

TOGAF®

Version 9.1 Enterprise Edition

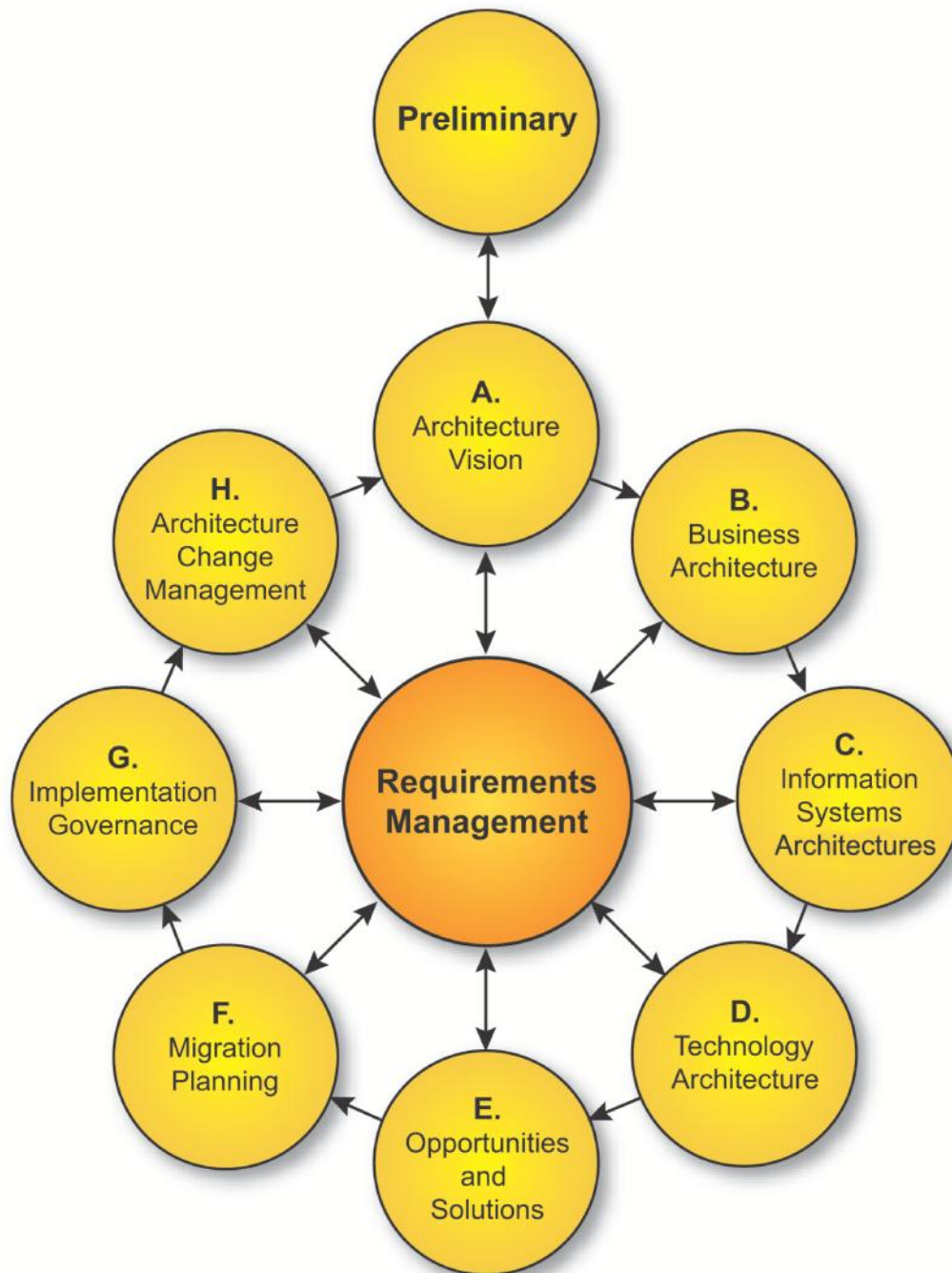
Module 12 Views and Viewpoints

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Views and Viewpoints



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Module Objectives

- To understand the concepts of views and viewpoints
- To understand the role of Architecture Views
- To introduce some TOGAF resources

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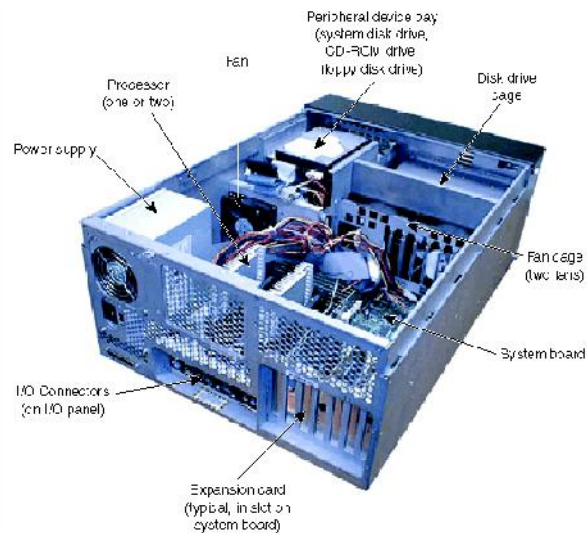


