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Version 9.1 Enterprise Edition

Module 20
Phase C
Application Architecture

THE Open GROUP

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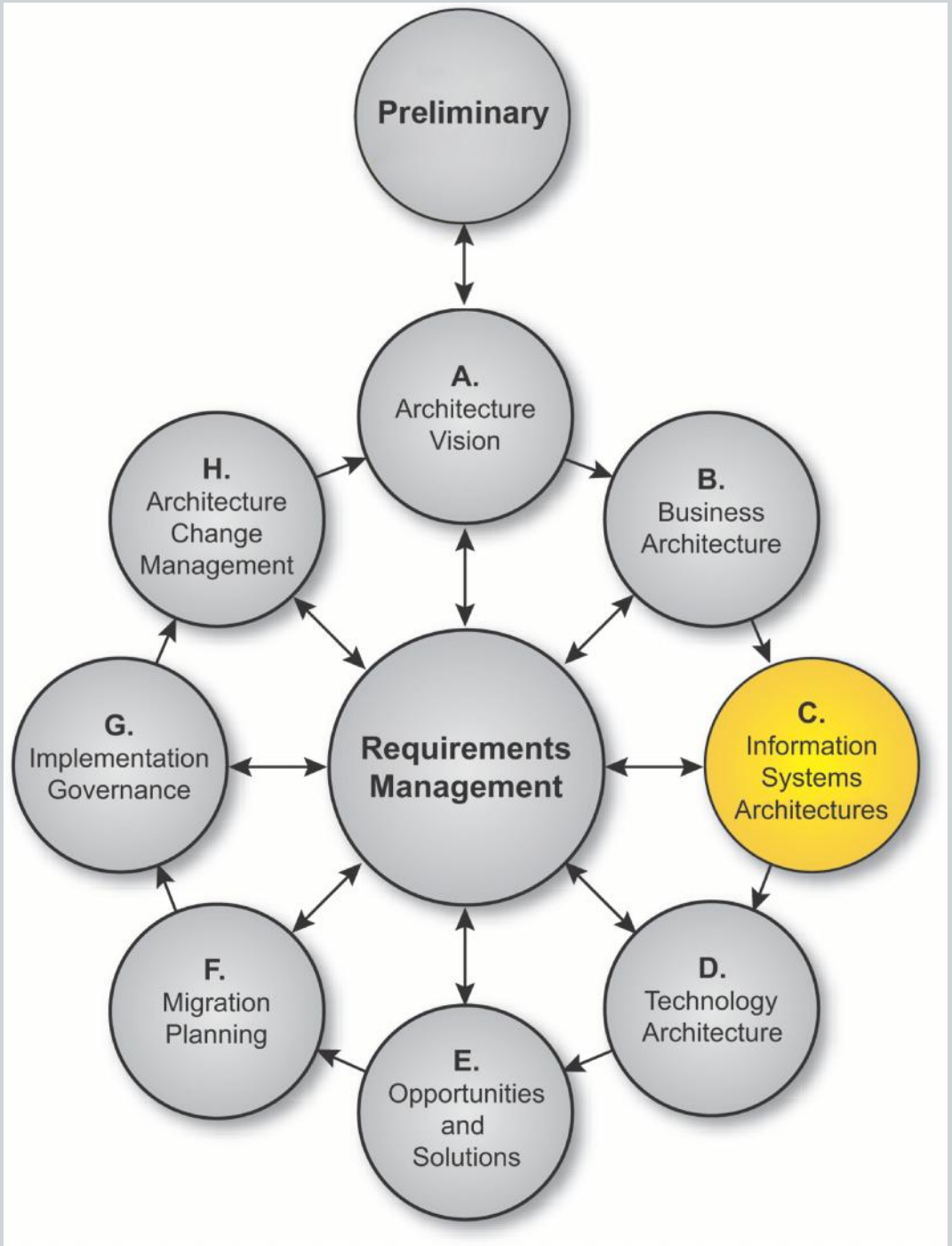
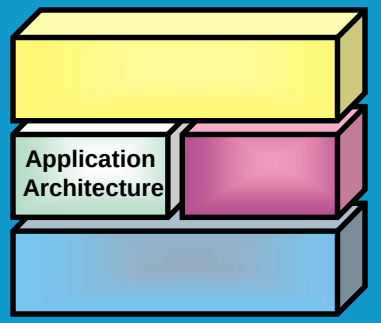


Phase C: Application Architecture



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Module Objectives

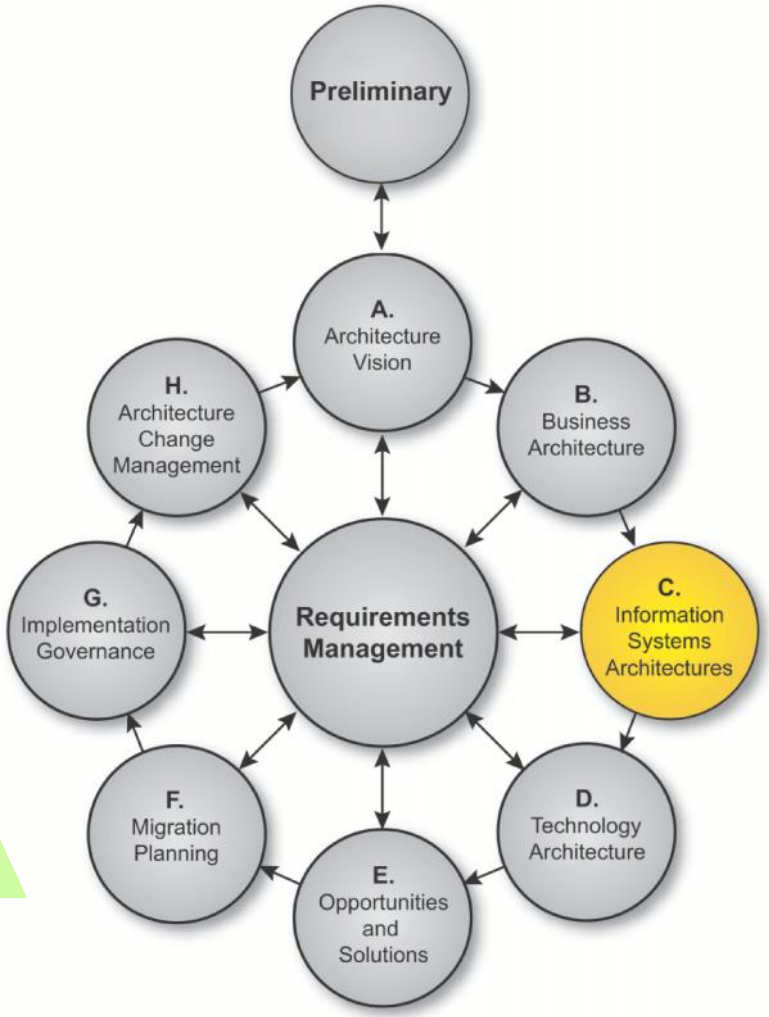
The aim of this module is to understand Phase C: Application Architecture:

