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Version 9.1 Enterprise Edition

Module 18
Phase C
Data Architecture

THE Open GROUP

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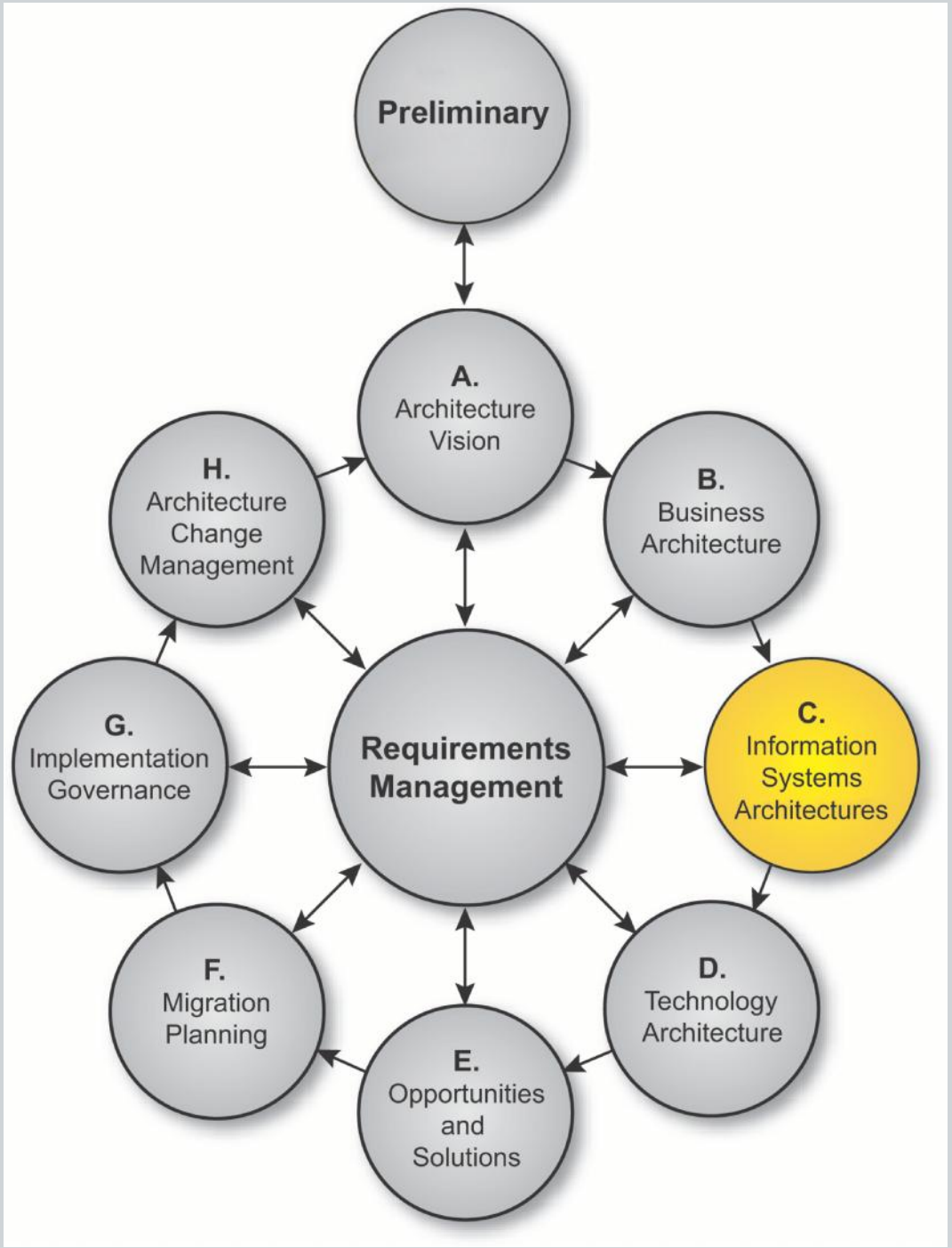
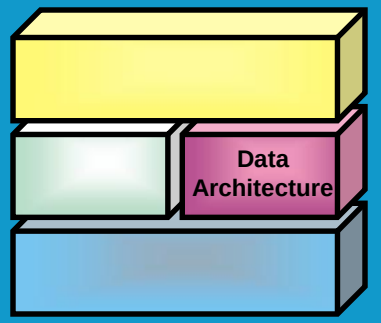


