

# TOGAF®



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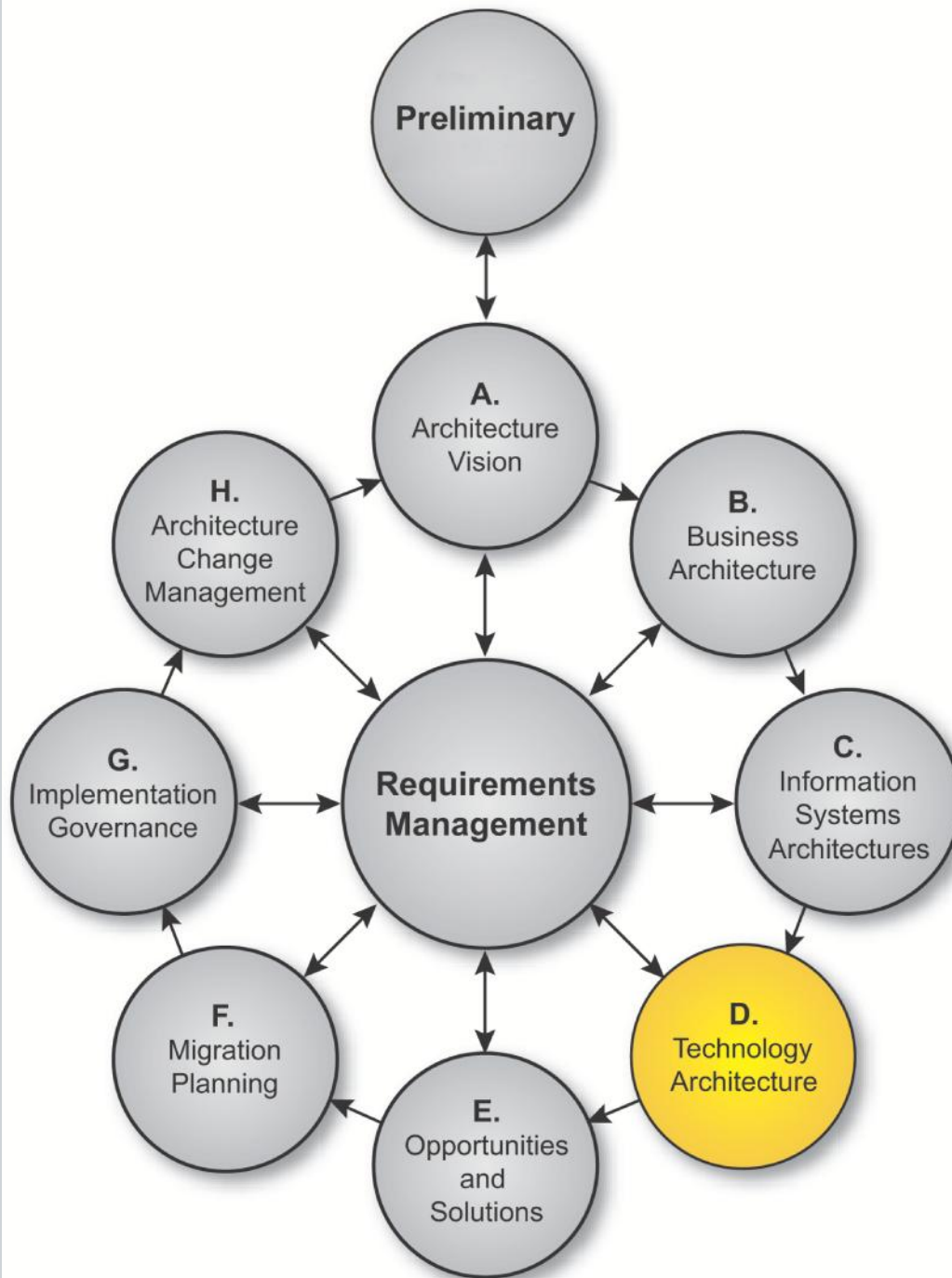
*Version 9.1 Enterprise Edition*

## Module 22 Phase D Technology Architecture

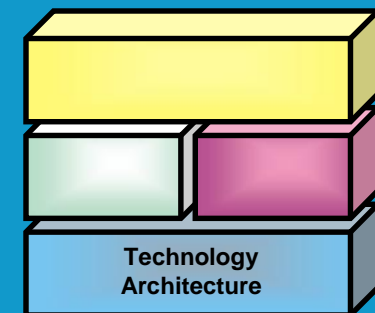
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## Phase D: Technology Architecture



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# Module Objectives

The objectives of this module are to understand:

- The objectives of Phase D, Technology Architecture
- What it consists of
- What inputs are needed for it
- What the outputs are

# Objectives

- Develop the Target Technology Architecture that enables the logical and physical application and data components and the Architecture Vision, addressing the Request for Architecture Work and stakeholder concerns
- Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Technology Architectures



