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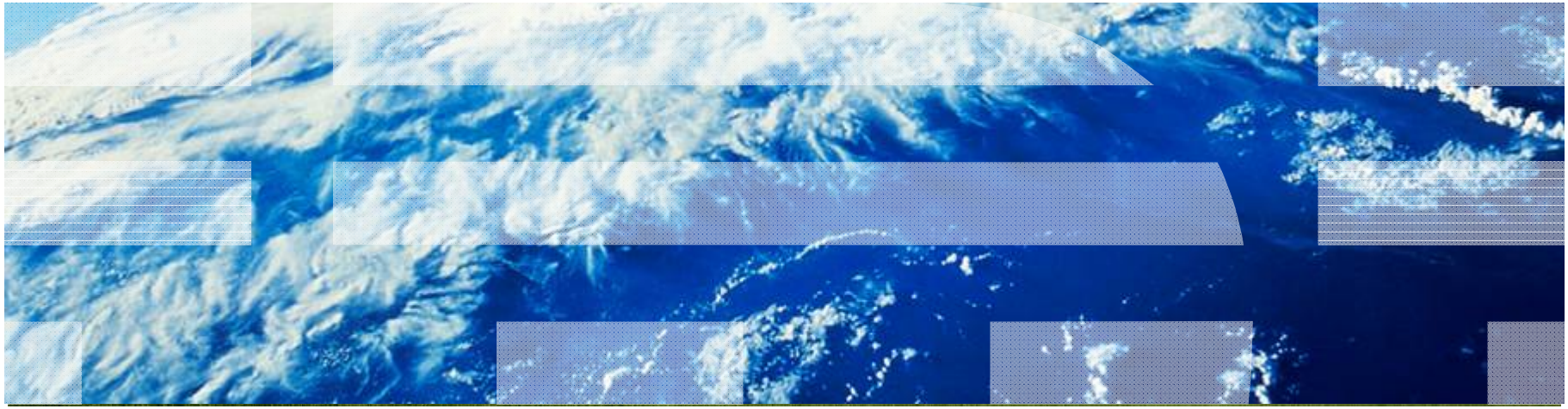
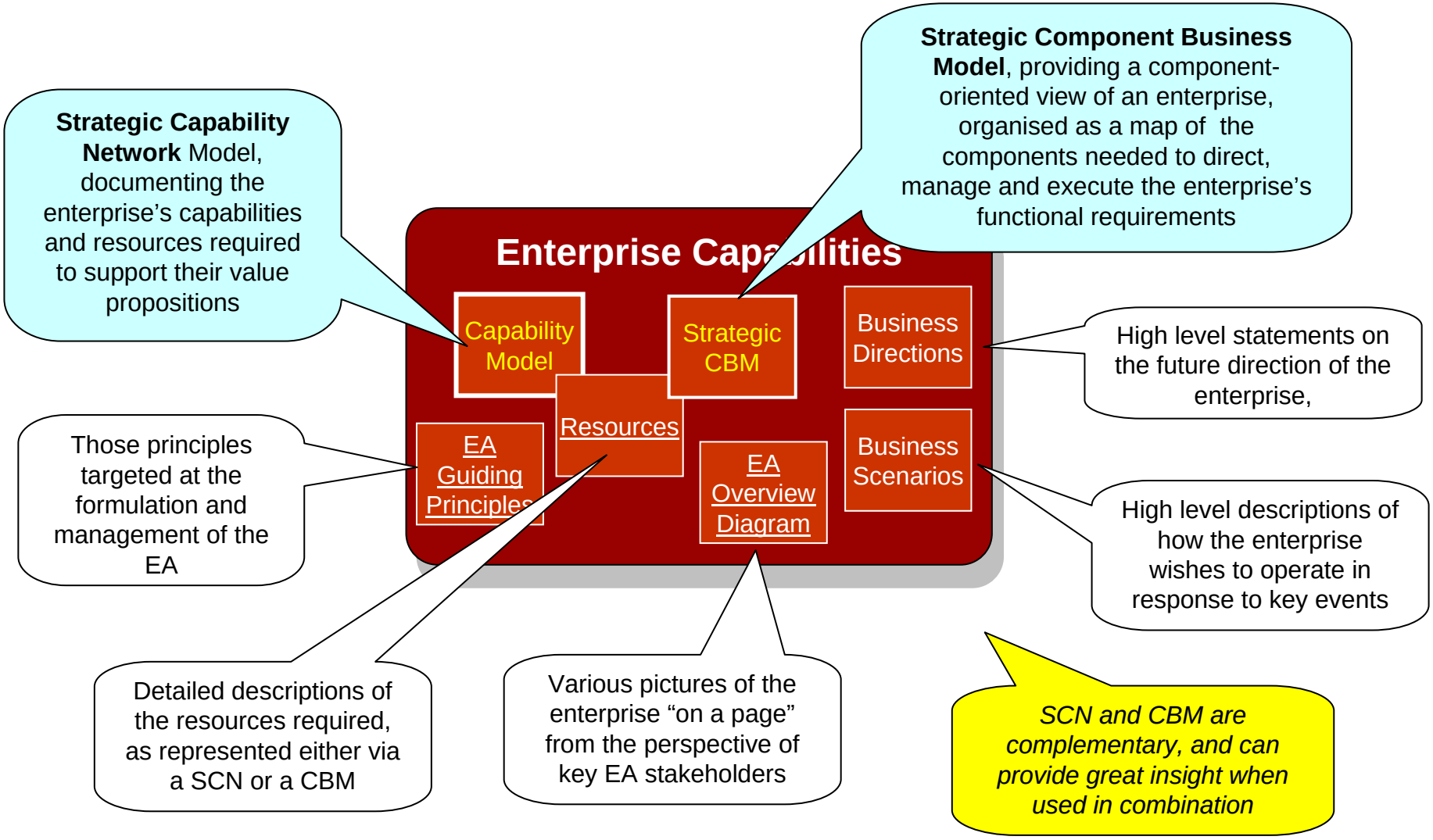
Enterprise IT Architectures

Enterprise Architecture – Architectures



Enterprise Architecture – Strategy View

Capturing Enterprise's strategic requirements can be captured in various ways



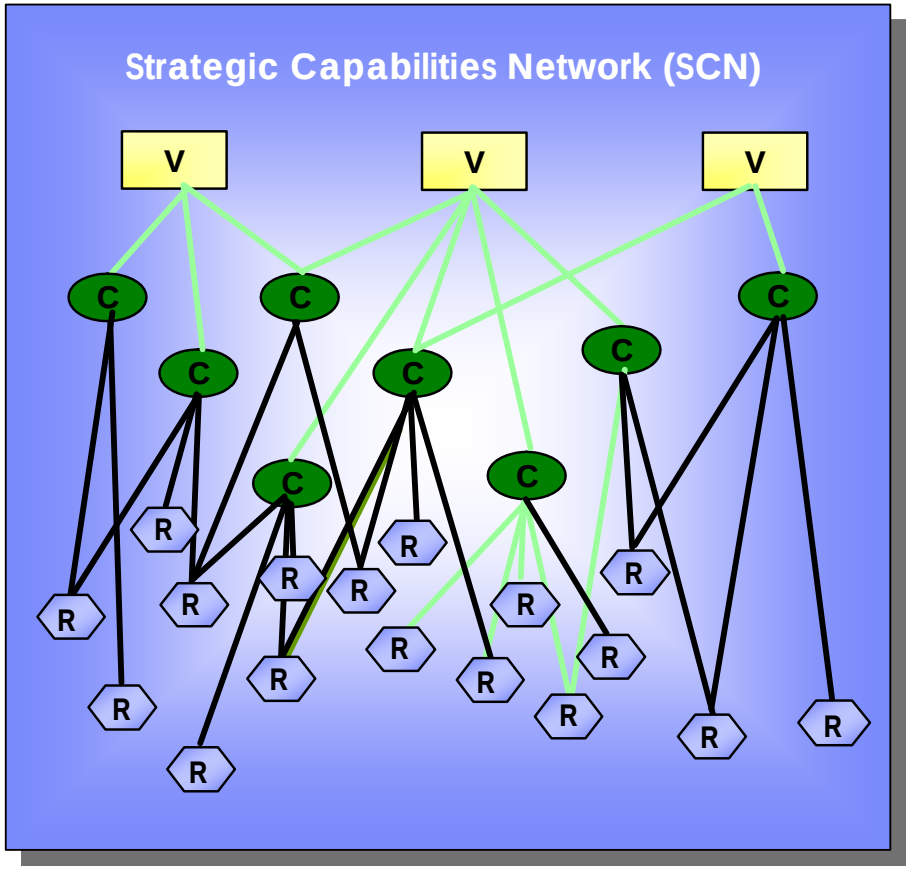
Strategy View in more Detail

- ***Enterprise Capabilities***
  - **Derived from Value Propositions (Business Strategy) and based on resources**
  - **Competitive Enterprise capabilities help to identify call to actions**

- ***Principles, (Policies & Guidelines)***
  - **The term "principle" is widely but not consistently used "Defines the underlying general rules which KB will use to make decisions"**
  - **"Policies" are regulations**
  - **Principles should be consistent and aligned**
  - **Principles should be aligned with business strategy and initiatives**

- ***CBM* (Component Business Model)**

Enterprise Capabilities: Strategic Capabilities Network link Strategy and Architecture



- Value Proposition: **What a company needs to be in order to offer a differentiated value to the market.**

  Example: Ikea's low cost, customer convenience, modular design

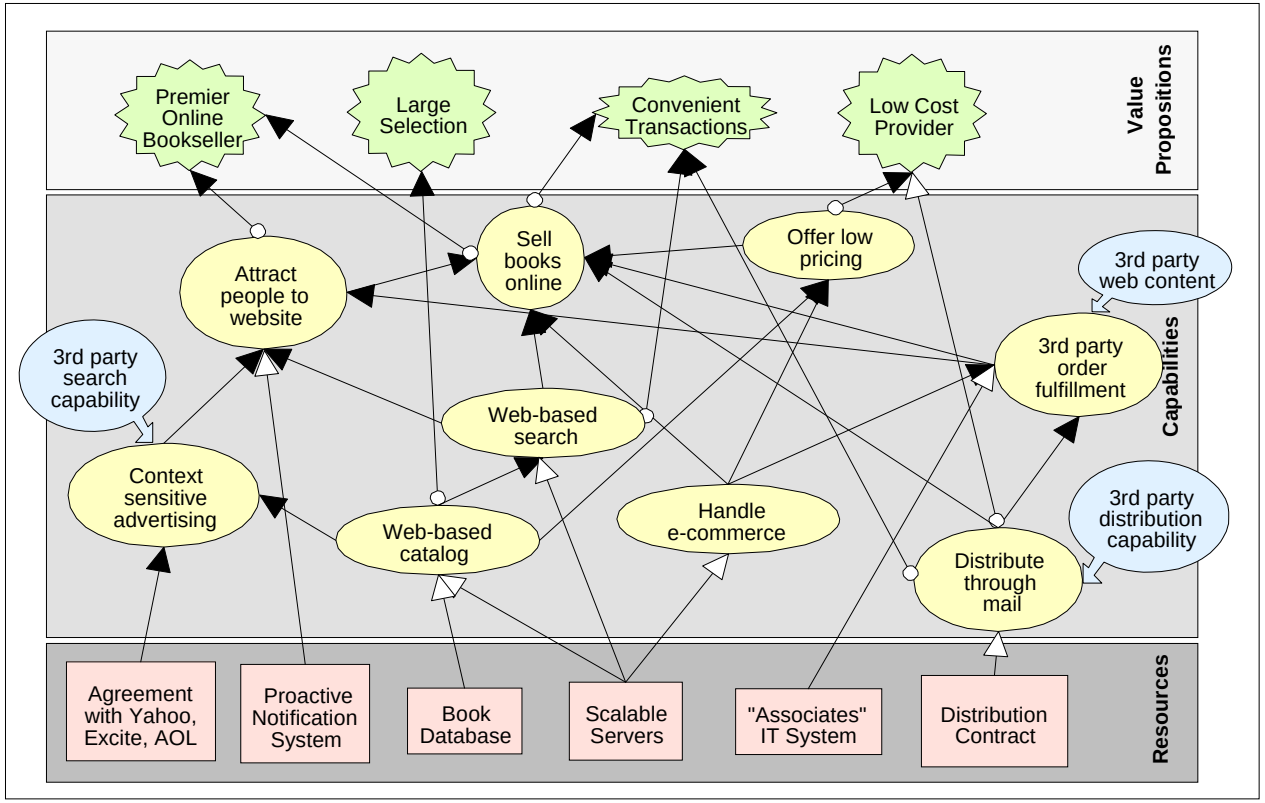
- Capability: **What a company needs to do in order to achieve its strategic positions. Capabilities perform, improve, and create the activities of the firm.**

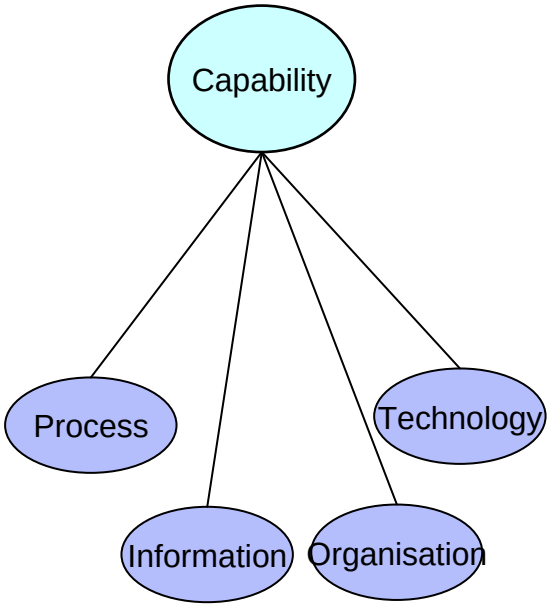
  Example: Ability to design for customer assembly, Ability to merchandise in-store and online.