Phase C: Data Architecture



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Module Objectives

The aim of this module is to understand:

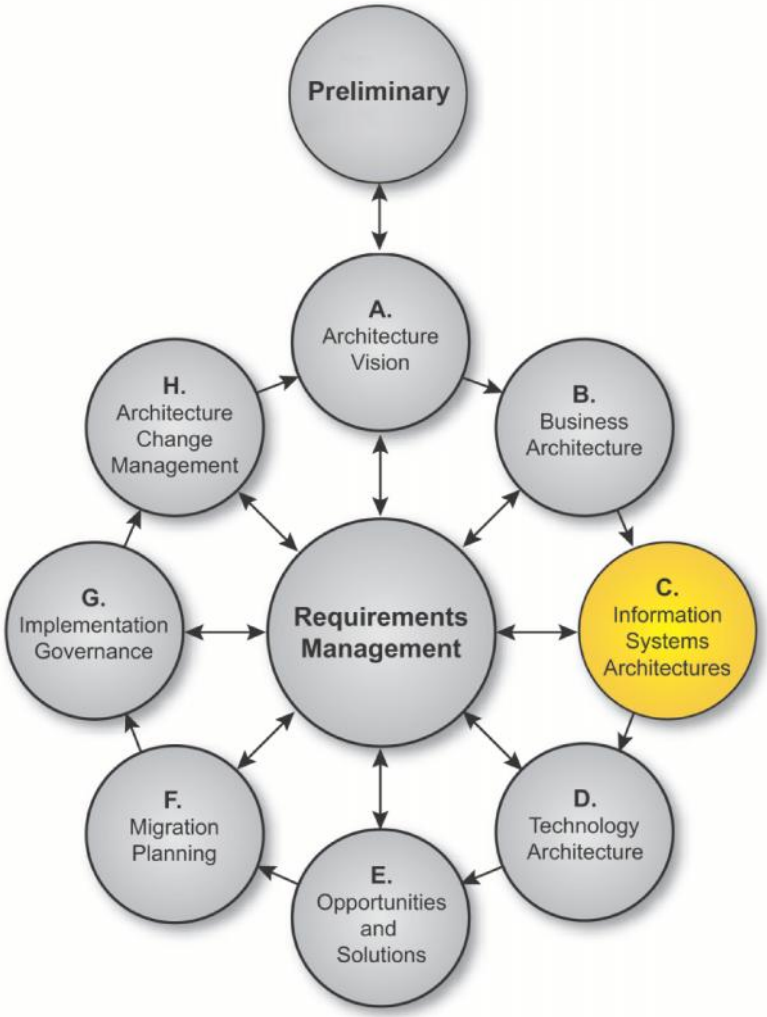
- The objectives of the Data Architecture part of Phase C
- What it consists of
- What inputs are needed for it
- What the outputs are

Data Architecture – Objectives

Develop the Target Data 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 Data Architectures