Concepts and Definitions

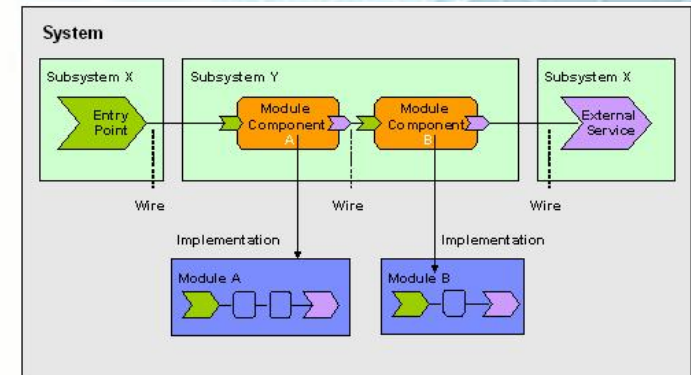
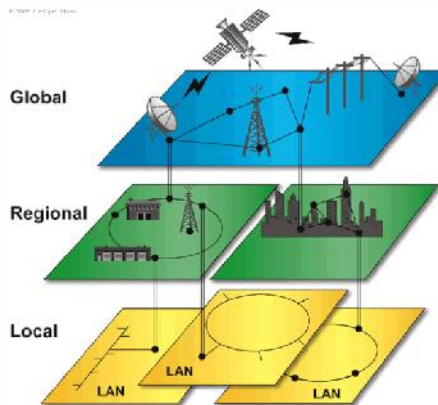
- System
- Stakeholders
- Concerns
- View
- Viewpoint

System

- A system is a collection of components organized to accomplish a specific function or set of functions.

