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TOGAF® Enterprise Architecture Practitioner

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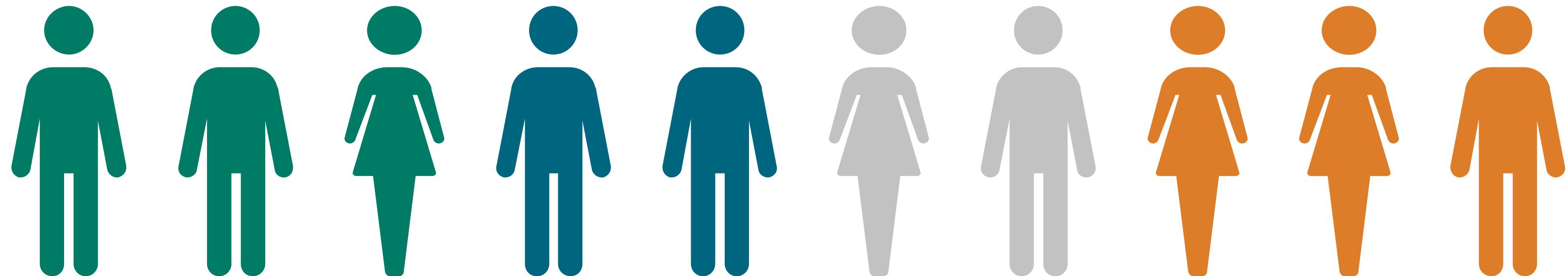
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TOGAF Enterprise Architecture Practitioner

- ✓ *Validation of knowledge, comprehension, including the ability to analyze and apply the TOGAF Standard, 10th Edition to developing, sustaining, and using an Enterprise Architecture.*



I am the person who does the work

I am the person who develops, maintains, and uses an EA

I am not worried about the theory

I am not worried about how to structure or maintain an EA Capability

Target Audience

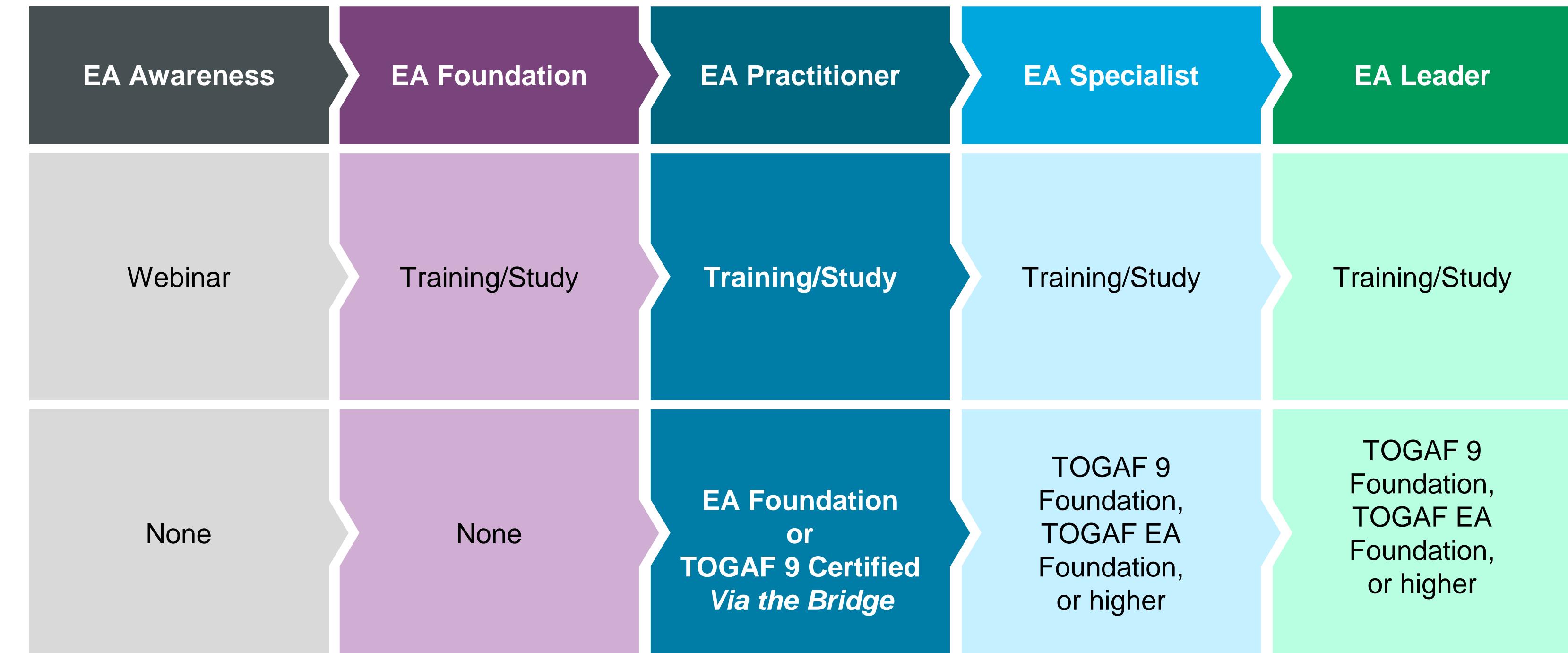
- Individuals expected to apply the TOGAF approach to develop, sustain, and transform domain architectures
- Individuals actively contributing to organizational transformation
- Individuals working in Agile environments who need to understand and apply Enterprise Architecture