Phase C: Inputs



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

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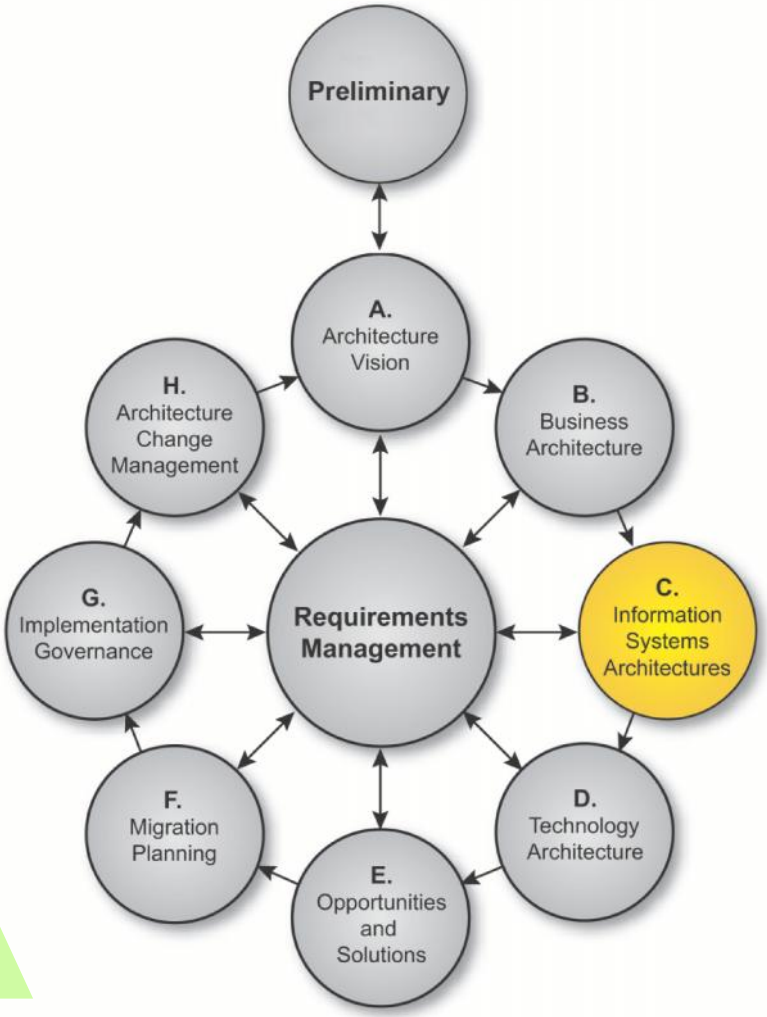
Phase C: Inputs



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

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Step 1: Select reference models, viewpoints, and tools

- Review/generate and validate data principles – see Architecture Principles
- Select Data Architecture resources (reference models, patterns, …)
- Select relevant Data Architecture viewpoints
- Identify appropriate tools and techniques (including forms) to be used for data capture, modeling, and analysis, in association with the selected viewpoints.
- Examples of data modeling techniques are:
  - Entity-relationship diagram
  - Class diagrams

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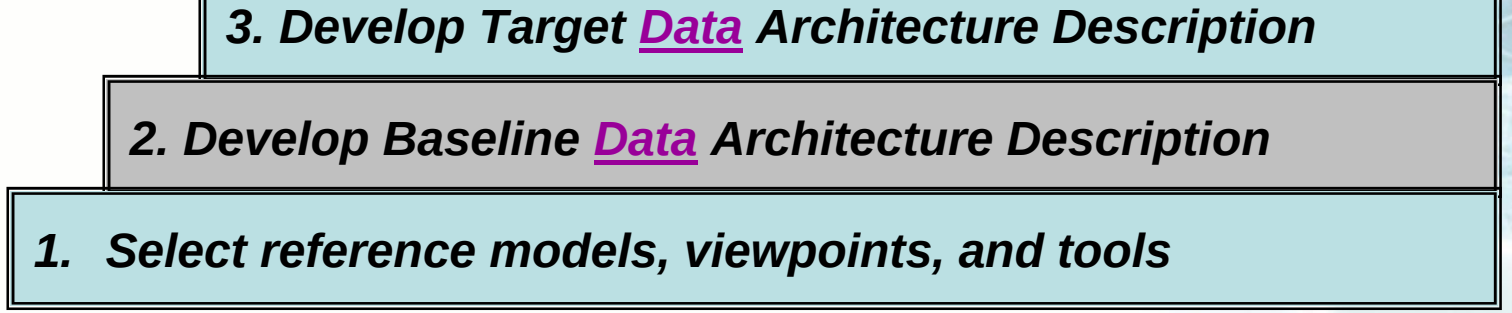
Steps

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



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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

Phase C, Application Architecture
- Application Portfolio catalog
- Interface catalog
- Application/Organization
- 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

Note:
Module 18A provides detailed information on Phase C: Data Architecture, Catalogs, Matrices and Diagrams

