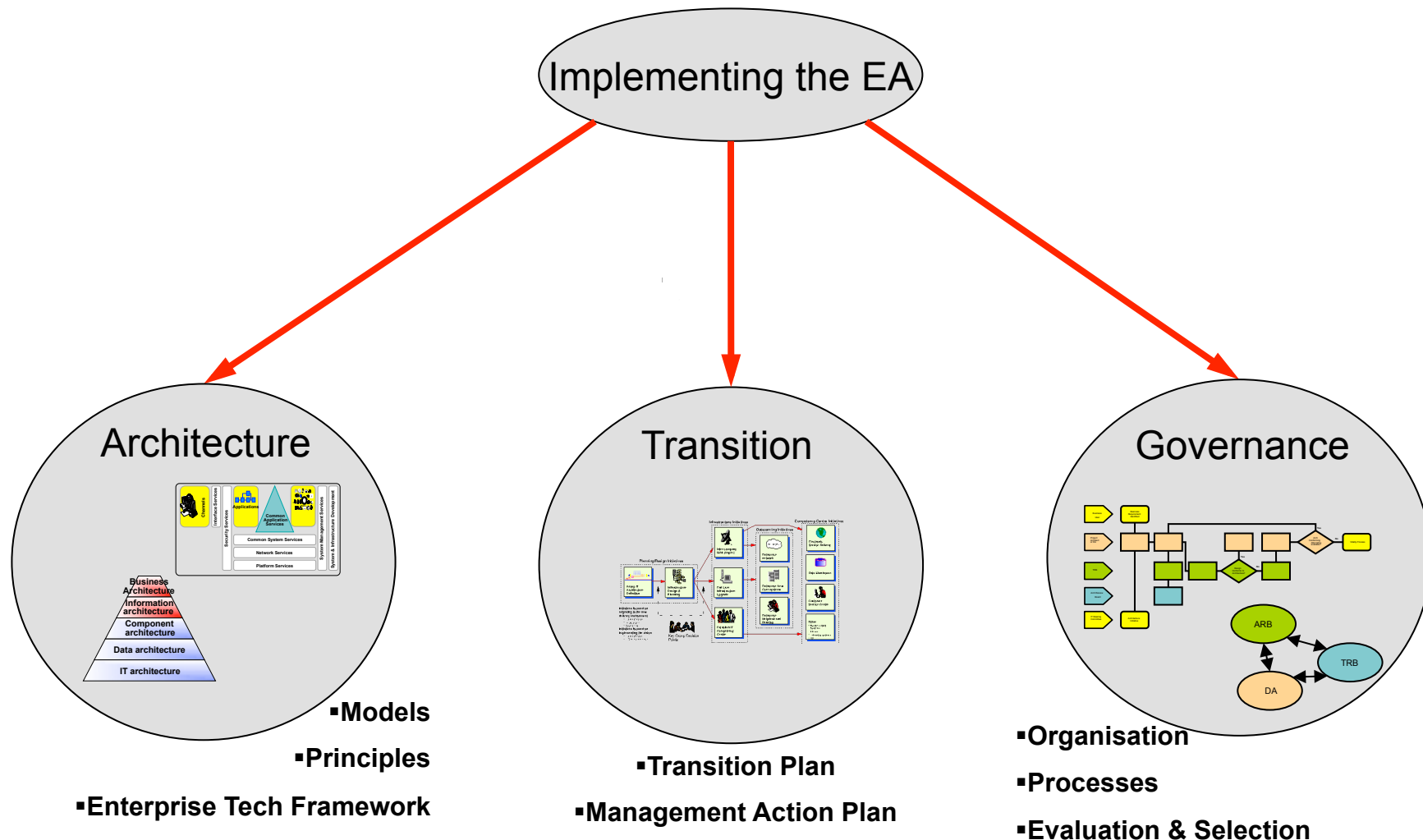
## Current Enterprise Planning and Control



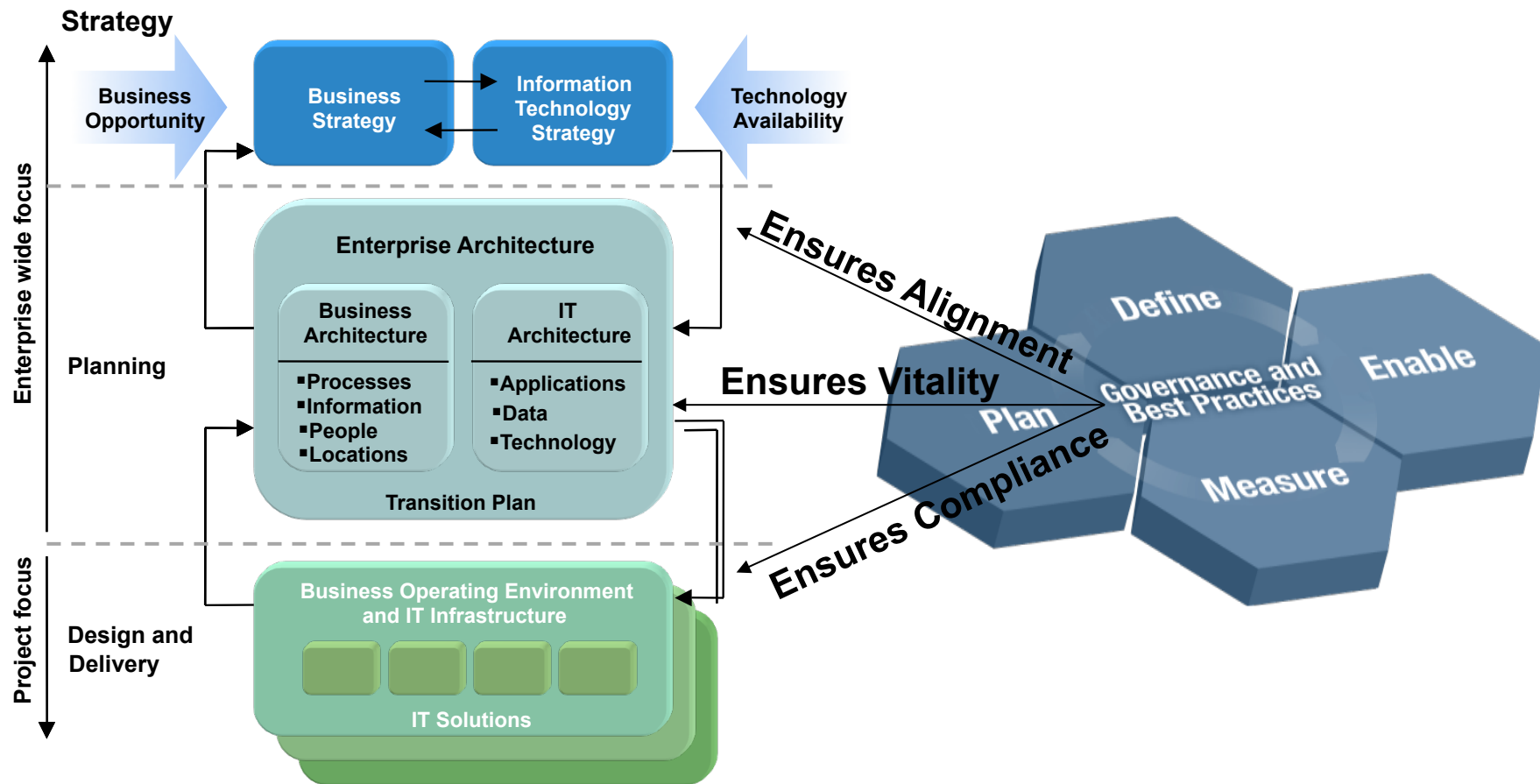
# Enterprise Architecture Solution Overview



## Therefore there are three aspects to implementing an Enterprise Architecture

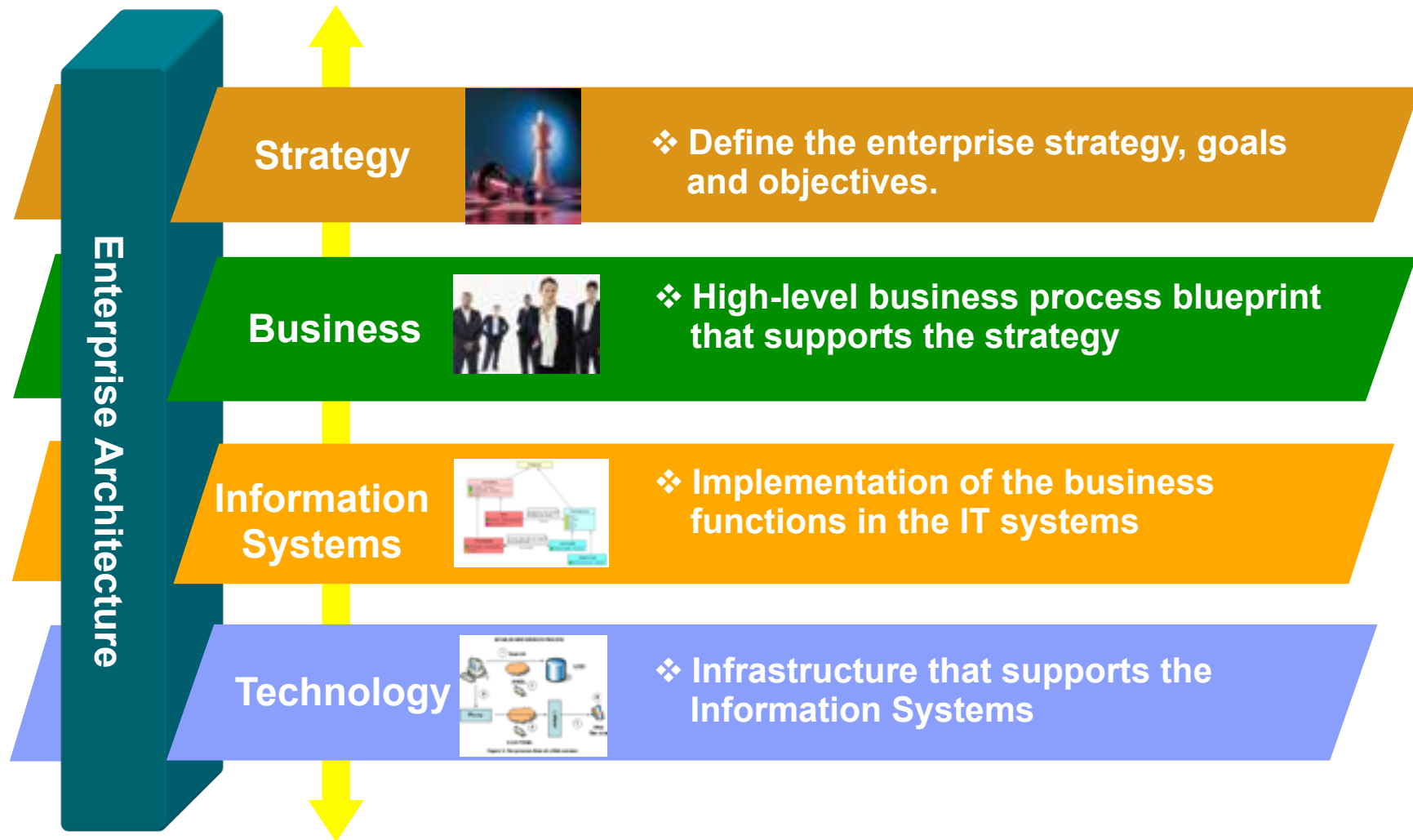


## Enterprise Architecture and Governance (see Architecture Management)



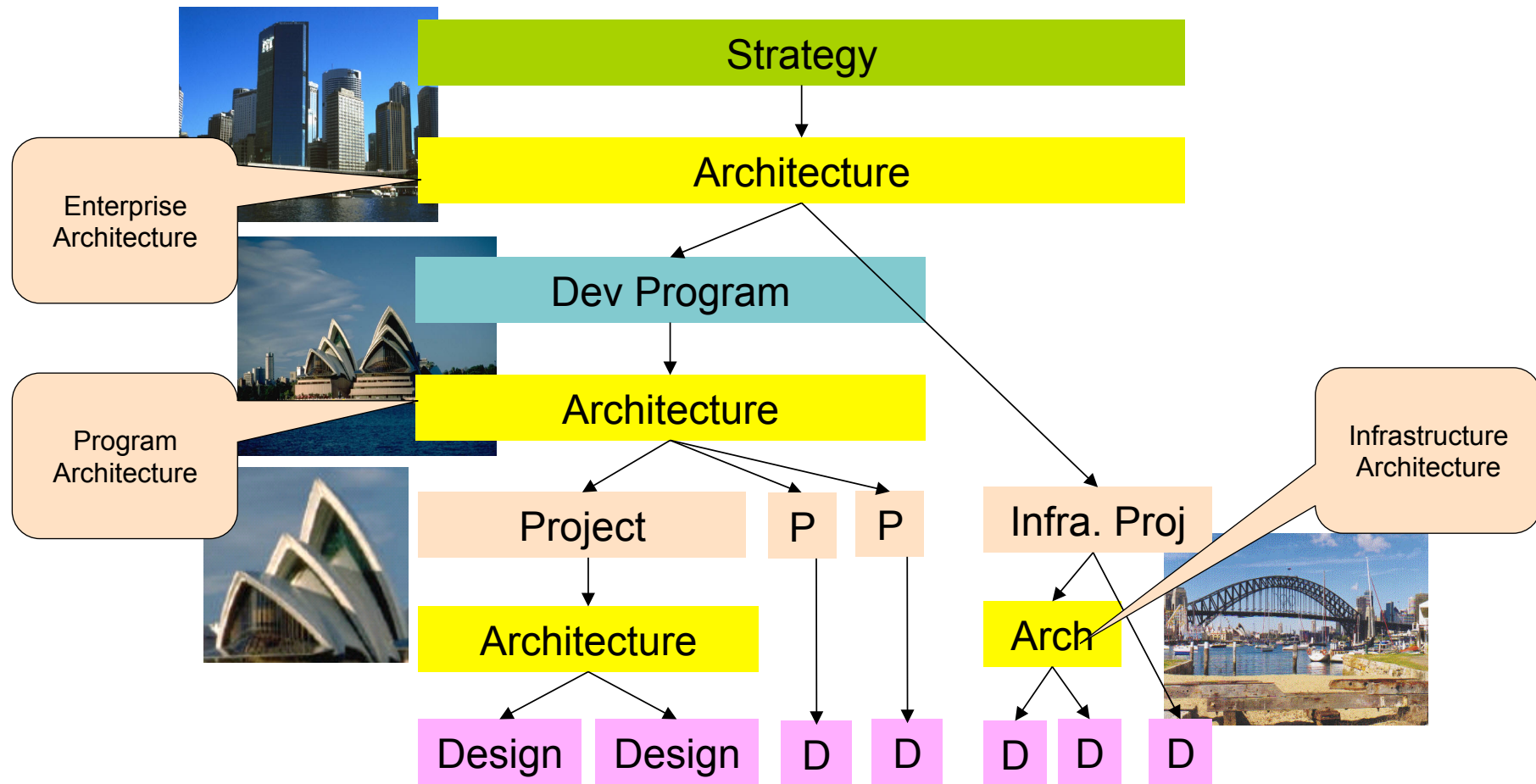


## Enterprise Architecture Defined



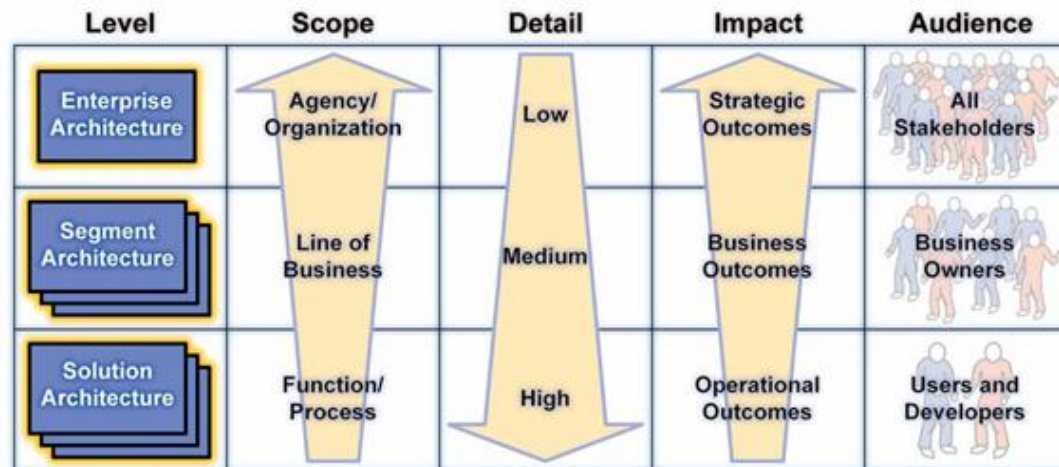
### **Enterprise Architecture – Methodology**