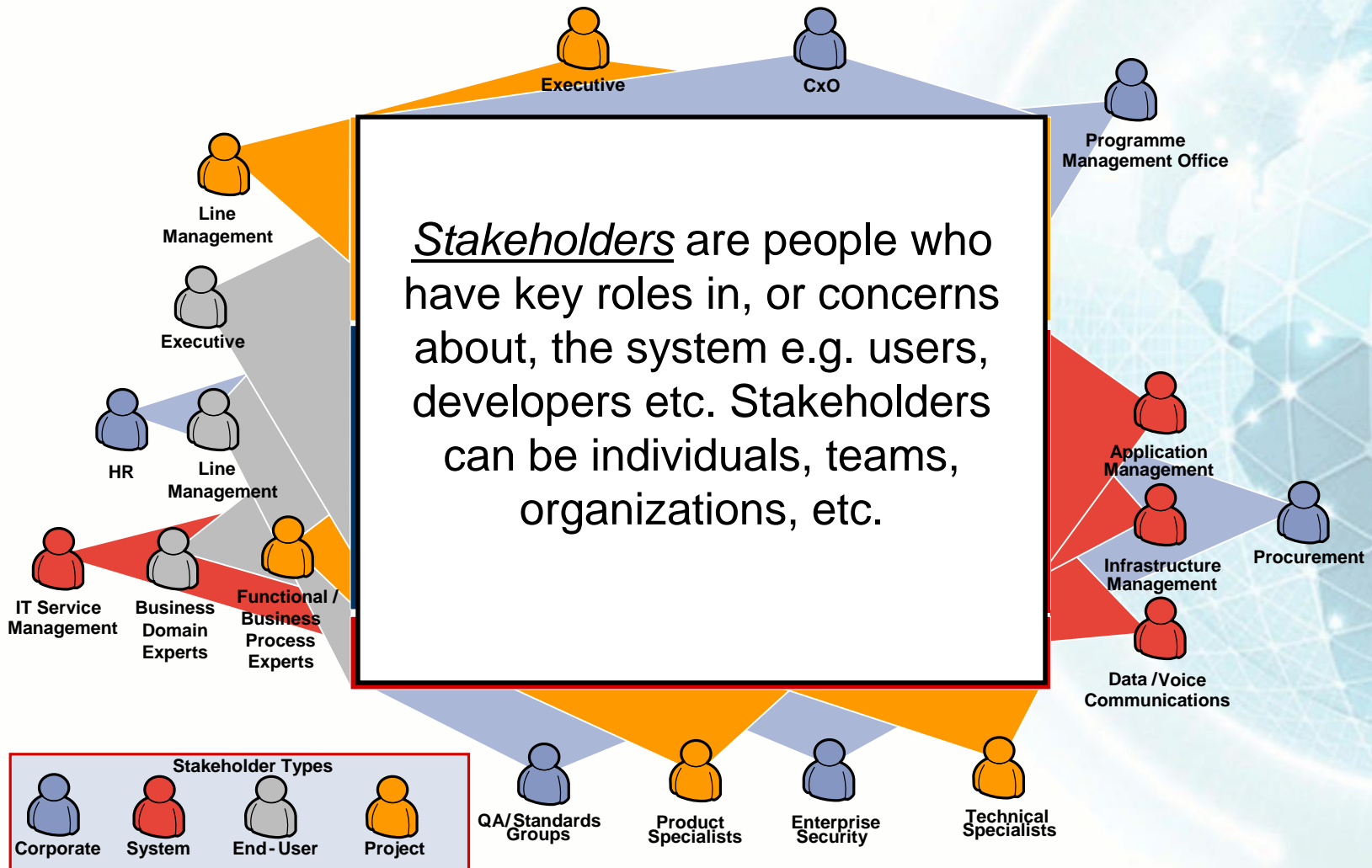


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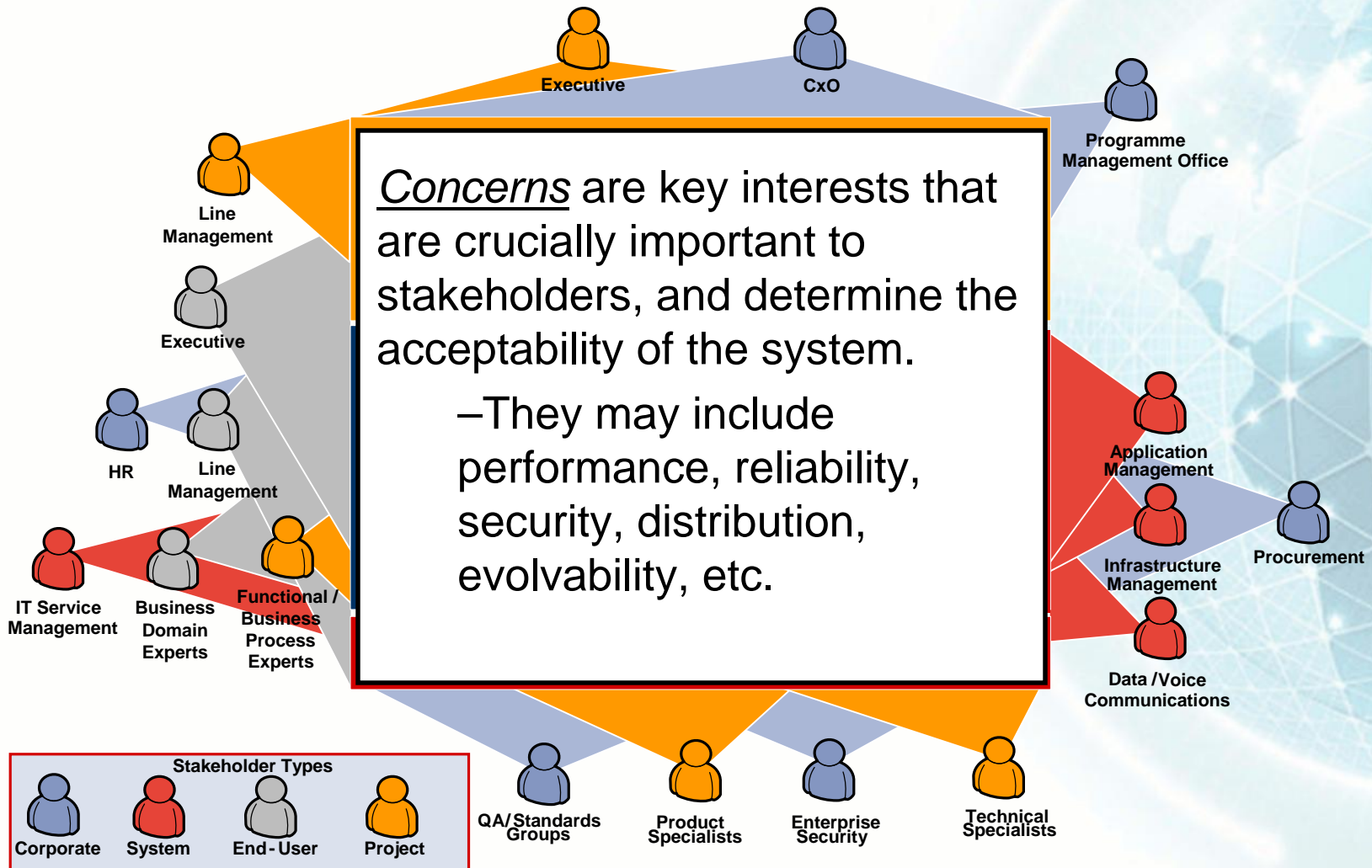


Source: IONA

Stakeholders

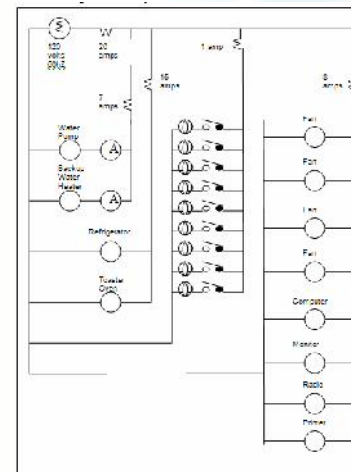
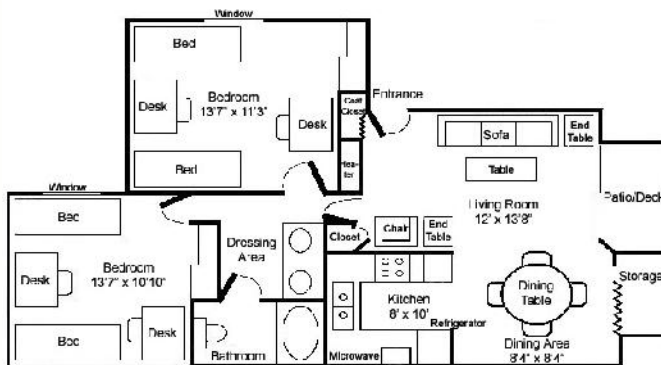