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

TOGAF 9 Artifacts

Catalogs

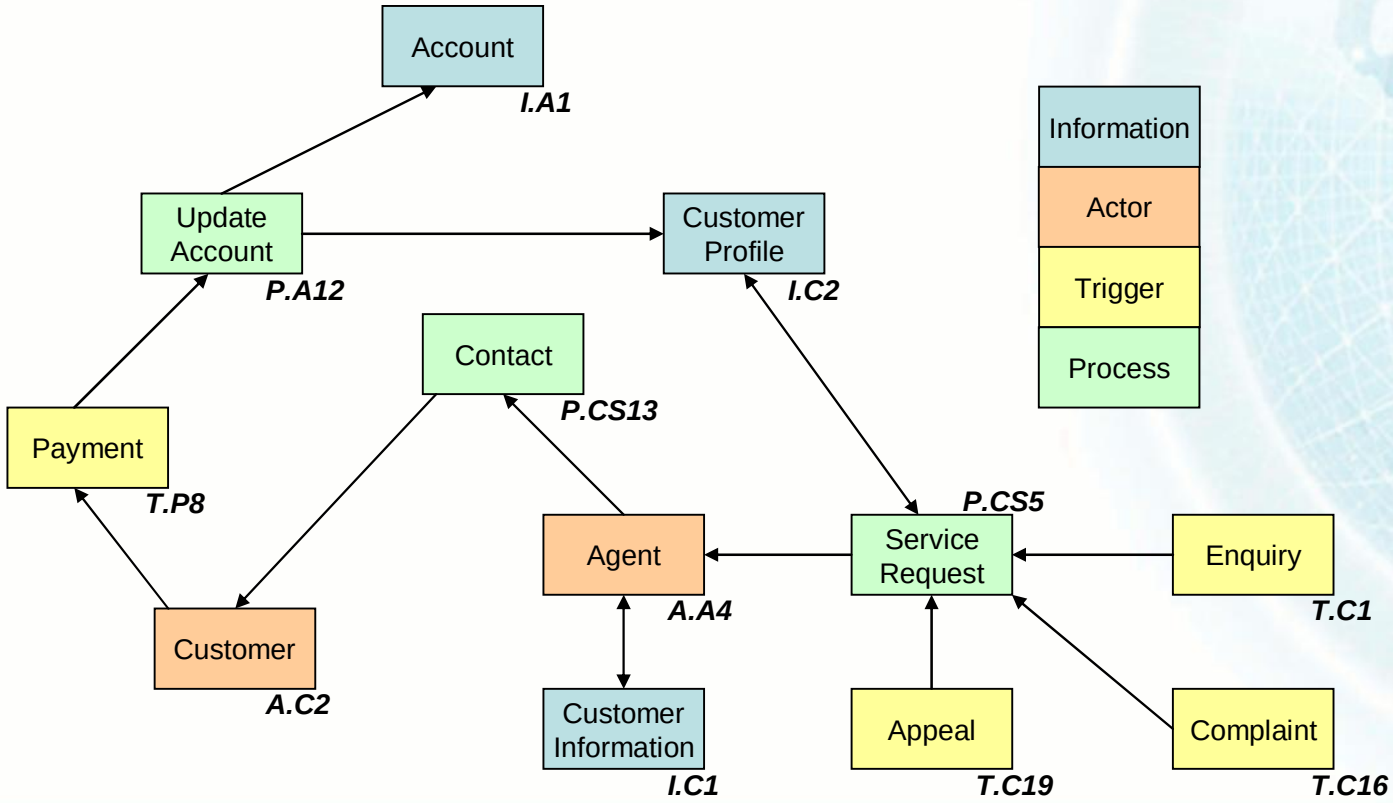
Catalog	Purpose
•Data Entity/Data Component Catalog	To identify and maintain a list of all the data use across the enterprise, including data entities and also the data components where data entities are stored. It contains the following metamodel entities: •Data Entity •Logical Data Component •Physical Data Component

Example Data Entity/Business Function Matrix

BUSINESS FUNCTION (Y-AXIS) / DATA ENTITY (X-AXIS)	CUSTOMER MASTER	BUSINESS PARTNER	CUSTOMER LEADS	PRODUCT MASTER
Customer Relationship Management	▪ Business partner data management service ▪ Owner – Sales & Marketing business unit executive ▪ Function can Create, read, update and delete customer master data	▪ Business partner data management service ▪ Owner of data entity (person or organization) ▪ Function can Create, read, update and delete	▪ Lead Processing Service ▪ Owner – Customer Relationship Manager ▪ Function can only Create, read, update customer leads	▪ N/A
Supply Chain Management	▪ Customer Requirement Processing Service ▪ Owner – Supply Chain Manager	▪ N/A	▪ N/A	▪ Product data management service ▪ Owner – Global product development organization

Conceptual Data Diagram

- The purpose is to depict the relationships among the critical data entities (or classes) within the enterprise.