- Objectives
- Inputs
- Steps
- Outputs

Objectives

- Develop the Target Application Architecture that enables the Business Architecture and the Architecture Vision, while addressing the Request for Architecture Work and stakeholder concerns
- Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Application Architectures

Phase C: Inputs: Application Architecture



- Request for Architecture Work
- Capability Assessment
- Communications Plan
- Organization model for enterprise architecture
- Tailored Architecture Framework
- Application principles
- Statement of Architecture Work

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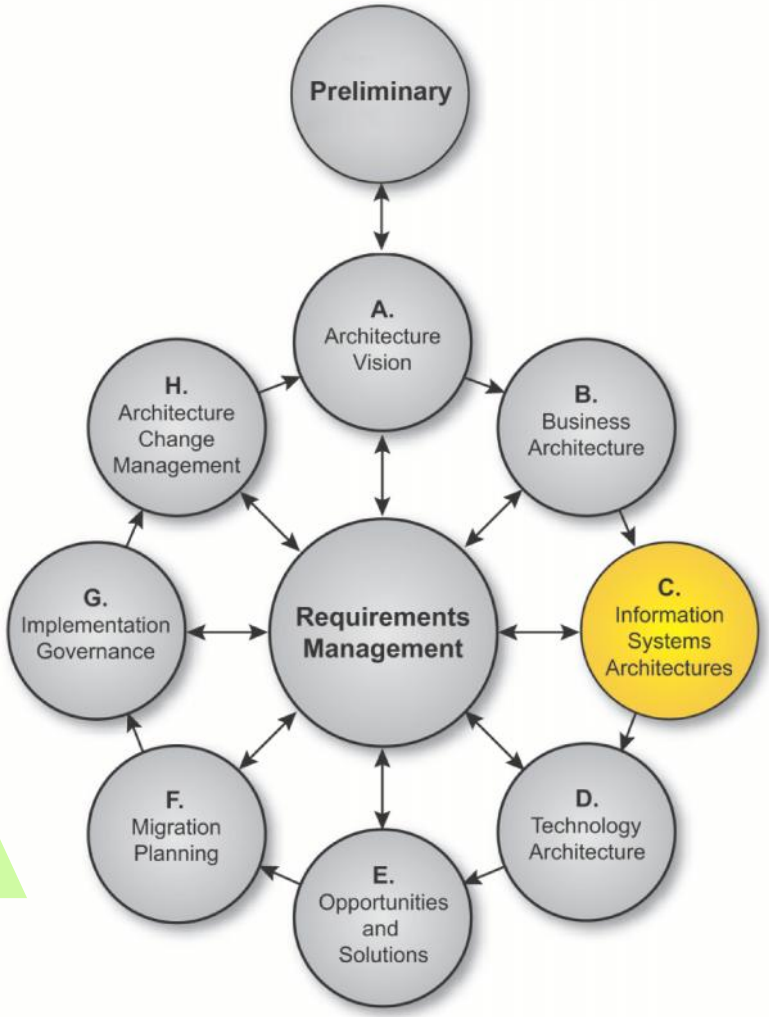
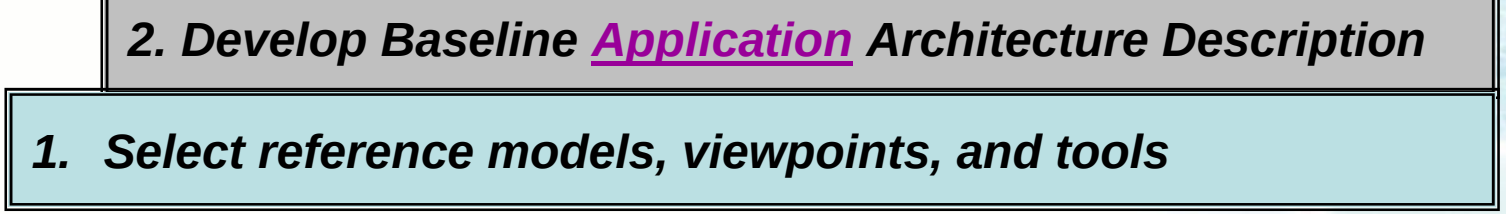
Phase C: Inputs: Application Architecture



- Architecture Vision
- Architecture Repository
- Draft Architecture Definition Document
- Draft Architecture Requirements Specification, including:
  - Gap analysis results
  - Relevant technical requirements
- Business and Data Architecture components of an Architecture Roadmap

Steps

The order of the steps should be adapted to the situation.
In particular you should determine whether it is appropriate to do the Baseline Application Architecture or Target Application Architecture development first



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Step 1: Select reference models, viewpoints, and tools