Concerns



View

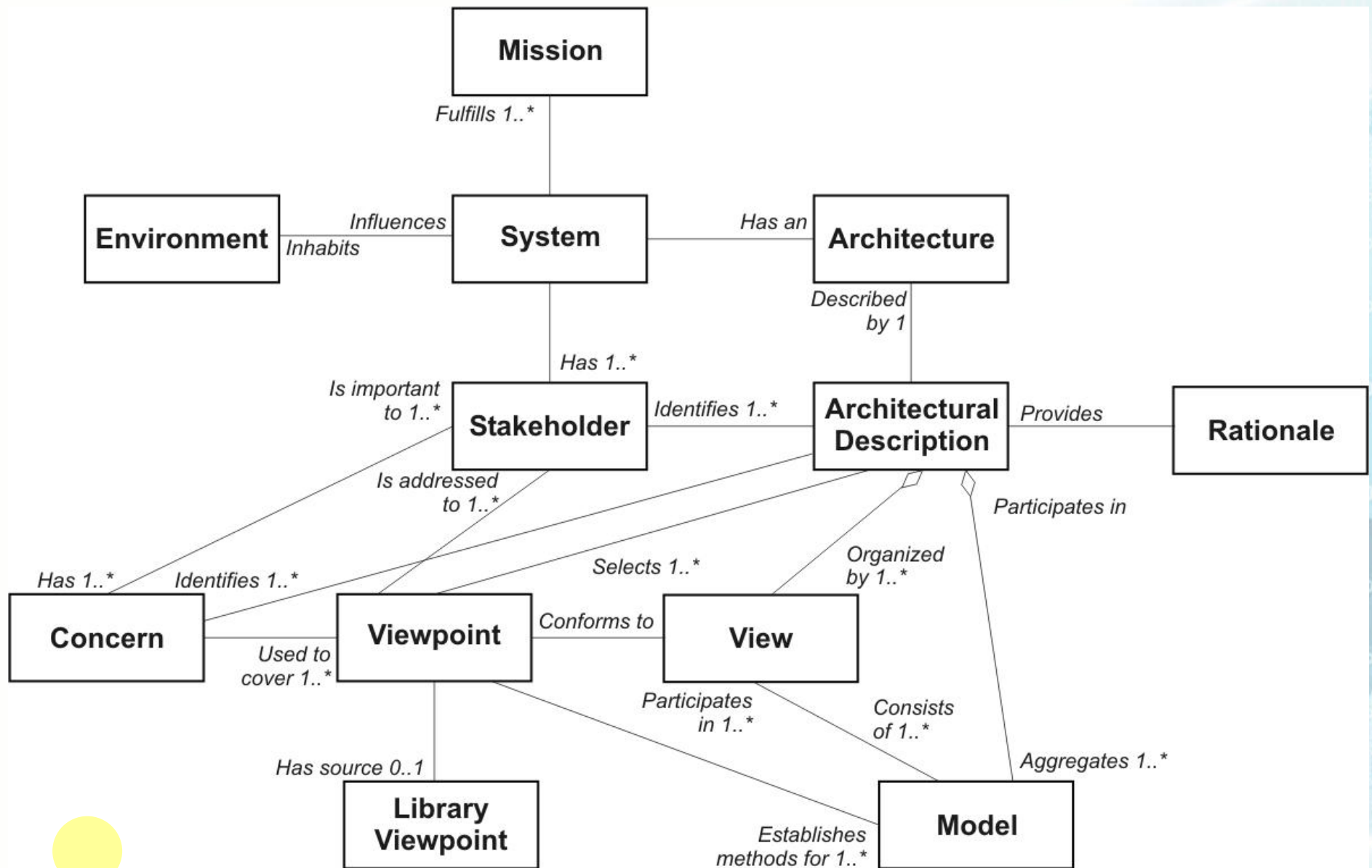
- A view is a representation of a system from the perspective of a related set of concerns.
 - An architect creates architecture models. A view consists of parts of these, chosen to show stakeholders that their concerns are being met.



Viewpoint

- A viewpoint defines the perspective from which a view is taken.
 - It defines how to construct and use a view, the information needed, the modeling techniques for expressing and analyzing it and a rationale for these choices (e.g. by describing the purpose and intended audience of the view).





Source: IEEE Std 1471-2000. Used with permission

Views and Viewpoints

The architect uses views and viewpoints in phases A to D for developing architectures for each domain (business, data, application, technology).

- A *view* is what you see.
- A *viewpoint* is where you are looking from, the vantage point or perspective that determines what you see
- Every view has an associated viewpoint that describes it, at least implicitly.
- Viewpoints are generic, and can be stored in libraries for reuse. A view is always specific to the architecture for which it is created.

What is an Architecture View?