Step 1: Select reference models, viewpoints, and tools

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- Examples of data modeling techniques are:
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Continued…

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. Examples of logical data models include:
    - the DODAF Logical Data Model
    - the ARTS Data Model for the Retail Industry and
    - the Energistics Data Model for the Petrotechnical industry
  - Confirm all stakeholders' concerns are addressed. If not, create new models to address concerns not covered, or augment existing models

- Identify Required Catalogs of Data Building Blocks
  - The organization's data inventory is captured as a catalog within the Architecture Repository..

Continued...

Step 1: Select reference models, viewpoints, and tools

- Identify Required Matrices
  - Matrices show the core relationships between related model entities.
- Identify Required Diagrams
  - Diagrams present the Data 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 data-focused requirements
  - Provide requirements input for the Application and Technology architectures

Step 2 Develop a Baseline Data Architecture Description

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

- If not, develop new architecture models:
  - use the models identified within Step 1 as a guideline

Continued...

Step 3 Develop Target Data Architecture Description

- If possible, identify the relevant Data 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 Data 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 Data Architecture create an impact on any pre-existing architectures?
  - Have recent changes been made that impact on the Data Architecture?
  - Are there any opportunities to leverage work from this Data Architecture in other areas of the organization?
  - Does this Data Architecture impact other projects ?
  - Will this Data 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 Data Architecture. Conduct an impact analysis to:

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

Continued...

Step 7 Conduct Formal Stakeholder Review

- Identify any areas where the Application Architecture may need to change to cater for changes in the Data Architecture (or to identify constraints on the Application Architecture about to be designed). If the impact is significant revisit the Application Architecture.
- Identify any constraints on the Technology Architecture.
- Refine the proposed Data Architecture if necessary.

Step 8: Finalize the Data 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

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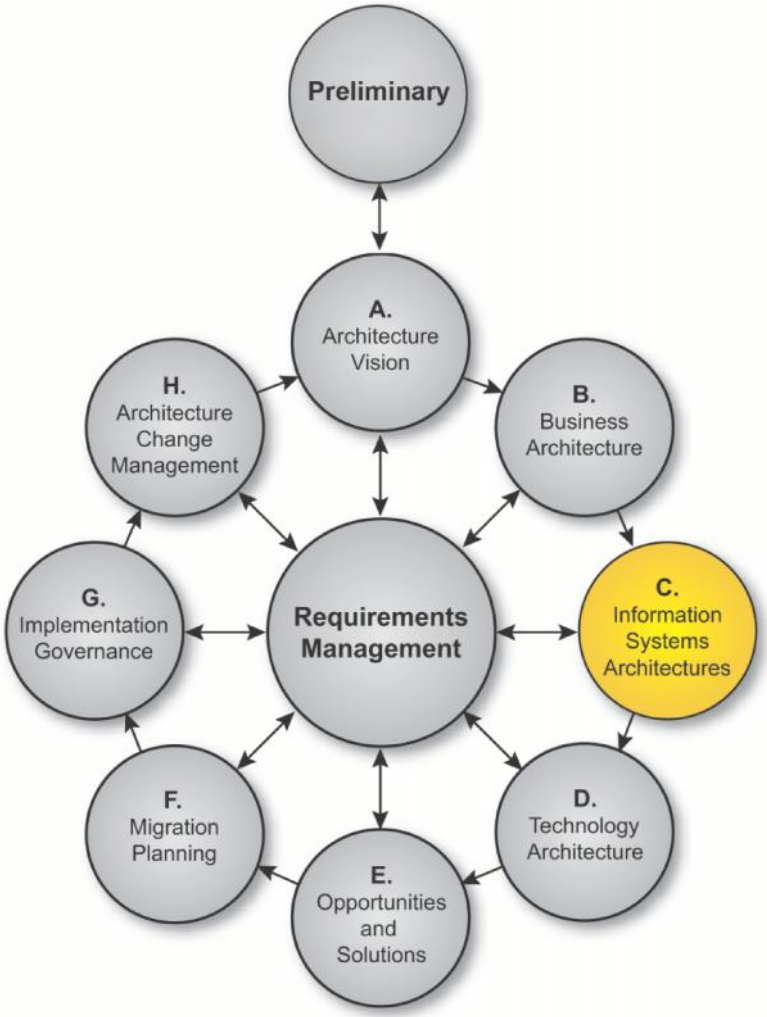
Step 9: Create Architecture Definition Document