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



# 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.

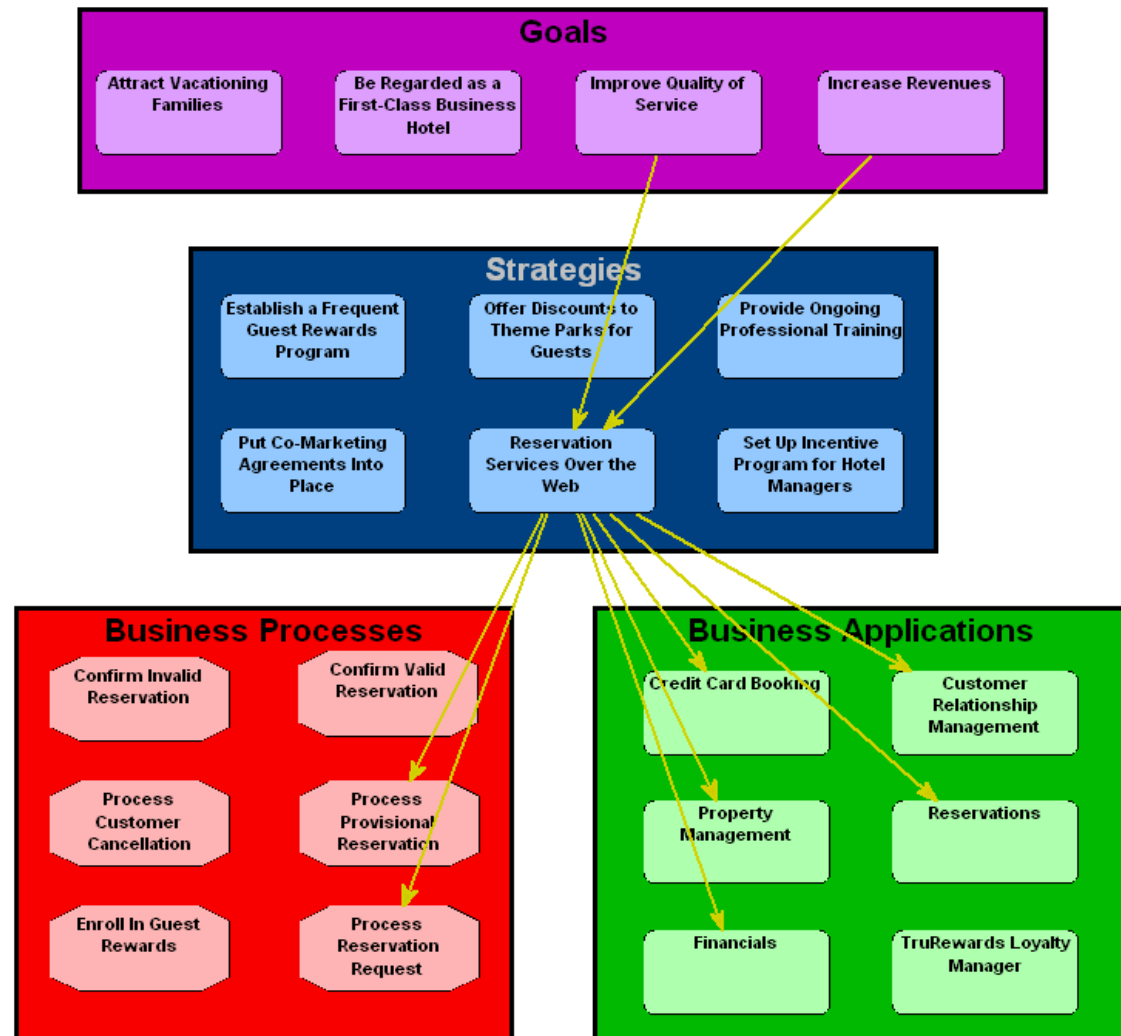
*“Enterprise Architects”*

- ...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.

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

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

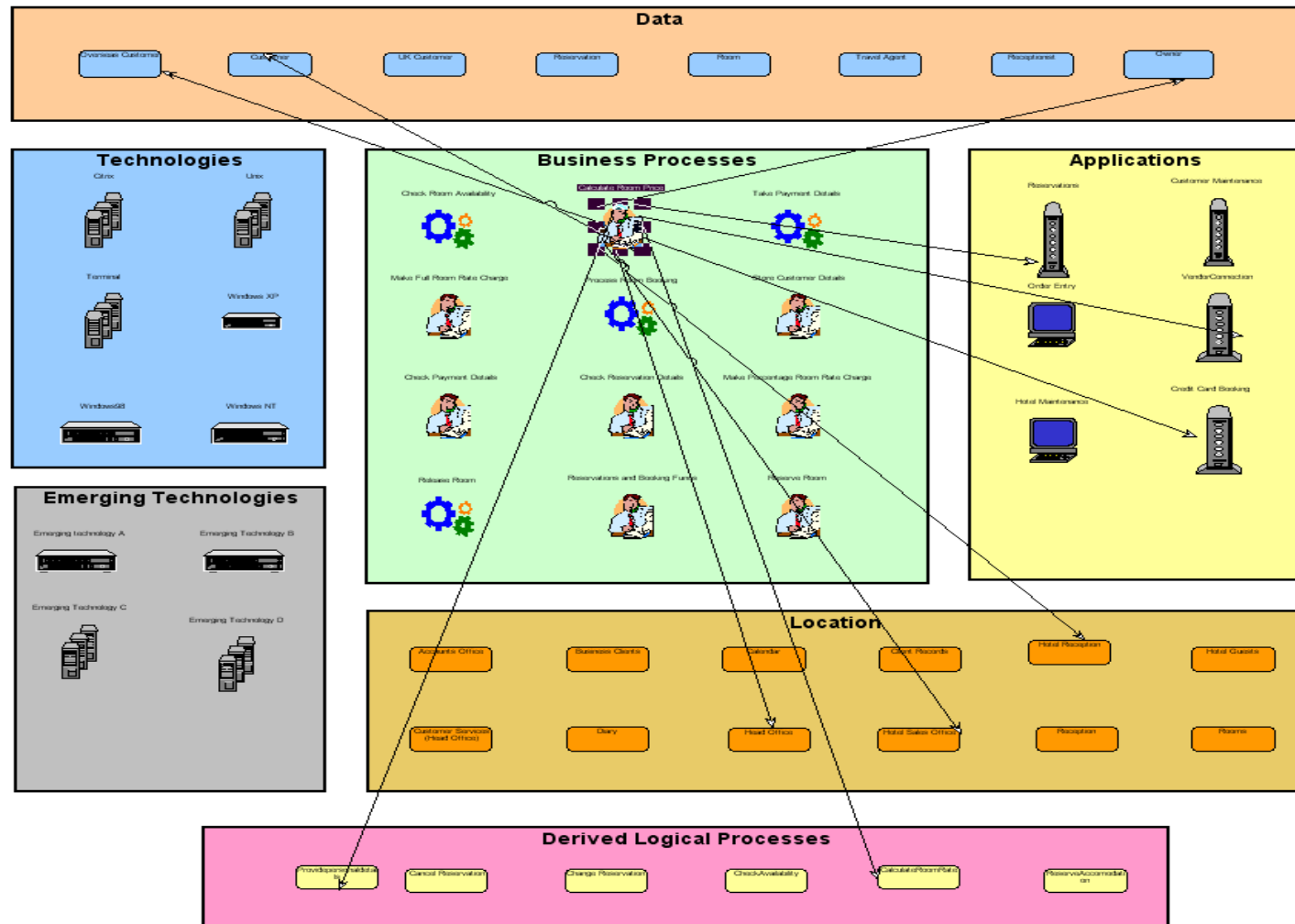
*“If we change our technology stack, what applications and organizations will be effected?”*



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

What Happens If....?

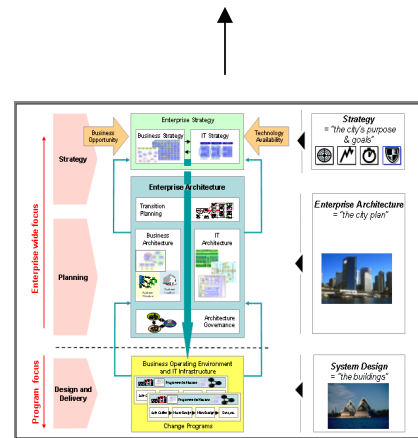
Focus on Information needed to make a decision



# Enterprise IT Architectures

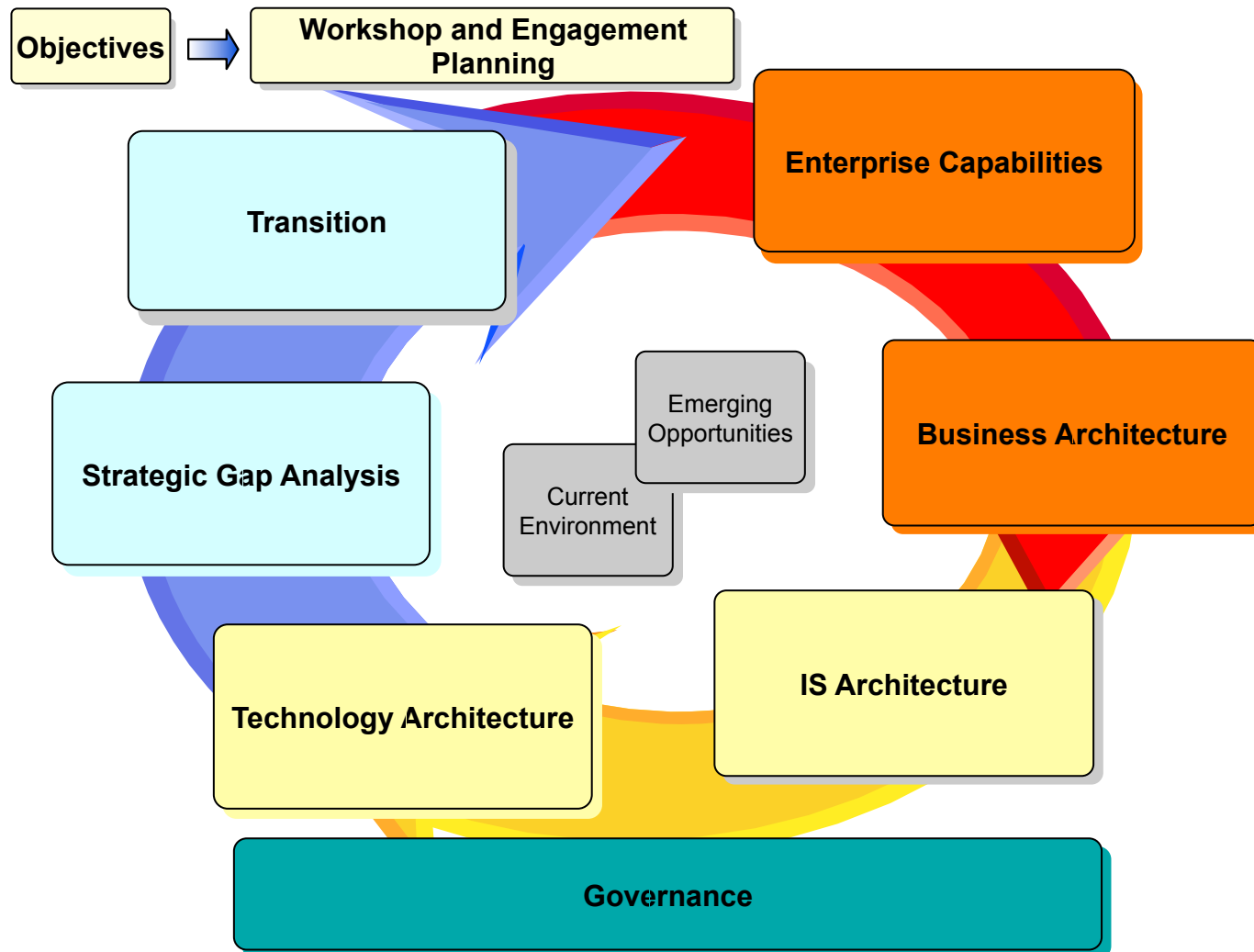
And only when we can ensure it's "architecture all the way down", will we be able to satisfy all our stakeholders

<p><b><u>The Board</u></b> Those responsible for the overall ROI for the Enterprise's (IT) investments and projects. (aka Programs Steering Committee)</p>	<p><b><u>Solution Development</u></b> Those responsible for the design and development of Business &amp; IT systems associated with specific business requirements</p>	<p><b><u>IT Operations</u></b> The folk who operate the Enterprise's IT infrastructure</p>
<p><i>Maximise the overall ROI by aligning all change programs with each other and with the enterprise's strategic direction</i></p>	<p><i>Minimise project risk and integration challenges, maximise value of available IT skills and resource. (i.e. maximise chance of success)</i></p>	<p><i>Minimise systems management challenges and product support issues, maximise value gained from IT infrastructure through shared and flexible deployment.</i></p>
<p><b>"The Bridge"</b></p>	<p><b>"The Engineers"</b></p>	<p><b>"The Engine Room"</b></p>