- A representation of an overall architecture with meaning to one or more stakeholders in the system
- Eg a building architect might create wiring diagrams, floor plans, and elevations to describe different facets of a building to its different stakeholders (electricians, owners, planning officials etc.)
- An enterprise architect might create physical and security views of an IT system

A Simple Example of a Viewpoint

Viewpoint Element	Description
Stakeholders	Management Board, CEO
Concerns	Show the top-level relationships between geographical sites and business functions.
Modeling technique	Nested boxes diagram. Outer boxes = locations; Inner boxes = business functions. Semantics of nesting = functions performed in the locations.



A Simple Example of a View

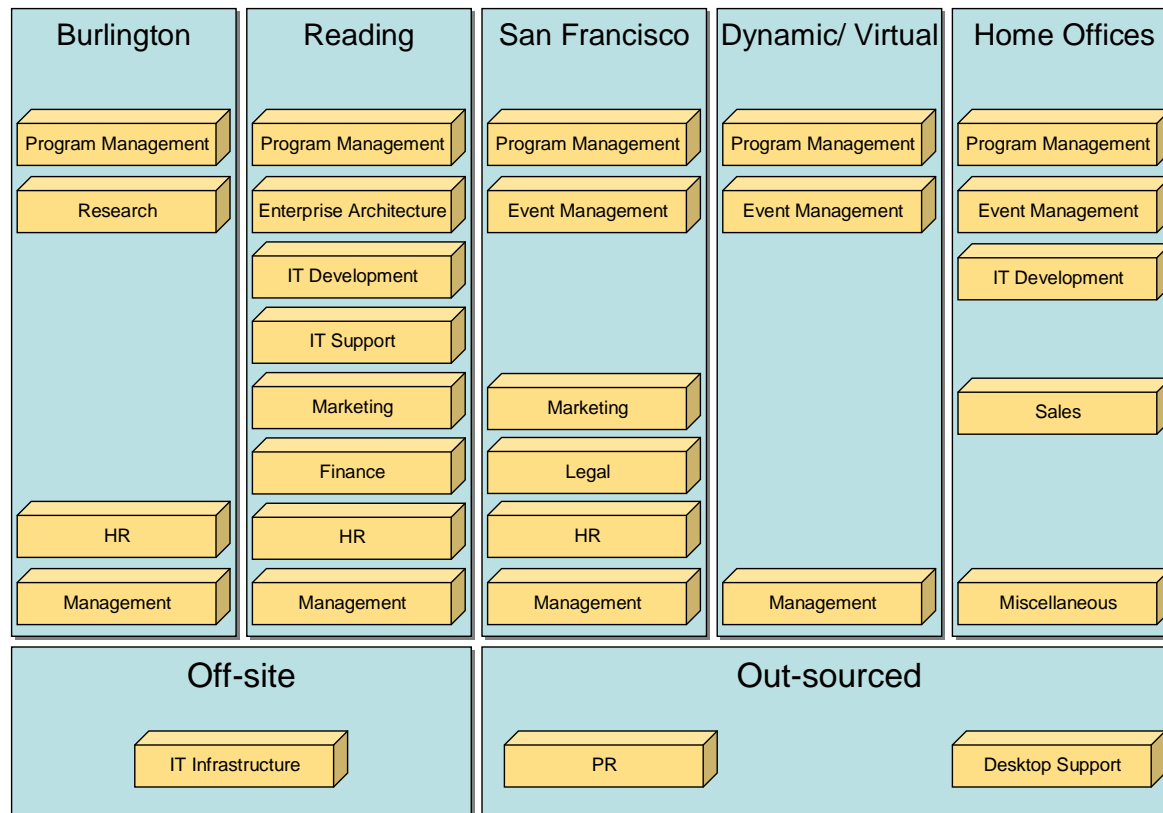


Figure 1: Example View - The Open Group Business Domains in 2008

Developing Views in the ADM

The choice of which particular architecture views to develop is one of the key decisions that the architect has to make.

The architect has a responsibility for ensuring:

- the completeness of the architecture
 - does it address all the concerns of its stakeholders?
- the integrity of the architecture
 - can the views be connected to each other?
 - can the conflicting concerns be reconciled?
 - what trade-offs have been made (e.g. between security and performance)?

Exercise: Views and Viewpoints for a Simple Airport System

The pilot has one view of the system, the air traffic controller has another. Neither view represents the whole system - the perspective of each stakeholder constrains how they see the overall system.

Q.

1. Name some elements in the pilot's view not viewed by the controller
2. Name some elements in the controller's view not viewed by the pilot
3. Name some shared elements

Continued

Exercise: Views and Viewpoints for a Simple Airport System

1. Describe 2 viewpoints for this system
2. Why is using viewpoints helpful?

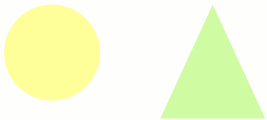
The View Creation Process

1. Refer to any existing libraries of viewpoints.
2. Select key stakeholders.
3. Analyze their concerns and document them.
4. Select appropriate viewpoints (based on the stakeholders and their concerns).
5. Generate views of the system using the selected viewpoints as templates.