- Capability Enabler (Resource): **What a company needs to have in order to perform its capabilities. Resources represent the process, knowledge, organization and technology assets of the firm.**

  Example: In-house engineers and designers, store locations, store layout expertise, web developer/programmer, server…

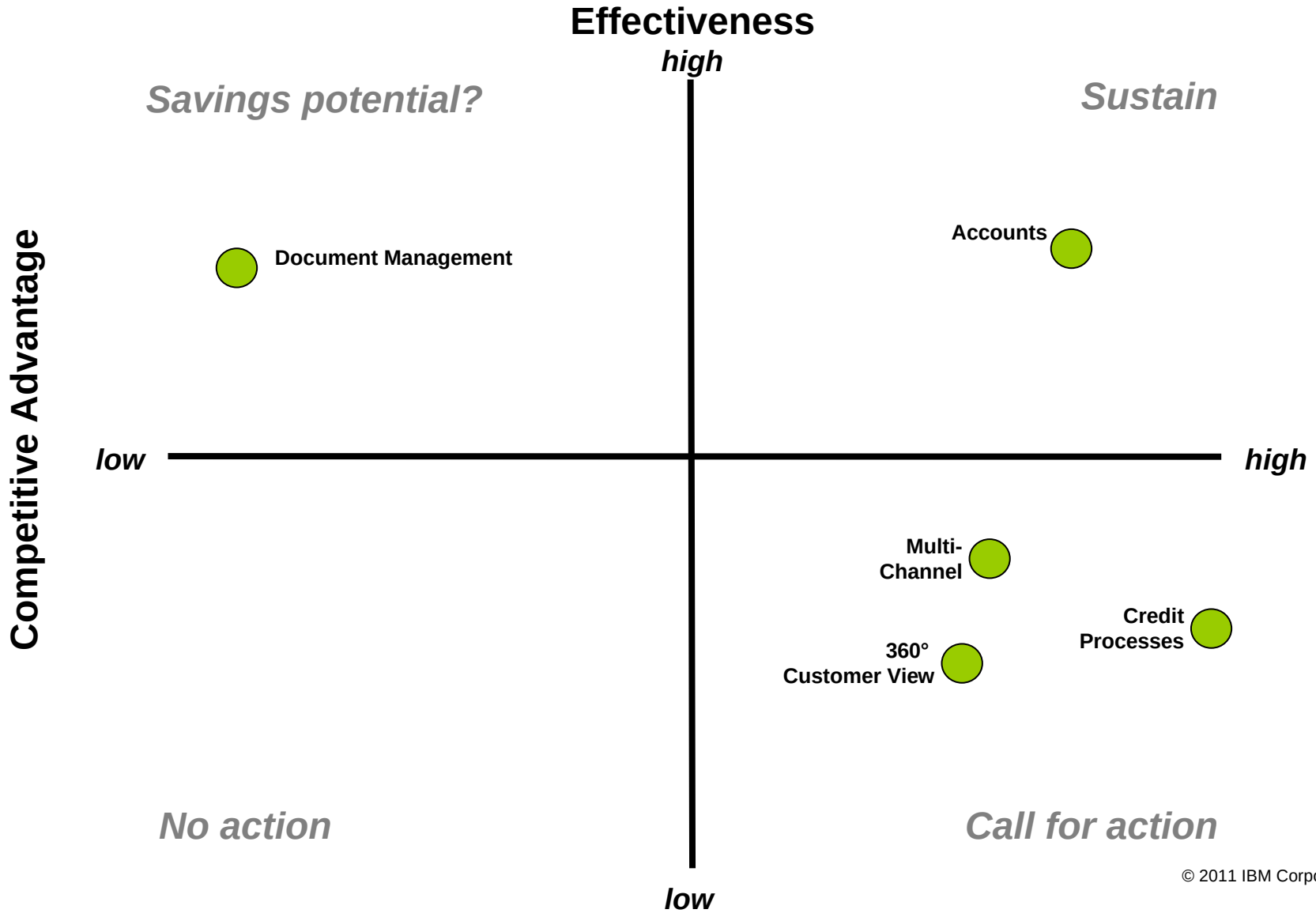
Enterprise Capabilities: Linking Strategy to Architecture (Example Amazon)





Example: Competitive Enterprise Capabilities Map

(May be investigated with Business Leaders)



Enterprise Architecture – Principles

Definitions

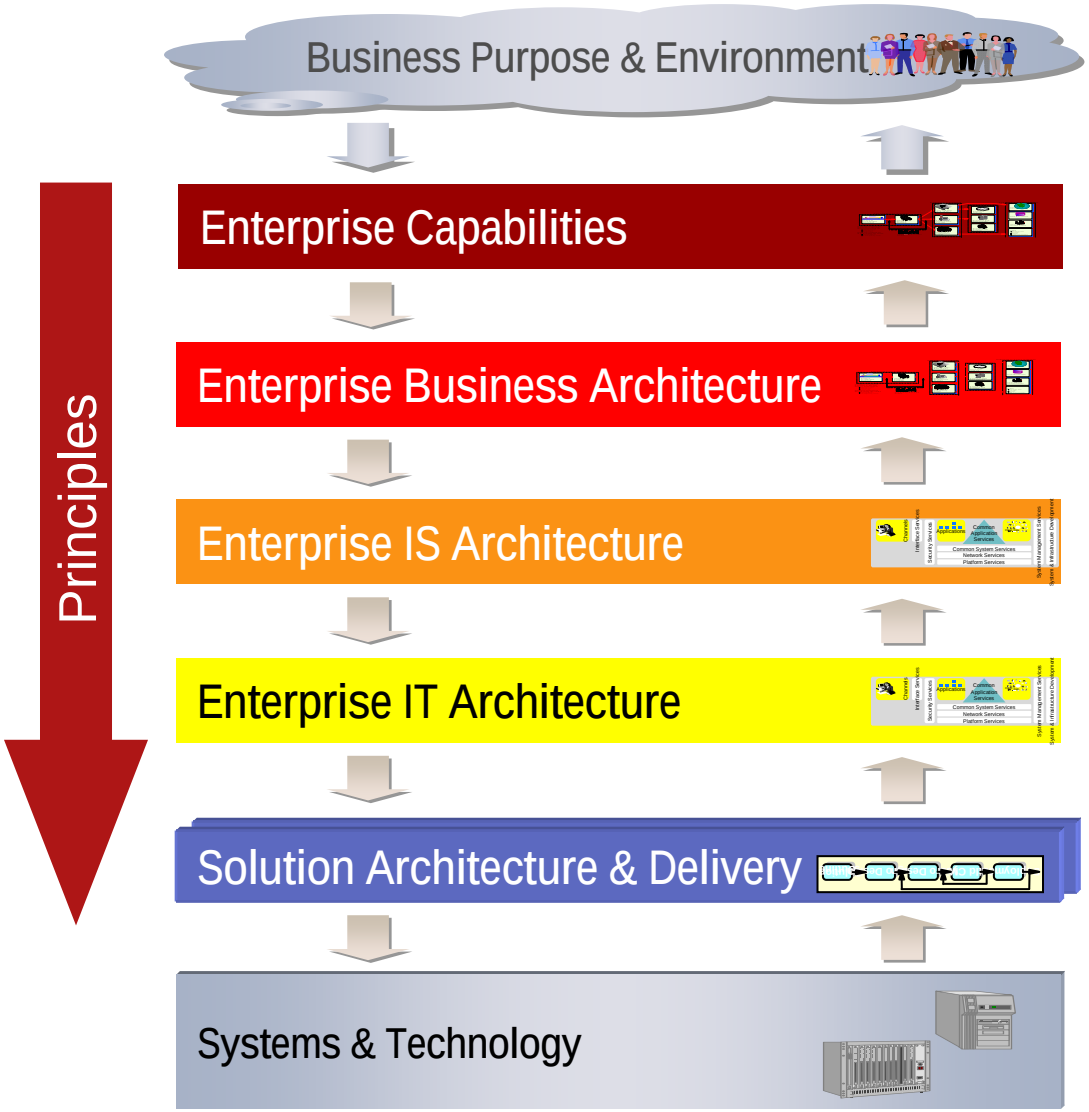
Term	Definition
Key Architecture Driver	Typically broad, high level statements, which define WHAT the EA must do, in order to support the business and IT strategies and be seen as successful and effective by the business. If capabilities have been defined, these will provide the key drivers for the architecture.
Principle	"A fundamental truth or proposition that serves as the foundation for a system of belief or behaviour or for a chain of reasoning." The New Oxford Dictionary of English Defines the underlying general rules which an organisation will use to make decisions about the selection, utilisation and deployment of all business and IT resources and assets, across the enterprise.
Policy	A high level statement of how things will be managed or organised, including management goals, objectives, beliefs and responsibilities.
Guideline	A general statement of direction, a desired future state which is not necessarily mandated. Guideline statements are similar in content to principle statements, but without the associated motivation and benefit statements.

A Context for Principles … why have Principles?

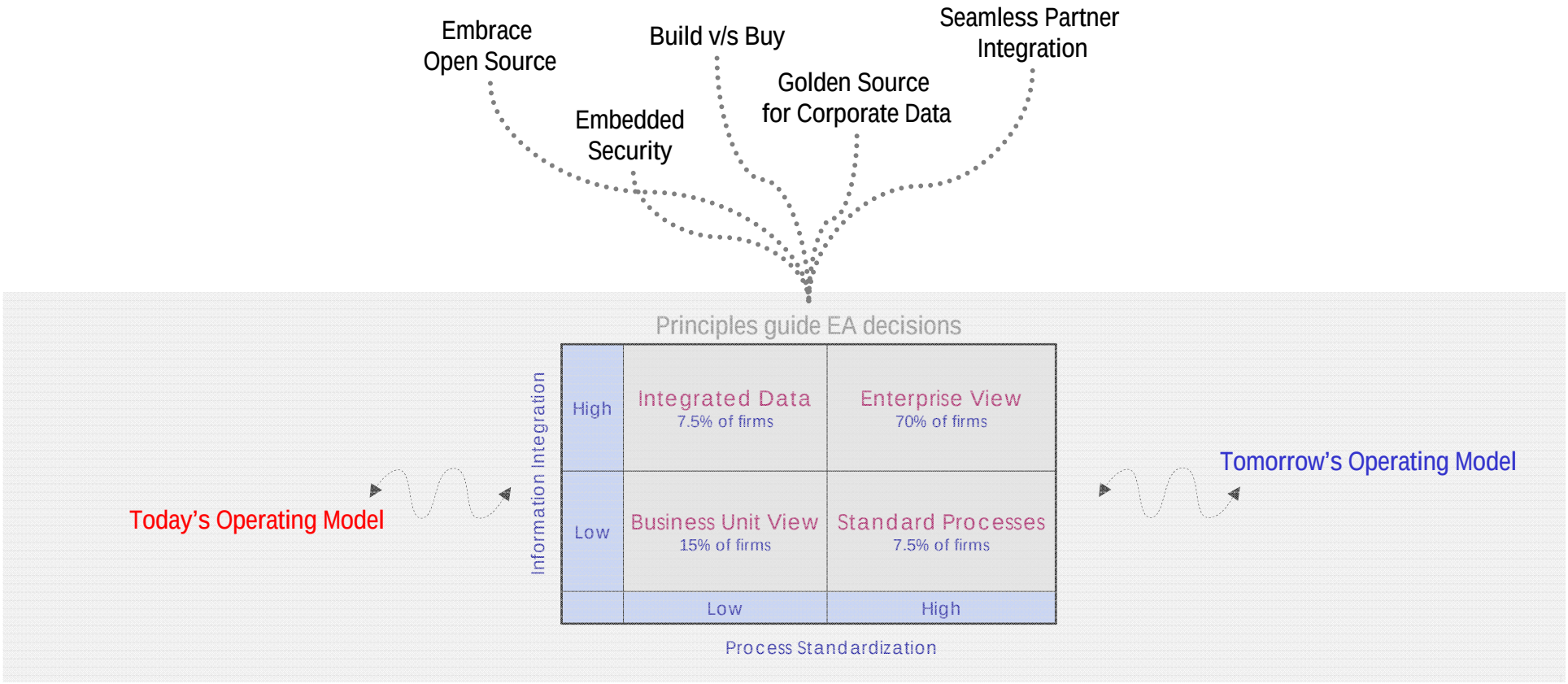
Enterprise Architecture provides a framework to guide investment and design decisions to support **business intent.**

Principles provide a means to articulate the architectural implications of that business at a high level.

- **Facilitate behaviour change;**
- Describe preferred practices;
- Reflect vision of improved ways of using technology to benefit business;
- Reflect high-level business & IT requirements in a commonly understood way;
- Rules or guidelines that apply across the business: to guide architects, designers, developers;
- Capture the “spirit” of the architecture.



Principles provide a means to articulate architectural implications to the business at a high level



Key outcomes: Initiate Enterprise-wide Conversations and Facilitate Behavior Change

Principles must show a clear traceable link back to business goals and to specific IT requirements

Business Goal

Cut account administration costs by offering online banking to existing customer base

Required Capabilities

- Ability to provide online access to customers
- Ability to integrate customer service to include web view of customer

Governing Principles

Data:

- All data will have a single identified business owner who will be responsible for ensuring the accuracy of the data and the definition of rules concerning its usage and protection.
- All unique representations of data should be captured once and stored in a manner that reduces data duplication and redundancy.

Application:

- Applications will use the standard interfaces and protocols for data, network, and systems access.

