TOGAF

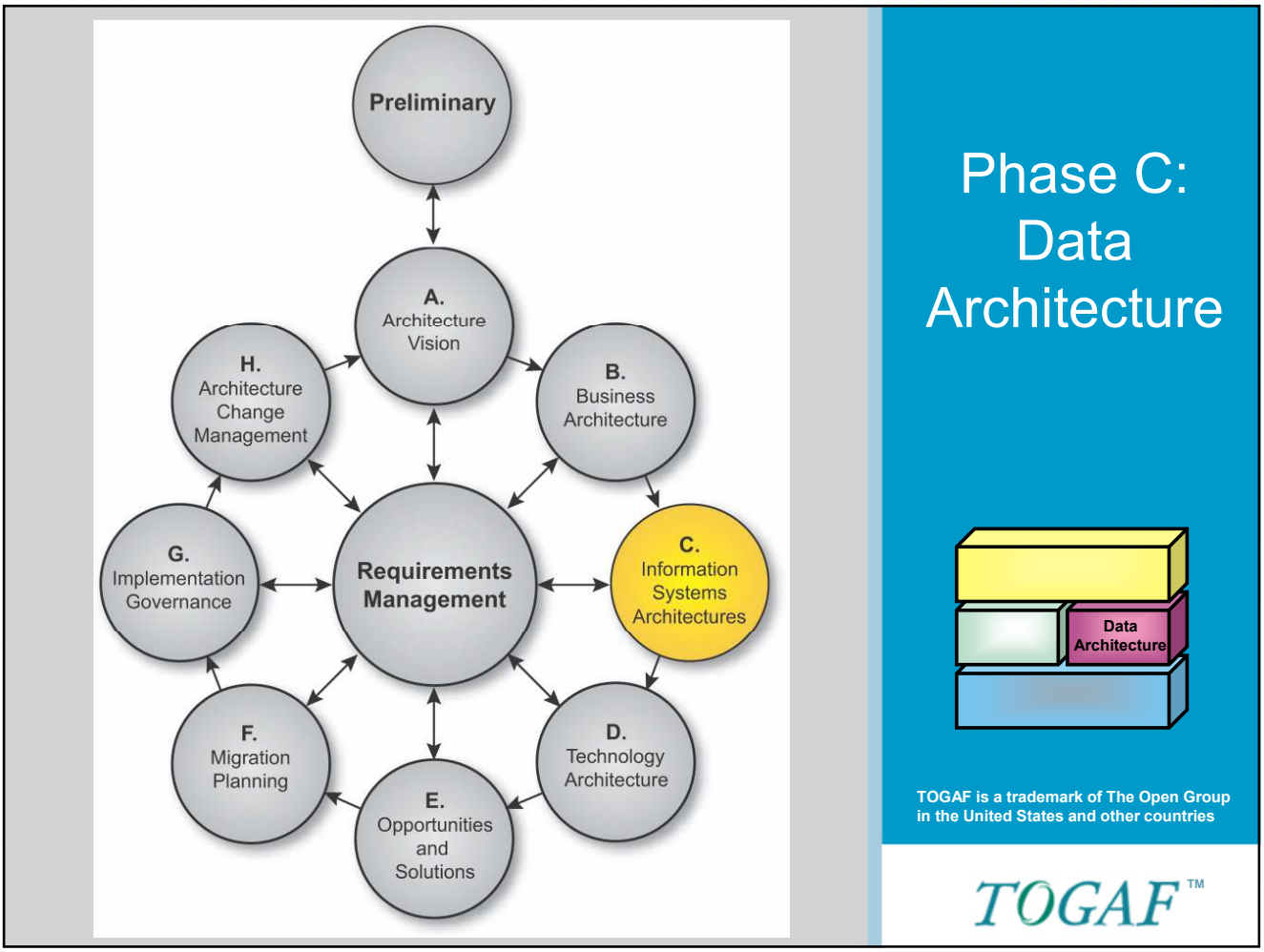
Version 9 Enterprise Edition

Module 18
Phase C
Data Architecture

THE Open GROUP

Making standards work™

Published by The Open Group, January 2009



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

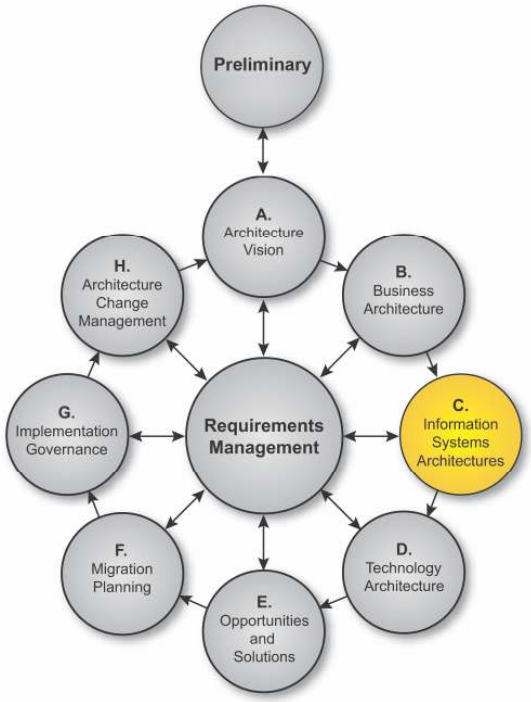
Data Architecture – Objectives

The objective of the Data Architecture work is to define the types and sources of data needed to support the business, in a way that can be understood by stakeholders.
The output should be complete, consistent and stable.

NOT to:
- design a database
- design logical or physical storage systems

But links to legacy files and databases may be developed.