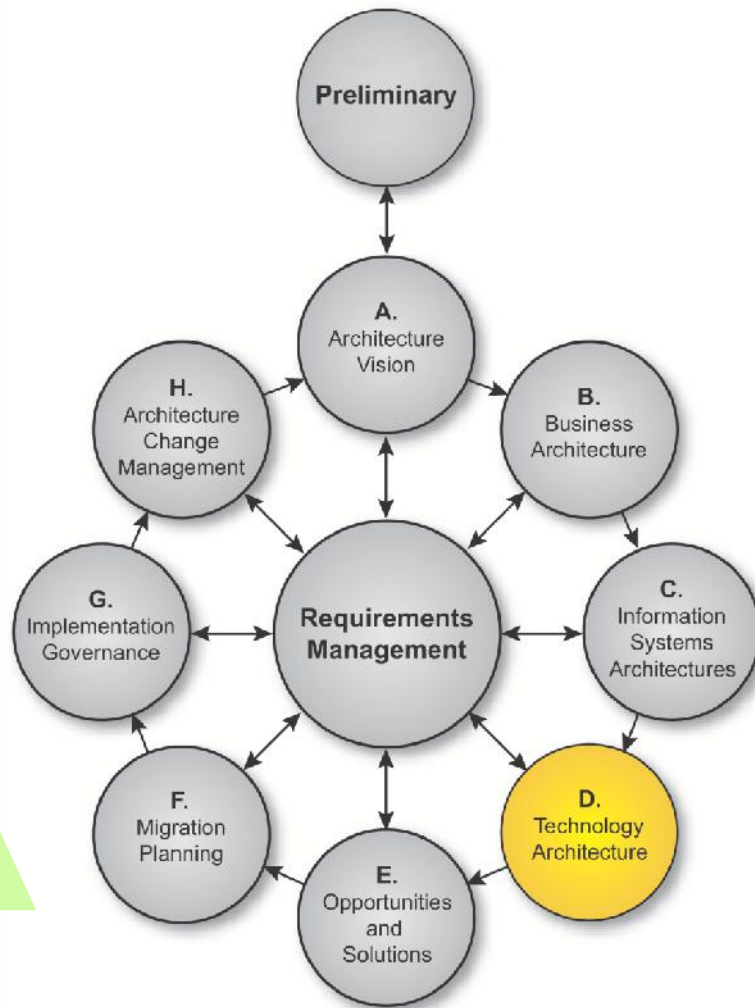
# Approach

- Review the Technology Architecture Resources available in the Architecture Repository
  - Existing IT Services in the IT Repository or IT Service Catalog
  - The TOGAF TRM
  - Technology models relevant to the organization





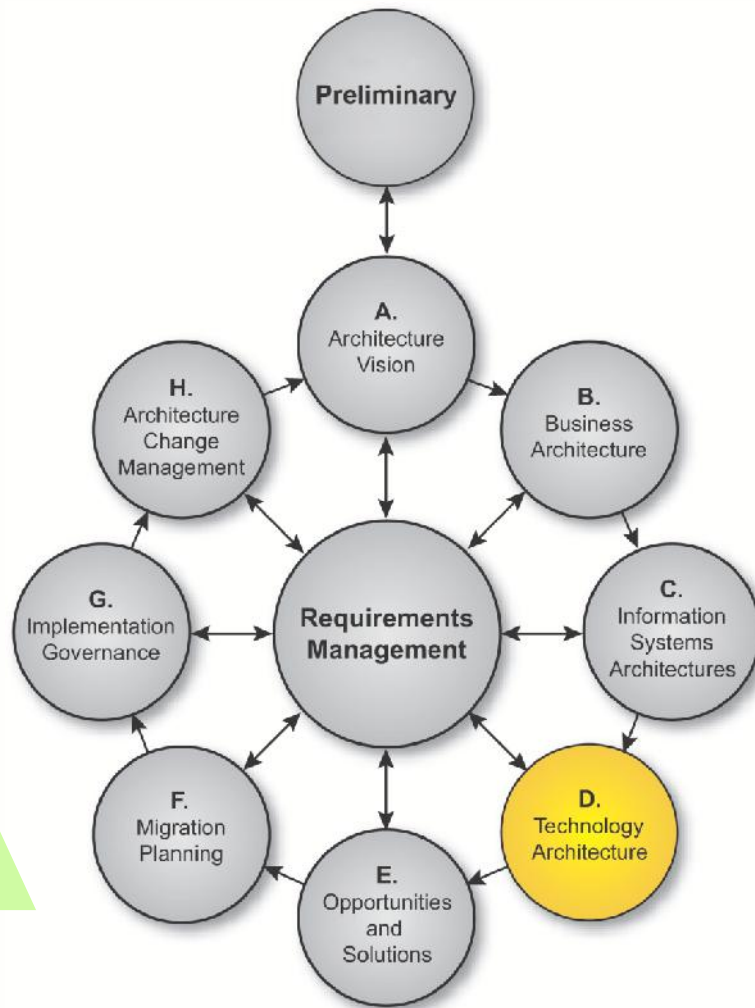
# Technology Architecture: Inputs



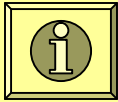
- Request for Architecture Work
- Capability Assessment
- Communications Plan
- Organization model for enterprise architecture
- Tailored Architecture Framework
- Technology principles
- Statement of Architecture Work
- Architecture Vision
- Architecture Repository