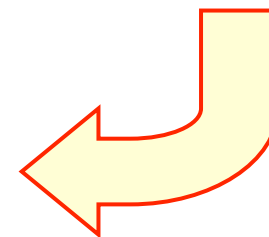
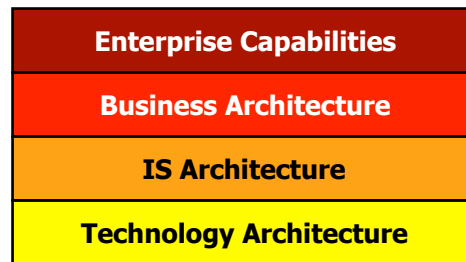
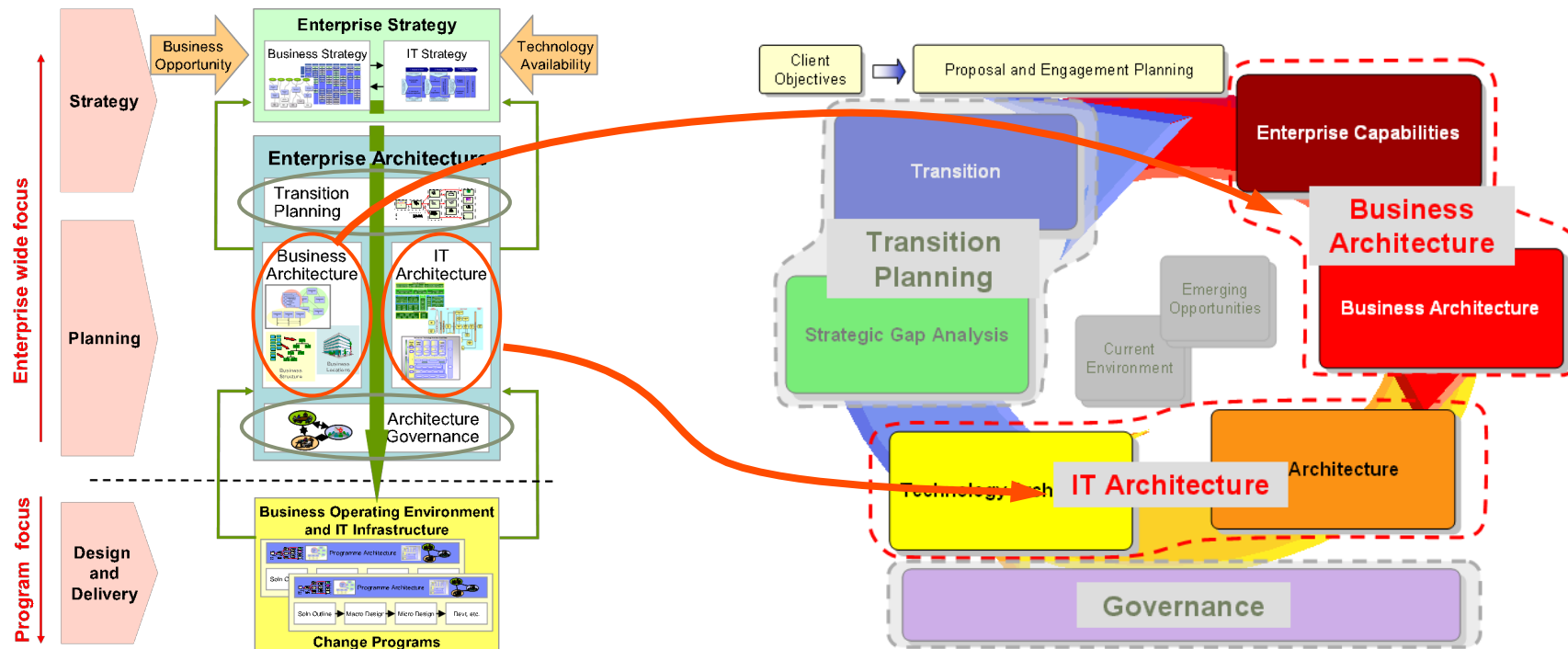


### IBM's Enterprise Architecture (EA) Framework – Best Practice shows that successful EA Management follows an iterative approach of EA Design



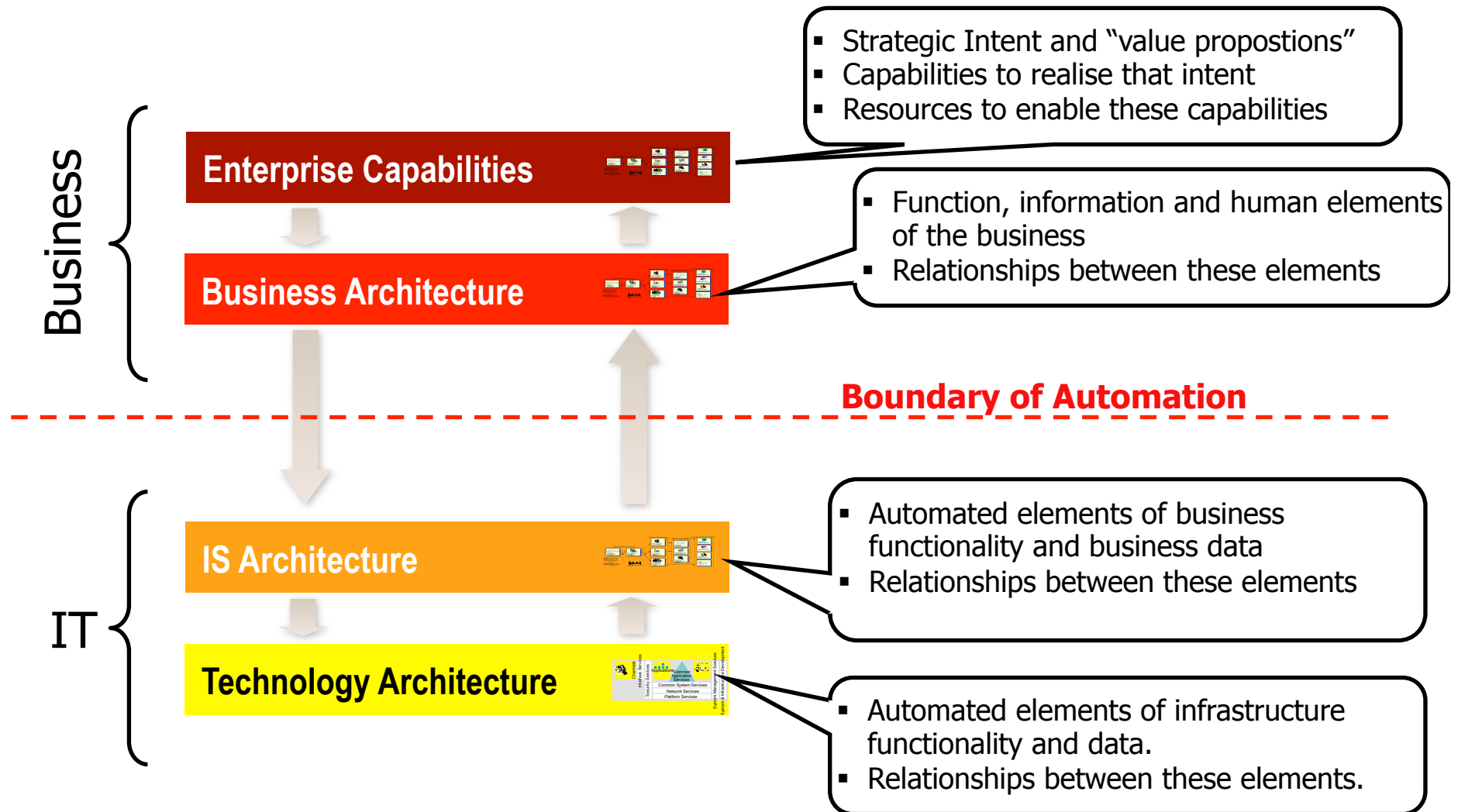
# Enterprise IT Architectures

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



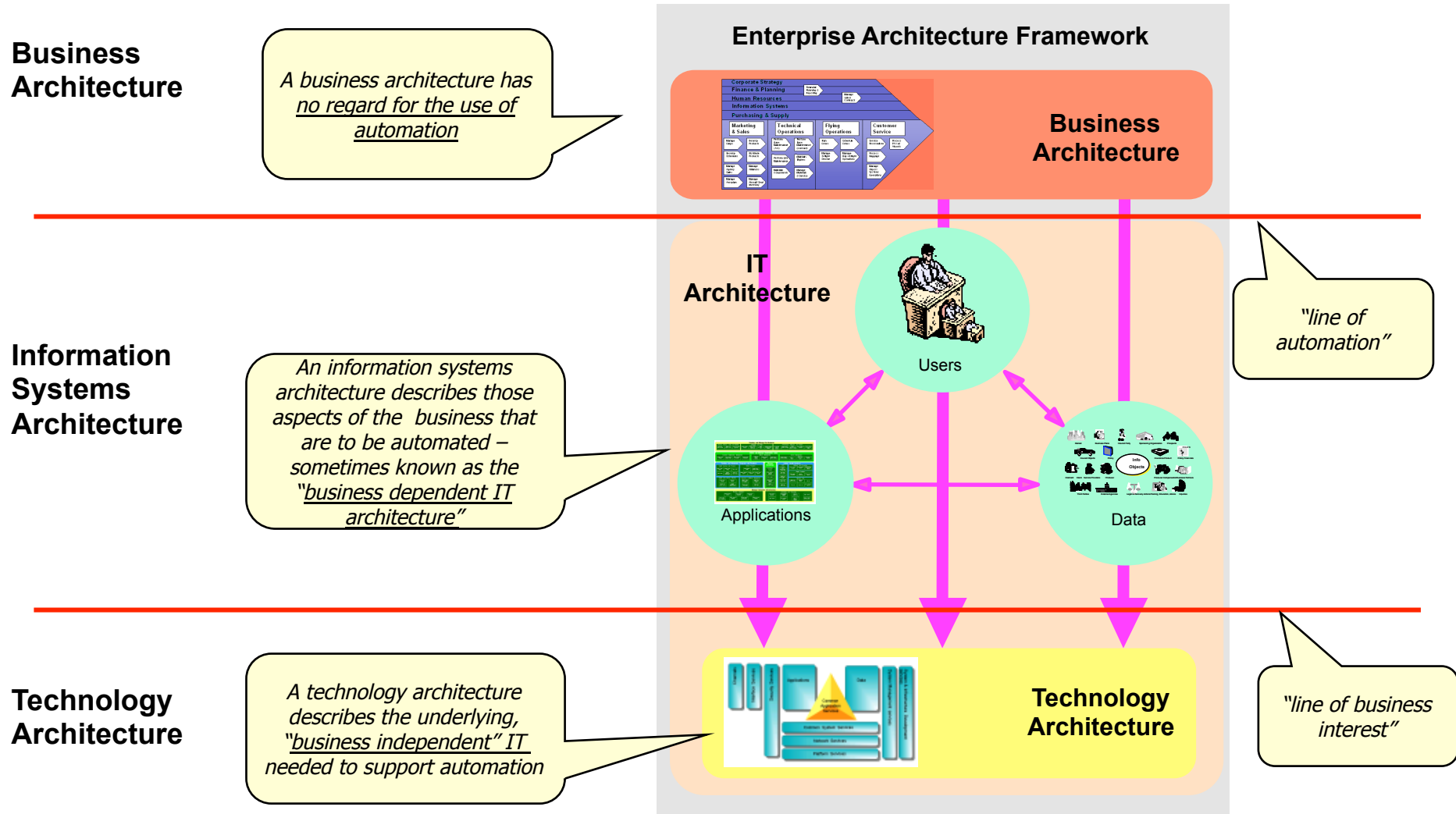
***The EA Consulting Method's architectural layers***

## Along with the Technology Architecture, the IS Architecture represents the “digitised” elements of the EA

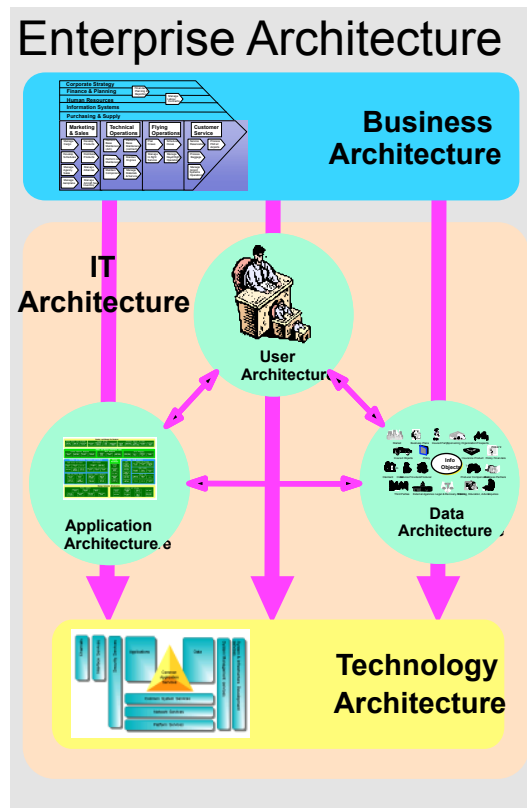


# Enterprise IT Architectures

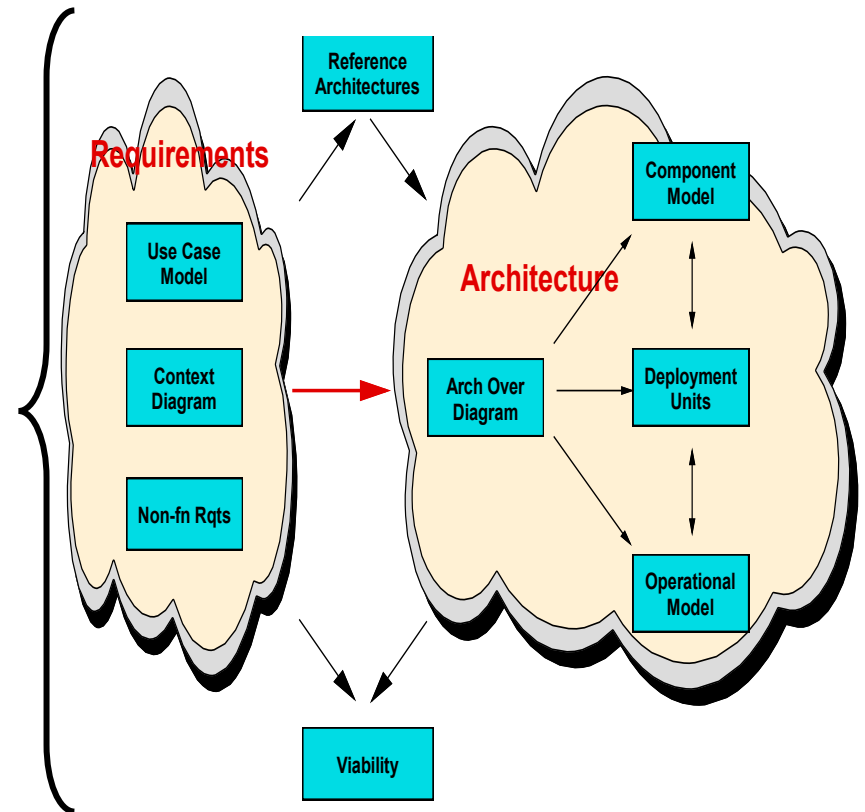
We can develop this way of thinking about an EA architecture framework a little more. First, let us highlight the nature of its layers...