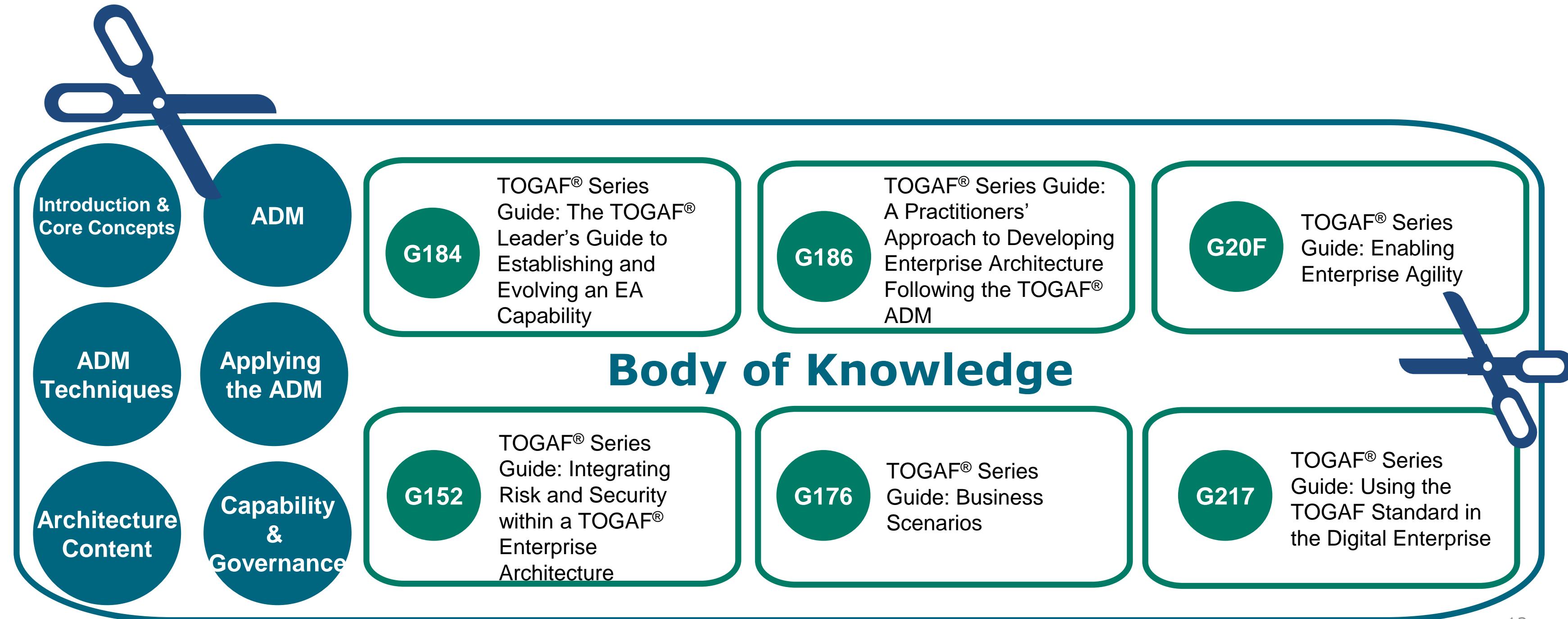
TOGAF Certification Program (Non-examinable)

TOGAF® Enterprise Architecture Learning Path

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Body of Knowledge: TOGAF Enterprise Architecture



TOGAF Enterprise Architecture Practitioner

Learning Units

- Unit 1 – The Context for Enterprise Architecture
- Unit 2 – Stakeholder Management
- Unit 3 – Phase A, the Starting Point
- Unit 4 – Architecture Development
- Unit 5 – Implementing the Architecture
- Unit 6 – Architecture Change Management
- Unit 7 – Requirements Management
- Unit 8 – Supporting the ADM Work