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# Technology Architecture: Inputs

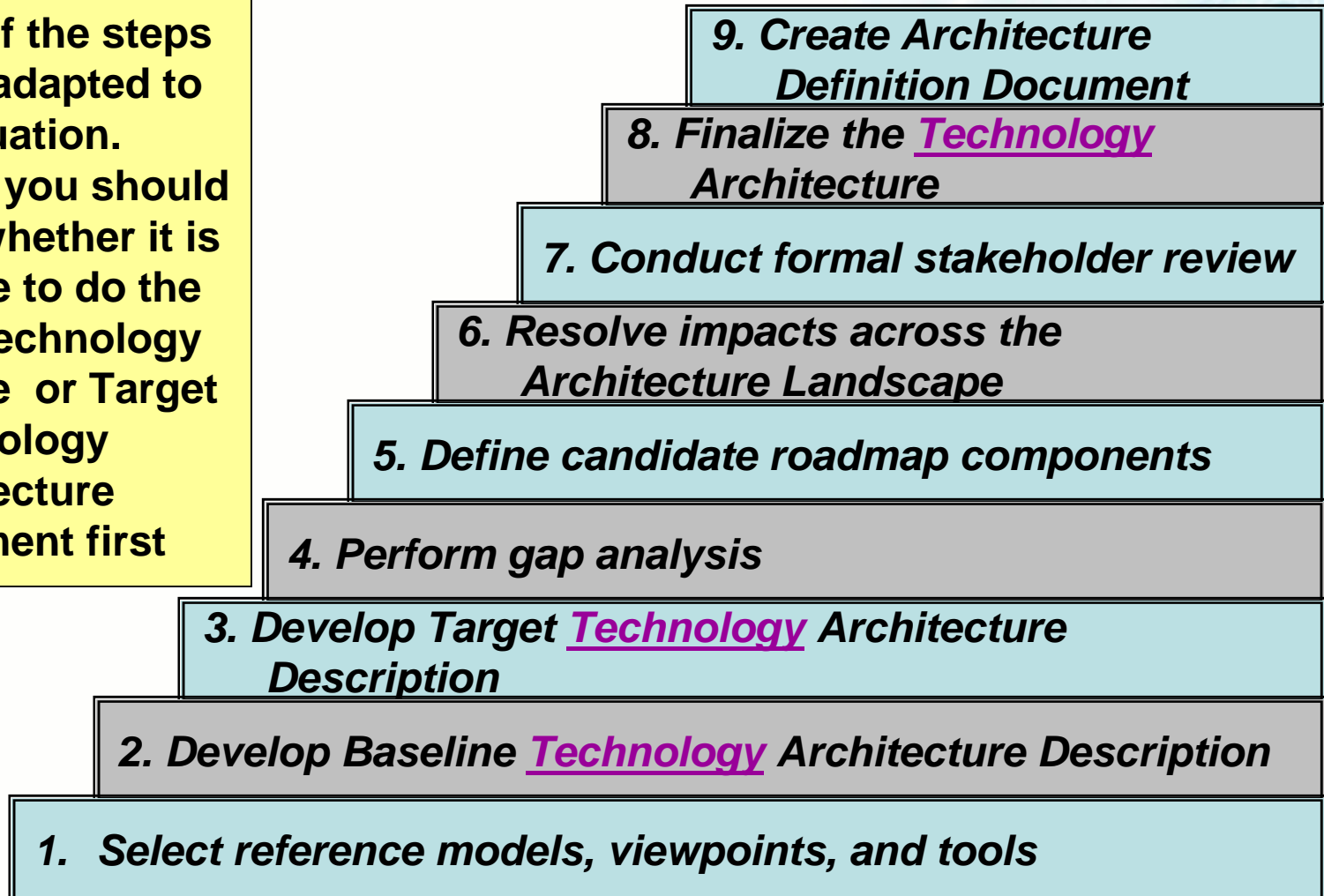


- Draft Architecture Definition Document, containing:
  - Baseline Business Architecture (detailed)
  - Target Business Architecture (detailed)
  - Baseline Data Architecture (detailed)
  - Target Data Architecture (detailed)
  - Baseline Application Architecture (detailed)
  - Target Application Architecture (detailed)
  - Baseline Technology Architecture (high-level)
  - Target Technology Architecture (high-level)
- Draft Architecture Requirements Specification, including gap analysis results and technical requirements
- Business, Data, and Application Architecture components of an Architecture Roadmap



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

## Steps





# Step 1: Select reference models, viewpoints, and tools

- Review/generate and validate technology principles – see Architecture Principles
- Select Technology Architecture resources (reference models, patterns, ...)
- Select relevant Technology Architecture viewpoints
- Identify appropriate tools and techniques to be used for data capture, modeling, and analysis, in association with the selected viewpoints.