## 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”

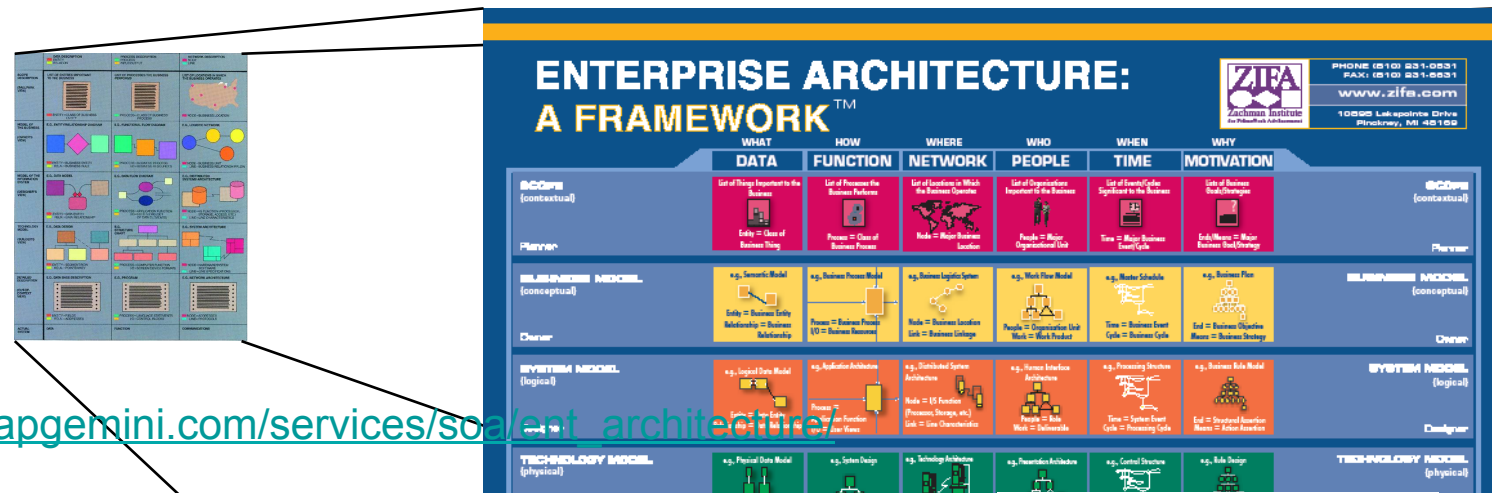


## Enterprise Architecture Methods

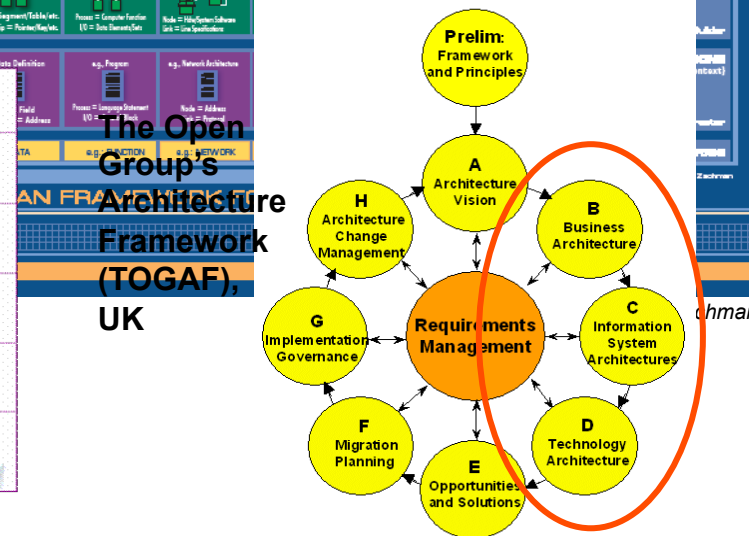
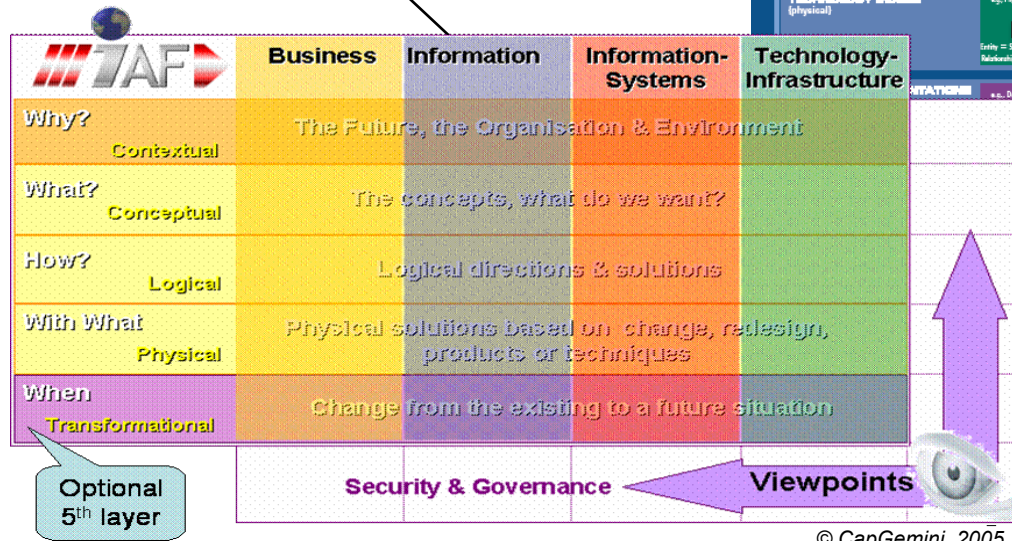
- **Enterprise Architecture methods provide guidelines and templates for the definition of an Enterprise Architecture**
- **Templates are available for Work Products / Artifacts – most of them as described in Architecture Methods**
- **Most popular Enterprise Architecture Methods**
  - IBM
  - Zachman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

# Enterprise IT Architectures

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



[http://www.capgemini.com/services/soa/ent\\_architecture/](http://www.capgemini.com/services/soa/ent_architecture/)



**Architecture Standard TOGAF (The Open Group Architecture Framework)**



### 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.**



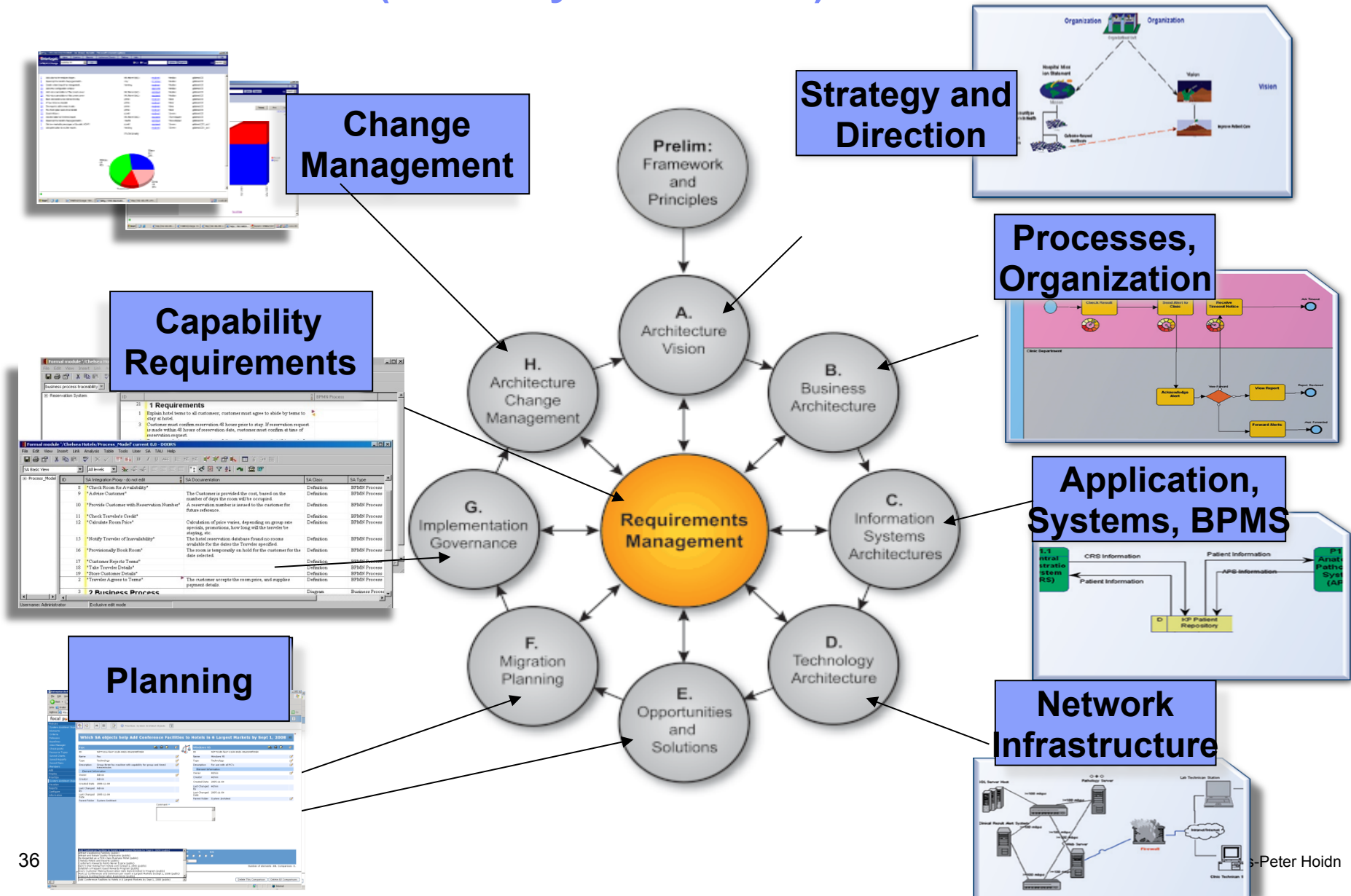
## What is TOGAF®?

- **TOGAF, an Open Group Standard:**
  - **A proven enterprise architecture methodology and framework used by the world's leading organizations to improve business efficiency**
  - **The most prominent and reliable enterprise architecture standard, ensuring consistent standards, methods, and communication among enterprise architecture professionals**
  - **Enterprise architecture professionals fluent in TOGAF standards enjoy greater industry credibility, job effectiveness, and career opportunities**
  - **TOGAF helps practitioners avoid being locked into proprietary methods, utilize resources more efficiently and effectively, and realize a greater return on investment**

## TOGAF (The Open Group Architecture Framework) 9.1

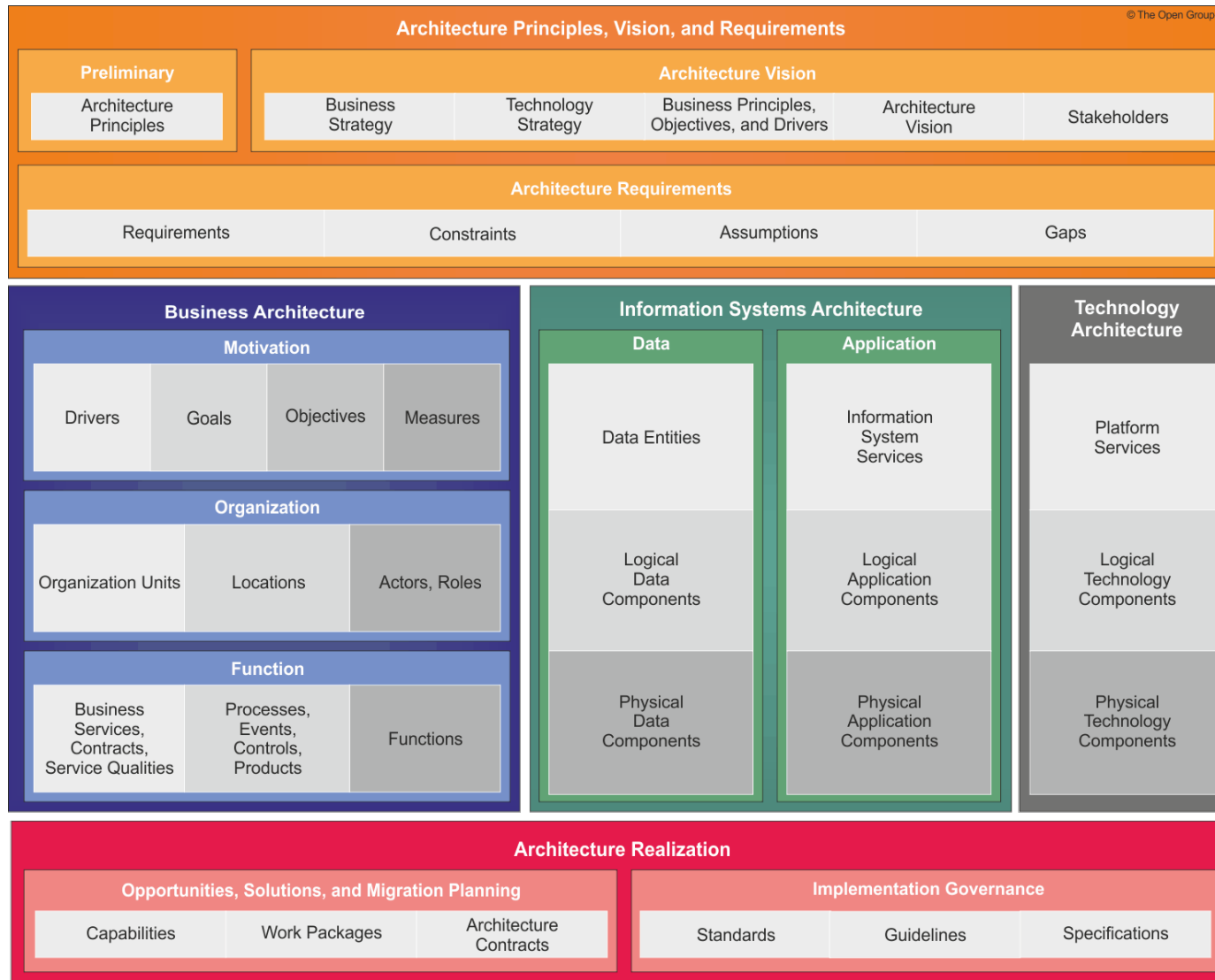
- **TOGAF Version 9.1 is a detailed method and set of supporting resources for developing an Enterprise Architecture. Developed and endorsed by the membership of The Open Group's Architecture Forum, TOGAF 9.1 represents an industry consensus framework and method for Enterprise Architecture that is available for use internally by any organization around the world - members and non-members of The Open Group alike - subject to license conditions.**
- **First developed in 1995, TOGAF was based on the US Department of Defense Technical Architecture Framework for Information Management (TAFIM). From this sound foundation, The Open Group Architecture Forum has developed successive versions of TOGAF at regular intervals and published them on The Open Group public web site.**