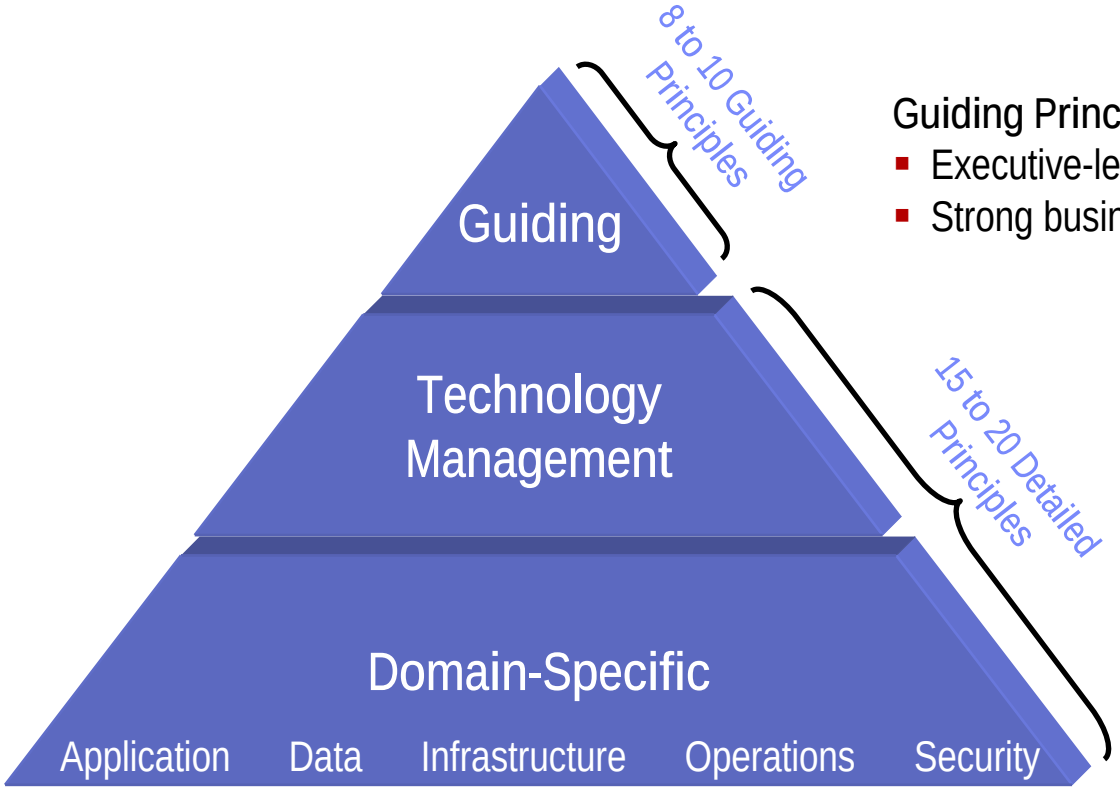
IT Requirements (Enablers)

1. Defined and agreed to common user interface standards (Portal)
2. Warehousing of customer data

Principles have a well-defined structure …

- **Name**
  - **A short name or title to identify the Principle**
- **Statement**
  - **A statement of the Principle**
- **Motivation**
  - **The rationale or impetus behind the Principle**
- **Implication**
  - **The consequences of adopting the Principle: potential transition initiatives, costs, and other implications**

It is convenient to classify EA Principles to assist in understanding and communication



Guiding Principles:

- Executive-level focus
- Strong business flavour

Detailed Principles:

- Focus on more detailed and specific principles
- Tend to have more of a technology focus

Note:

- Principles should be consistent with capabilities and reinforce or support these.
- Senior executive commitment is imperative if changes are to be effected. As such the number of Guiding Principles should be limited to a maximum of 10.
- More detailed principles are needed for architects and developers to help them design and implement solutions which deliver the business capabilities.

EA Principles must be at a consistent level, provide guidance and not dictate how things should be done in the organization

Defining Principles - Rules, Guidelines

A good principle:

- States a fundamental belief of the enterprise in one or two clearly written sentences.
- Recommends an action against which some arguments could be made.
- Has relevance to a technical architecture.
- Is worded directly and simply in terms understandable by both business and IT managers.
- Has business wide applicability.
- Is durable; will not be outdated quickly by advancing technology.
- Has objective reasons for advancing it instead of the alternatives which were considered.
- Has impacts which need to be documented.
- Represents change

A poor principle:

- Makes a statement which no one would dispute.
- Is a general business or financial statement.
- Has little or no general applicability. It may actually select a standard or a technology.
- Is stated at too low a level of detail and may not endure.
- May be included "because I say so".

Effectiveness of principles is dependent upon some key success factors …

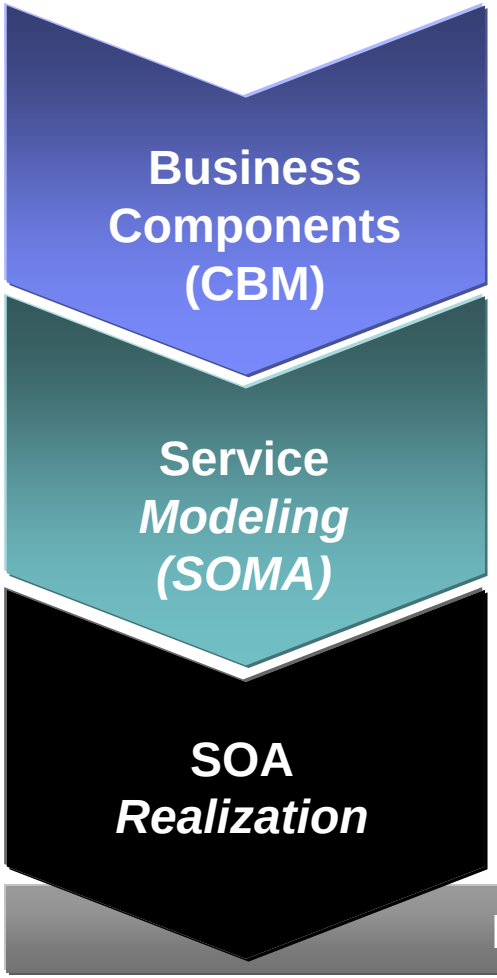
- Ownership
  - By Architecture Review Board.
- Engagement & Involvement
  - Created and endorsed by business and IT executives who have the authority to enforce.
  - Top-down support through leadership and action.
- Compliance Process
  - Compliance to Principles needs to be part of governance process.
- Communication
  - Architecture orientation and training.
  - Communication to all stakeholders and participants.

Example Guiding Principles – from IBM's own EA

Guiding Principle	Description
Provide Component/Services Based Architecture	**Applications will be designed to enable Services Oriented Architecture. Isolation of business functions, reusable Enterprise and Business Unit Components will be provided, and rules driven process modules must be provided.**
Buy rather than Build Solutions	**Application packages will be purchased rather than built and strategic alliances will be leveraged. We will use these packages with minimal extensions to ensure flexibility in upgrades. We will drive our strategic SW suppliers to fully exploit IBM technology.**
Drive productivity and cost savings through asset reuse	
Use IBM Marketed Products and Services (Use what we sell)	**We will use and showcase IBM products and services whenever they are available and meet the business needs. When IBM products and services are not available, we will leverage the use of IBM platforms in Business Partner products. We will drive our strategic SW suppliers to fully exploit IBM technology.**
Design to enable on-demand e-business, B2B (enable ValueNet)	**We will design our internal solutions to enable Business to Business interactions. We use industry standards e.g., RosettaNet, XML, etc. for communication with external entities. Ensure application-to-application interfaces will be through open standards (Web Service, XML, etc.).**
Manage Data as a corporate wide asset	**Data will be manages as an asset. Enterprise Data Stewards will be identified to ensure data consistency and non-redundancy. There will be an identified source of key corporate data.**
Design for Global use	**All strategic applications must be designed for global use. Key considerations include: NLS and DBCS enablement, multi-currency support, multi-country enablement supporting legal separation of country operations as required, and 24x7 support for run-once applications.**
Migrate to strategic application / sunset legacy applications	**Approved strategic applications and components will be used to support business requirements, and non-strategic applications will be sunset.**
Use common application, data, technology standards	**All IT solutions will conform to the application, data, and technology architectures, standards, and guidelines. Details of IBM architectures, standards, and guidelines are provided on the Architecture and Standards web site.**

Enterprise Architecture – Business View with CBM

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

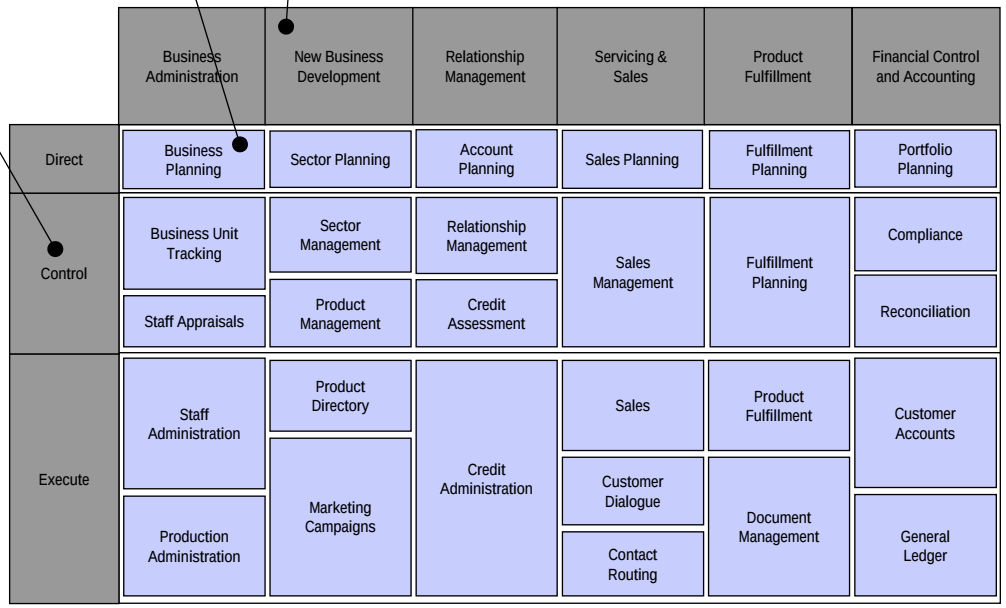
Component Business Model (CBM) – Definition (1)

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.

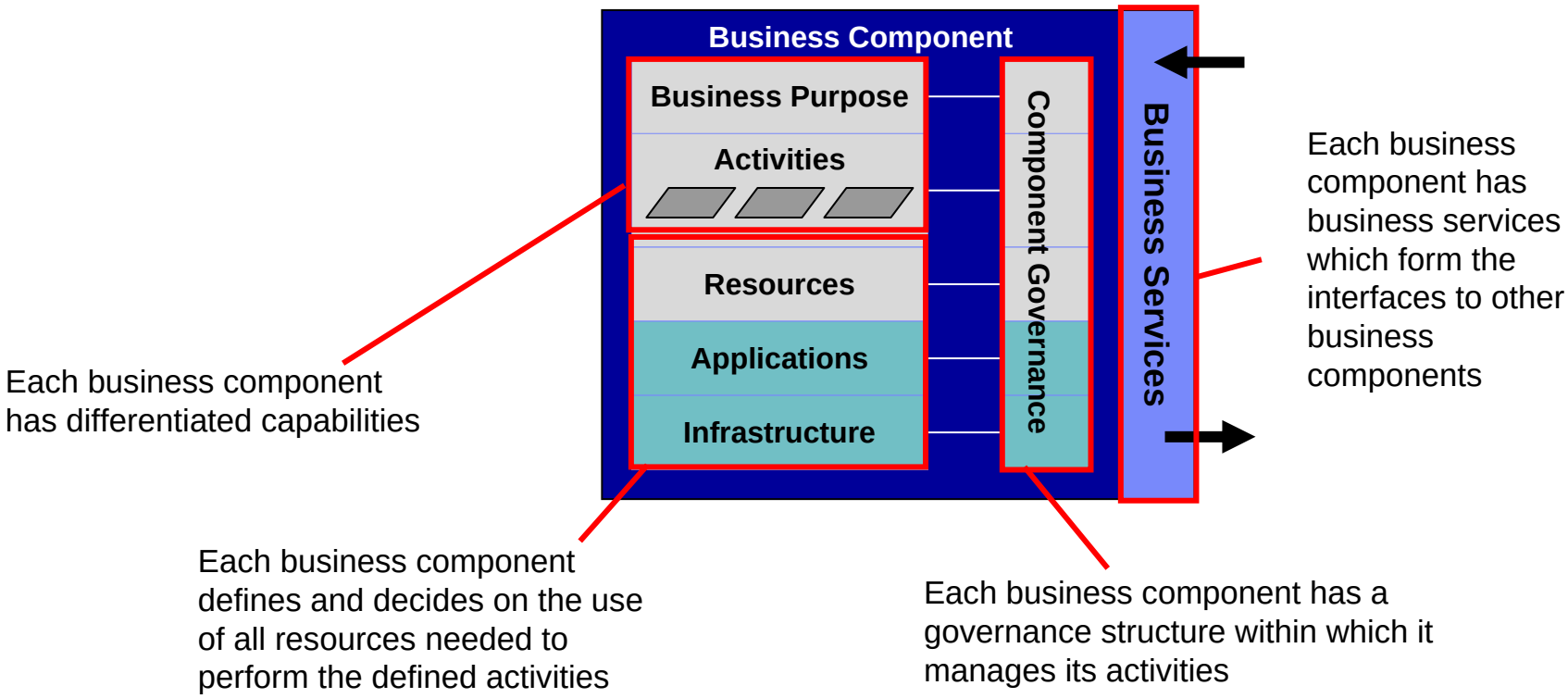
- Direct is about strategy, overall direction and policy.
- Control is about monitoring, managing exceptions and tactical decision making
- Execute is about doing the work



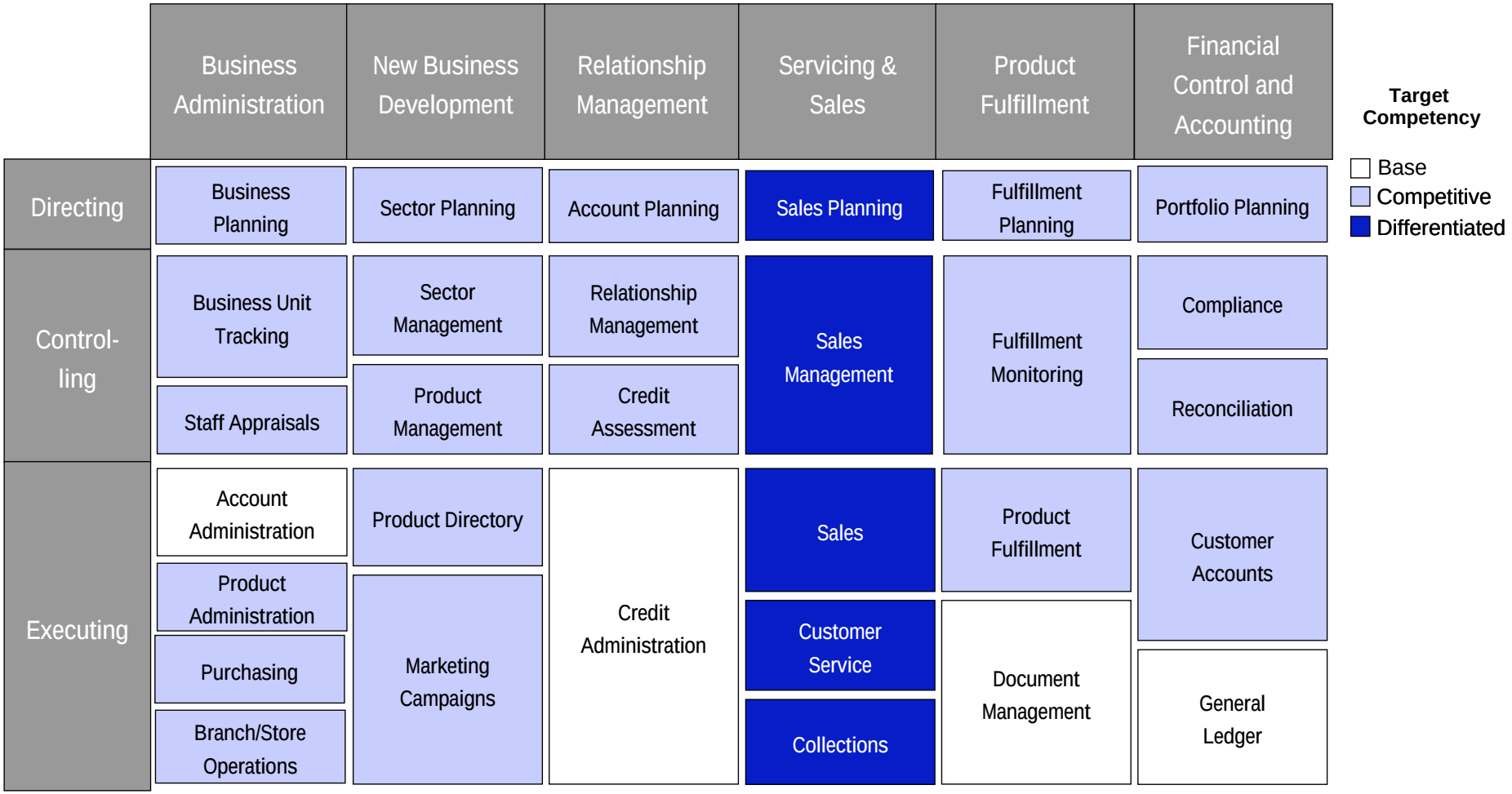
CBM – Definition (2): The building block of a component business model is a 'business component'