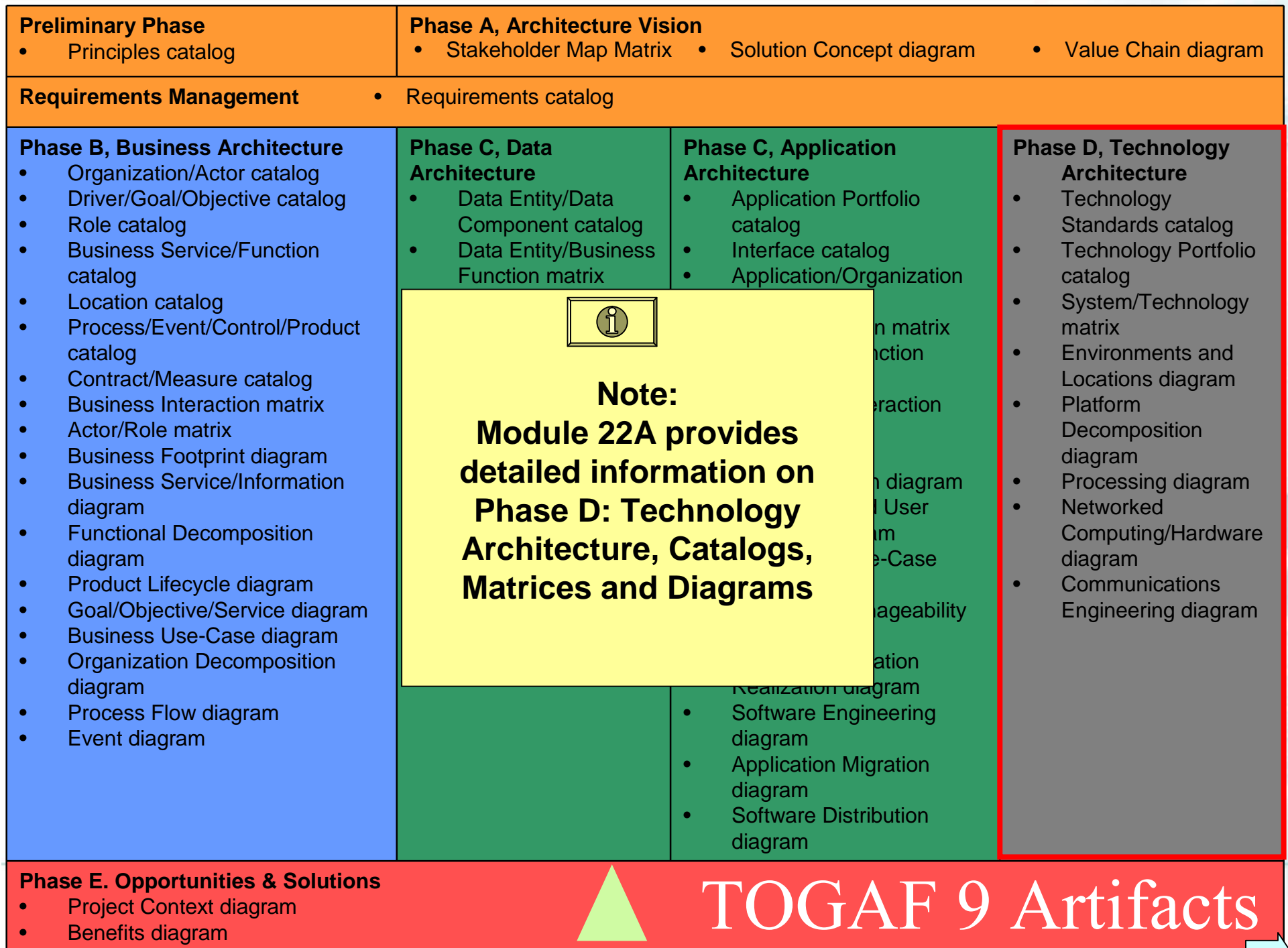
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# Step 1: Select reference models, viewpoints, and tools

- Determine Overall Modeling Process
  - For each viewpoint, select the models needed to support the specific view required, using the selected tool or method. Confirm all stakeholders' concerns are addressed. If not, create new models to address concerns not covered, or augment existing models