Benefits

- Less work for the architects (the viewpoints have already been defined and so the views can be created faster)
- Better comprehensibility for stakeholders (the viewpoints are already familiar)
- Greater confidence in the validity of the views (their viewpoints have a known track record)



The View Creation Process

If no libraries of viewpoints exist then:

1. Select key stakeholders
2. Analyze their concerns and document them
3. Develop new viewpoints (based on the stakeholders and their concerns).
4. Generate views of the system using the new viewpoints as templates.

Alternatively create an *ad hoc* view and then consider whether a generalized form of the implicit viewpoint should be defined explicitly and saved.



Using TOGAF Artifacts

- TOGAF includes an example set of recommended artifacts that can be adopted, enhanced and combined to produce architecture views
- Three classes of artifacts are defined:
 - Catalogs
 - Matrices
 - Diagrams



Catalogs

- Catalogs are lists of building blocks of a specific type, or of related types
- For example
 - Principles Catalog created in the Preliminary Phase
 - Organization/Actor Catalog created in Phase B
 - Driver/Goal/Objective Catalog



Matrices

- Matrices show the relationships between building blocks of specific types
- Matrices are used to represent list-based rather than graphical-based relationships
- For example
 - The Stakeholder Map Matrix created in Phase A



Stakeholder Map Matrix

STAKEHOLDER	KEY CONCERNS	CLASS	Catalogs, Matrices and Diagrams
CxO – CEO, CFO, CIO, COO	The high level drivers, goals and objectives of the organization, and how these are translated into an effective process and IT architecture to advance the business.	KEEP SATISFIED	Business Footprint diagram Goal/Objective/Service diagram Organization Decomposition diagram
Program Management Office – Project Portfolio Managers	Prioritizing, funding and aligning change activity. An understanding of project content and technical dependencies between projects adds a further dimension of richness to portfolio management decision making.	KEEP SATISFIED	Requirements Catalog Business Footprint diagram Application Communication diagram Functional Decomposition diagram
Procurement - Acquirers	Understanding what building blocks of the architecture can be bought, and what constraints (or rules) exist that are relevant to the purchase. The acquirer will shop with multiple vendors looking for the best cost solution while adhering to the constraints (or rules) applied by the architecture, such as standards. The key concern is to make purchasing decisions that fit the architecture, and thereby to reduce the risk of added costs arising from non-compliant components.	KEY PLAYERS	Technology Portfolio catalog Technology Standards Catalog