- Document the rationale for all building block decisions in the architecture definition document.
- Prepare the Data 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: Data Architecture



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

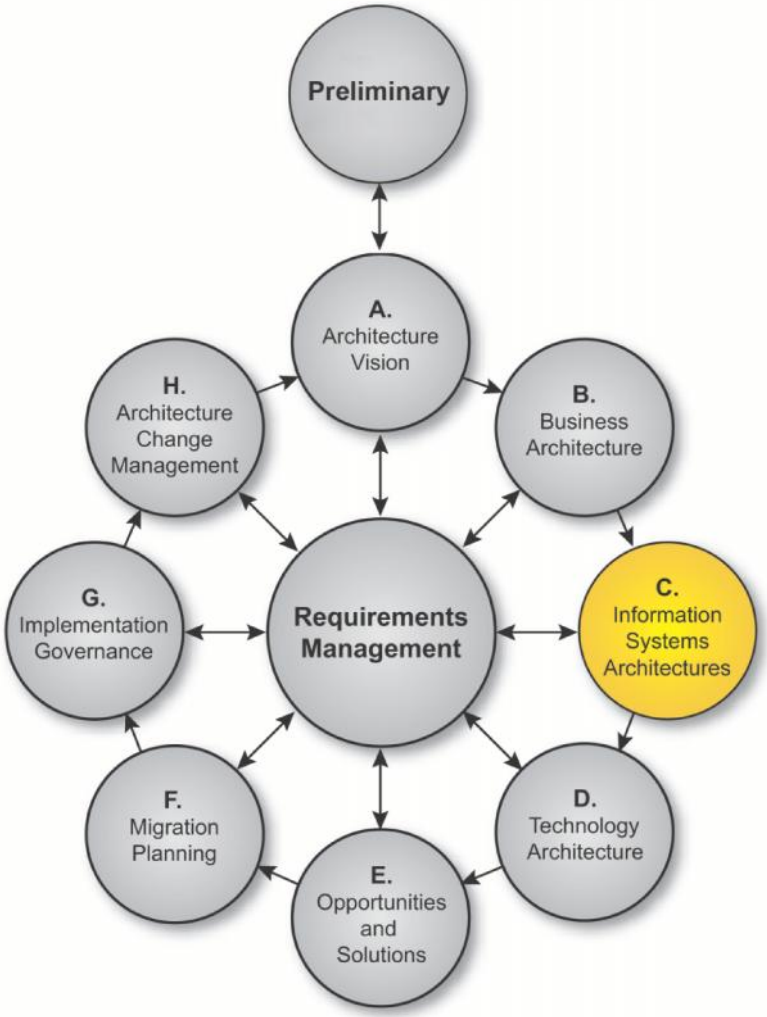
Architecture Definition Document – Data Architecture Components

- Baseline Data Architecture, if appropriate
- Target Data Architecture, including:
  - Business data model
  - Logical data model
  - Data management process models
  - Data Entity/Business Function matrix
- Data Architecture views corresponding to the selected viewpoints addressing key stakeholder concerns

Architecture Requirements Specification – Data Architecture Components

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

Summary



- The Data Architecture phase defines the types and sources of data needed to support the business, in a way that can be understood by stakeholders.
- The architecture team should consider existing relevant data models, such as the ARTS and Energistics models.