## Standard TOGAF (currently Version 9.1)

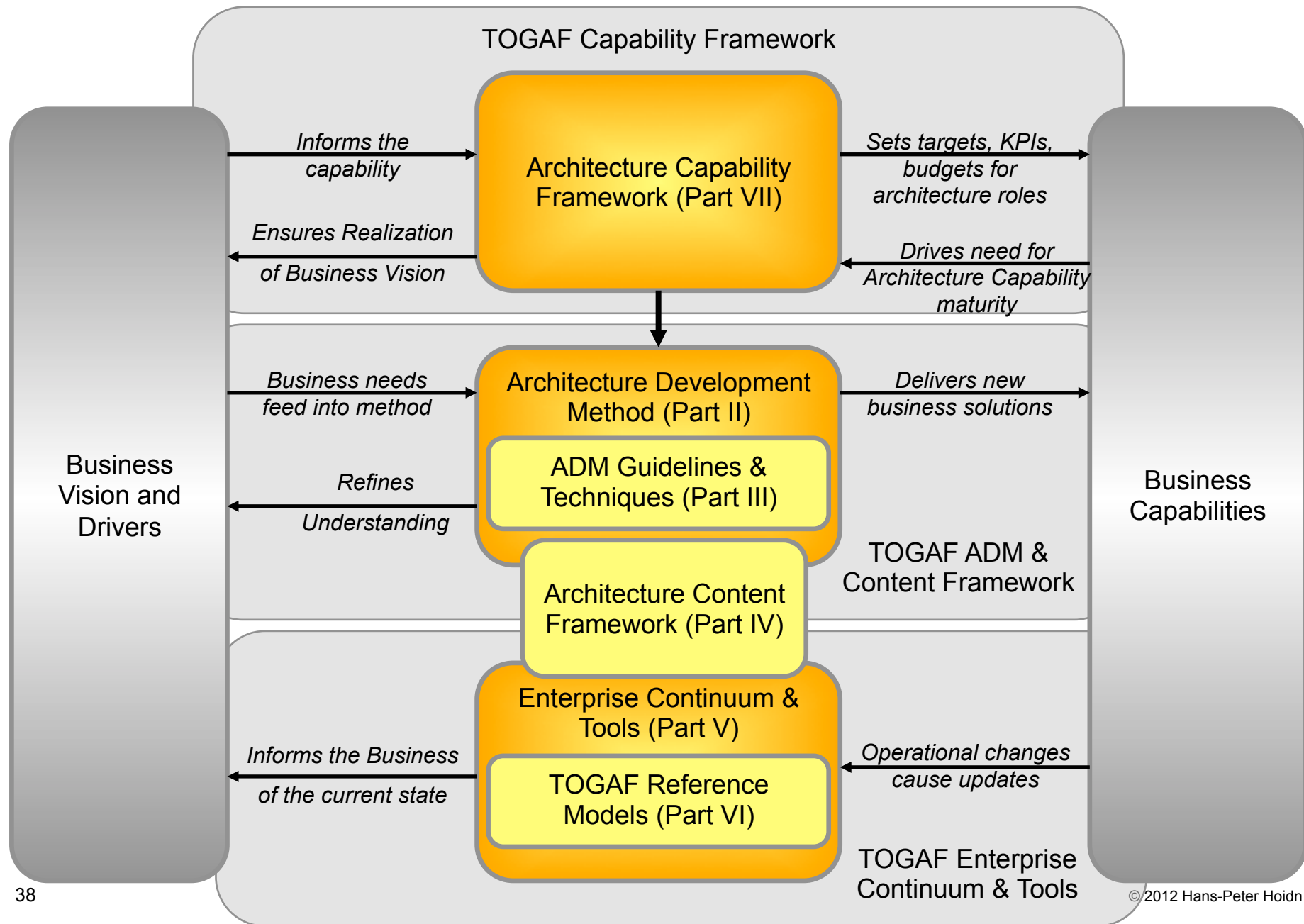


# Enterprise IT Architectures

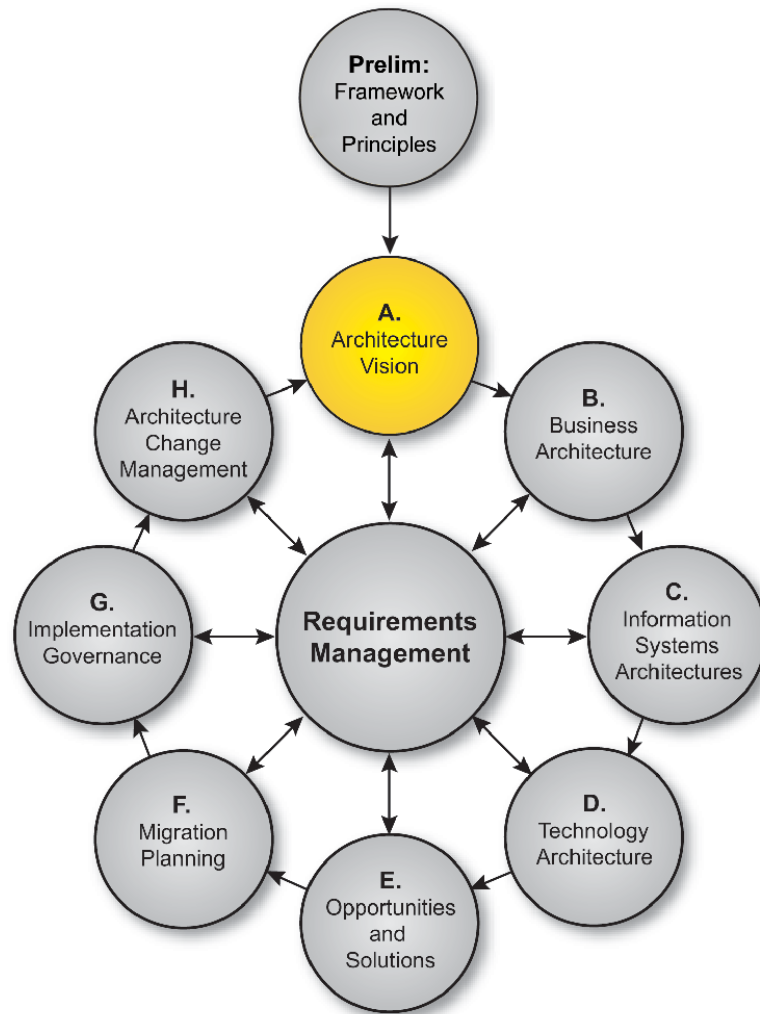
## TOGAF 9.1 Content Metamodel



# Enterprise IT Architectures

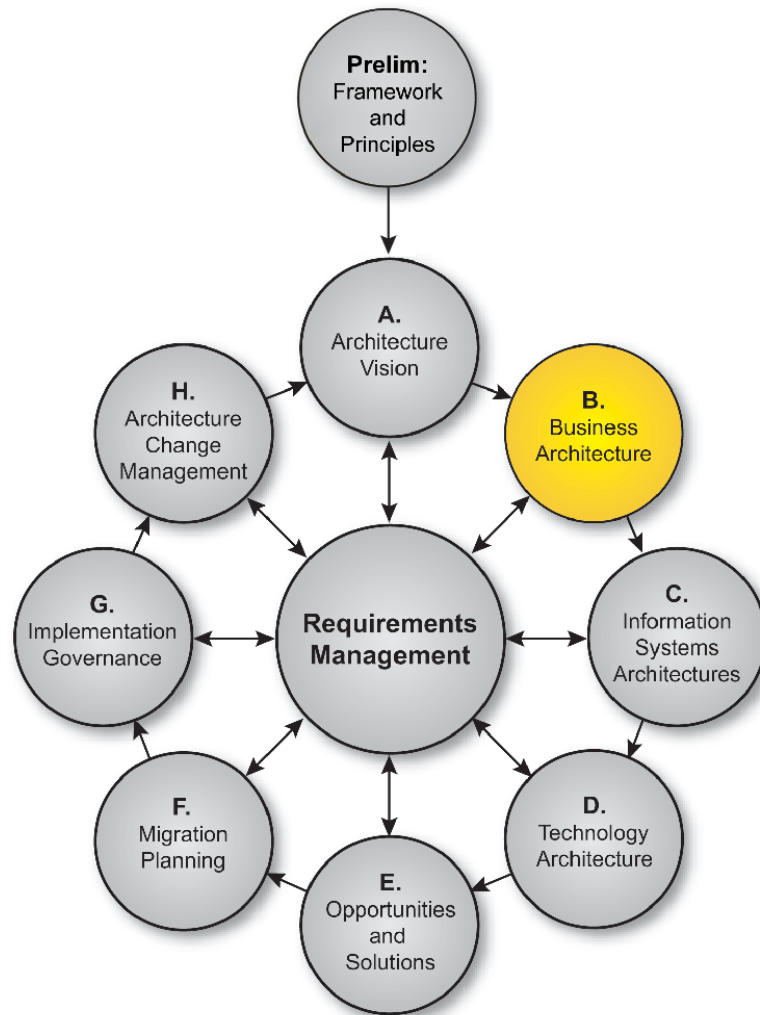


# Architecture Vision



- **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**
- **Guiding Principles**
- **Architectural Decisions**
- **Will be followed up with Governance**

# Business Architecture



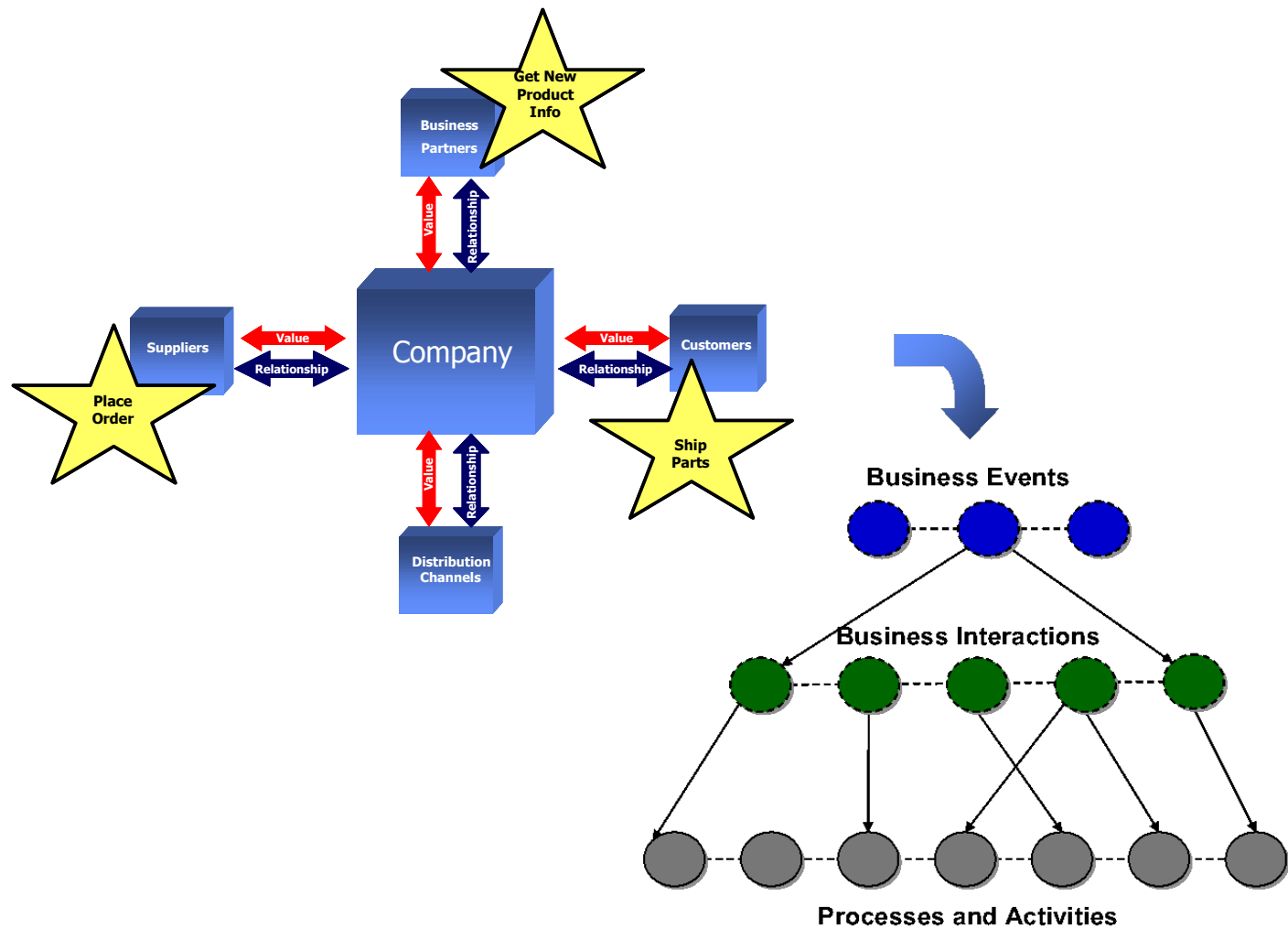
- **Organization structure**
- **Business Goals and Objectives**
- **Business Functions**
- **Business Services**
- **Business Processes**
- **Business Roles**
- **Correlation of organization and functions.**
- **Enterprise Information Model (according to IBM EA Methodology)**



## Business Architecture

- **Business Architecture**
  - **Seen as the prerequisite for all architecture work**
  - **Provides a frame for capturing the business capabilities required independent of IT technology**
  
- **Business Modeling**
  - **Activity Models or Business Process Models**
  - **Use-Case Diagrams, Class Models**
  
- **SOA Environment**
  - **BPM provides Business Modeling through process diagrams (and activities)**
  - **Business Services – and the portfolio of business services provide the business functions (see CBM)**

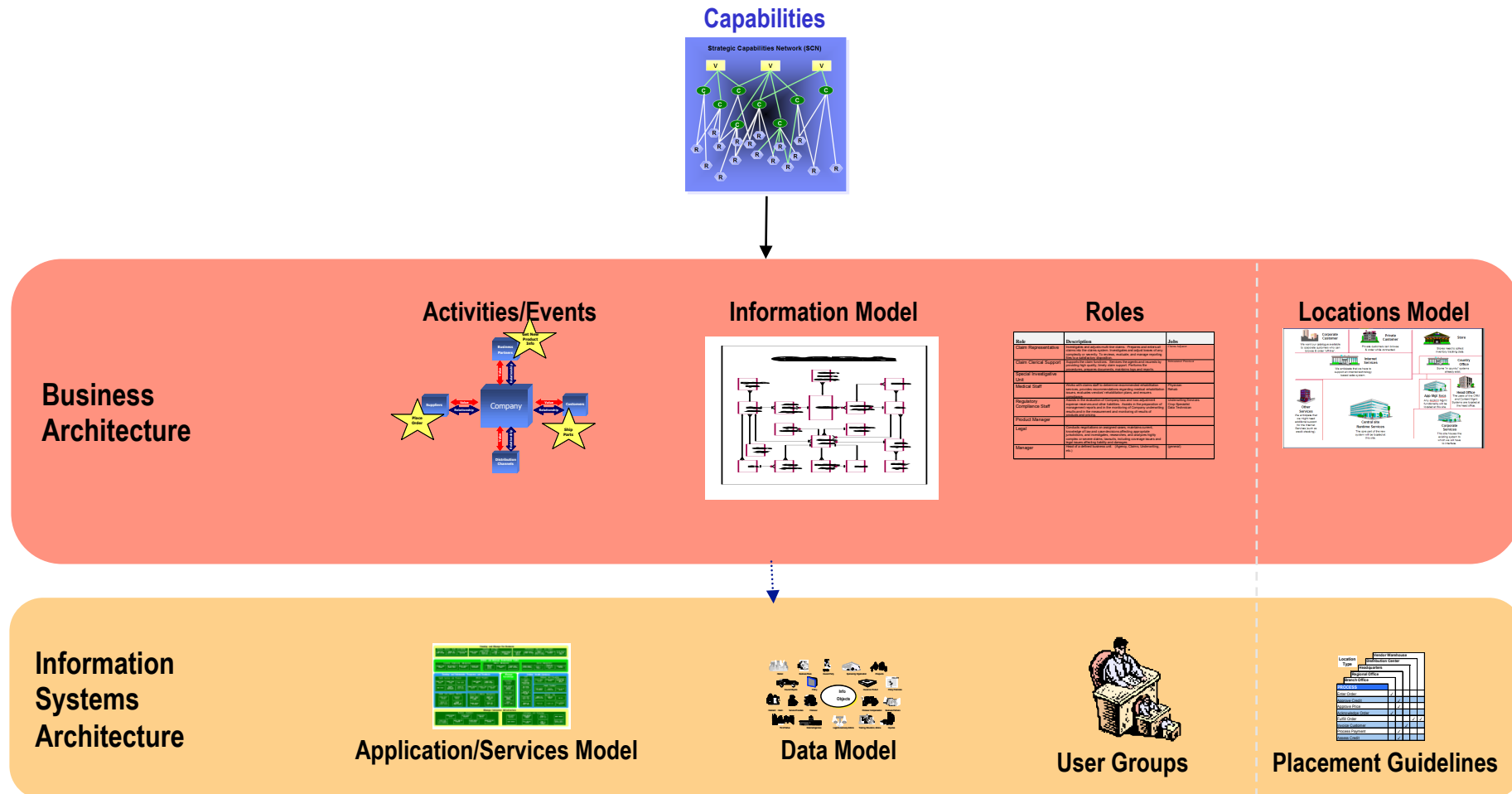
Value in the business ecosystem is exchanged by means of business events and associated interactions.