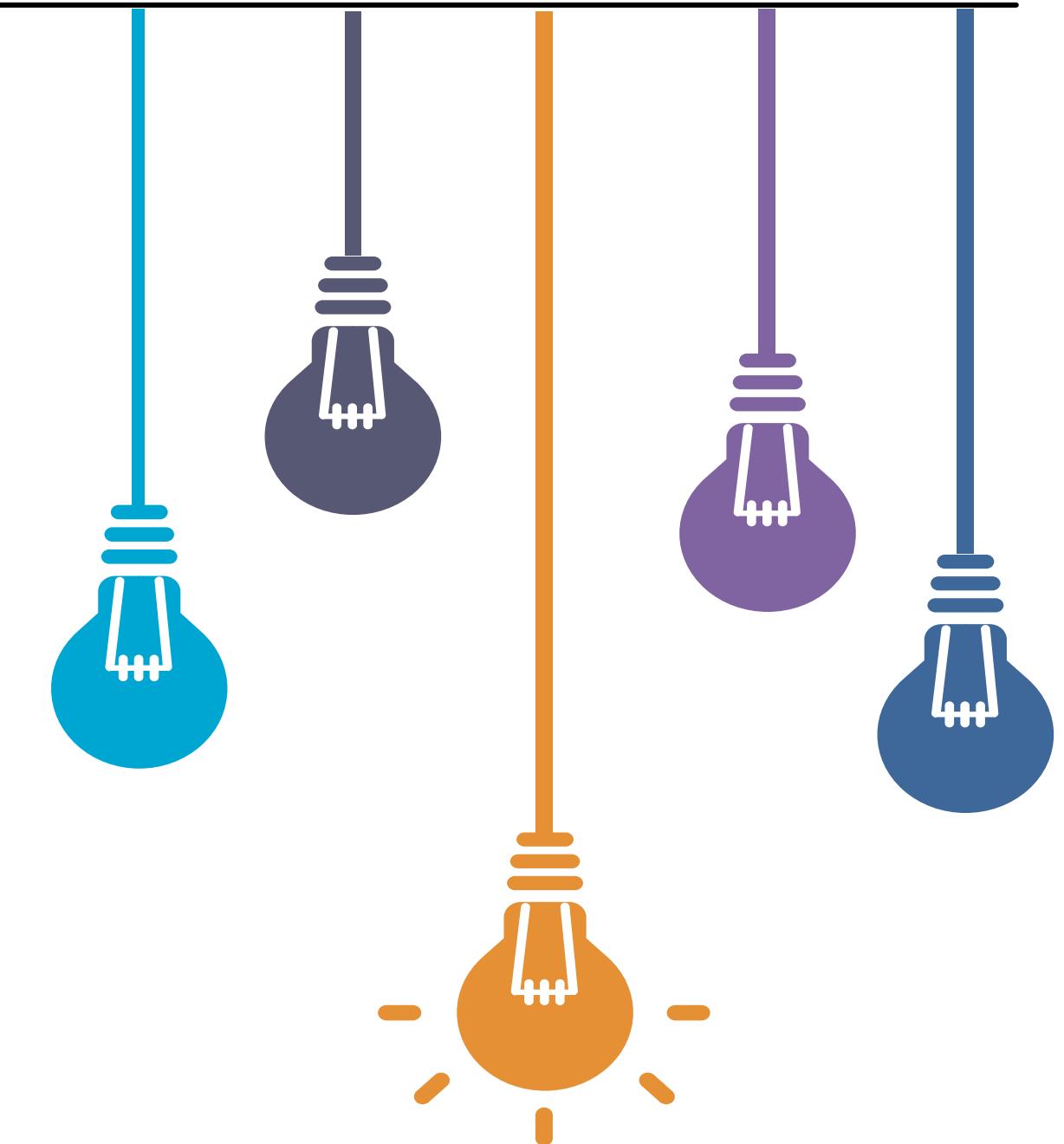
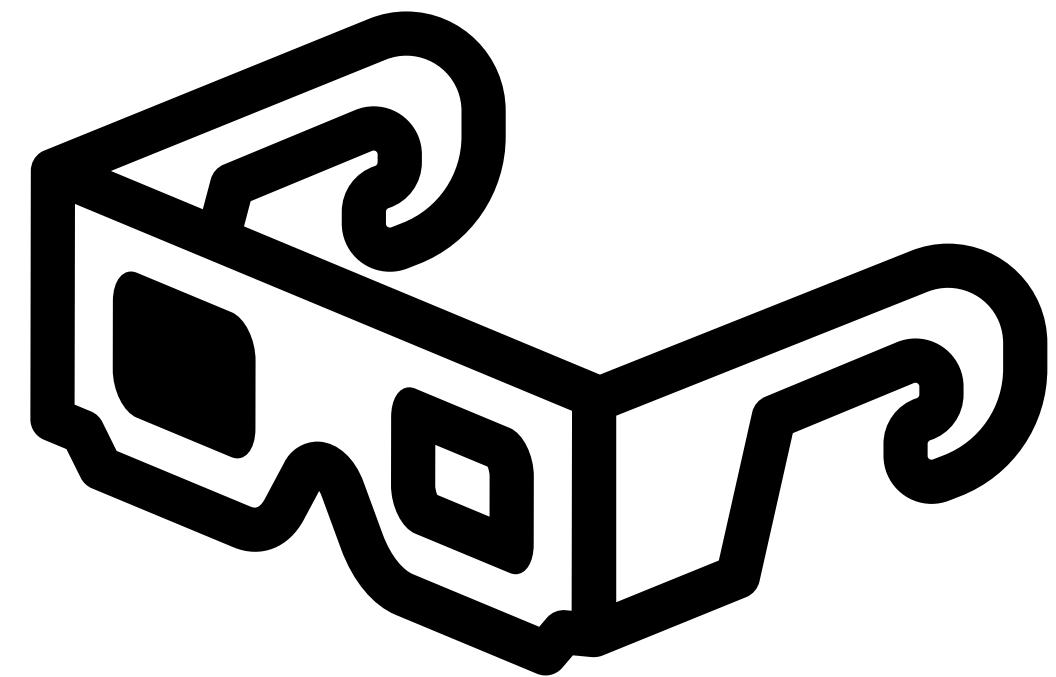
How to use the Materials