- Review/generate and validate application principles – see Architecture Principles
- Select Application Architecture resources (reference models, patterns, …)
- Select relevant Application Architecture viewpoints
- Identify appropriate tools and techniques (including forms) to be used for capture, modeling, and analysis, in association with the selected viewpoints.
- Consider using platform-independent descriptions of business logic (e.g. the OMG's MDA)

Continued…

Preliminary Phase
- Principles catalog

Phase A, Architecture Vision
- Stakeholder Map Matrix
- Solution Concept diagram
- Value Chain diagram

Requirements Management
- Requirements catalog

Phase B, Business Architecture
- Organization/Actor catalog
- Driver/Goal/Objective catalog
- Role catalog
- Business Service/Function catalog
- Location catalog
- Process/Event/Control/Product catalog
- Contract/Measure catalog
- Business Interaction matrix
- Actor/Role matrix
- Business Footprint diagram
- Business Service/Information diagram
- Functional Decomposition diagram
- Product Lifecycle diagram
- Goal/Objective/Service diagram
- Business Use-Case diagram
- Organization Decomposition diagram
- Process Flow diagram
- Event diagram

Phase C, Data Architecture
- Data Entity/Data Component catalog
- Data Entity/Business Function matrix

Note:
Module 20A provides detailed information on Phase C: Application Architecture, Catalogs, Matrices and Diagrams

Phase C, Application Architecture
- Application Portfolio catalog
- Interface catalog
- Application/Organization
- n matrix
- nction
- eraction
- n diagram
- l User
- m
- e-Case
- ageability
- ation
- Realization diagram
- Software Engineering diagram
- Application Migration diagram
- Software Distribution diagram

Phase D, Technology Architecture
- Technology Standards catalog
- Technology Portfolio catalog
- System/Technology matrix
- Environments and Locations diagram
- Platform Decomposition diagram
- Processing diagram
- Networked Computing/Hardware diagram
- Communications Engineering diagram

Phase E. Opportunities & Solutions
- Project Context diagram
- Benefits diagram

TOGAF 9 Artifacts

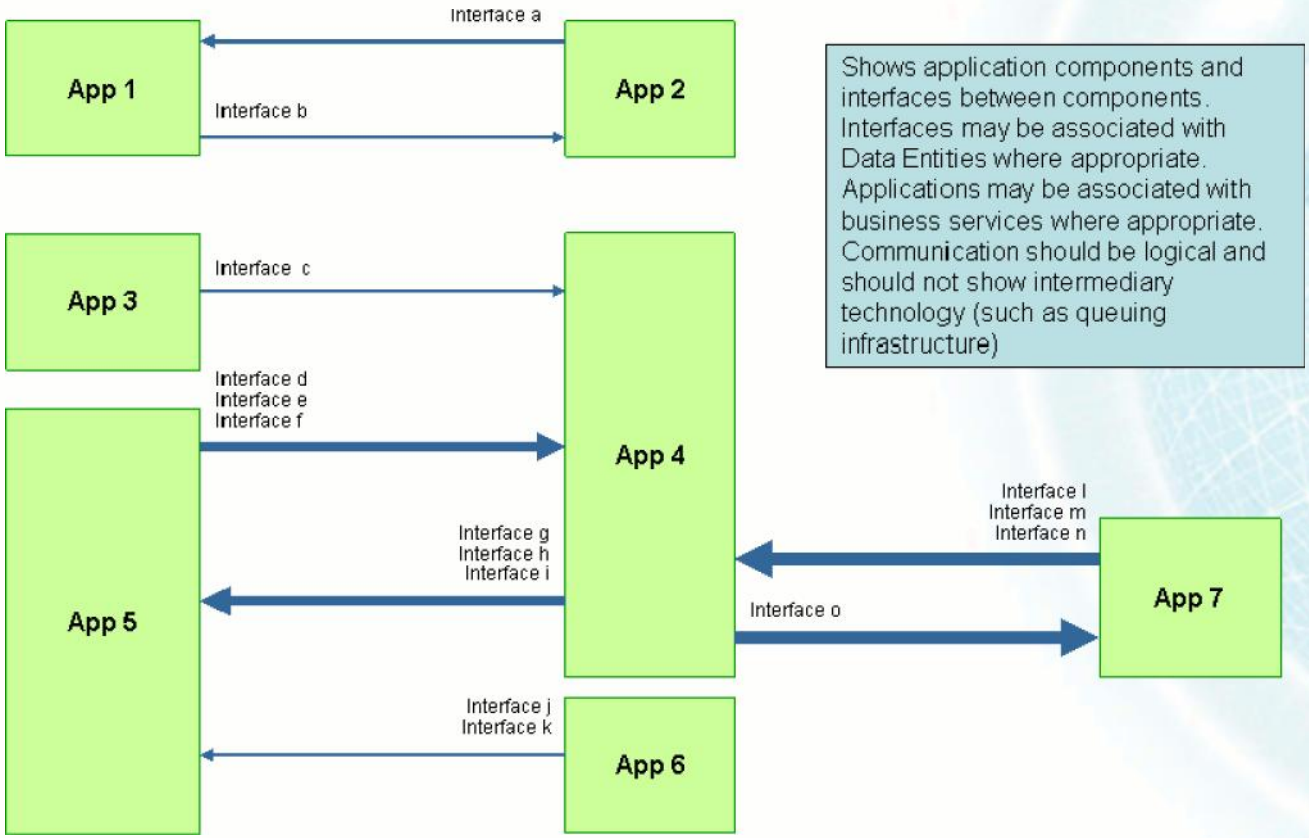
Catalogs

Catalog	Purpose
Application Portfolio Catalog	To identify and maintain a list of all the applications in the enterprise. This list helps to define the horizontal scope of change initiatives that may impact particular kinds of applications. An agreed Application Portfolio allows a standard set of applications to be defined and governed. It contains the following metamodel entities: •Information System Service •Logical Application Component •Physical Application Component
Interface Catalog	The purpose of the Interface catalog is to scope and document the interfaces between applications to enable the overall dependencies between applications to be scoped as early as possible. It contains the following metamodel entities: •Logical Application Component •Physical Application Component •Application *communicates with* application relationship