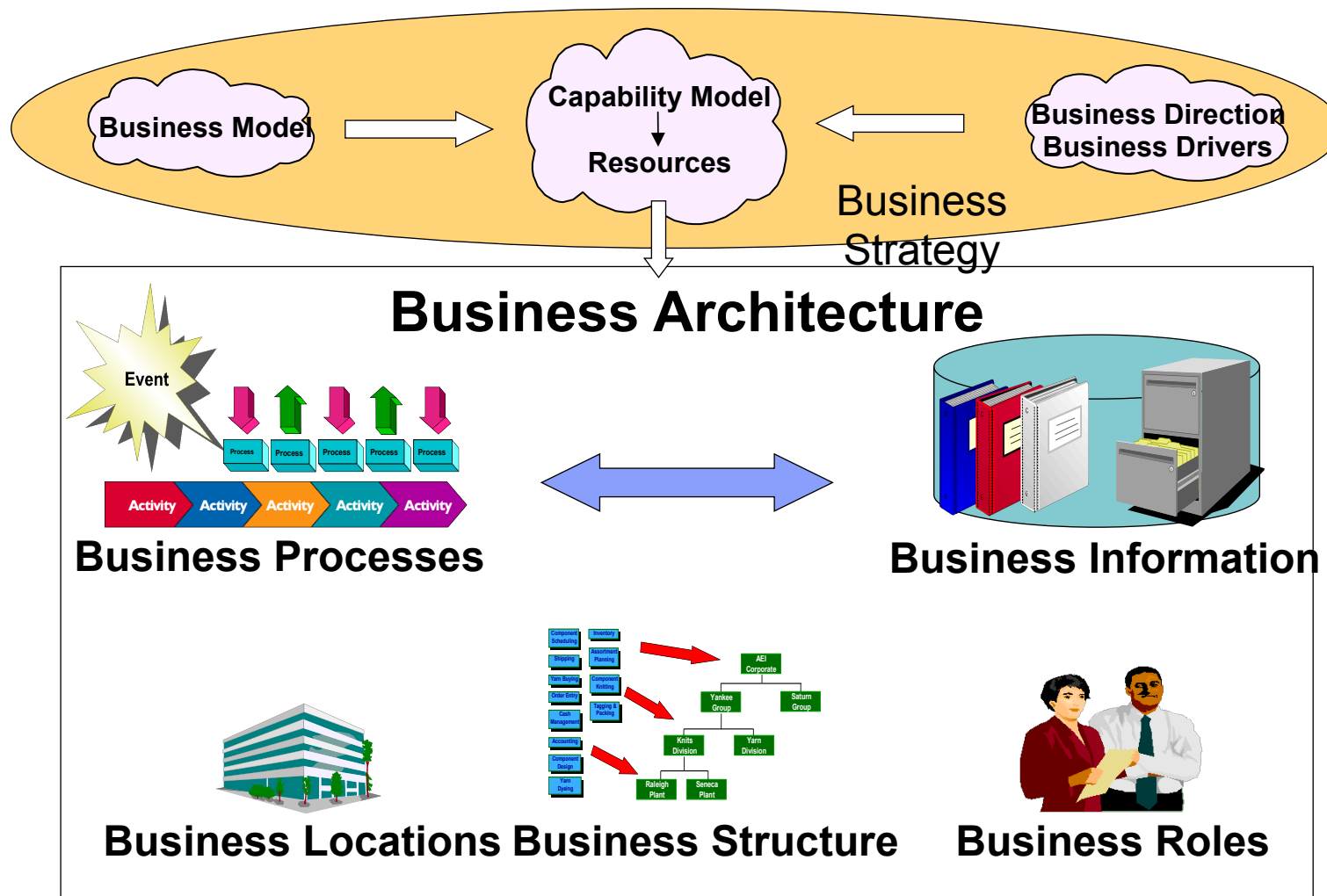
These externally facing business events and interactions are the starting point for developing the operational details of the subsequent business design.

# Enterprise IT Architectures

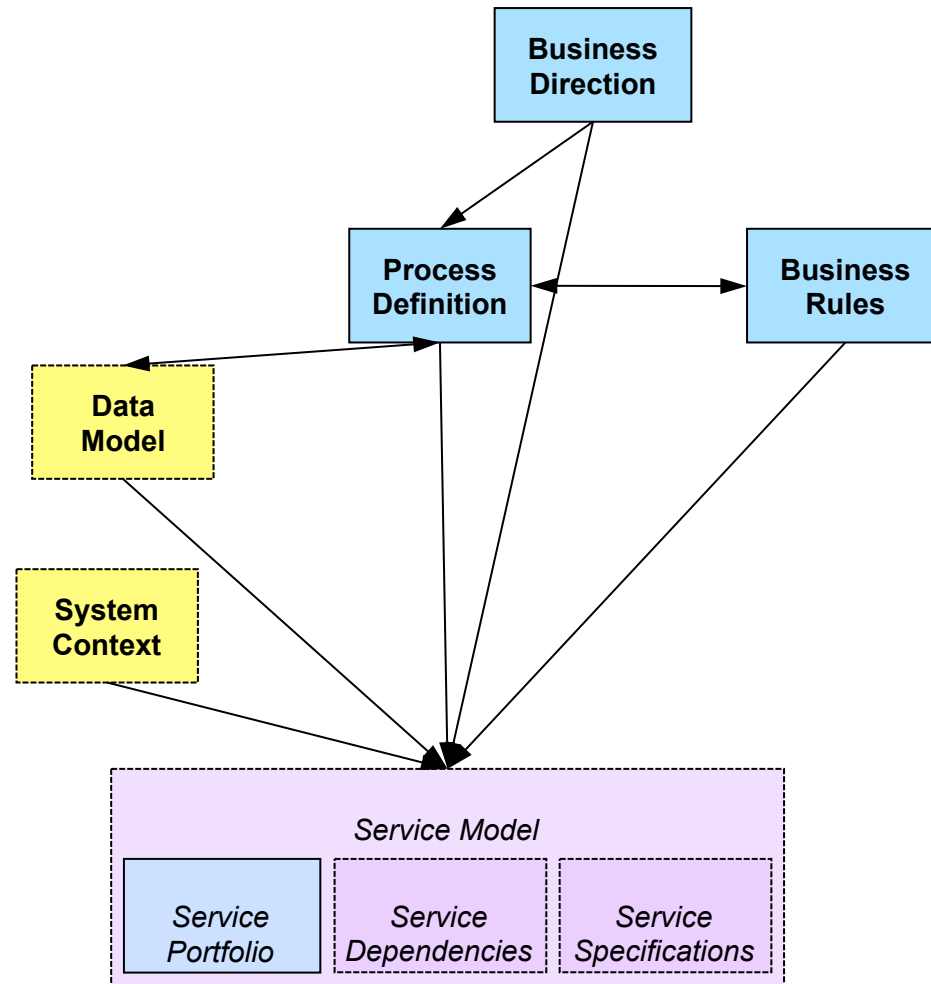
Business Architecture artefacts guide the structure of the enterprise's Information Systems architecture



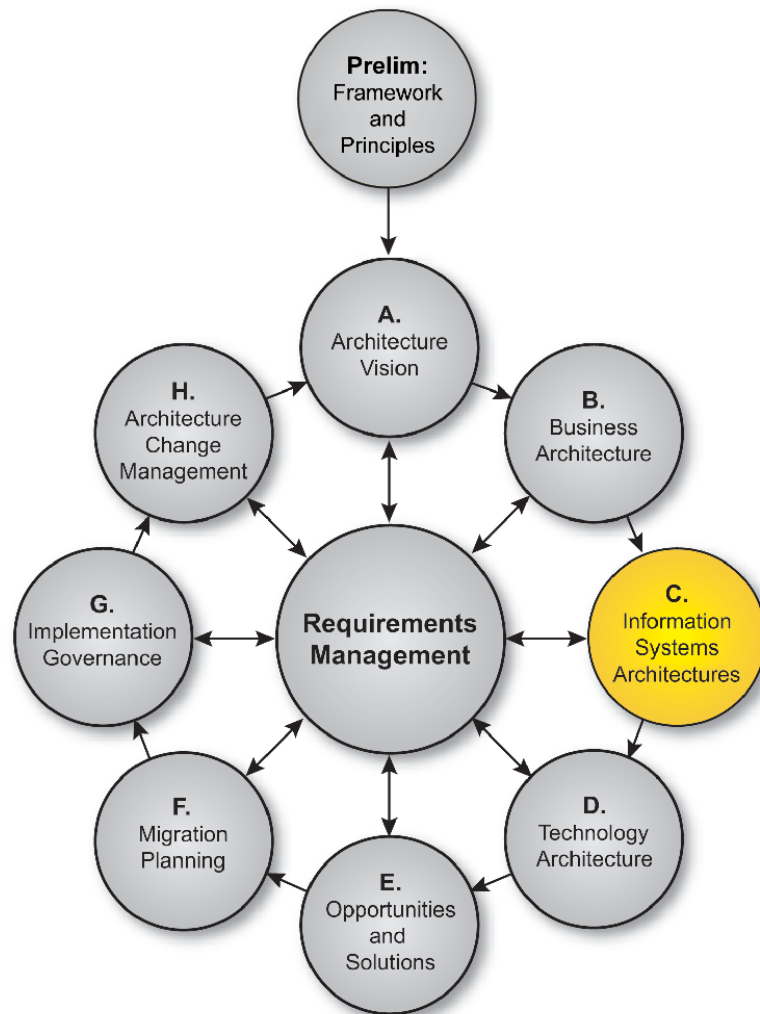
A Business Architecture describes the “business” aspects of the enterprise, independent of technology



## Main Business Architecture Work Products – reduced to the Minimum – emphasis on Business Processes



# Information Systems Architecture



- 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
- Includes
  - *Application Architecture*
  - *Data Architecture*

## Information Systems Architecture

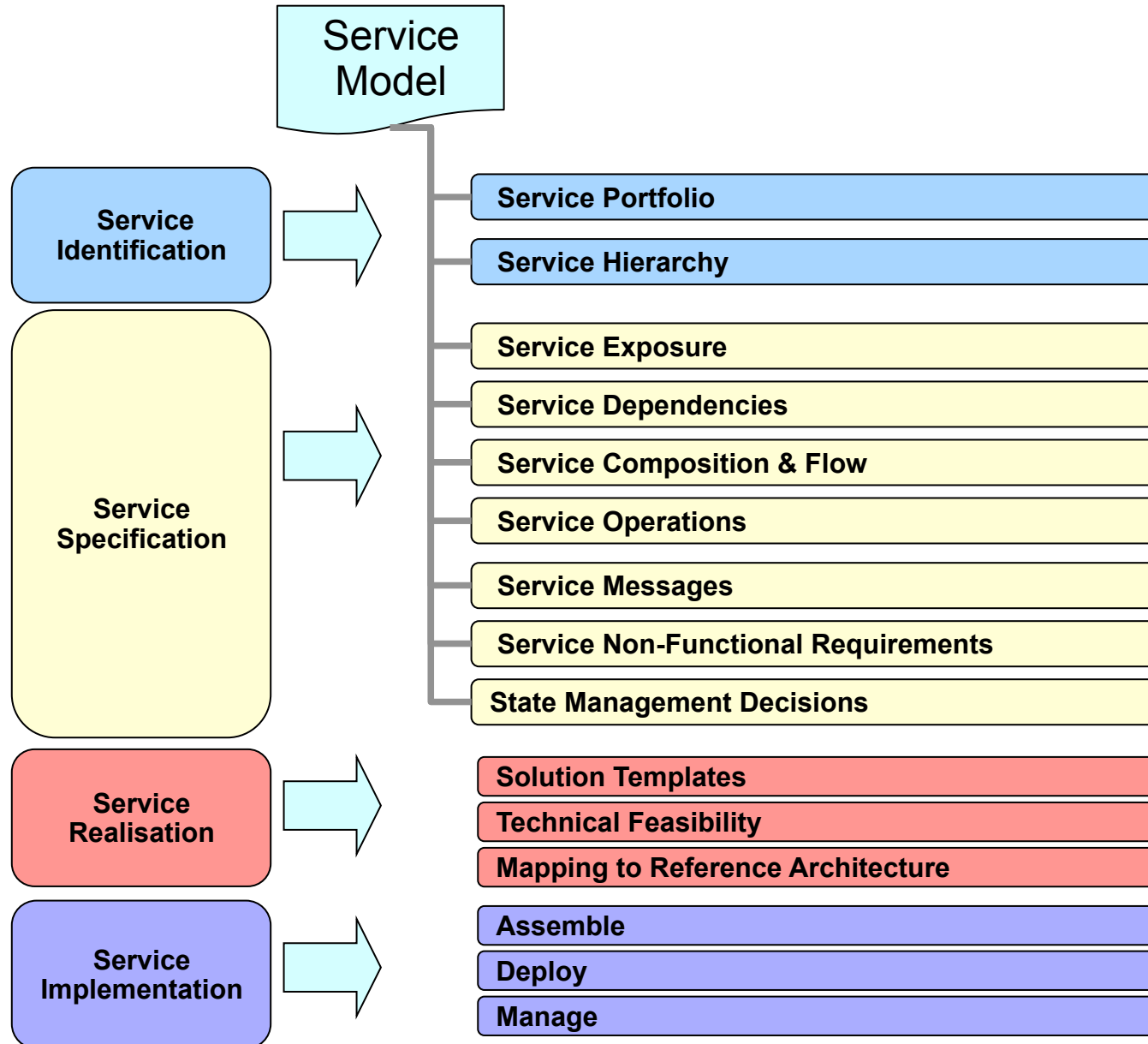
### ▪ Data Architecture

- Understand and address data management issues
- Define which components will serve as the system as record
- Canonical Form for the information used throughout the enterprise (e.g. in the processes)
- Note: structure of data stored is not the structure of data passed through services

### ▪ Application Architecture

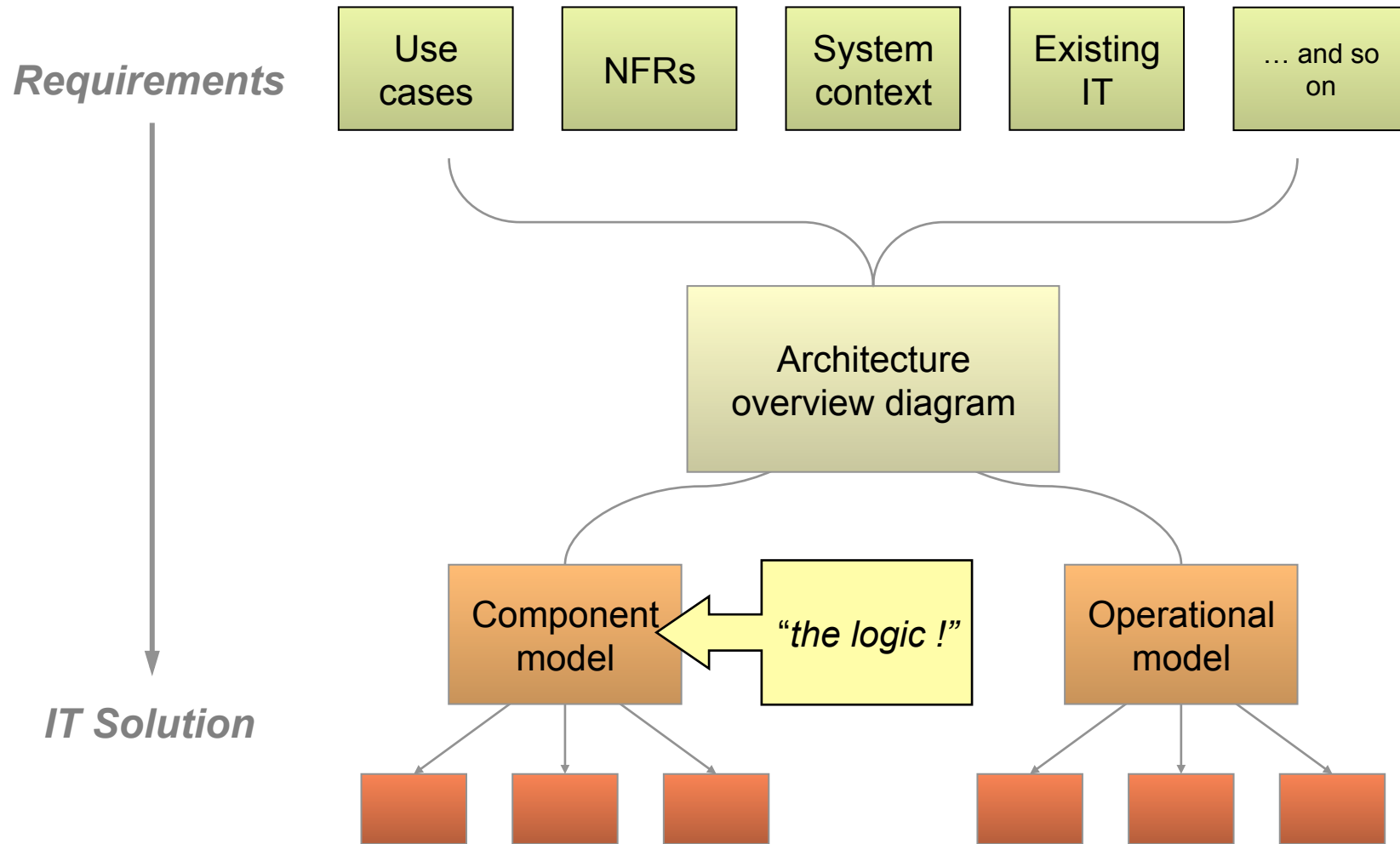
- Reference Models (from OMG, III-RM from Open Group, ebxml for electronic Business) may help
- In an SOA environment we prefer the notation of a portfolio of services