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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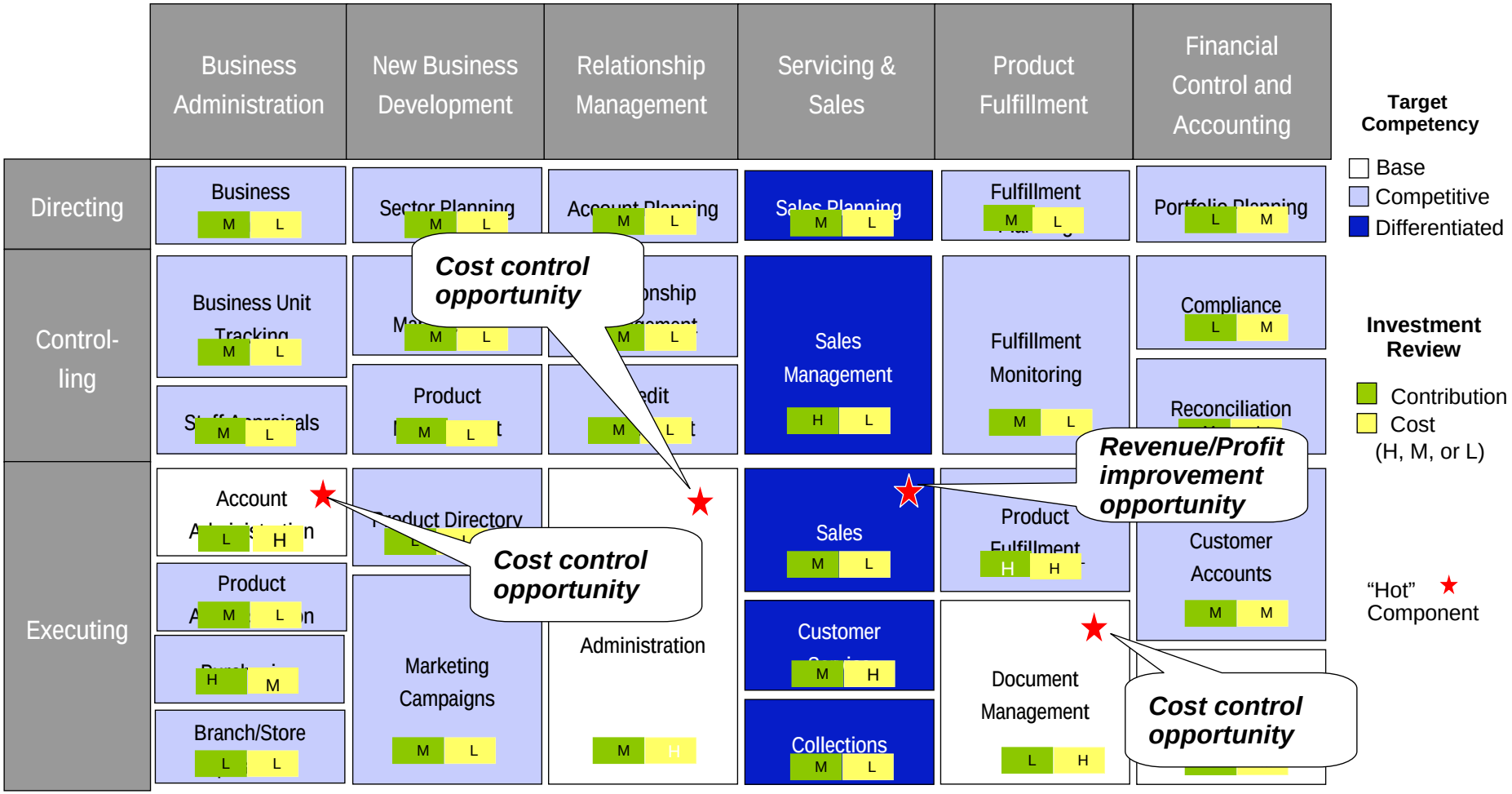
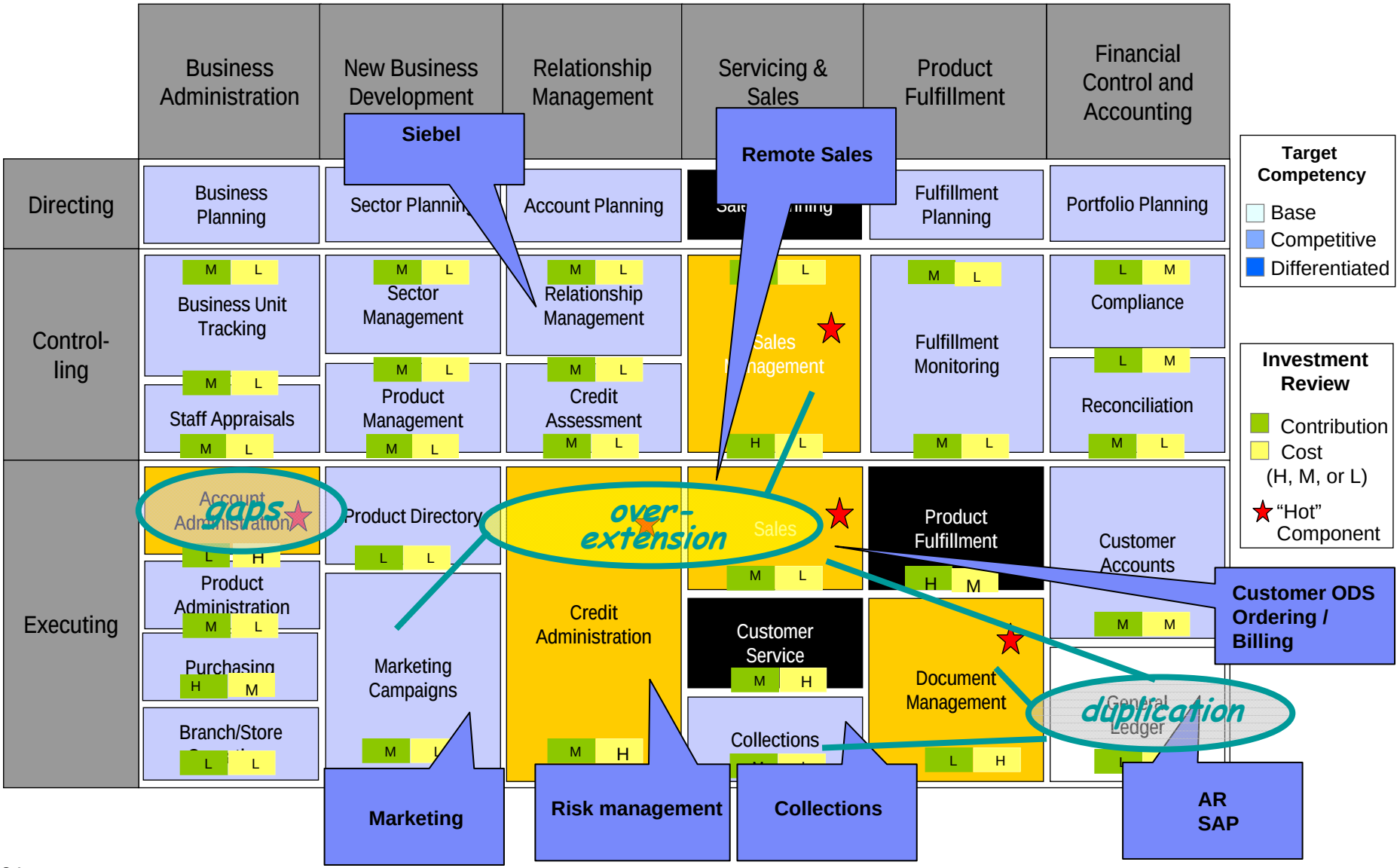


CBM and IT Systems Coverage for JKE



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	

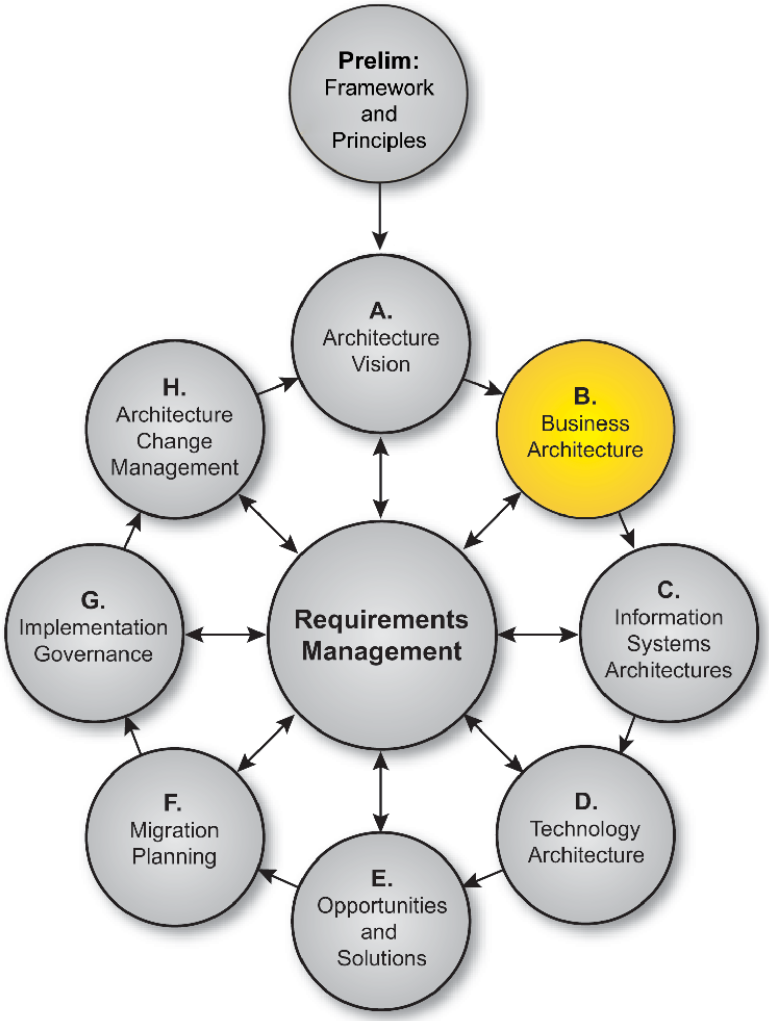
Key Performance Indicators

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.**

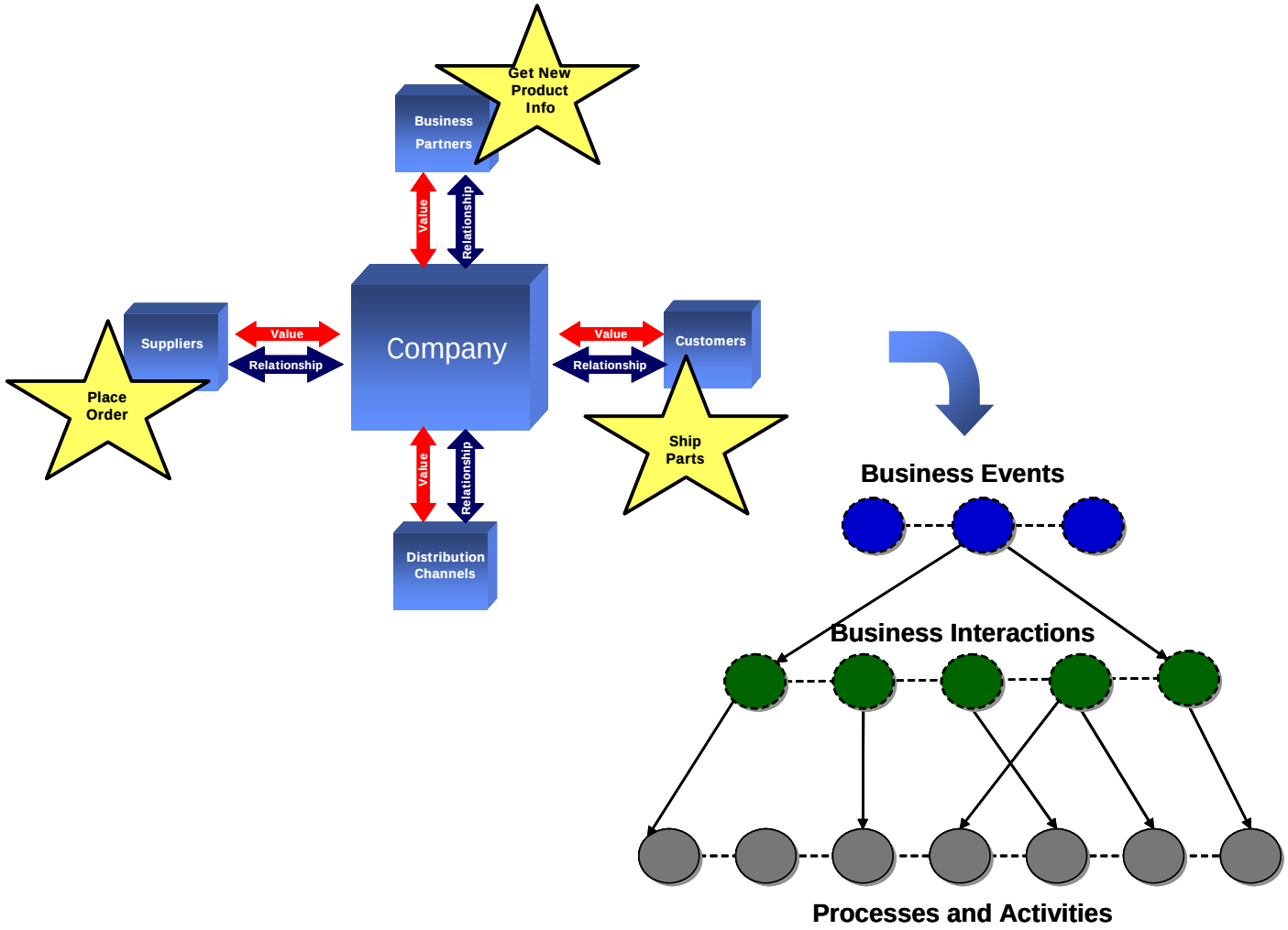
Enterprise Architecture – Business View

In more Detail: Business Architecture Content
(according to TOGAF augmented)