Example Application/Function Matrix

APPLICATION (Y-AXIS) AND FUNCTION (X-AXIS)	CALL CENTRE 1ST LINE	WAREHOUSE CONTROL	VACANCY FILLING	GENERAL LEDGER MAINTENANCE
SAP HR	X	X	X	X
SIEBEL	X	X		
SAP FINANCIALS	X	X		X
PROCURESOFT	X	X		

Application Communication Diagram



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Step 1: Select reference models, viewpoints, and tools

- Determine Overall Modeling Process
  - For each viewpoint, select the models needed to support the specific view required, using the selected tool or method. E.g.: The TMF has developed detailed applications models relevant to the Telecommunications industry. The OMG has some vertical Domain Task Forces developing models for specific vertical domains such as Healthcare, Transportation, Finance, etc.

  - Confirm all stakeholders' concerns are addressed. If not, create new models to address concerns not covered, or augment existing models

Continued...

Recommended Process

- Understand the list of applications or application components that are required, based on the baseline Application Portfolio, what the requirements are, and the business architecture scope
- Simplify complicated applications by decomposing them into two or more applications
- Ensure that the set of application definitions is internally consistent, by removing duplicate functionality as far as possible, and combining similar applications into one
- Identify logical applications and the most appropriate physical applications
- Develop matrices across the architecture by relating applications to business service, business function, data, process, etc.
- Elaborate a set of Application Architecture views by examining how the application will function, capturing integration, migration, development, and operational concerns

Step 1: Select reference models, viewpoints, and tools

- Identify Required Catalogs of Application Building Blocks
  - The organization's Application portfolio is captured as a catalog within the Architecture Repository..
- Identify Required Matrices
  - Matrices show the core relationships between related model entities.
- Identify Required Diagrams
  - Diagrams present the Application Architecture information from a set of different viewpoints
- Identify Types of Requirements to be Collected
  - Identify requirements to be met by the Architecture
  - Formalize the application-focused requirements
  - Provide requirements input for the Data and Technology architectures

Example – The Integrated Information Infrastructure Model

- An Applications Architecture reference model
  - a model of the application components and application services software essential for an integrated information infrastructure
- Based on the TRM
- Aimed at the helping the design of architectures to enable and support the vision of Boundaryless Information Flow

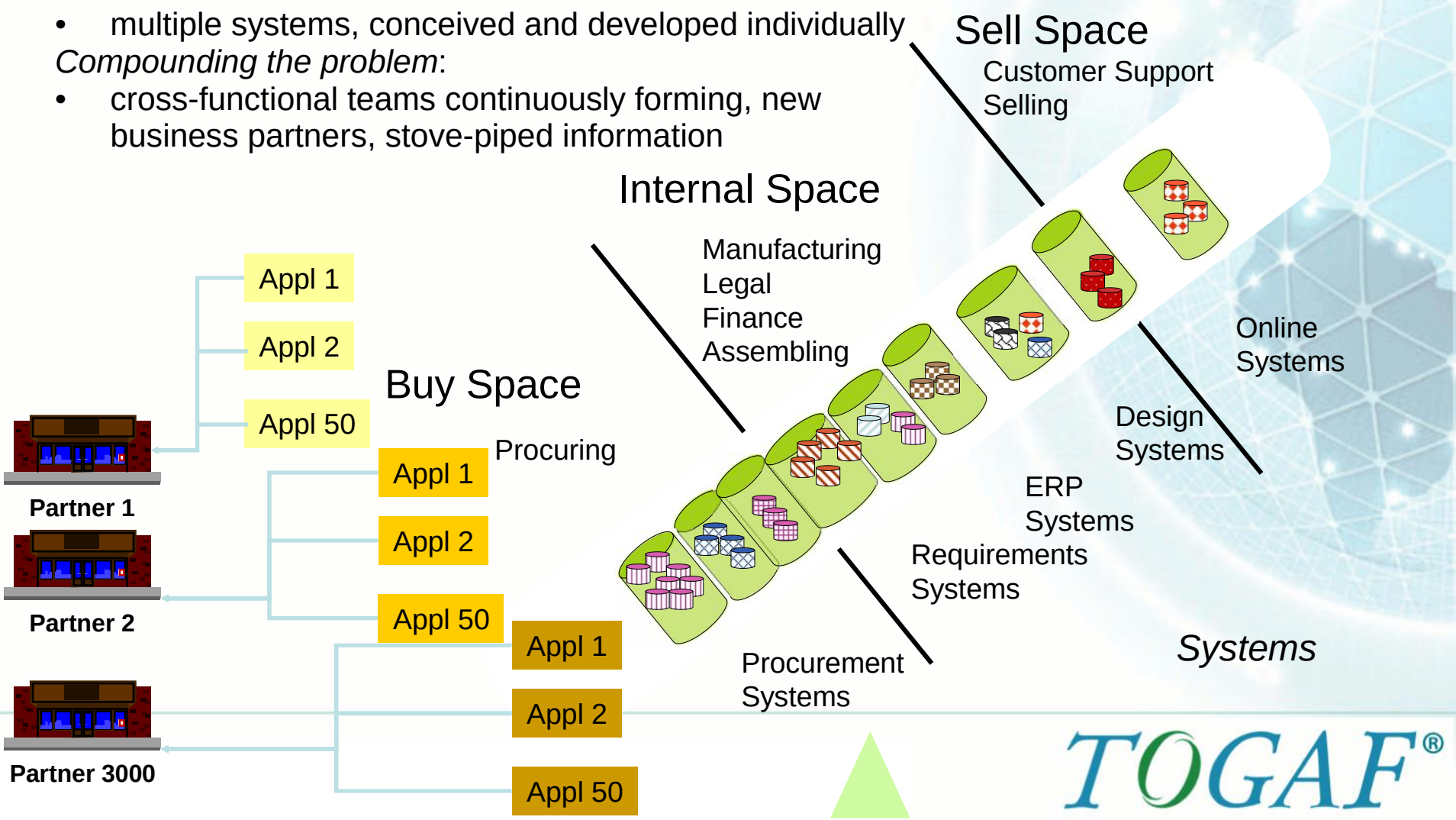
III-RM
Business and Technical Drivers

The cause:

- multiple systems, conceived and developed individually

Compounding the problem:

- cross-functional teams continuously forming, new business partners, stove-piped information



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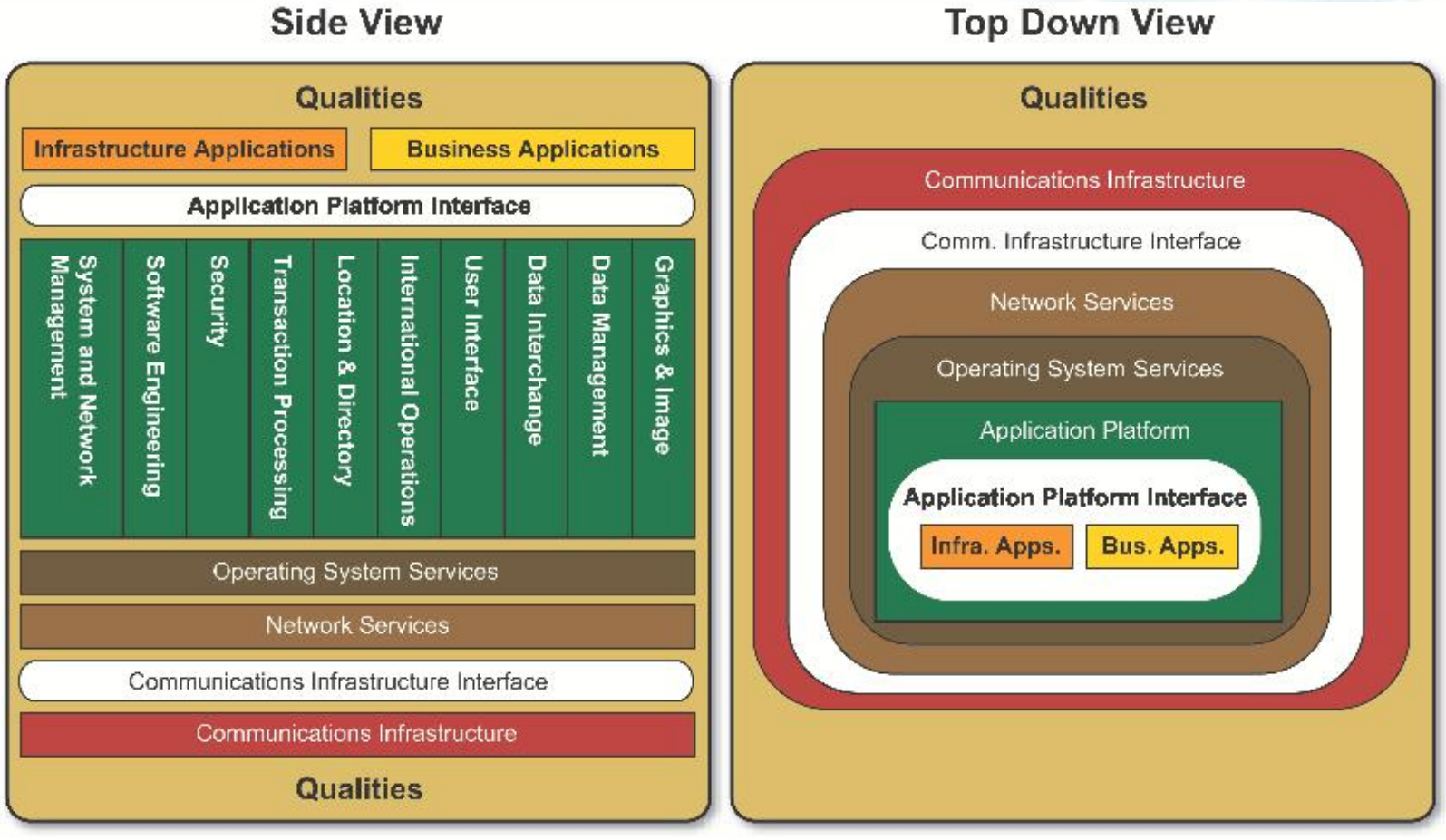
III-RM Focus