Some Learning Outcomes are mainly covered by additional materials as indicated on the slides.



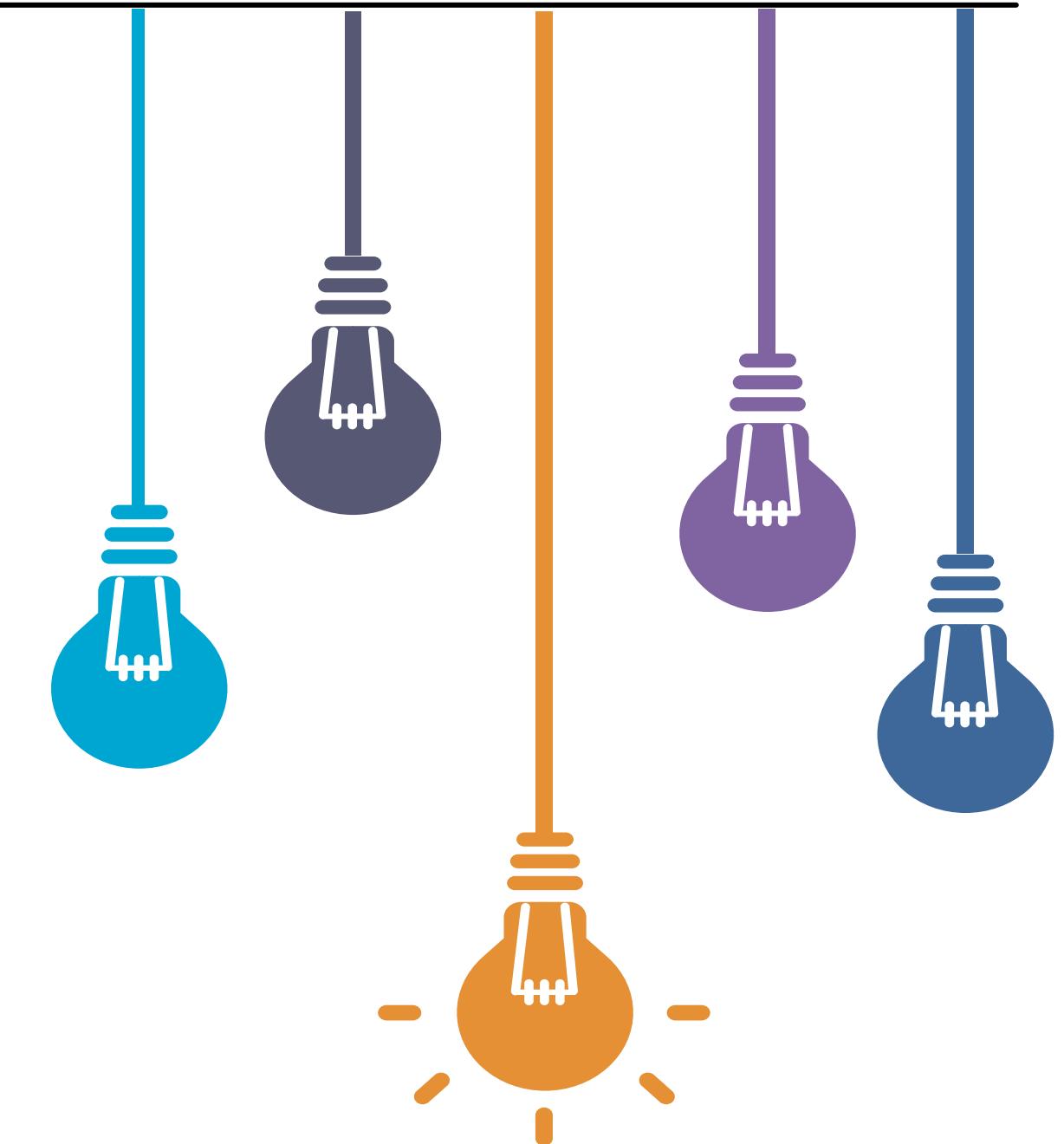
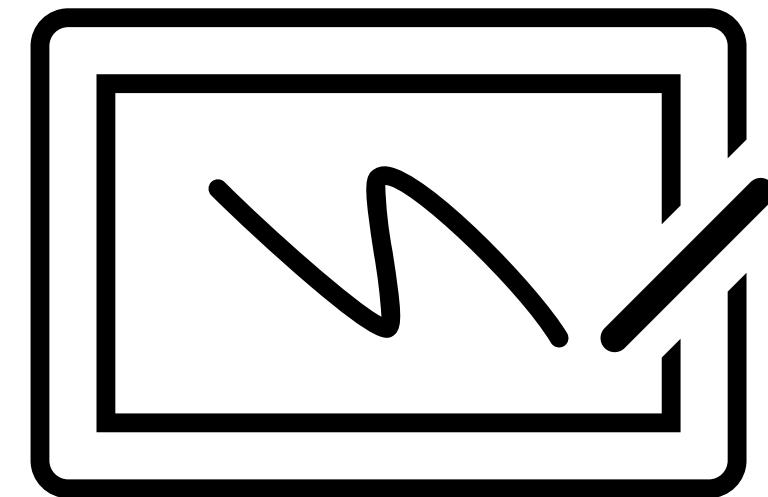
How to Use