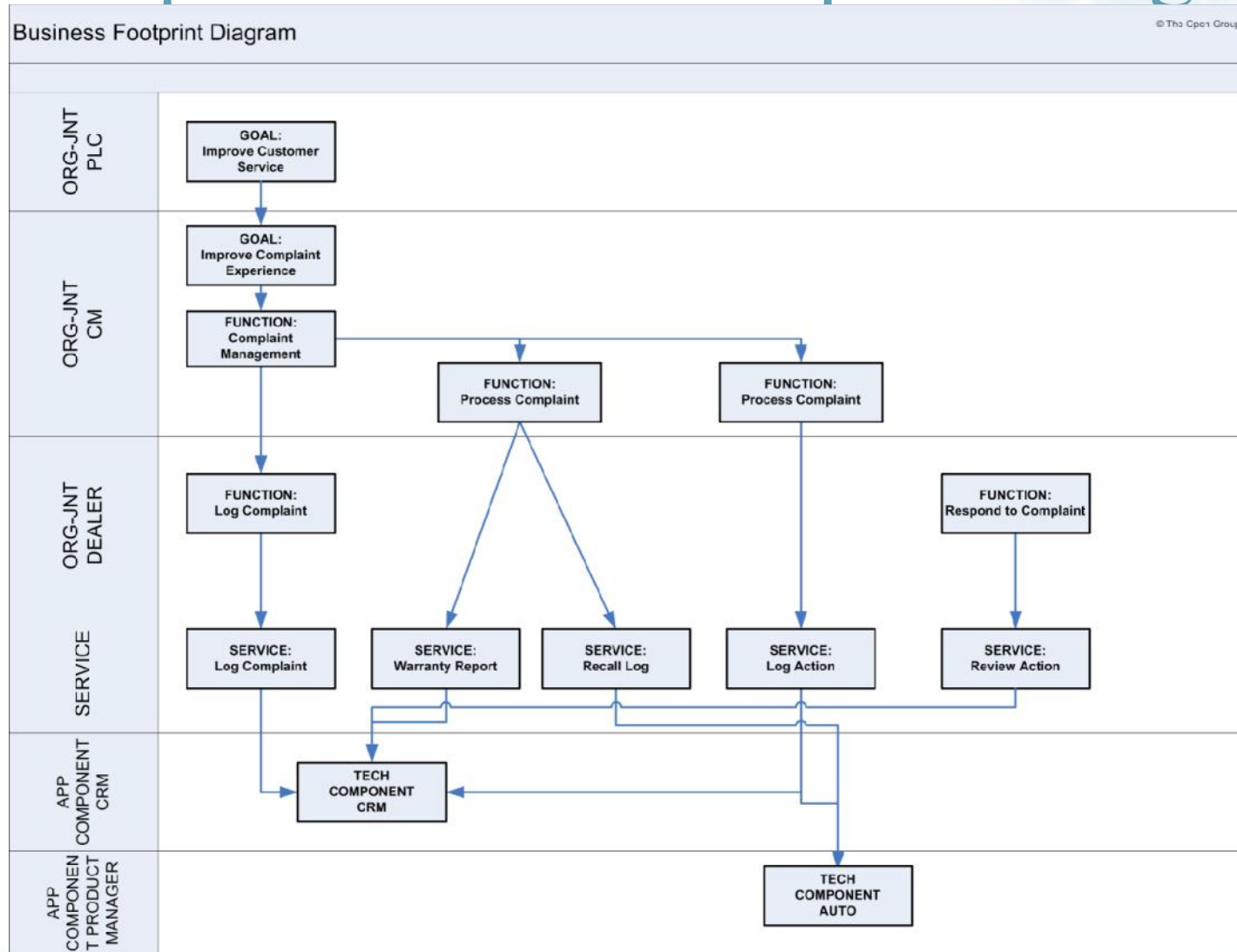


Diagrams

- Diagrams representing building blocks in a rich and visual way, especially suited to stakeholder communication.
- For example
 - Value Chain diagram created in Phase A
 - Business footprint diagram created in Phase B



Example Business Footprint Diagram



Preliminary Phase <ul style="list-style-type: none">Principles catalog	Phase A, Architecture Vision <ul style="list-style-type: none">Stakeholder Map MatrixSolution Concept diagramValue Chain diagram		
Requirements Management <ul style="list-style-type: none">Requirements catalog			
Phase B, Business Architecture <ul style="list-style-type: none">Organization/Actor catalogDriver/Goal/Objective catalogRole catalogBusiness Service/Function catalogLocation catalogProcess/Event/Control/Product catalogContract/Measure catalogBusiness Interaction matrixActor/Role matrixBusiness Footprint diagramBusiness Service/Information diagramFunctional Decomposition diagramProduct Lifecycle diagramGoal/Objective/Service diagramBusiness Use-Case diagramOrganization Decomposition diagramProcess Flow diagramEvent diagram	Phase C, Data Architecture <ul style="list-style-type: none">Data Entity/Data Component catalogData Entity/Business Function matrixApplication/Data matrixLogical Data diagramData Dissemination diagramData Security diagramClass Hierarchy diagramData Migration diagramData Lifecycle diagram	Phase C, Application Architecture <ul style="list-style-type: none">Application Portfolio catalogInterface catalogApplication/Organization matrixRole/Application matrixApplication/Function matrixApplication Interaction matrixApplication Communication diagramApplication and User Location diagramApplication Use-Case diagramEnterprise Manageability diagramProcess/Application Realization diagramSoftware Engineering diagramApplication Migration diagramSoftware Distribution diagram	Phase D, Technology Architecture <ul style="list-style-type: none">Technology Standards catalogTechnology Portfolio catalogSystem/Technology matrixEnvironments and Locations diagramPlatform Decomposition diagramProcessing diagramNetworked Computing/Hardware diagramCommunications Engineering diagram
Phase E. Opportunities & Solutions <ul style="list-style-type: none">Project Context diagramBenefits diagram			

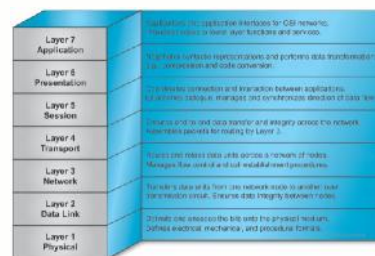
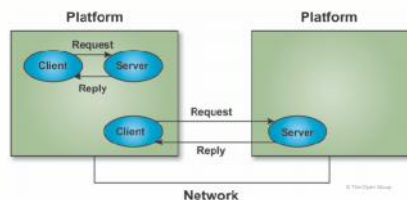
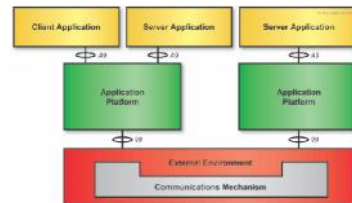
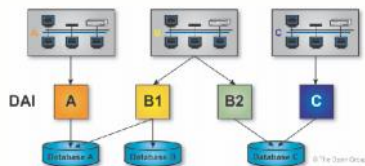
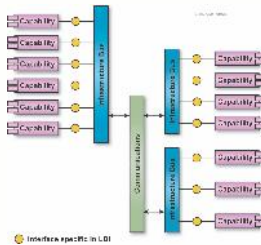
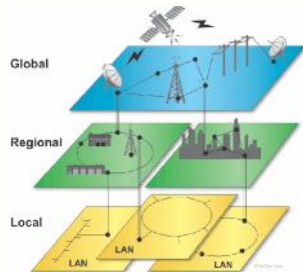
TOGAF 9 Artifacts



TOGAF 9 Artifacts



Recommended Architecture Views



- Business Architecture View
- Enterprise Security View
- Software Engineering View
- System Engineering View
- Communications Engineering View
- Data Flow View
- Enterprise Manageability View
- Acquirer View



Summary

In general, TOGAF embraces the concepts and definitions of ISO/IEC 42010: 2007, specifically those that guide the development of a view and make the view actionable, such as:

- Selecting key stakeholders
- Analyzing their concerns and documenting them
- Understanding how to model and deal with those concerns

The language used to depict the view is the viewpoint.