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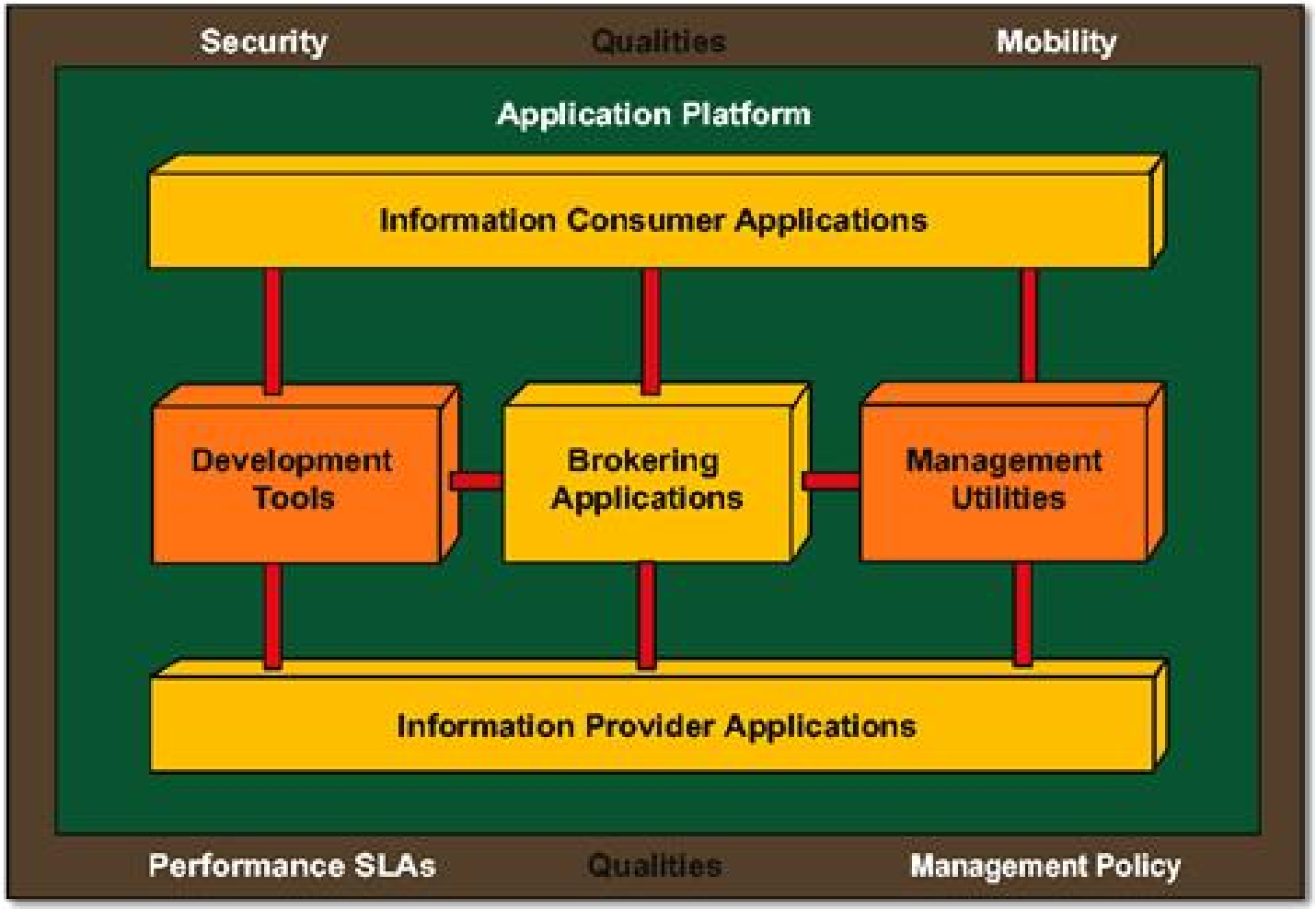
III-RM High Level View



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Step 2 Develop a Baseline Application Architecture Description

If possible, identify the relevant Application ABBs, drawing on the Architecture Repository.

- If not, define each application in line with the Application Portfolio catalog

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Step 3 Develop Target Application Architecture Description

- If possible, identify the relevant Application Architecture building blocks, drawing on the Architecture Repository
- If not, develop a new architecture model:
  - use the models identified within Step 1 as a guideline

Step 4: Perform Gap Analysis

- Verify the architecture models for internal consistency and accuracy
- Note changes to the viewpoint represented in the selected models from the Architecture Repository, and document
- Test architecture models for completeness against requirements
- Identify gaps between the baseline and target using the standard Gap Analysis Technique

Step 5: Define candidate roadmap components

- This initial Application Architecture roadmap will be used as raw material to support more detailed definition of a consolidated, cross-discipline roadmap within the Opportunities & Solutions phase.

Step 6: Resolve impacts across the Architecture Landscape

- Architecture artifacts in the Architecture Landscape should be examined to identify:
  - Does this Application Architecture create an impact on any pre-existing architectures?
  - Have recent changes been made that impact on the Application Architecture?
  - Are there any opportunities to leverage work from this Application Architecture in other areas of the organization?
  - Does this Application Architecture impact other projects ?
  - Will this Application Architecture be impacted by other projects?

Step 7 Conduct Formal Stakeholder Review

Check the original motivation for the architecture project and the Statement of Architecture Work against the proposed Application Architecture. Conduct an impact analysis to:

- Identify any areas where the Business and Data Architecture may need to change to cater for changes in the Application Architecture. If the impact is significant revisit the Business and Data Architectures.

Continued...

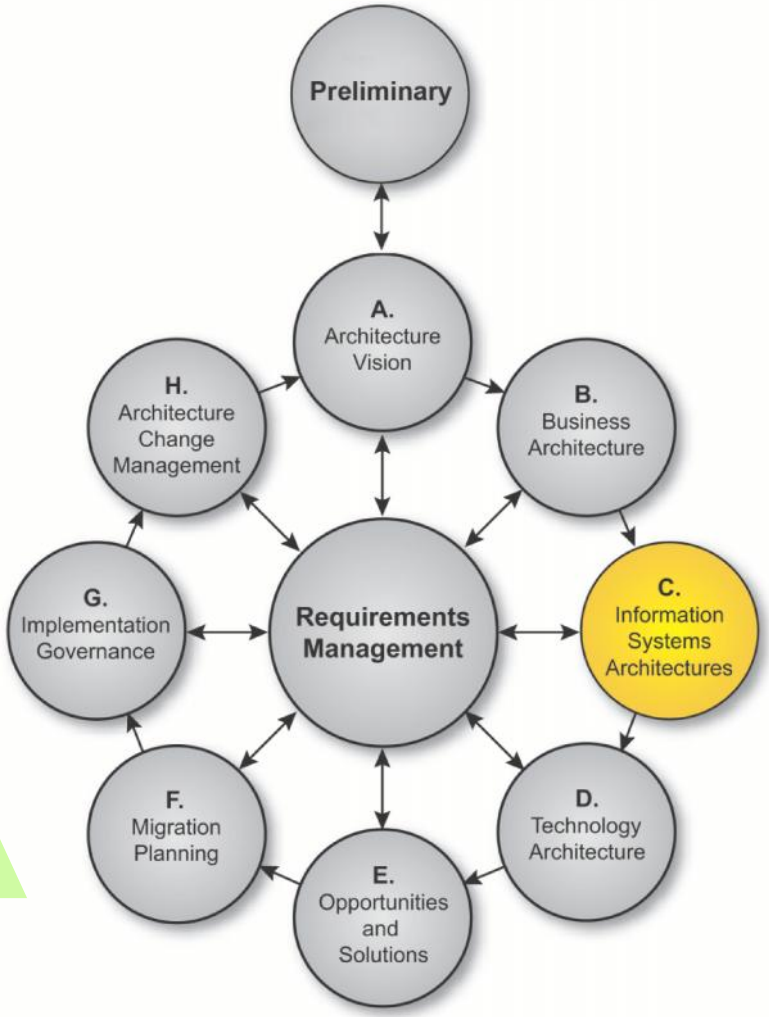
Step 8 Finalize the Application Architecture