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**Note:**

**Module 22A provides detailed information on Phase D: Technology Architecture, Catalogs, Matrices and Diagrams**

# Catalogs

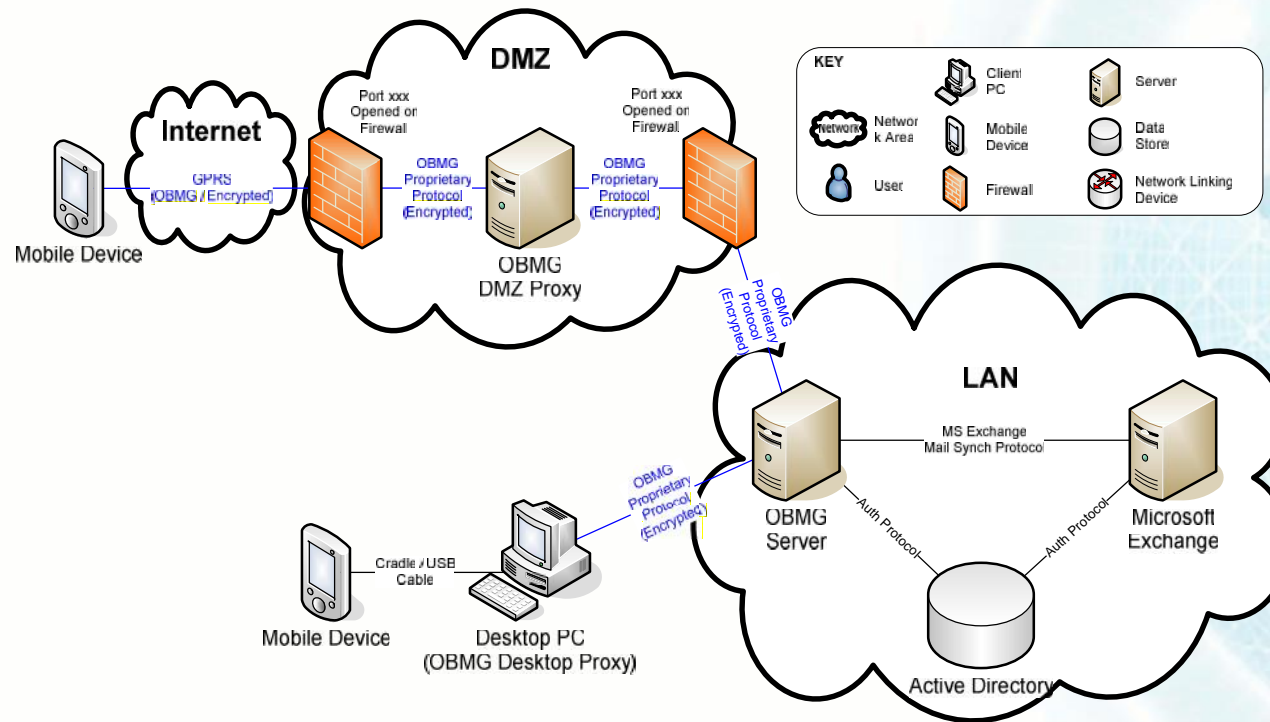
Catalog	Purpose
Technology Standards Catalog	<p>This documents the agreed standards for technology across the enterprise covering technologies, and versions, the technology lifecycles, and the refresh cycles for the technology.</p> <p>It can be implemented as an extension to the Technology Portfolio Catalog and thus will share the same metamodel entities:</p> <ul style="list-style-type: none"><li>•Platform Service, Logical Technology Component, Physical Technology Component</li></ul>
Technology Portfolio Catalog	<p>This catalog identifies and list all the technology in use across the enterprise, including hardware, infrastructure software, and application software. An agreed technology portfolio supports lifecycle management of technology products and versions and also forms the basis for definition of technology standards</p> <p>It contains the following metamodel entities:</p> <ul style="list-style-type: none"><li>•Platform Service, Logical Technology Component, Physical Technology Component</li></ul>



# Example Application/Technology Matrix

LOGICAL APPLICATION COMPONENT	PHYSICAL TECHNOLOGY COMPONENT	SERVER ADDRESS	IP ADDRESS
ABM	Web server - node 1	F01ws001@host.com	10.xx.xx.xx
	Web server - node 2	F01ws002@host.com	10.xx.xx.xx
	Web server - node 3	F01ws003@host.com	10.xx.xx.xx
	App server – node 1	F02as001@host.com	10.xx.xx.xx
	App server – node 2	F02as002@host.com	10.xx.xx.xx
	App server – node 3	F02as003@host.com	10.xx.xx.xx
	Database server (production)	F02dbp001@host.com	10.xx.xx.xx
	Database server (stating)	F03dbs001@host.com	10.xx.xx.xx
Load balancer and Dispatcher	Dispatcher server	F03nd001@host.com	242.xx.xx.xx

# Communications Engineering Diagram



# Step 1: Select reference models, viewpoints, and tools

- Identify Required Catalogs of Technology Building Blocks

The following catalogs should be considered for development within a Technology Architecture:

- Technology Standards catalog
- Technology Portfolio catalog

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# Step 1: Select reference models, viewpoints, and tools

- Identify Required Matrices
  - Matrices show the core relationships between related model entities.
  - Recommended to develop an Application/Technology Matrix
- Identify Required Diagrams
  - Diagrams present the Technology Architecture information from a set of different viewpoints
  - The following diagrams are recommended
    - Environments and Locations diagram
    - Platform Decomposition diagram
    - Networked Computing / Hardware diagram
    - Communication diagram

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# Step 1: Select reference models, viewpoints, and tools

- Identify Types of Requirements to be Collected
  - Identify requirements to be met by the Architecture
  - Formalize the technology-focused requirements
  - If applicable, provide detailed guidance to be reflected during design and implementation

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# Step 1: Select reference models, viewpoints, and tools

- **Select Services**
  - The services portfolios are combinations of basic services from the service categories in the TOGAF TRM.
  - For each building block, build up a service description portfolio as a set of non-conflicting services.
  - The set of services must be tested to ensure that the functionality provided meets application requirements.