# IS Architecture – Portfolio of Services as Application Functions

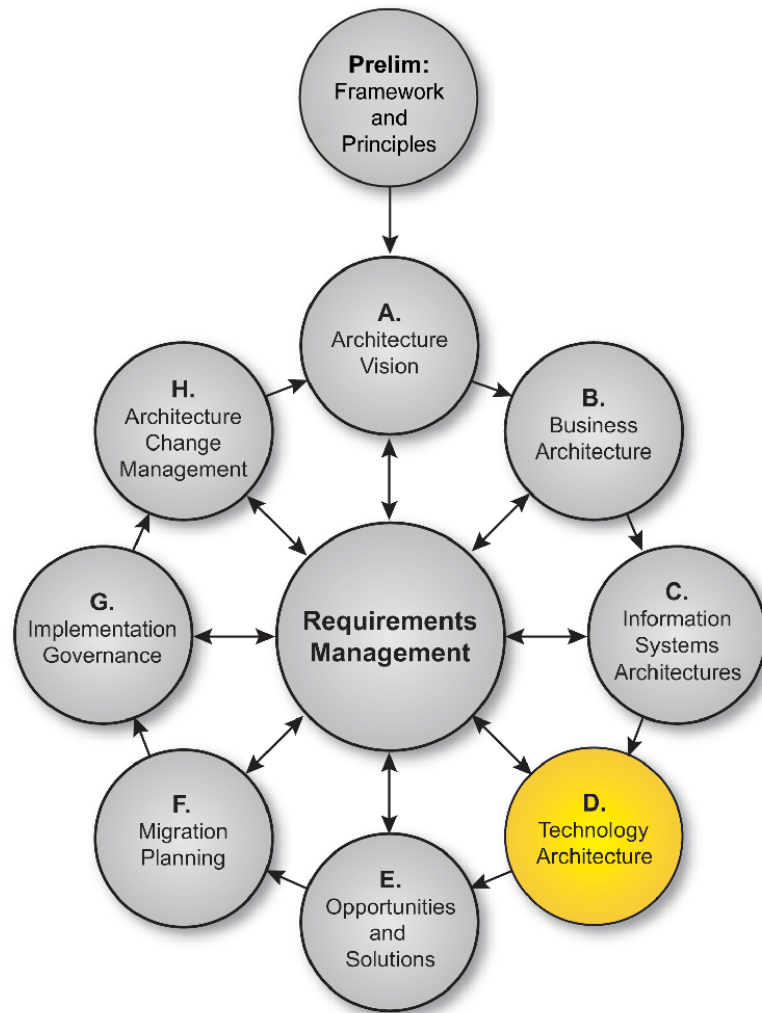




# Application Architecture and Component Model (although component model can be extended to technology)



# Technology Architecture

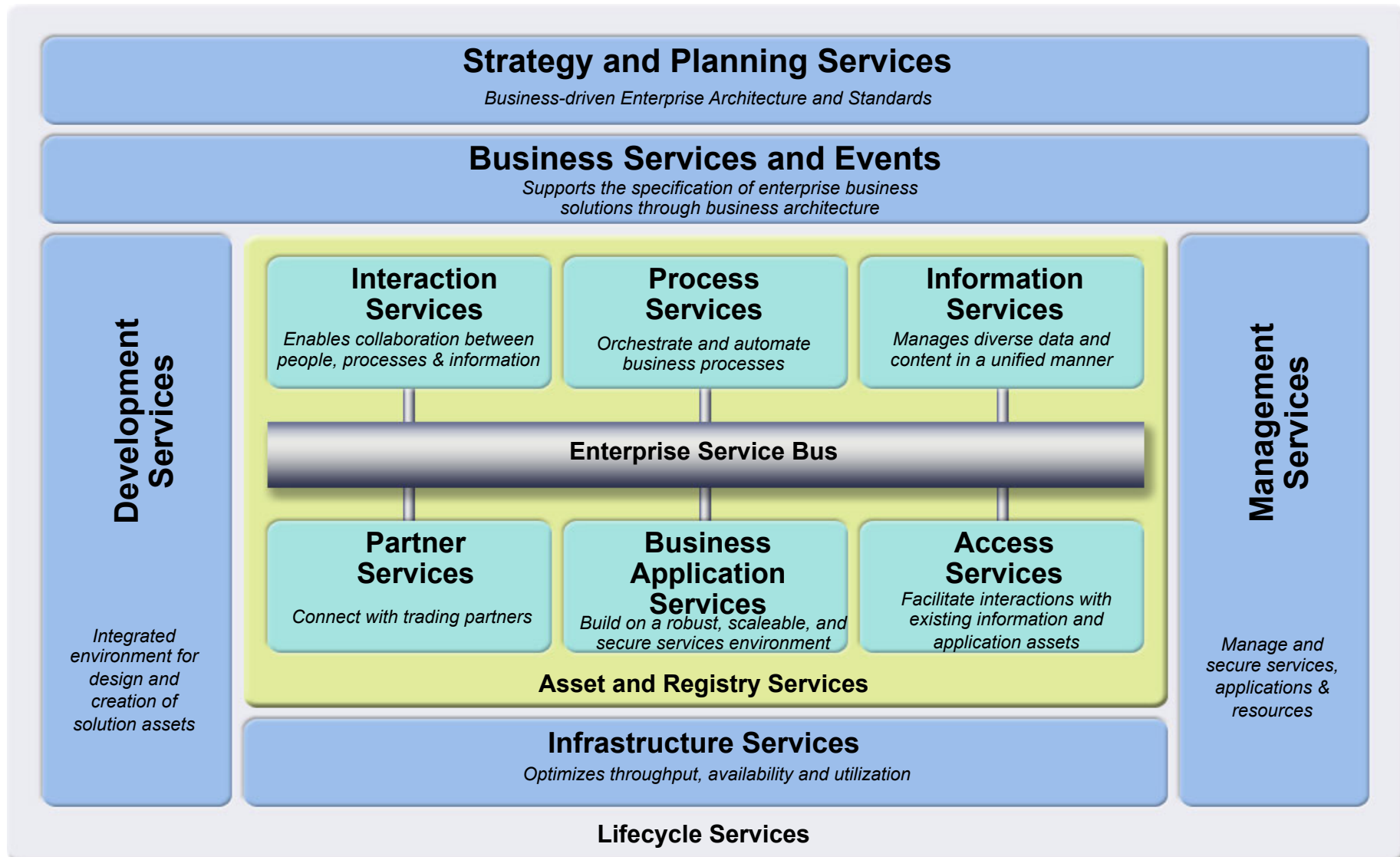


- The fundamental organization of an IT system, embodied in
  - its hardware, software and communications technology
  - their relationships to each other and the environment,
  - and the principles governing its design and evolution

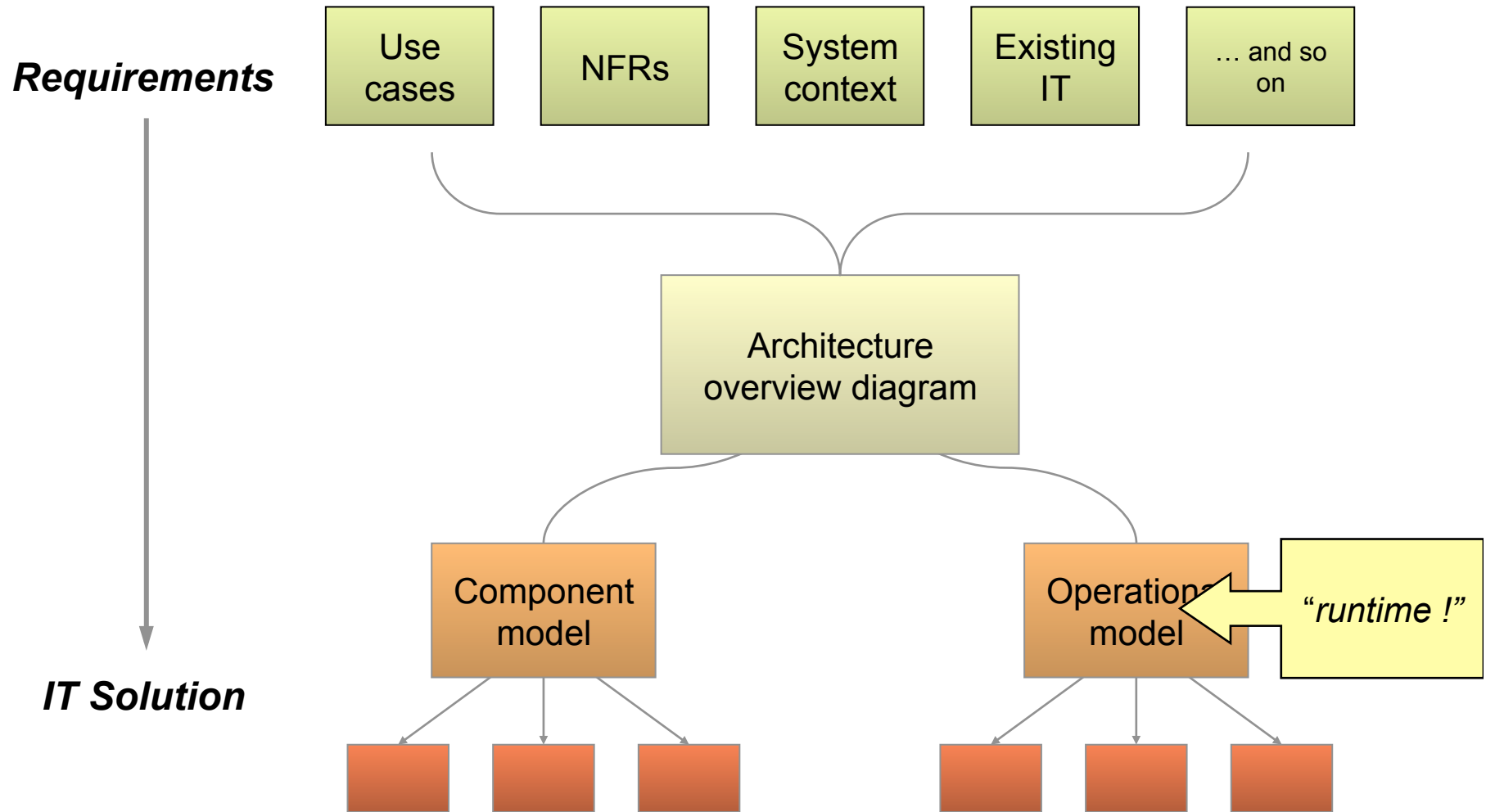
## Technology Architecture – refers to Reference Architecture

- **TRM (Technology Reference Model) of TOGAF**
  - Provides a Taxonomy as well an illustration of the taxonomy
  - Lists the various technology components and services
  - (see TOGAF 9.1 Chapter 43 – 30 pages)
  
- **We prefer SOA Reference Model**
  - ESB in the center
  - Necessary areas are covered
  
- **Note: in both cases Software Engineering is one of the areas**

## IBM SOA Foundation Reference Model

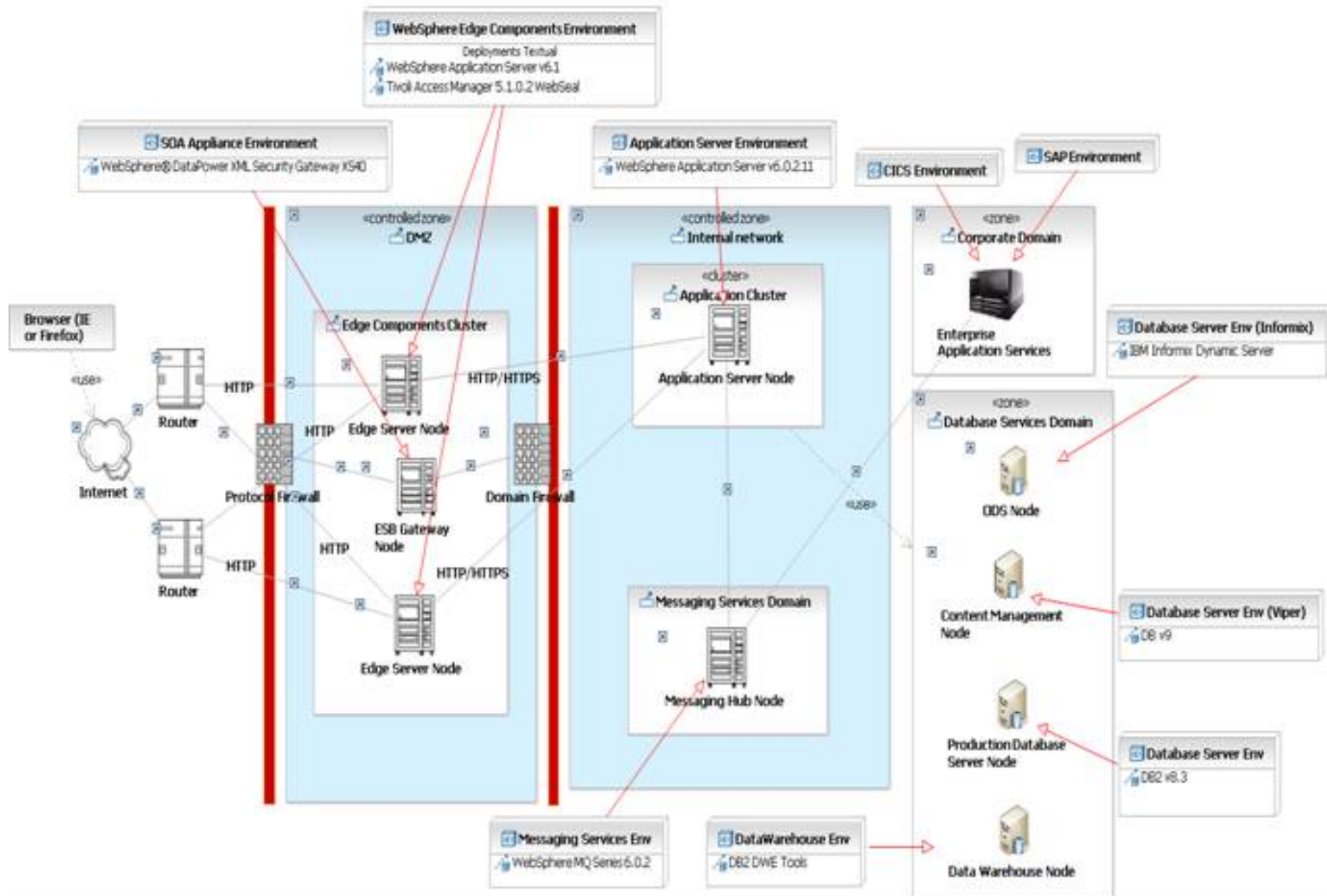


# Technology Architecture and Operational Model (deployment units placed on IT nodes in locations and their interactions)