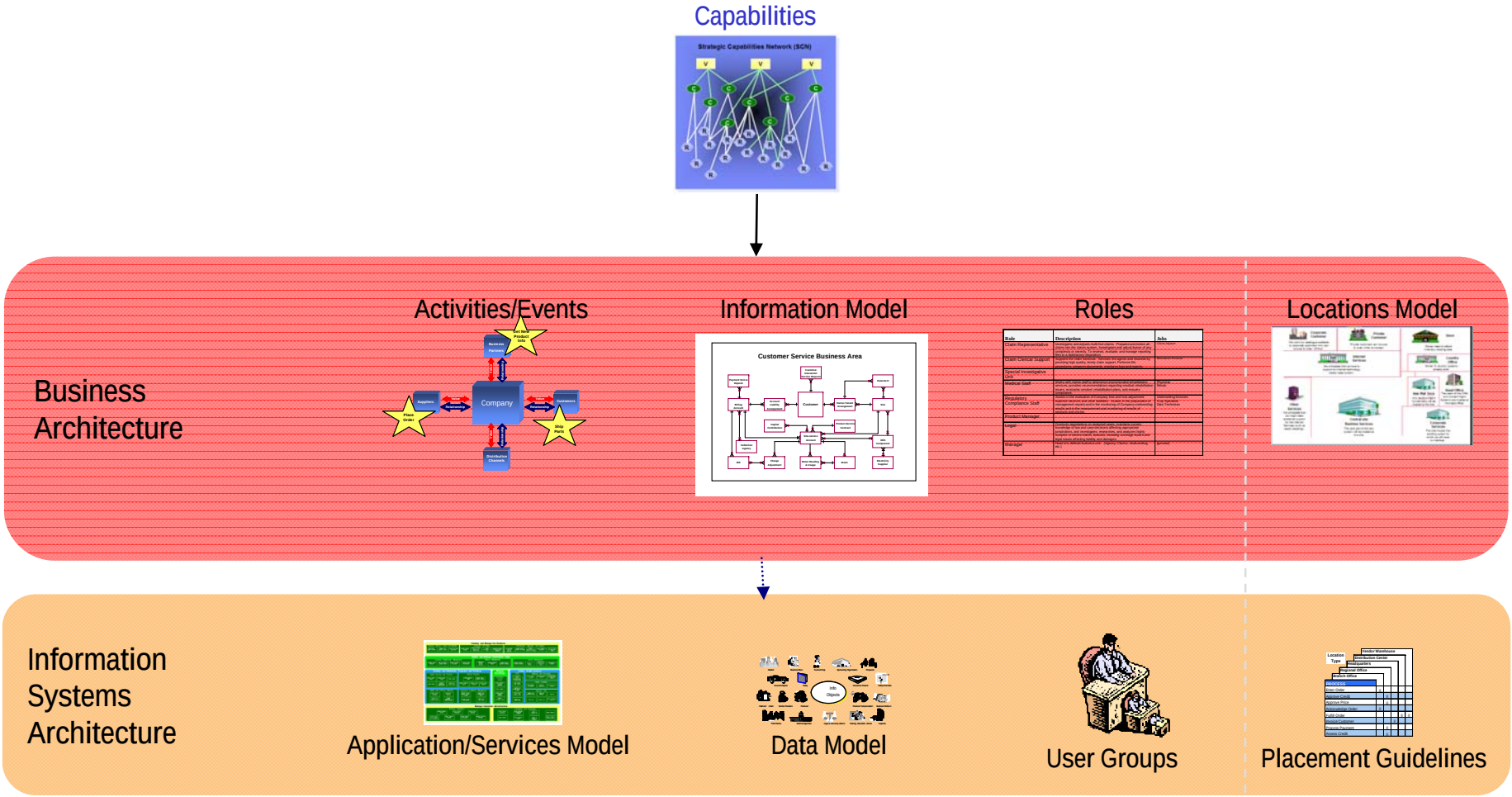
- **Organization structure**
- **Business Goals and Objectives**
- **Business Functions**
- **Business Services**
- **Business Processes**
- **Business Roles**
- **Correlation of organization and functions.**
- **Enterprise Information Model (according to IBM EA Methodology)**

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

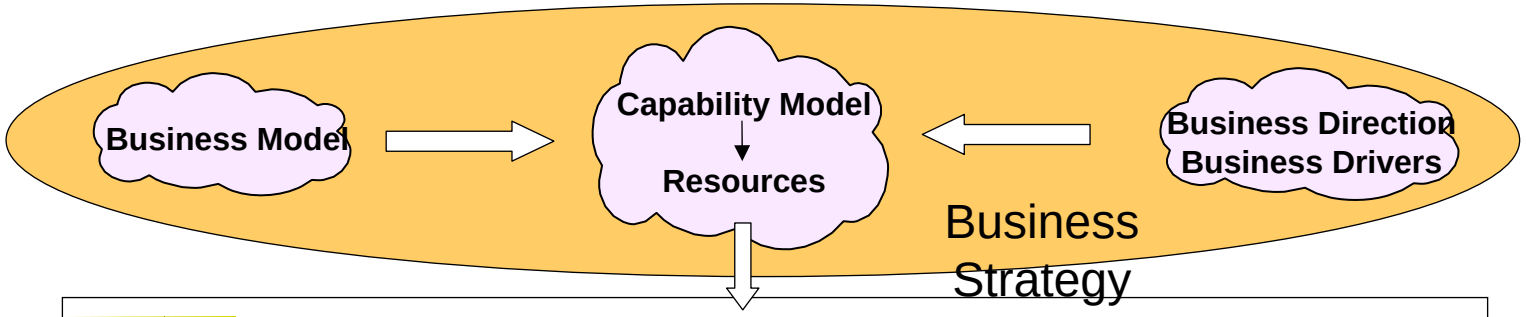


These externally facing business events and interactions are the starting point for developing the operational details of the subsequent business design.

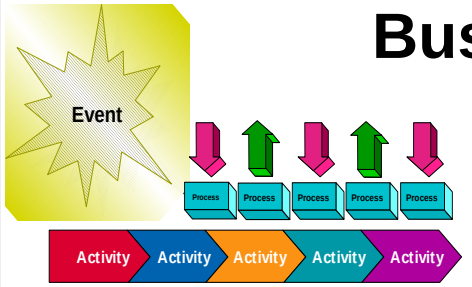
Business Architecture artefacts guide the structure of the enterprise's Information Systems architecture



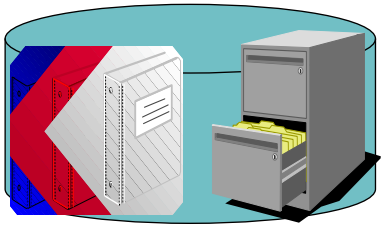
A Business Architecture describes the “business” aspects of the enterprise, independent of technology



Business Architecture

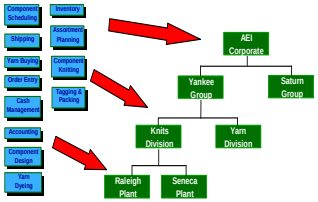


Business Processes



Business Information

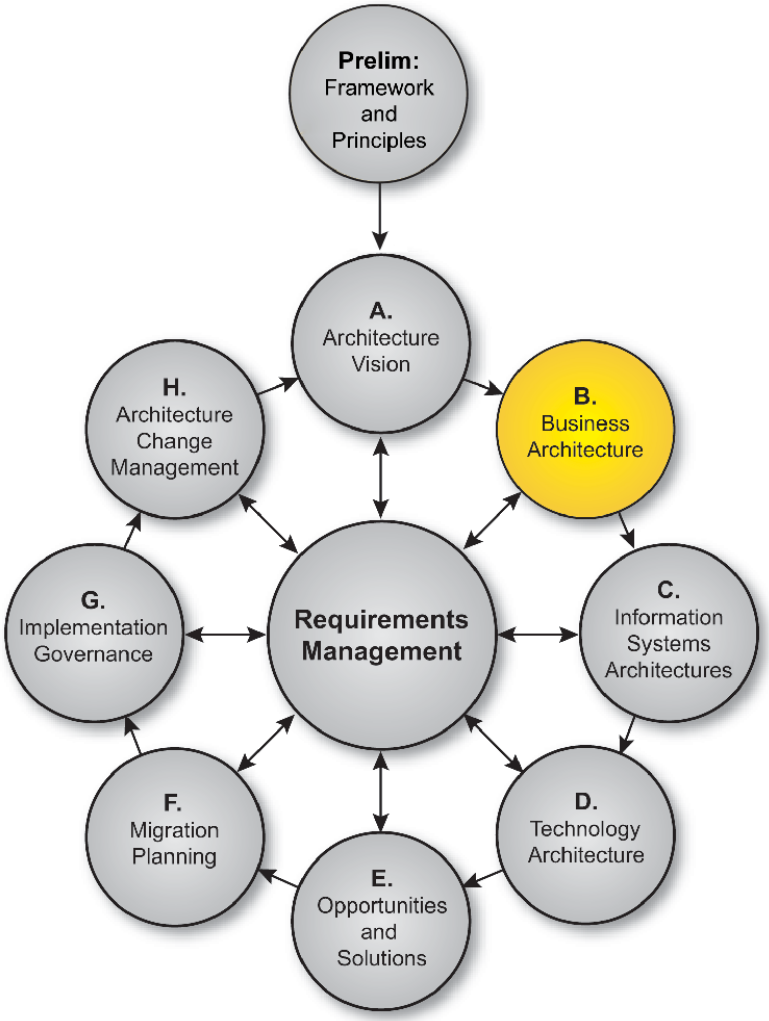
Business Locations



Business Structure

Business Roles

Business Architecture Content according to TOGAF augmented



- **Organization structure**
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- **Business Functions**
- **Business Services**
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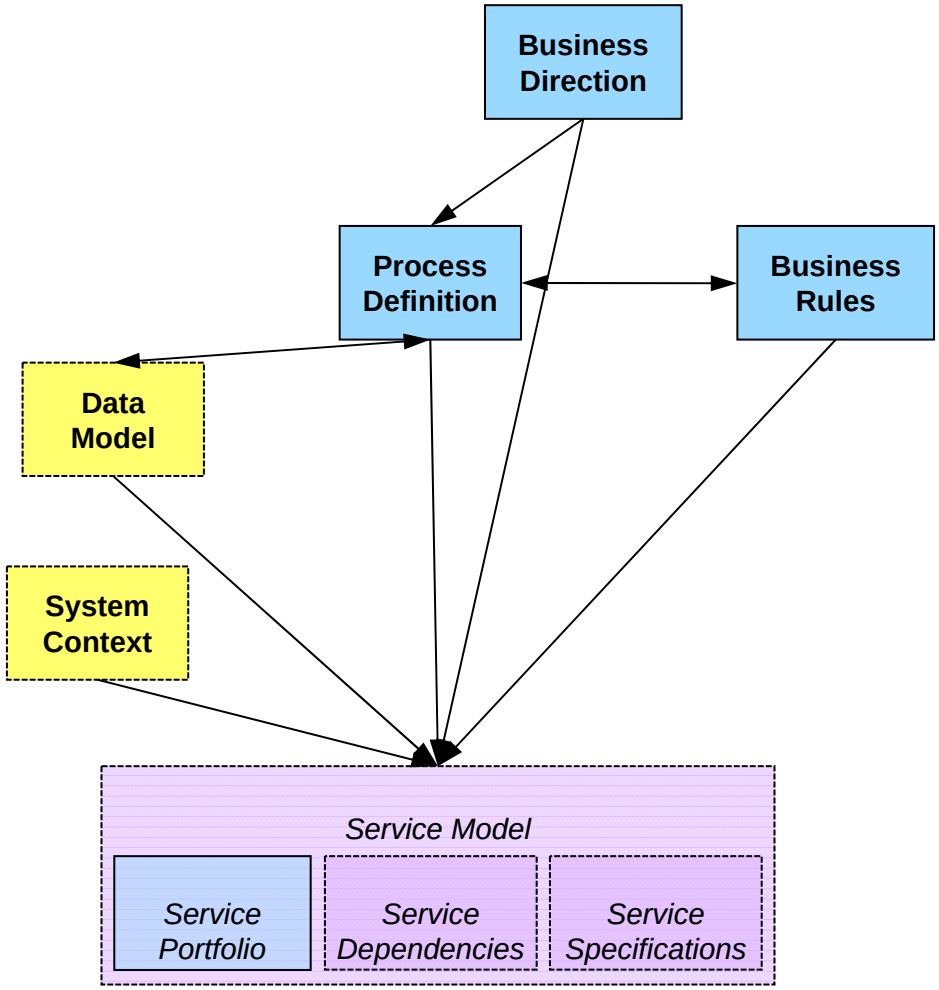
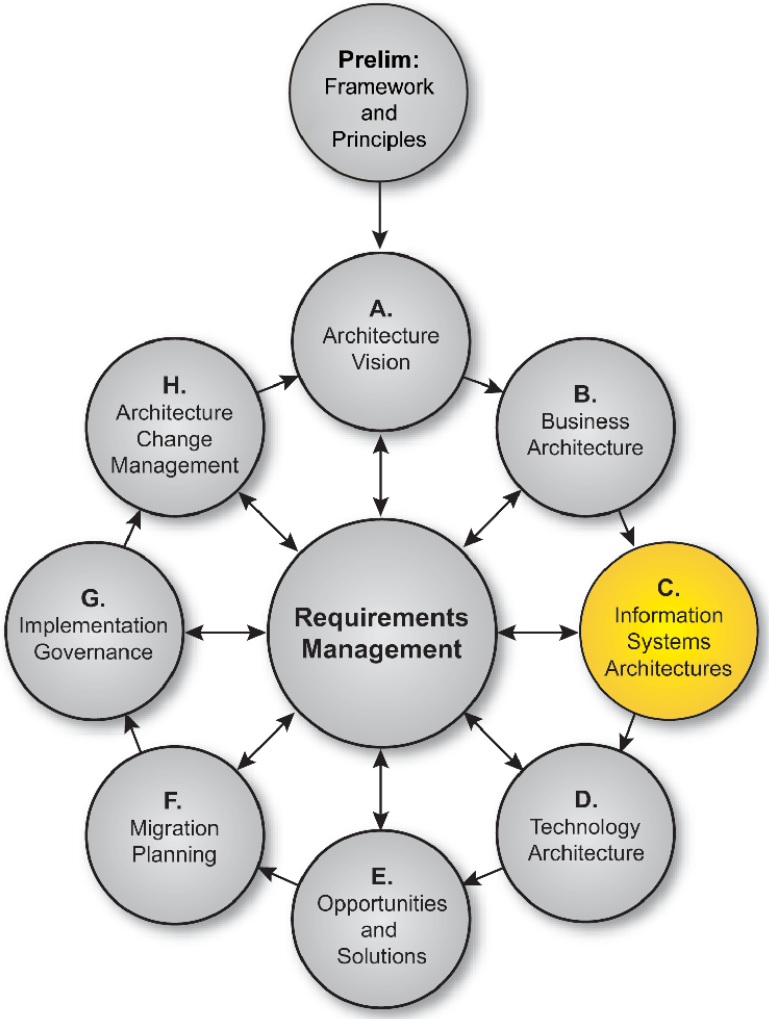
- **Enterprise Information Model (according to IBM EA Methodology)**