# Step 2 Develop a Baseline Technology Architecture Description

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

- If nothing exists, define each application in line with the Technology Portfolio catalog
- Where new architecture models need to be developed use the models identified in Step 1 as a guideline for creating new architecture content to describe the Baseline Architecture.



# Step 3 Develop Target Technology Architecture Description

- If possible, identify the relevant Technology Architecture building blocks, drawing on the Architecture Repository
- Where new architecture models need to be developed 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 standard Gap Analysis technique



## Step 5: Define candidate roadmap components

- This initial Technology 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 Technology Architecture create an impact on any pre-existing architectures?
  - Have recent changes been made that impact on the Technology Architecture?
  - Are there any opportunities to leverage work from this Technology Architecture in other areas of the organization?
  - Does this Technology Architecture impact other projects ?
  - Will this Technology 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 Technology Architecture.

- Is the Technology Architecture fit for the purpose of supporting subsequent work in the other architecture domains?
- Refine the proposed Technology Architecture only if necessary.

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# Step 8 Finalize the Technology 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 goals.
- 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

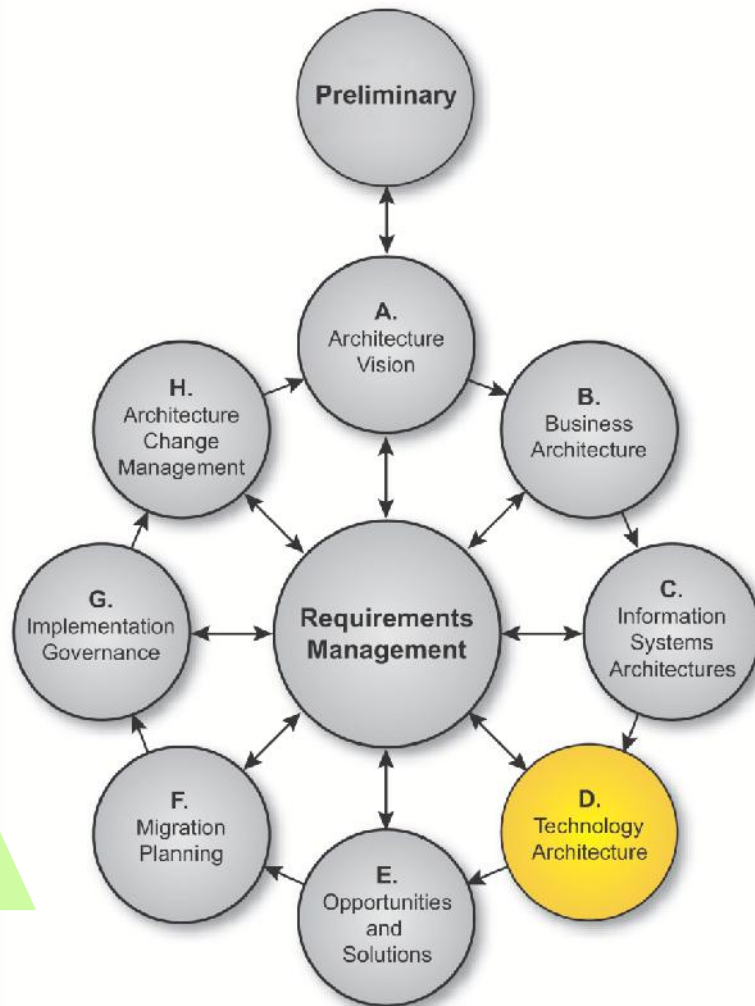


# Step 9: Create Architecture Definition Document

- Document the rationale for all building block decisions in the architecture definition document.
- Prepare the Technology 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. Send the document to relevant stakeholders for review and incorporate feedback.