- Select standards for each of the ABBs, reusing as much as possible.
- Fully document each ABB.
- Cross check the overall architecture against the business requirements.
- Document the final requirements traceability report.
- Document the final mapping of the architecture within the Architecture repository. Identify the ABBs that might be reused and publish them via the architecture repository.
- Finalize all the work products

Step 9: Create Architecture Definition Document

- Document the rationale for all building block decisions in the architecture definition document.
- Prepare the Application Architecture sections of the architecture definition document report.
- If appropriate, use reports and/or graphics generated by modeling tools to demonstrate key views of the architecture. Route the document for review by relevant stakeholders, and incorporate feedback.

Phase C: Outputs: Application Architecture



- Statement of Architecture Work
- Validated application principles, or new application principles
- Draft Architecture Definition Document
- Draft Architecture Requirements Specification
- Application Architecture components of an Architecture Roadmap

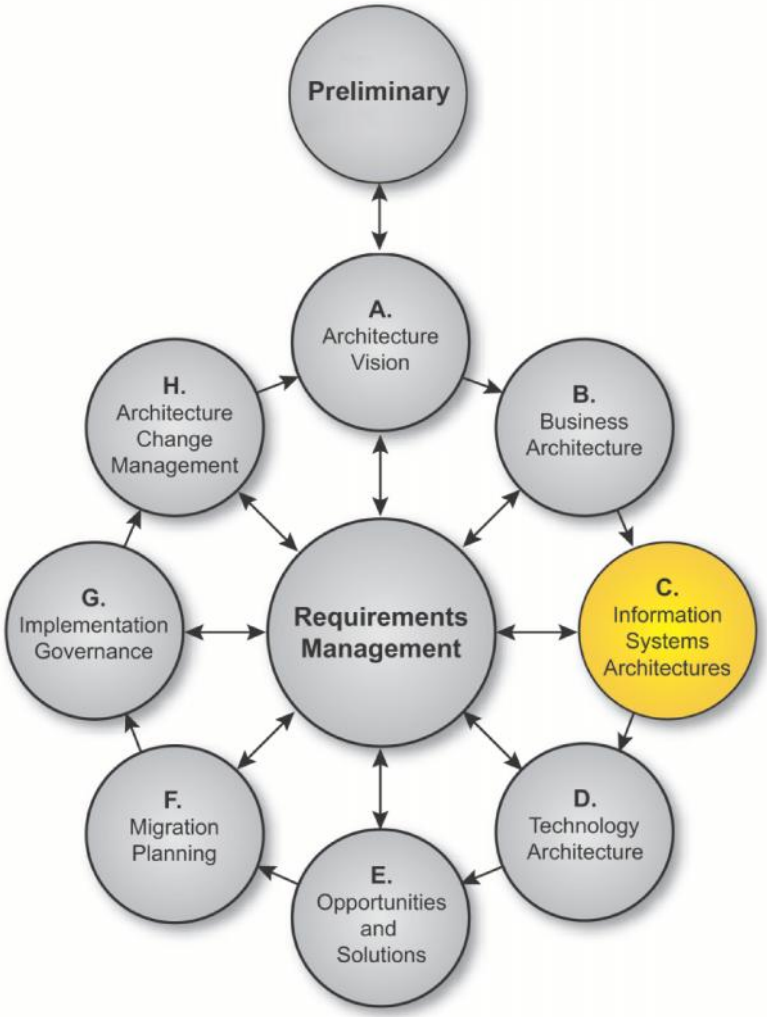
Architecture Definition Document – Application Architecture Components

- Baseline Application Architecture, if appropriate
- Target Application Architecture, including:
  - Process systems model
  - Place systems model
  - Time systems model
  - People systems model
- Application Architecture views corresponding to the selected viewpoints addressing key stakeholder concerns

Architecture Requirements Specification – Application Architecture Components

- Gap analysis results
- Application interoperability requirements
- Areas where the Business Architecture may need to change in order to comply with changes in the Application Architecture
- Constraints on the Technology Architecture about to be designed
- Updated business/application/data requirements, if appropriate

Summary



- This phase defines the *kinds* of applications necessary to process the data and support the business.
- The goal is to define what kinds of applications are relevant and what those applications need to do.