Viewpoints provide architecture concepts from different perspectives, including components, interfaces, and allocation of services critical to the view.

Summary

When applying TOGAF a number of tailoring steps should occur:

- The viewpoints provided should be customized to create a set of architecture views that ensure all stakeholder concerns are met
- New viewpoints and views should be created to address specific needs

Test Yourself Question

- Q. Views and viewpoints are used by an architect to capture or model the design of a system architecture. Which of the following statements is true?
- A A view is the perspective of an individual stakeholder
 - B Different stakeholders always share the same views
 - C Some views do not have associated viewpoints
 - D A viewpoint is the perspective of an individual stakeholder
 - E Views and viewpoints are rarely used in TOGAF

Exercises

Select a scenario (i.e. a business problem) from your own organization.

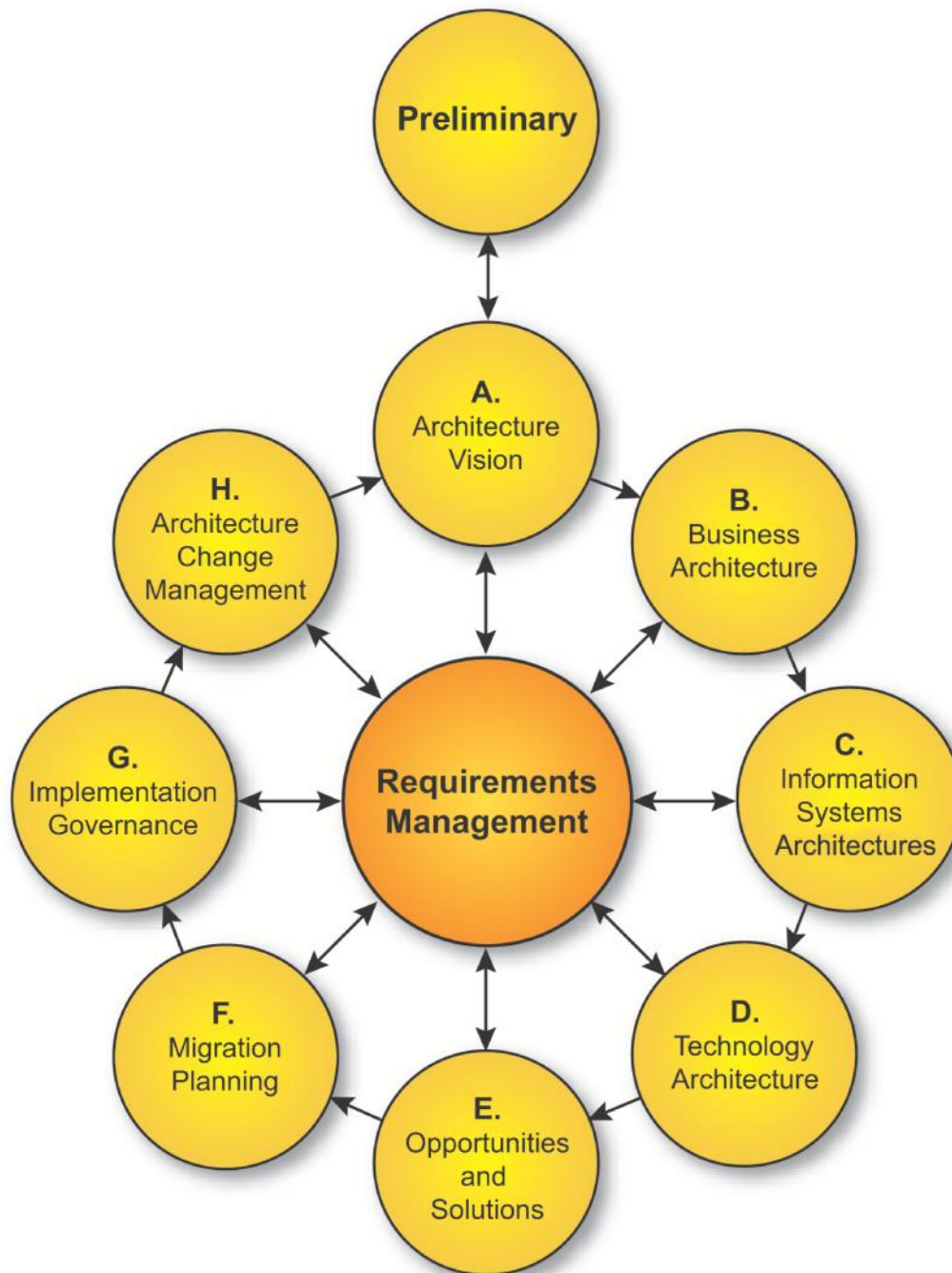
- Identify two stakeholders (i.e. human actors) and their place in the business model.
- State the views and viewpoints for each stakeholder.

Exercises

For a Vehicle Licensing Bureau, which has the following stakeholders: licensing authority, individual car driver, tax authority, car insurance firms, vehicle roadworthiness authority, law enforcement

- Identify two stakeholders (i.e. human actors) and their place in the business model.
- State the views and viewpoints for each stakeholder.

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