# Technology Architecture Outputs



- Statement of Architecture Work, updated if necessary
- Validated technology principles or new technology principles
- Draft Architecture Definition Document
- Draft Architecture Requirements Specification
- Technology Architecture components of an Architecture Roadmap

# Architecture Definition Document – Technology Architecture Components

- Baseline Technology Architecture, if appropriate
- Target Technology Architecture, including:
  - Technology components and their relationships to information systems
  - Technology platforms and their decomposition, showing the combinations of technology required to realize a particular technology “stack”
  - Environments and locations – a grouping of the required technology into computing environments (e.g., development, production)
  - Expected processing load and distribution of load across technology components
  - Physical (network) communications
  - Hardware and network specifications
- Views corresponding to the selected viewpoints addressing key stakeholder concerns





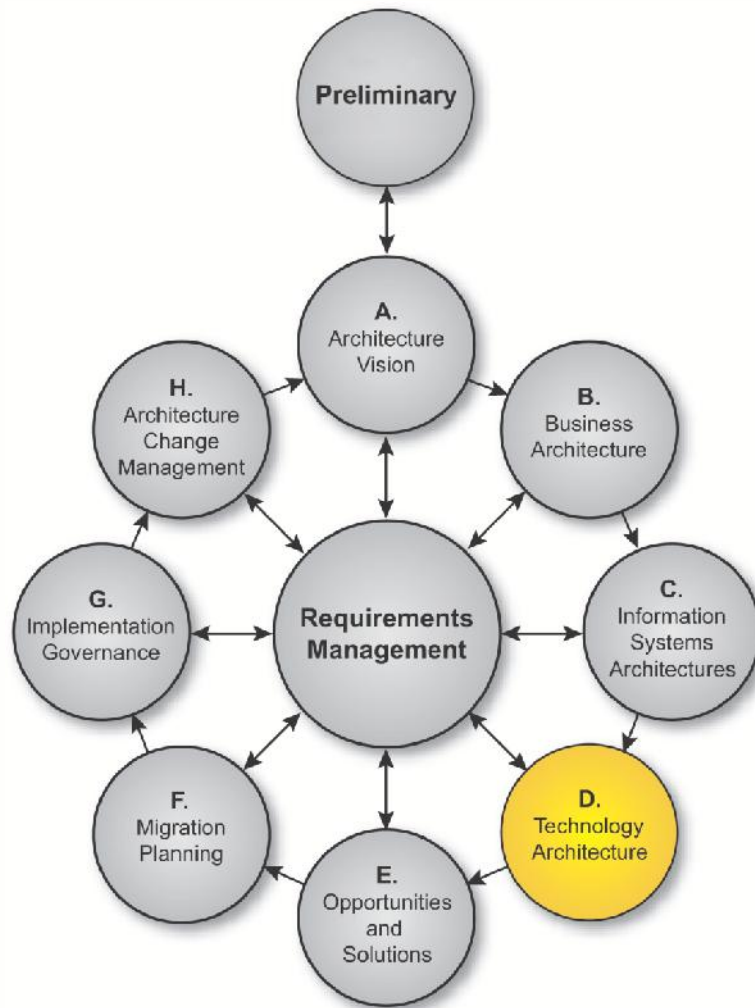
# Architecture Requirements Specification – Technology Architecture Components

- Gap analysis results
- Updated technology requirements





# Summary



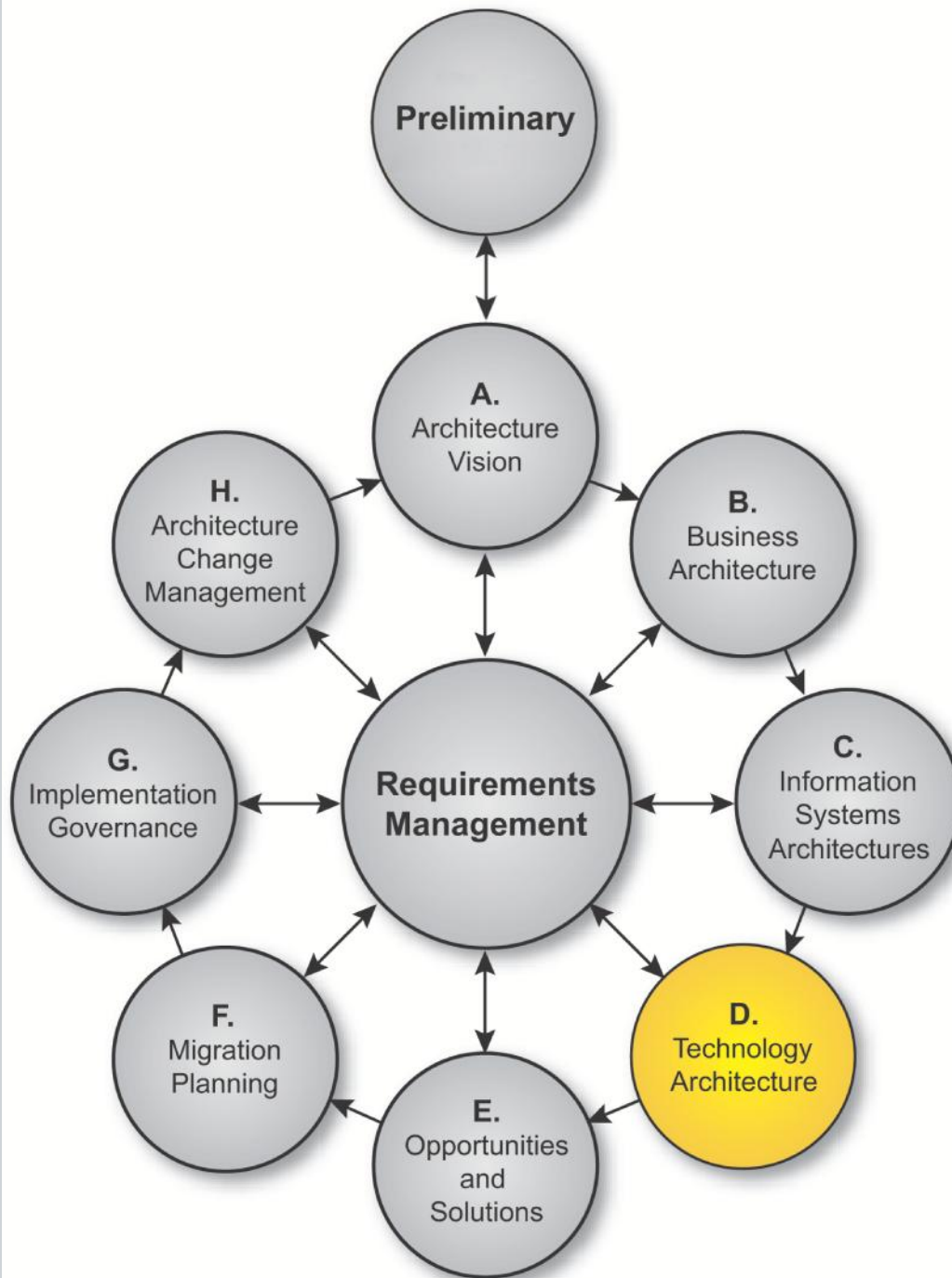
- The purpose of Phase D: Technology Architecture is to transform application components into a set of technology components.
- The technology components can be both software and hardware components, available from the market or configured within the organization