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Summary

Phase C: Information Systems Architectures – Application Architecture			
Objectives	**Steps**	**Inputs**	**Outputs**
Develop the Target Application Architecture that enables the Business Architecture and the Architecture Vision, while addressing the Request for Architecture Work and stakeholder concerns Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Application Architectures	Select reference models, viewpoints, and tools Develop Baseline Application Architecture Description Develop Target Application Architecture Description Perform gap analysis Define candidate roadmap components Resolve impacts across the Architecture Landscape Conduct formal stakeholder review Finalize the Application Architecture Create Architecture Definition Document	Request for Architecture Work Capability Assessment Communications Plan Organizational Model for Enterprise Architecture Tailored Architecture Framework Application principles Statement of Architecture Work Architecture Vision Architecture Repository Draft Architecture Definition Document containing: •* Baseline Business Architecture (detailed) •* Target Business Architecture (detailed) •* Baseline Data Architecture (detailed or high-level) •* Target Data Architecture (detailed or high-level) •* Baseline Application Architecture (high-level) •* Target Application Architecture (high-level) •* Baseline Technology Architecture (high-level) •* Target Technology Architecture (high-level) Draft Architecture Requirements Specification including: •* Gap analysis results •* Relevant technical requirements * Business and Data Architecture components of an Architecture Roadmap	Statement of Architecture Work, updated if necessary Validated application principles, or new application principles Draft Architecture Definition Document containing content updates: •* Baseline Application Architecture •* Target Application Architecture •* Application Architecture views corresponding to the selected viewpoints, addressing key stakeholder concerns Draft Architecture Requirements Specification including content updates: •* Gap analysis results •* Application interoperability requirements •* Relevant technical requirements that will apply to this evolution of the architecture development cycle •* Constraints on the Technology Architecture •* Updated business requirements •* Updated data requirements * Application Architecture components of an Architecture Roadmap

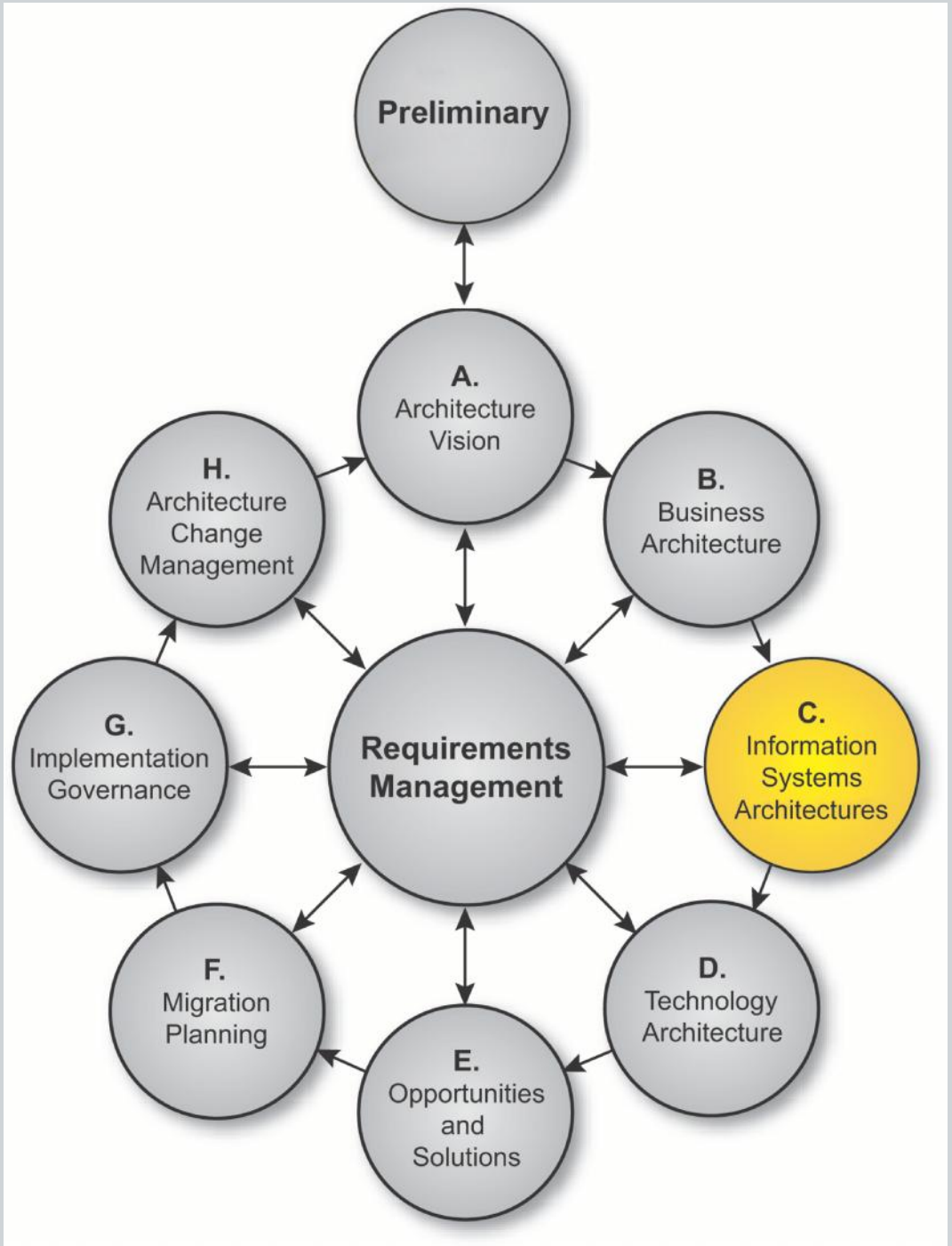
Test Yourself Question

Q1. How should the applications best be described?

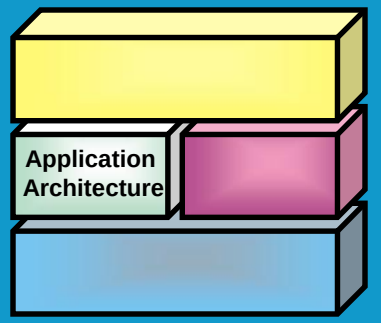
A. As computer systems
B. As logical groups of capabilities
C. As schemas
D. As data-flow diagrams
E. As UML diagrams

Exercise

- Identify five sources of information within your organization that could be used to draw up a Baseline Application Architecture Description.



Phase C: Application Architecture



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