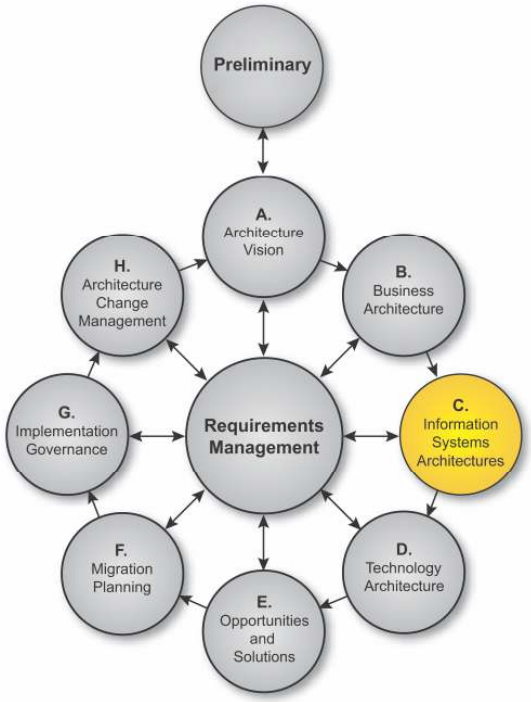
Phase C: Inputs



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

Continued…

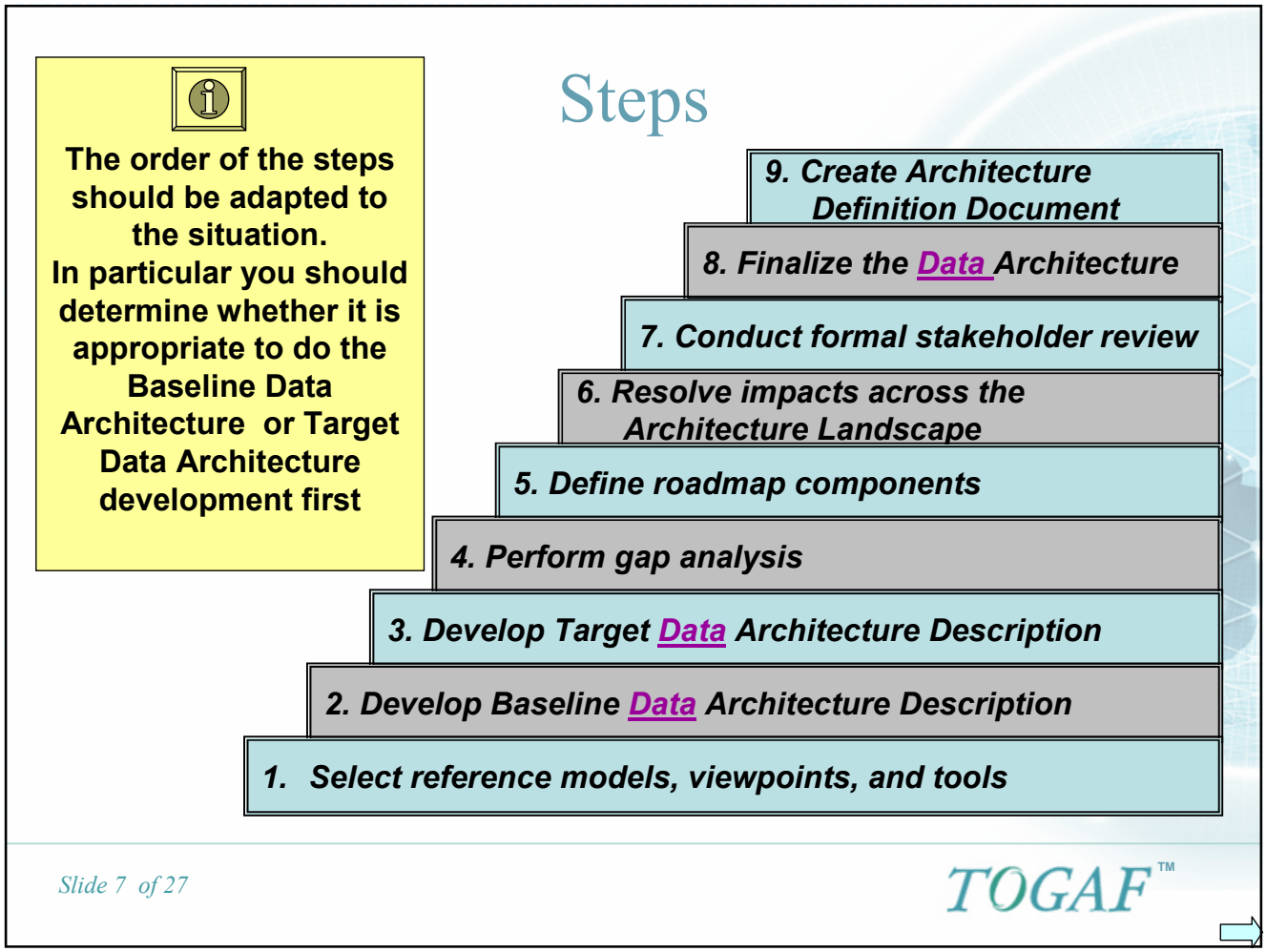
Phase C: Inputs



- 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

Slide 6 of 27

TOGAF™



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
  - Object role modeling
- ctd.

TOGAF 9 Viewpoints

Preliminary Phase

- Principles catalog

Phase A, Architecture Vision

- Stakeholder Map matrix
- Value Chain diagram
- Solution Concept diagram

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
- Functional Decomposition diag
- Product Lifecycle diagram
- Goal/Objective/Service diagra
- Use-Case diagram
- Organization Decomposition d
- Process Flow diagram
- Event diagram

Phase C, Data Architecture

- Data Entity/Data Component catalog
- Data Entity/Business

diagram

- Benefits diagram

Phase C, Application Architecture

- Application Portfolio catalog
- Interface catalog
- System/Organization matrix
- Role/System matrix

Function matrix
on Interaction matrix
on Communication

on and User Location

Use-Case diagram
e Manageability

System Realization

Engineering diagram
on Migration diagram
Distribution diagram

Management
nents catalog