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



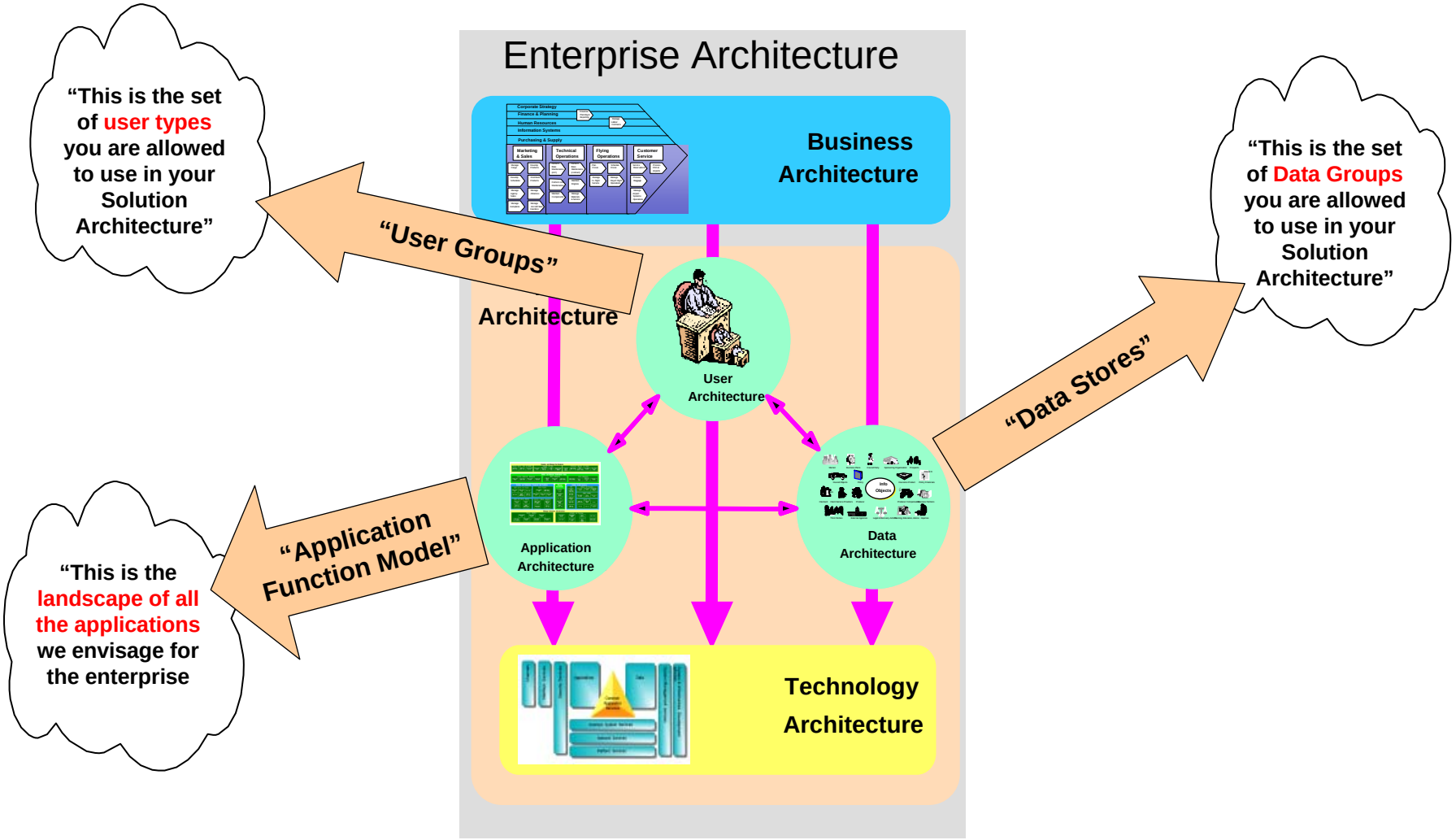
Enterprise Architecture
Information System (IS) Architecture

In more Detail: IS Architecture Content
(according to TOGAF)

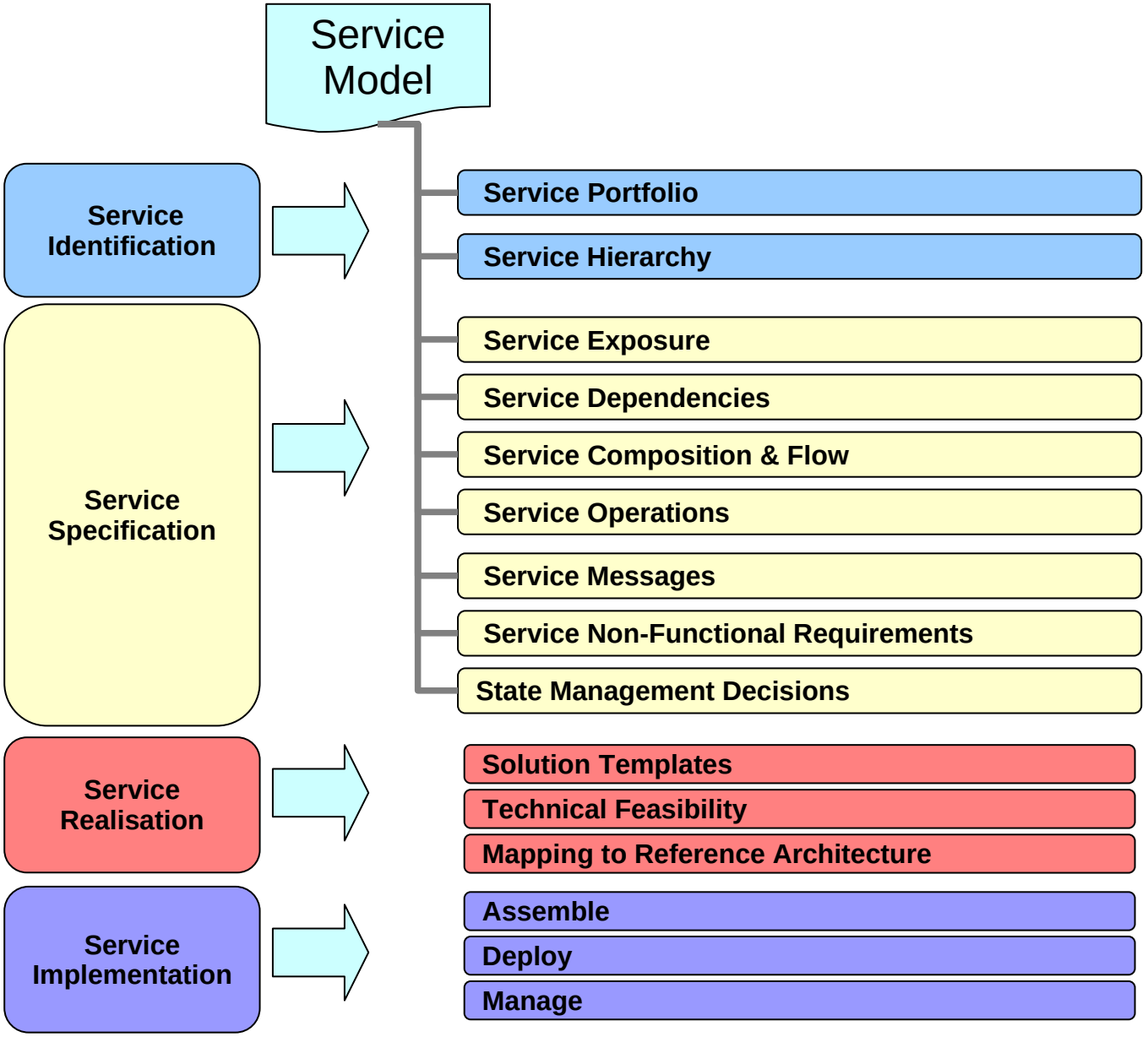


- **The fundamental organization of an IT system, embodied in**
  - **relationships to each other and the environment, and the principles governing its design and evolution**
- **Shows how the IT systems meets the business goals of the enterprise**

Overview



IS Architecture – Portfolio of Services as Application Functions



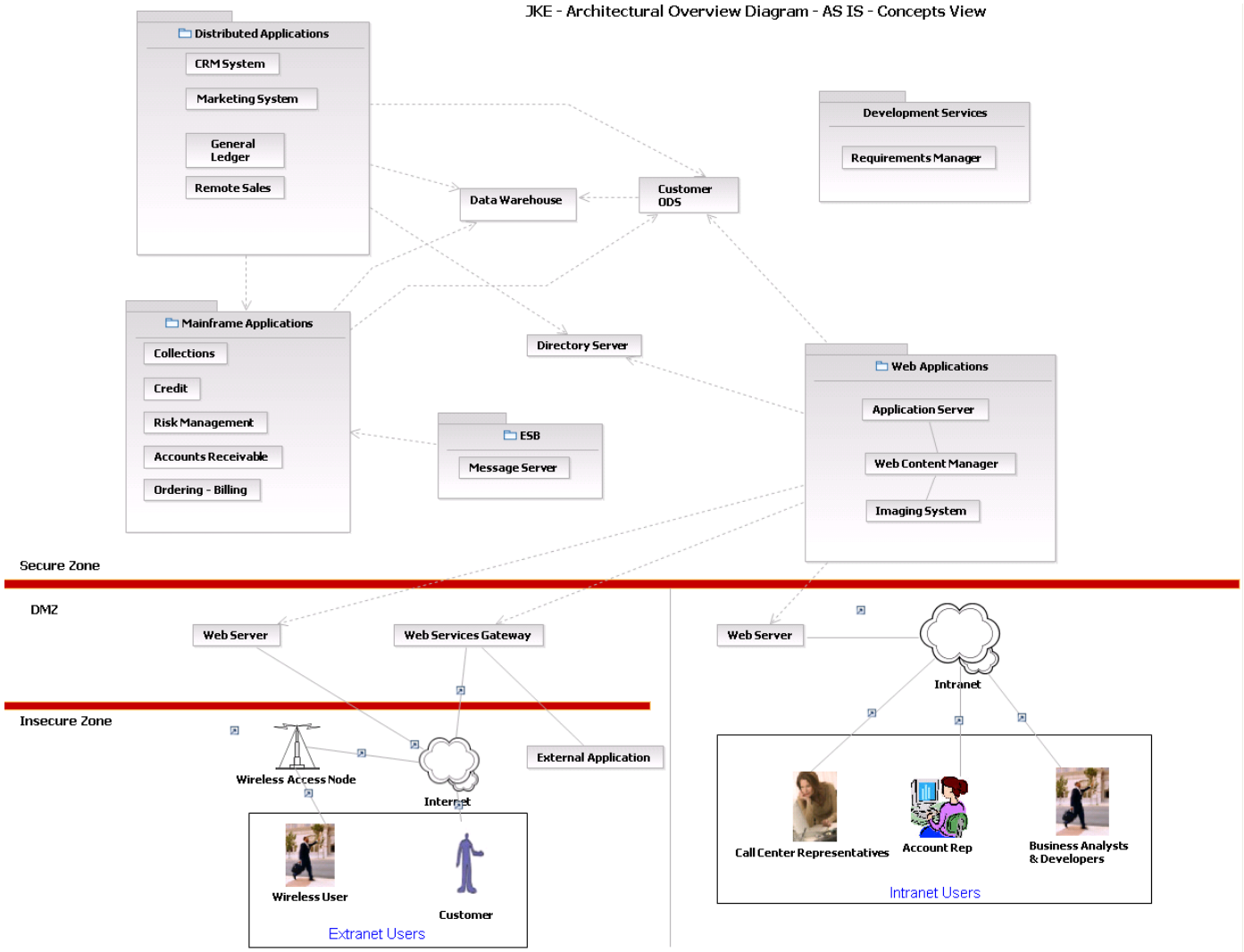
Architectural Decisions

- Records in a single place for reuse, those underlying decisions and principles that give the architecture its fundamental characteristics and consistency.
- Evaluates choices during design as well as the correctness of the final solution.
- Promotes evaluation of choices against principles rather than product vs. product, etc.
- Documents the important decisions about all aspects of architecture including the structure of the system, the provision and allocation of function, the contextual fitness of the system and adherence to standards.