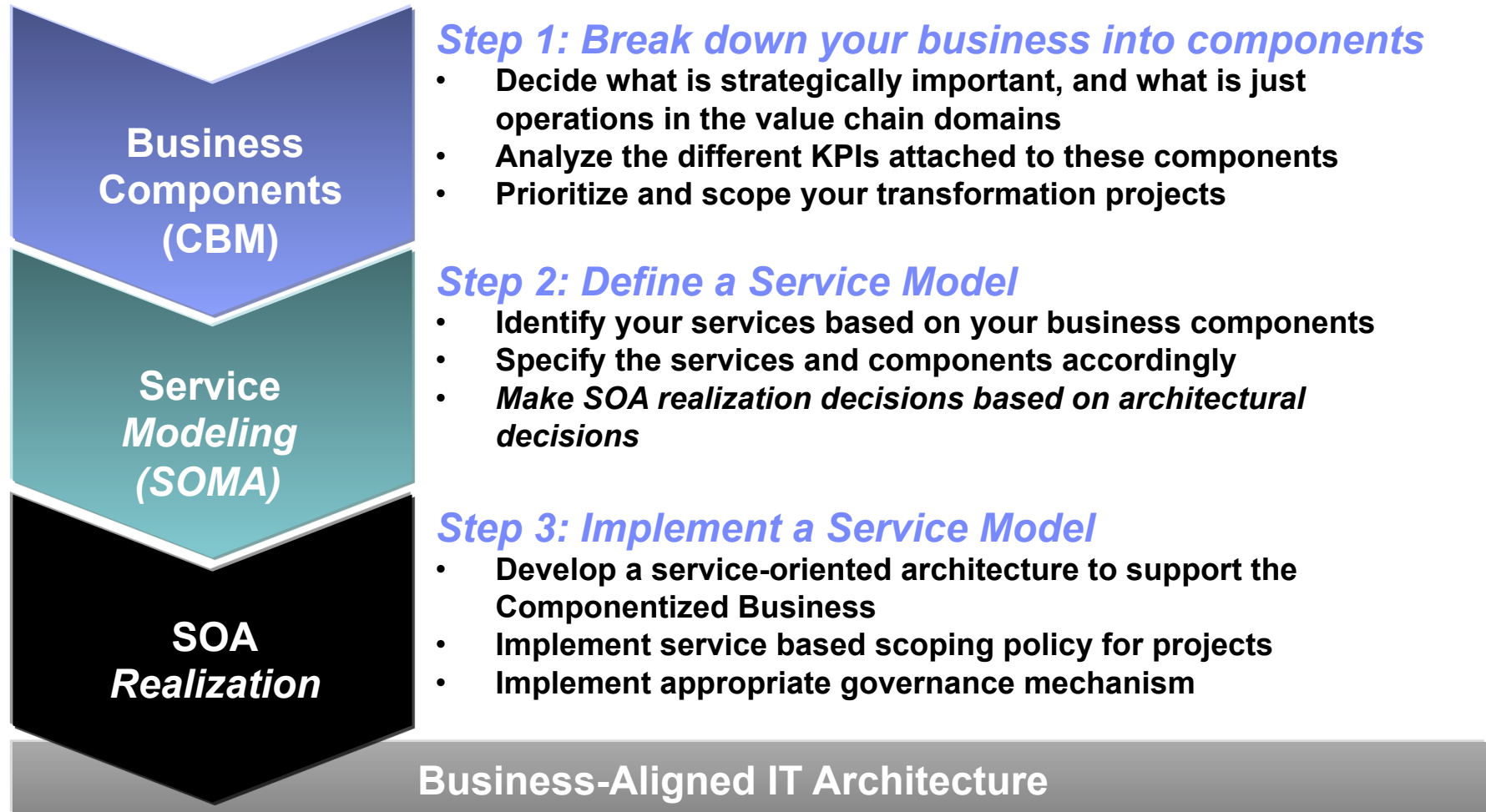
# Enterprise IT Architectures

JKE - Operational Model - Starting Point



### **Business View with CBM (Enterprise Architecture)**

## Approach for SOA





## 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.

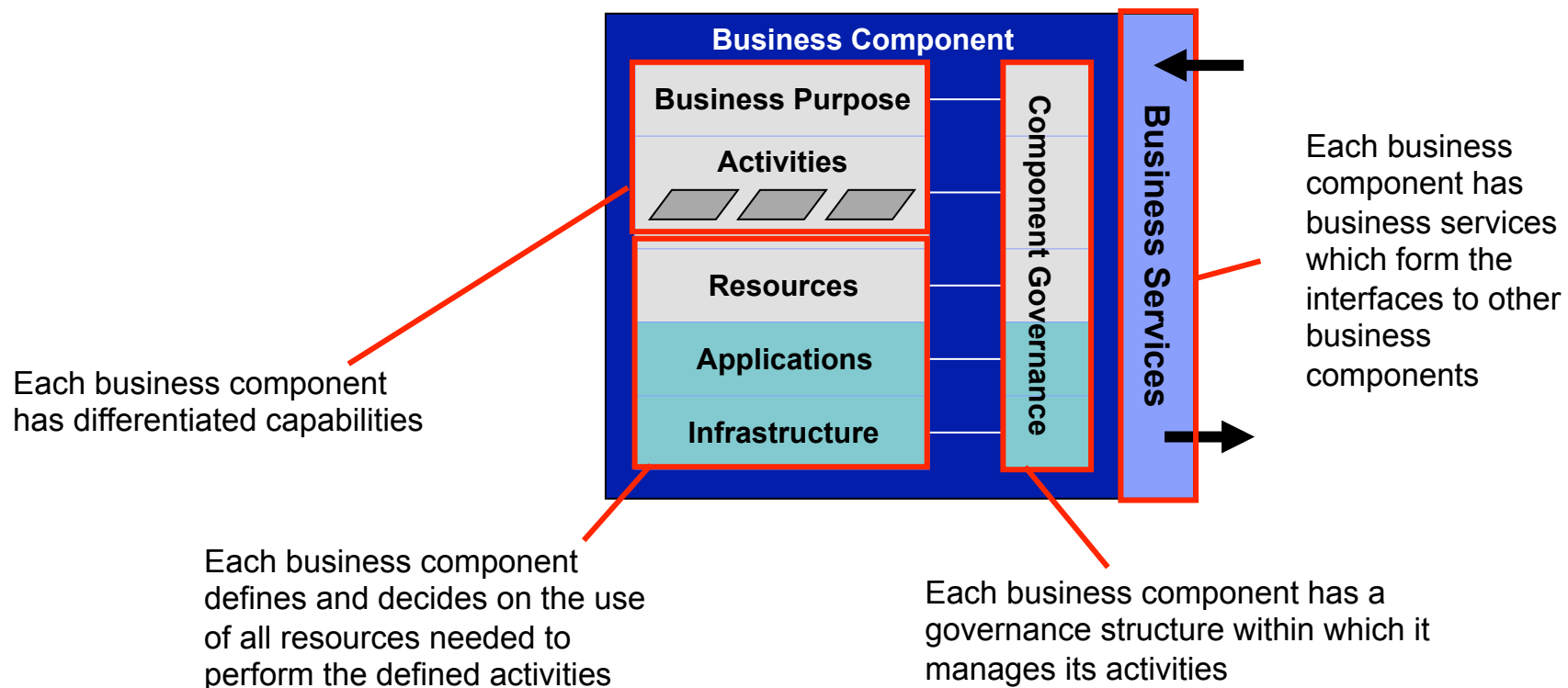
- Direct is about strategy, overall direction and policy.
- Control is about monitoring, managing exceptions and tactical decision making
- Execute is about doing the work

	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



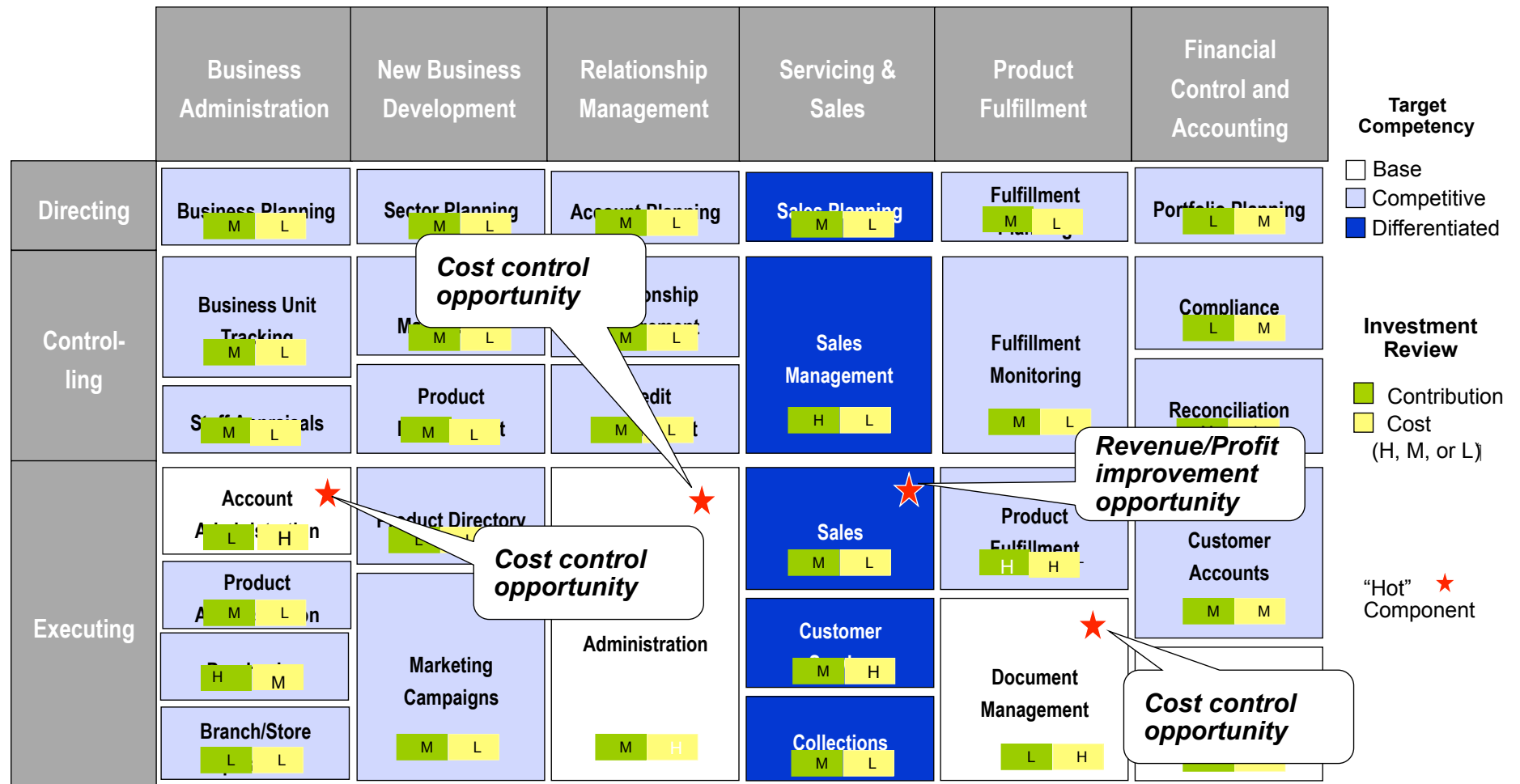
# Domain Decomposition– Component Business Modeling for JKE

	Business Administration	New Business Development	Relationship Management	Servicing & Sales	Product Fulfillment	Financial Control and Accounting
Directing	Business Planning	Sector Planning	Account Planning	Sales Planning	Fulfillment Planning	Portfolio Planning
Controlling	Business Unit Tracking	Sector Management	Relationship Management	Sales Management	Fulfillment Monitoring	Compliance
	Staff Appraisals	Product Management	Credit Assessment			Reconciliation
Executing	Account Administration	Product Directory	Credit Administration	Sales	Product Fulfillment	Customer Accounts
	Product Administration	Marketing Campaigns		Customer Service	Document Management	
	Purchasing			Collections		
	Branch/Store Operations			General Ledger		

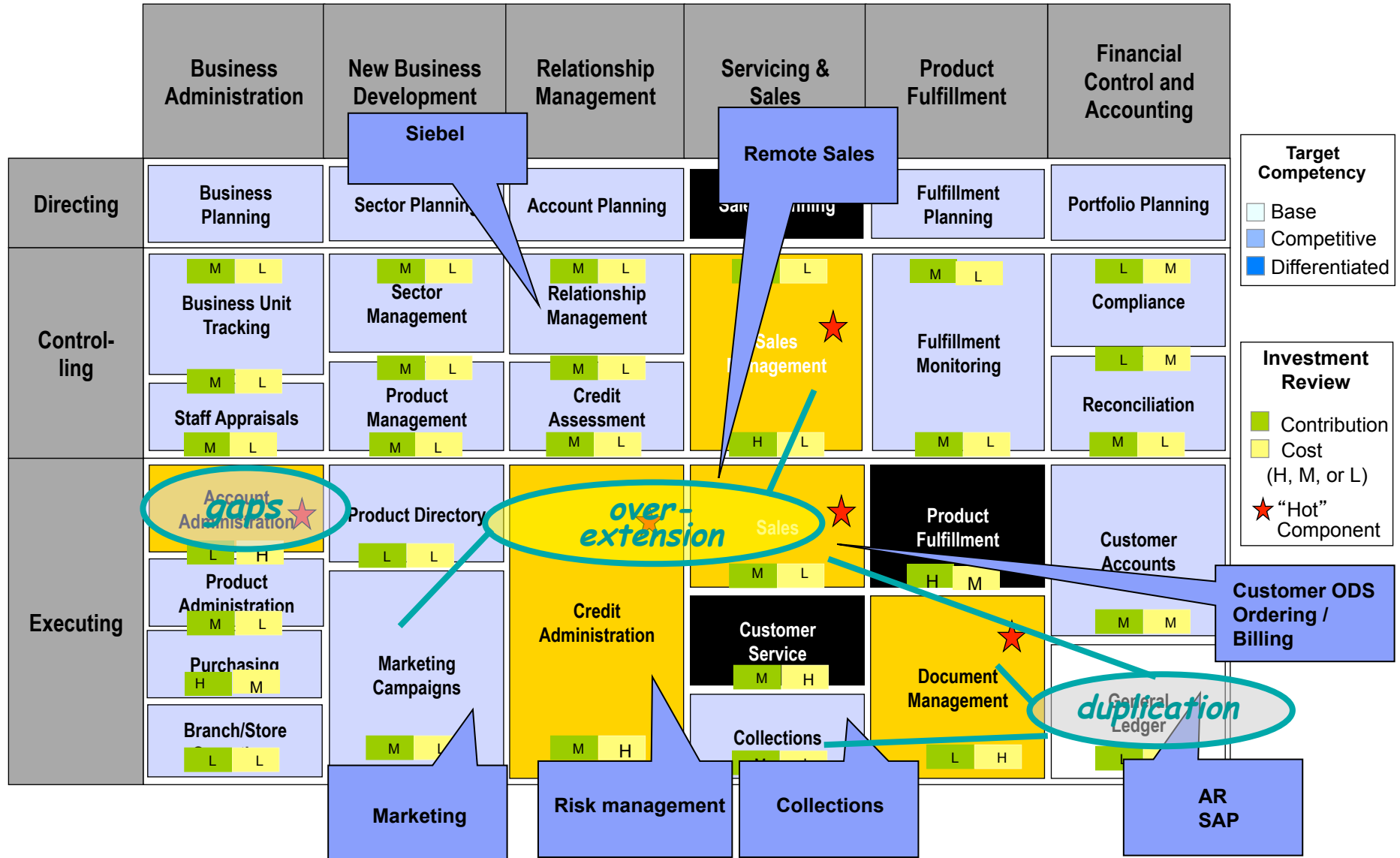
**Target Competency**

- Base
- Competitive
- Differentiated

## Domain Decomposition– Component Business Modeling for JKE



## CBM and IT Systems Coverage for JKE



# Questions