Summary

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

Test Yourself Question

Q. Which of the following is/are logical data model(s) which can be used during Data Architecture?

A. DODAF

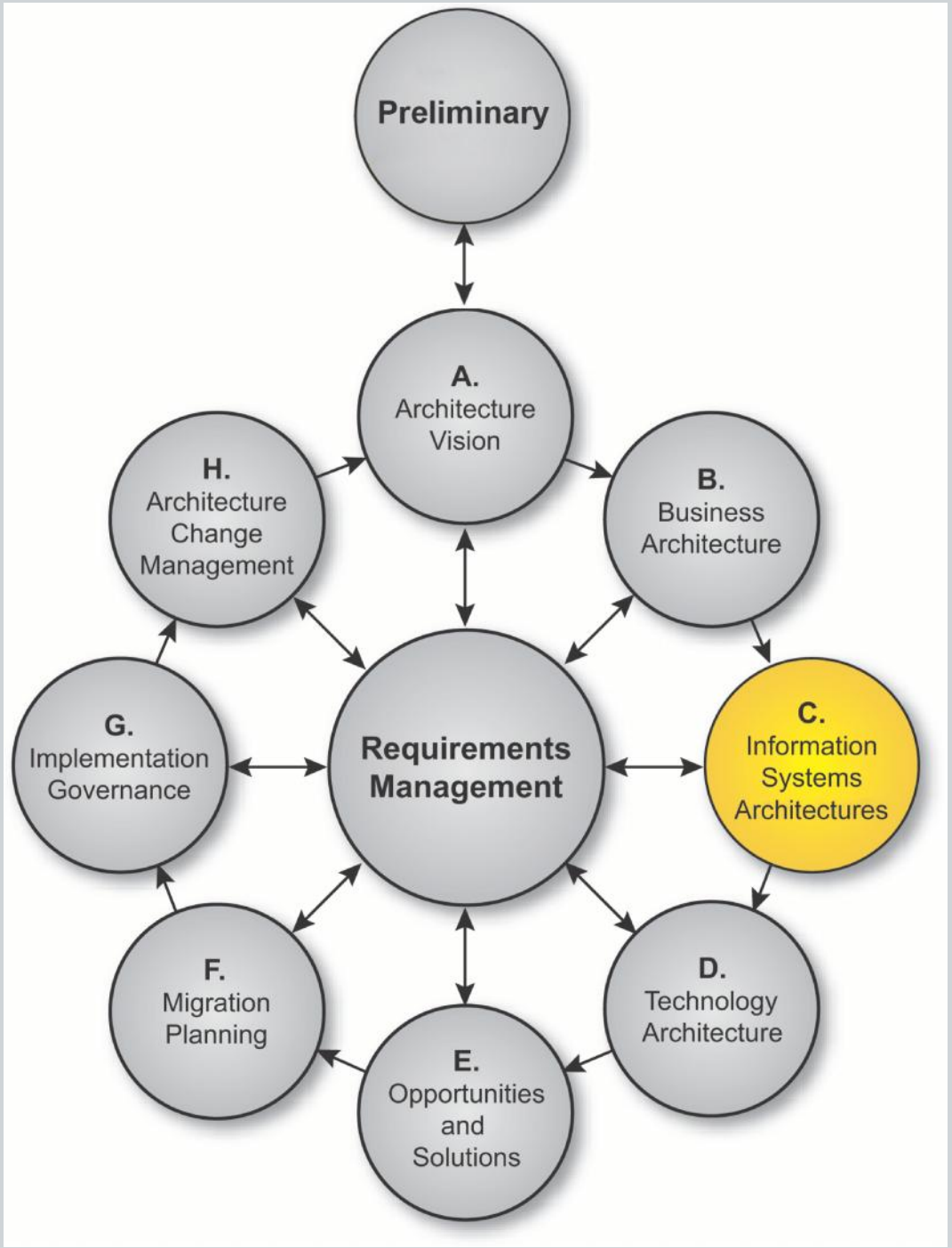
B. ARTS

C. Energistics Data Model for the Petrotechnical industry

D. Zachman

Exercise

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



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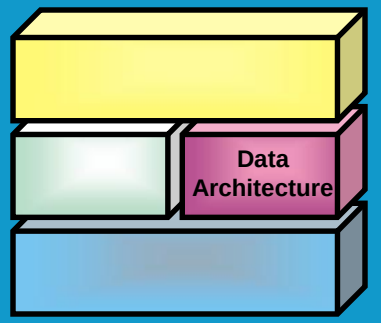

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