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 12A provides detailed information on Phase C Data Architecture – Catalogs, Matrices and Diagrams

TOGAF™

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.

• ctd.

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
  - e.g. Functional requirements, Non-functional requirements, Assumptions, Constraints, Domain-specific Business Architecture principles, Policies, Standards, Guidelines, Specifications

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:

- Create the gap matrix
- Identify building blocks to be carried over, classifying them as either changed or unchanged.
- Identify eliminated building blocks.
- Identify new building blocks.
- Identify gaps and classify as those that should be developed and those that should be procured.

Step 5: Define 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

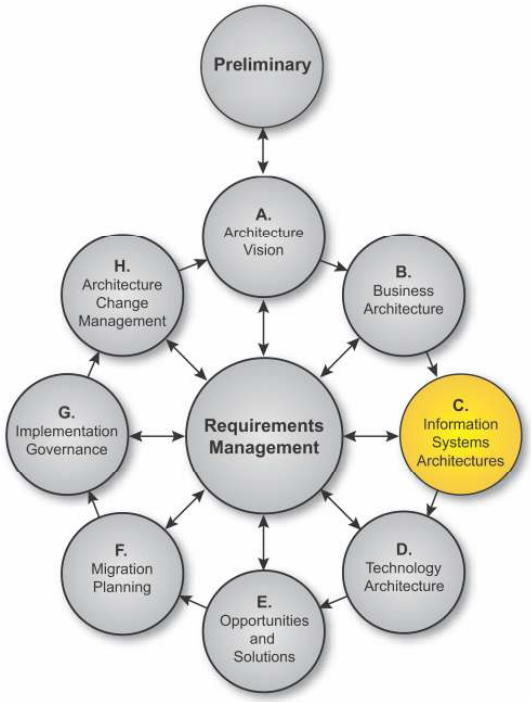
- Select standards for each of the ABBs, reusing as much as possible.
- Fully document each ABB.
- Cross check the overall architecture against the business requirements.
- Document the final requirements traceability report.
- Document the final mapping of the architecture within the Architecture repository.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