# Summary

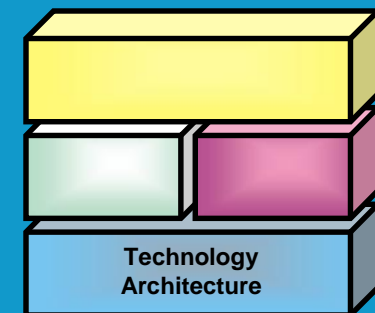
Phase D: Technology Architecture			
Objectives	Steps	Inputs	Outputs
<p>Develop the Target Technology Architecture that enables the logical and physical application and data components and the Architecture Vision, addressing the Request for Architecture Work and stakeholder concerns</p> <p>Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Technology Architectures</p>	<p>Select reference models, viewpoints, and tools</p> <p>Develop Baseline Technology Architecture Description</p> <p>Develop Target Technology Architecture Description</p> <p>Perform gap analysis</p> <p>Define candidate roadmap components</p> <p>Resolve impacts across the Architecture Landscape</p> <p>Conduct formal stakeholder review</p> <p>Finalize the Technology Architecture</p> <p>Create Architecture Definition Document</p>	<p>Request for Architecture Work</p> <p>Capability Assessment</p> <p>Communications Plan</p> <p>Organizational Model for Enterprise Architecture</p> <p>Tailored Architecture Framework</p> <p>Technology principles</p> <p>Statement of Architecture Work</p> <p>Architecture Vision</p> <p>Architecture Repository</p> <p>Draft Architecture Definition Document containing:</p> <ul style="list-style-type: none"> <li>* Baseline Business Architecture (detailed)</li> <li>* Target Business Architecture (detailed)</li> <li>* Baseline Data Architecture (detailed)</li> <li>* Target Data Architecture (detailed)</li> <li>* Baseline Application Architecture (detailed)</li> <li>* Target Application Architecture (detailed)</li> <li>* Baseline Technology Architecture (high-level)</li> <li>* Target Technology Architecture (high-level)</li> </ul> <p>Draft Architecture Requirements Specification including:</p> <ul style="list-style-type: none"> <li>* Gap analysis results</li> <li>* Relevant technical requirements</li> </ul> <p>Business, Data, and Application Architecture components of an Architecture Roadmap</p>	<p>Statement of Architecture Work, updated if necessary</p> <p>Validated technology principles or new technology principles (if generated here)</p> <p>Draft Architecture Definition Document containing content updates:</p> <ul style="list-style-type: none"> <li>* Baseline Technology Architecture</li> <li>* Target Technology Architecture</li> <li>* Technology Architecture views corresponding to the selected viewpoints, addressing key stakeholder concerns</li> </ul> <p>Draft Architecture Requirements Specification including content updates:</p> <ul style="list-style-type: none"> <li>* Gap analysis results</li> <li>* Requirements output from Phases B and C</li> <li>* Updated technology requirements</li> </ul> <p>Technology Architecture components of an Architecture Roadmap</p>

# Exercise

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



## Phase D: Technology Architecture



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