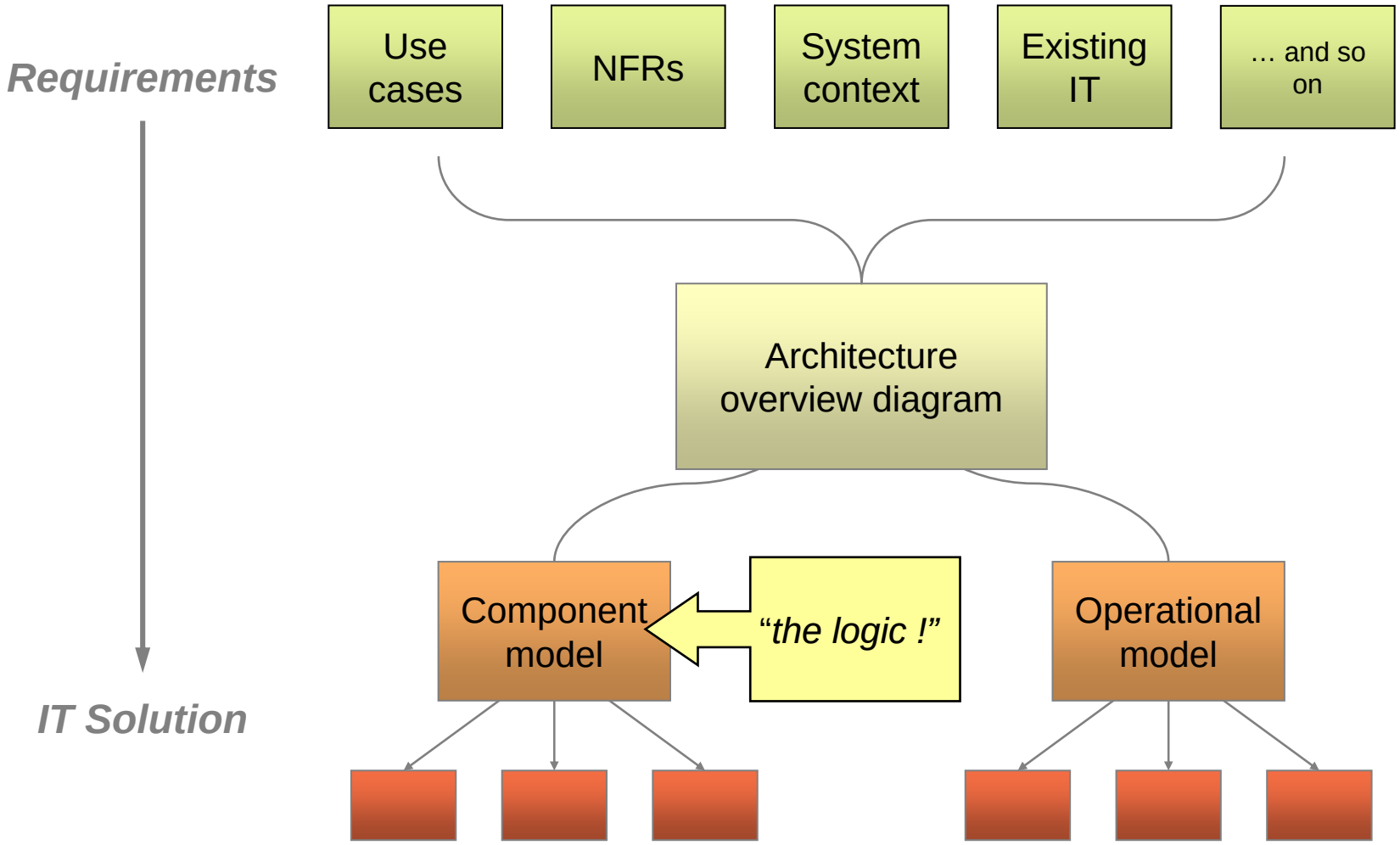
Architectural Decision – Example

ARCHD Attribute	Value
Subject Area	**Data Governance**
Architectural Decision	**Where to enforce data governance - LOB, Enterprise, or both**
Issue	**Require extension to govern development and runtime aspec of data**
Assumptions	**Limited JKE processes and standards**
Motivation	**Define roles, responsibilities, policies for governance**
Alternatives	**LOB, Enterprise, or both**
Decision	**Managed at enterprise level**
Justification	**Enables management of cross-organizational data in transformation a consistent fashion across the enterprise**
Implications	**Introduces data ownership issues.**

Reference – As-Is Architectural Overview Diagram (JKE)



Where does the Operational Model fit?

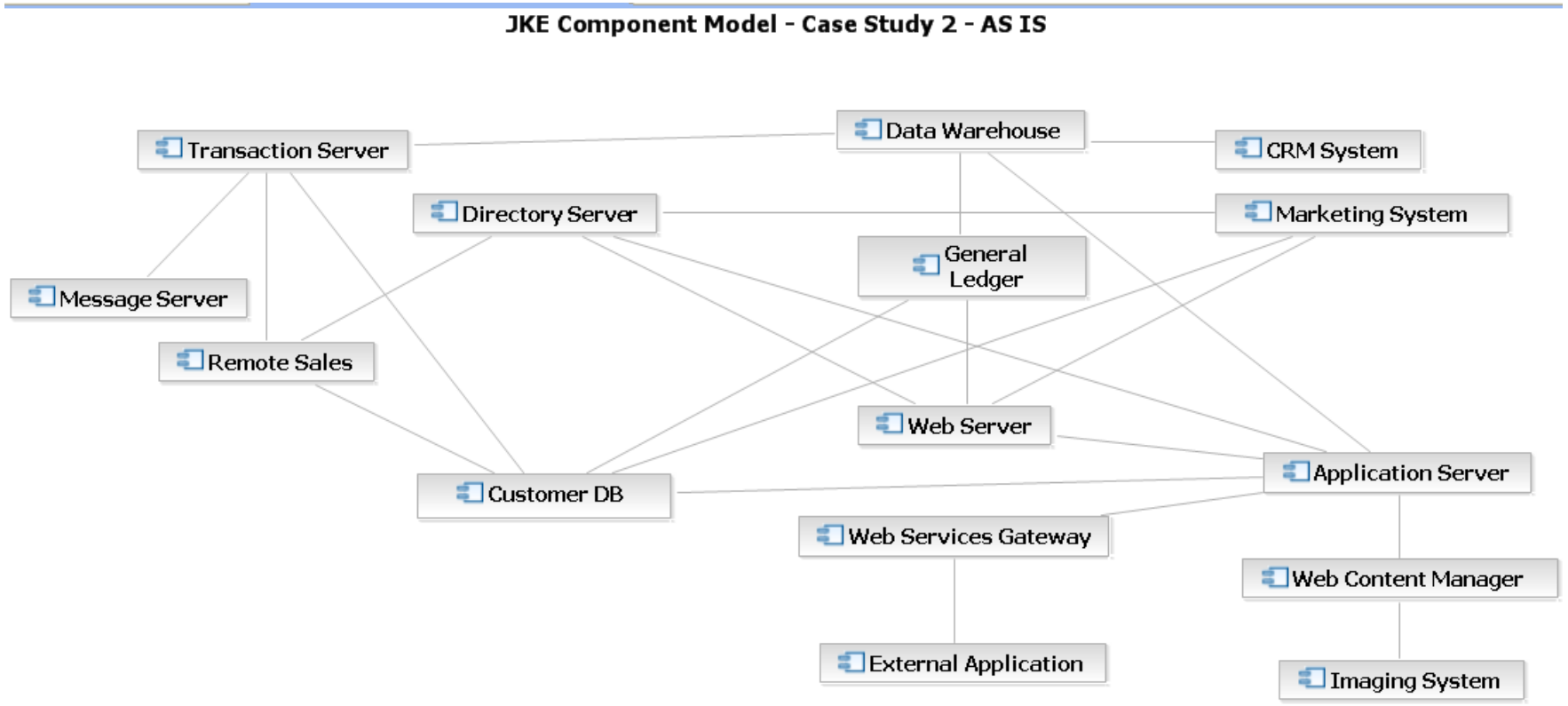


Component Model

- Components
  - Replaceable part of a system that conforms to and provides the realization of a set of interfaces
- Used to describe the high level structure of the system, and to precisely describe
  - Responsibilities, relationship boundaries, and interactions
- Descriptions of the responsibilities of a component from the point of view of the user of the component. (Eventually used to create the APIs)
- Define the service levels
  - Users, Availability
- Document Risk, and decisions, as well as potential approaches

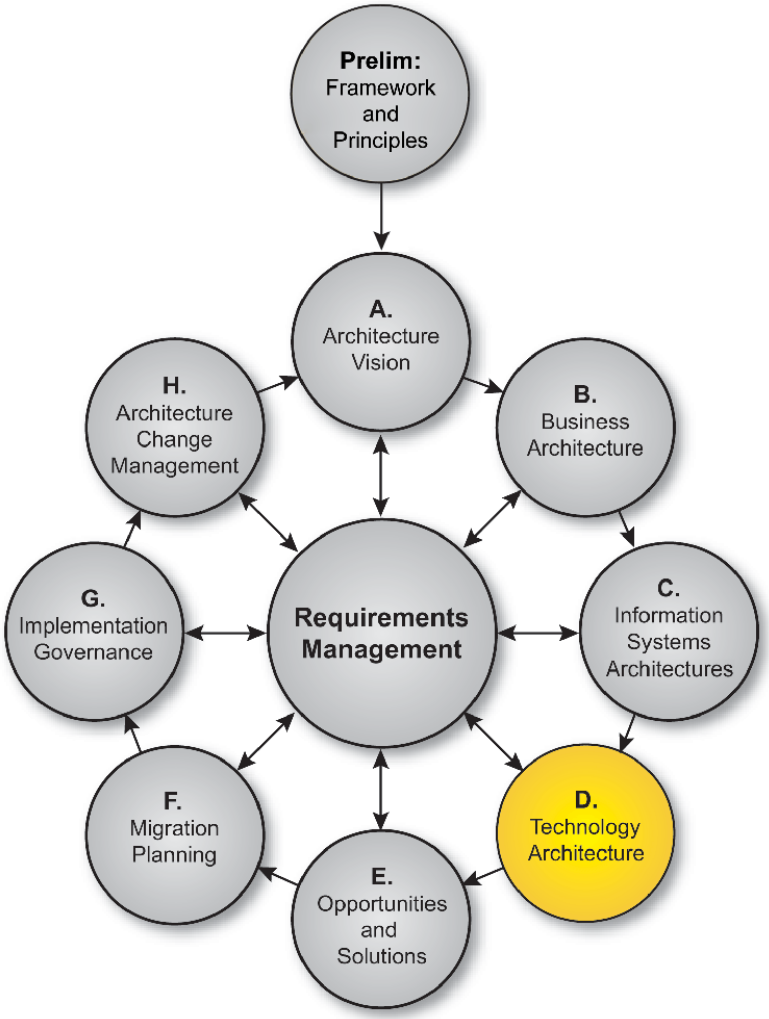
- Do we need this in sales
  - Yes sometimes… to help decide how flows will work, verify viability of key processes, prove that certain decisions need to be made… and more

Example – As-Is Component Model (JKE)



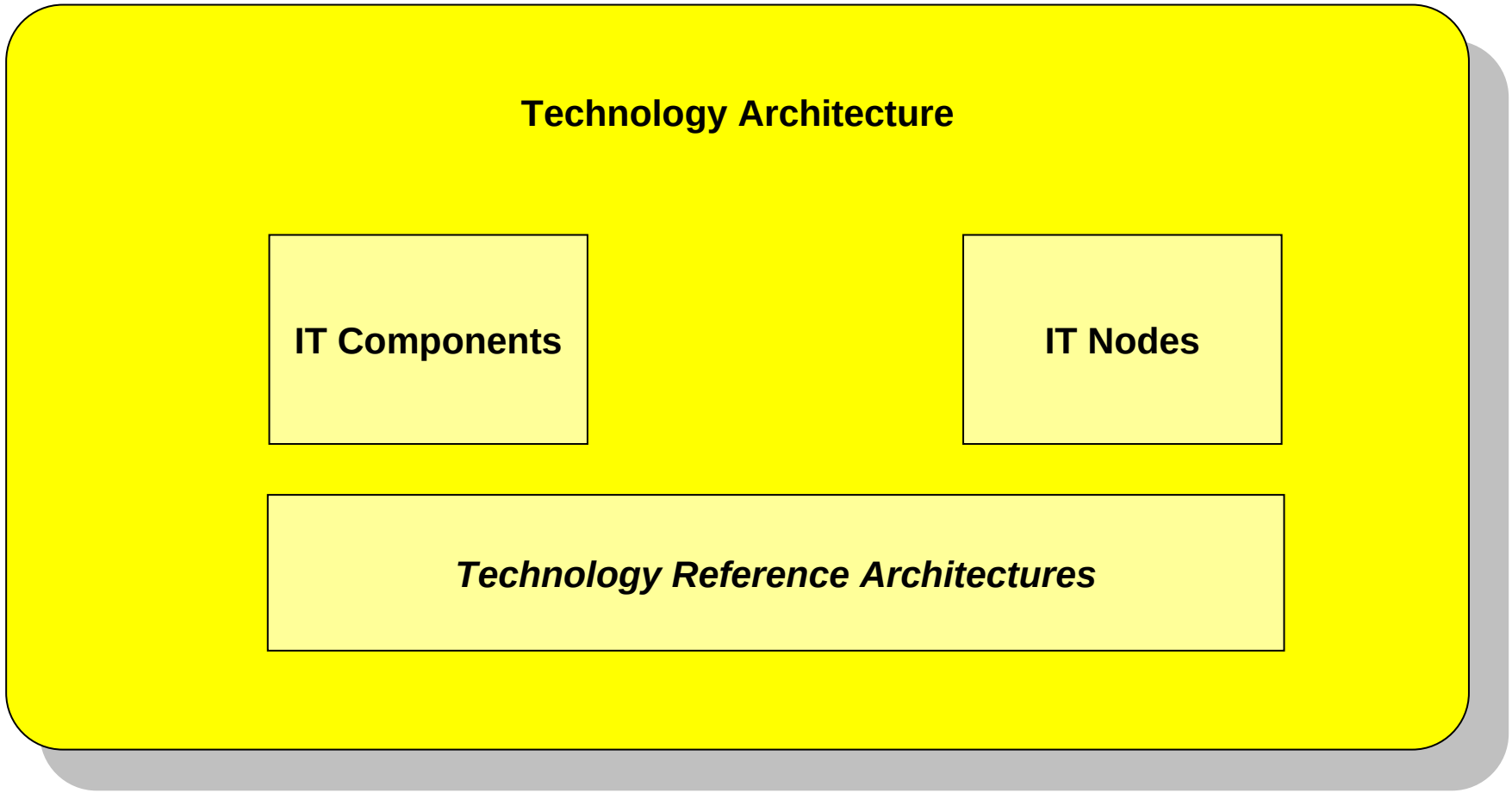
Enterprise Architecture
Technology Architecture