Continued…

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

TOGAF™

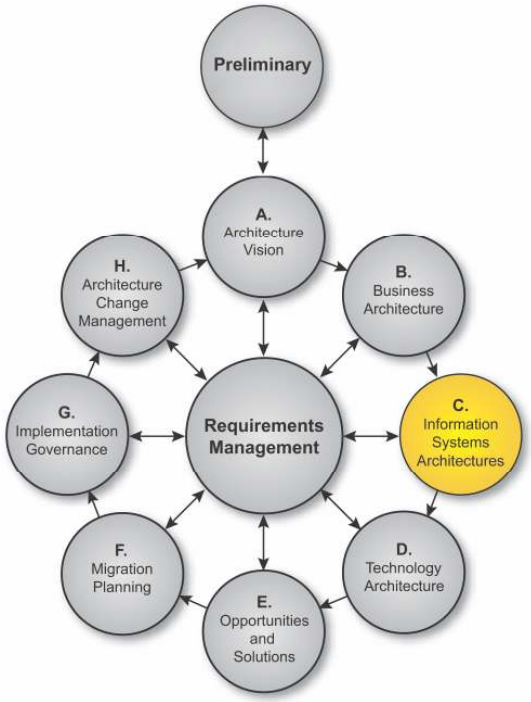
Architecture Definition Document – Data Architecture Components

- 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.

Test Yourself Question

Q. Which of the following is not an objective of the Data Architecture part of Phase C?

A To define the types of data needed

B To define the sources of data needed

C To design a database

D To produce output that is complete

E To produce output that is understandable by the stakeholders

Test Yourself Question

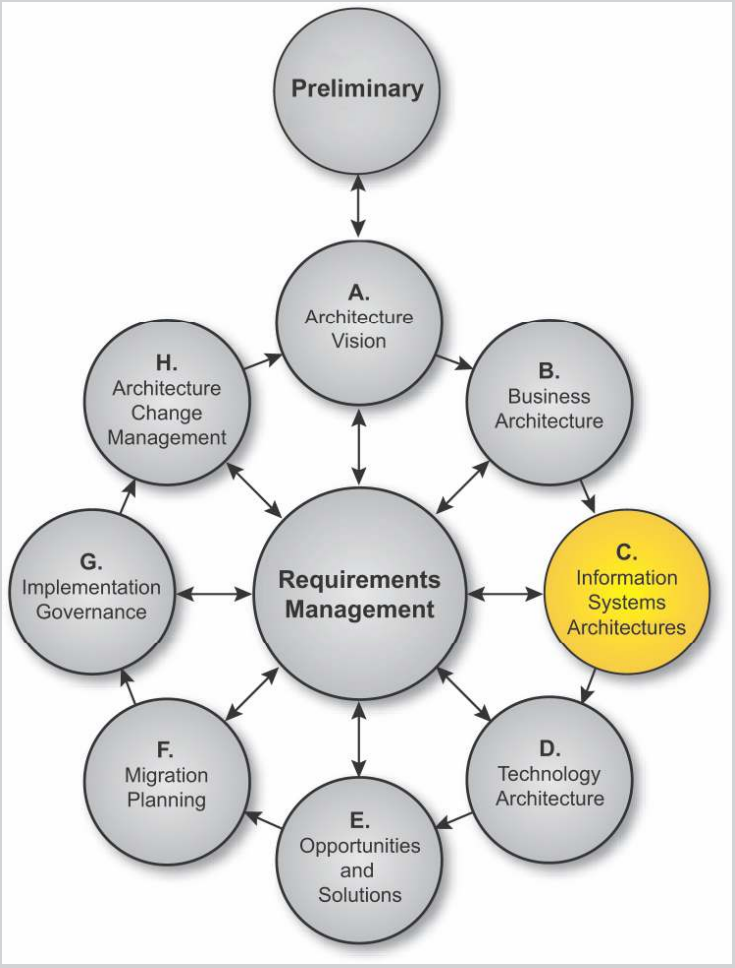
Q. Which of the following is/are logical data model(s) which can be used during Data Architecture?

A. DODAF

B. ARTS

C. Energistics Data Model for the Petrotechnical industry

D. Zachman



Phase C: Data Architecture

TOGAF™