In more Detail: Technology Architecture Content
(according to TOGAF)

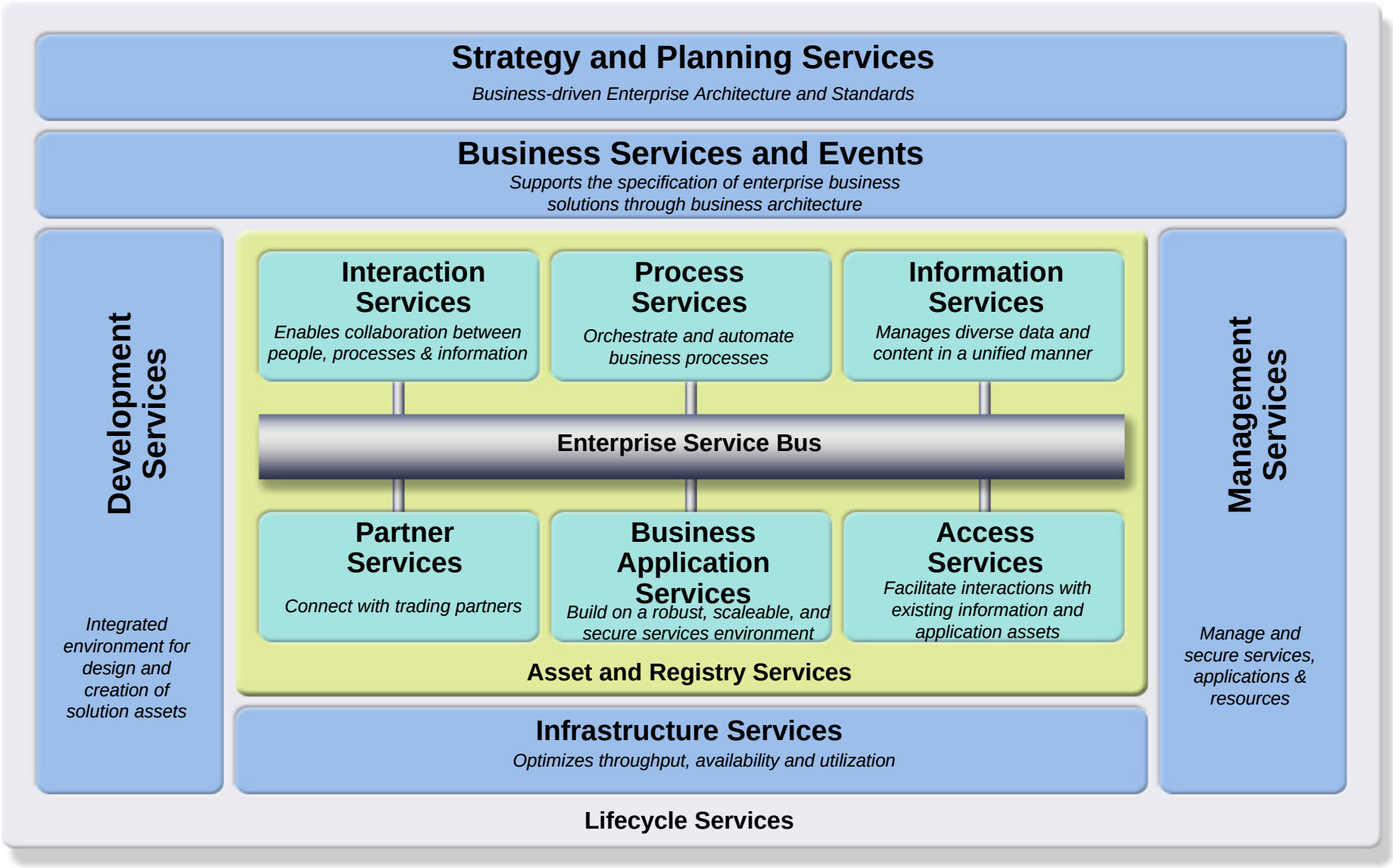


- **Technology Architecture must support implementation work**
- **The fundamental organization of an IT system, embodied in**
  - **its hardware, software and communications technology**
  - **their relationships to each other and the environment,**
  - **and the principles governing its design and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

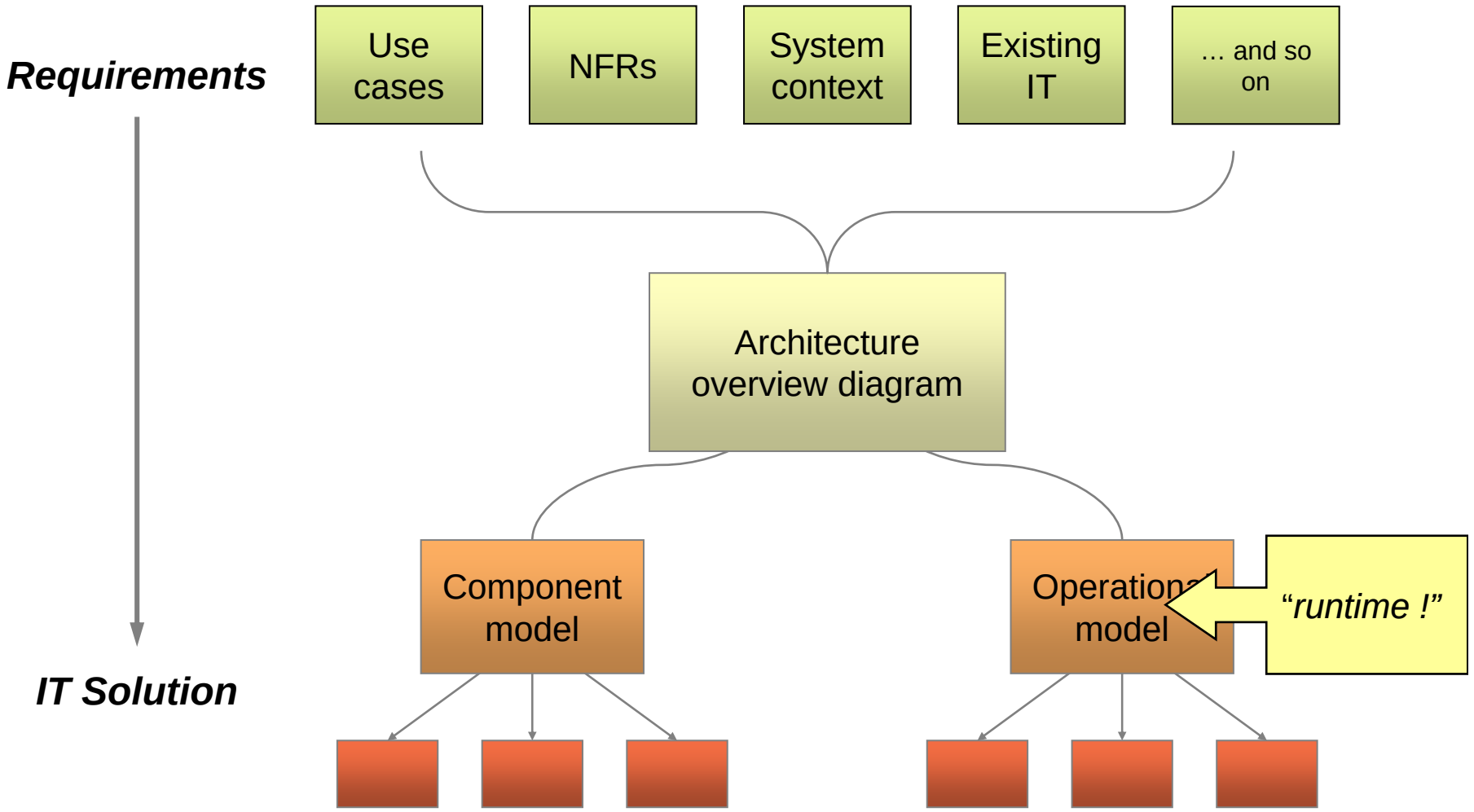
Technology Architecture according to IBM EA Method



Example: SOA Reference Architecture

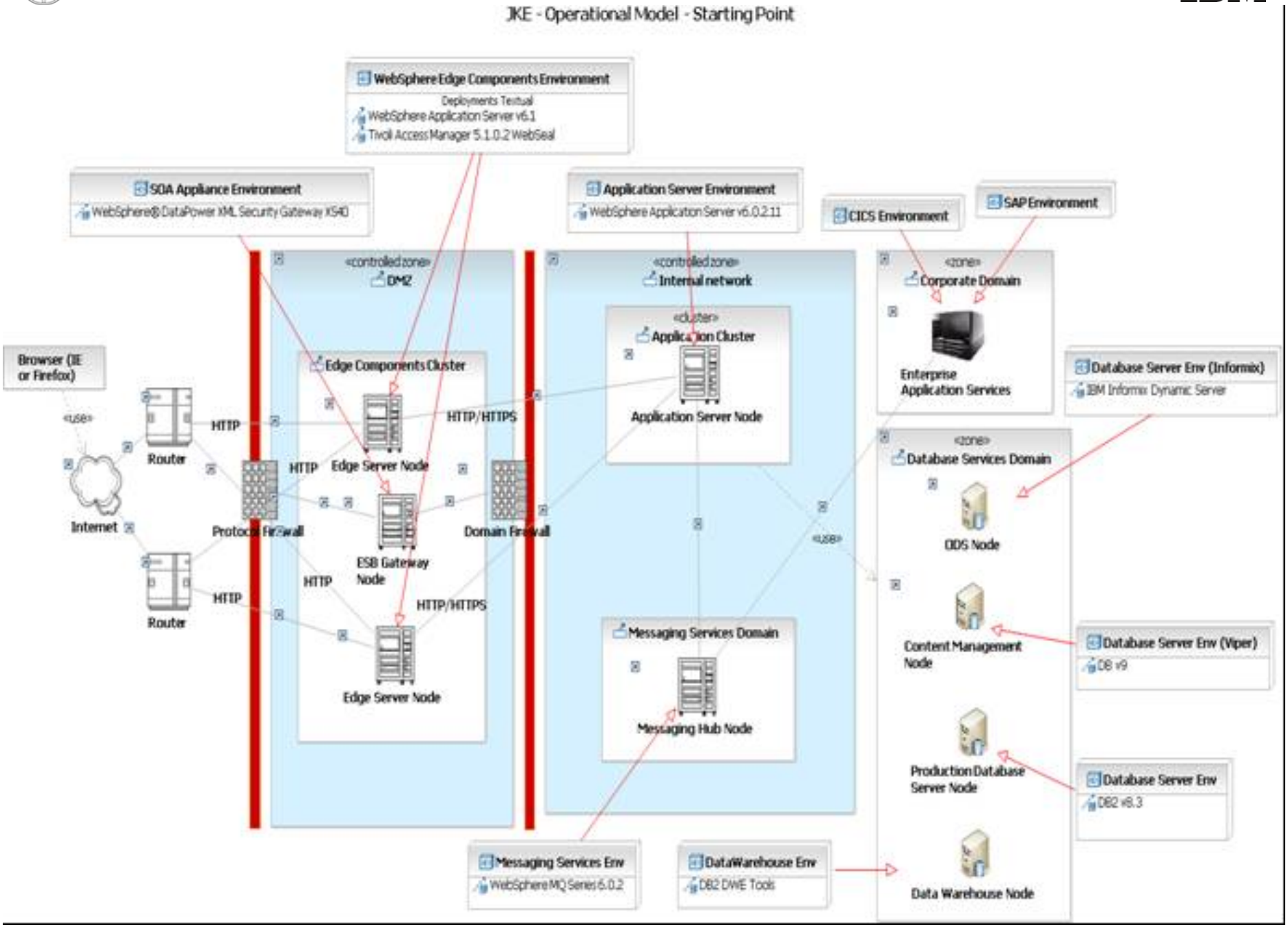


Where does the Operational Model fit?



Operational Model

- The Operational Model is the key work product created in analyzing the operational aspect of the architecture of an IT System.
- Represents how components (described in the component model) are deployed across the (geographical) structure of the IT System
- Describes how the Service Level Requirements (SLRs) are satisfied and how the system will be managed and operated
- Is usually documented as deployment units (DUs) placed on IT Nodes in locations (static relationships), and their interactions across connections (dynamic behavior)


JKE - Operational Model - Starting Point
WebSphere Edge Components Environment
Deployments Textual
WebSphere Application Server v6.1
Tivoli Access Manager 5.1.0.2 WebSeal
SOA Appliance Environment
WebSphere® DataPower XML Security Gateway XS40
Application Server Environment
WebSphere Application Server v6.0.2.11
CICS Environment
SAP Environment
«controlled zone»
DMZ
«controlled zone»
Internal network
«zone»
Corporate Domain
Enterprise Application Services
«cluster»
Application Cluster
Application Server Node
Edge Components Cluster
Edge Server Node
Edge Server Node
ESB Gateway Node
Messaging Services Domain
Messaging Hub Node
Database Server Env (Informix)
IBM Informix Dynamic Server
«zone»
Database Services Domain
CIDS Node
Content Management Node
Production Database Server Node
Data Warehouse Node
Database Server Env (Viper)
DB v9
Database Server Env
DB2 v8.3
Browser (IE or Firefox)
«use»
Internet
Router
Router
HTTP
HTTP
HTTP
HTTP
HTTP/HTTPS
HTTP/HTTPS
«use»
Messaging Services Env
WebSphere MQ Series 6.0.2
DataWarehouse Env
DB2 DWE Tools