- Some slides reference handouts and show this symbol



How to Use

- Some slides reference Learning Studies and show this symbol



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TOGAF® Enterprise Architecture Practitioner Unit 1- Concepts

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Unit 1

Concepts

1.1

Guiding Effective Change: the Purpose of Enterprise Architecture

1.2

What does an Enterprise Architecture look like?

1.3

Architecture Capability

1.4

Architecture Governance and the role of an Enterprise Architect

1.5

Architecture Compliance, Levels of Conformance, Reviews, and the Role of the Architect

1.6

How an Architecture enables alignment to Organisational Objectives using Agile development as an example

Unit 1

Concepts

1.7 The need to Manage Multiple Architecture States

1.8 Enterprise Security Architecture

1.9 Security, a Cross-Cutting Concern

1.10 Managing Uncertainty in order to optimise Maximum Business Benefit and Minimum Business Loss

1.11 The Enterprise Architect and Enterprise Architecture in a Digital Enterprise

1.1 Guiding Effective Change: the Purpose of Enterprise Architecture

Guiding Effective Change

- ❑ An Enterprise Architecture (EA) is developed for one simple reason: to guide effective change.
- ❑ Guidance on effective change takes place during the activity to realise the approved EA.
- ❑ During implementation, EA is used by the stakeholders to govern change.

How Enterprise Architecture guides Effective Change

- An architected approach provides a rigorous planning and change governance methodology.
- Enterprise Architecture facilitates effective governance, management, risk management, and exploitation opportunities.
It describes the future state and the current state of the Enterprise.
- The gap between the Enterprise's current state and future state highlights what must change.

1.2 What does an Enterprise Architecture look like?

1.2 What does an Enterprise Architecture look like?

- An Enterprise Architecture (EA) is the set of models, the components, and their relationships that comprise the scope of the EA Landscape under consideration.
- It exists to guide and constrain change planning and work to perform the change.
- The scope of work embedded in a Request for Architecture Work should identify the applicable characteristics of the EA Landscape.

Models

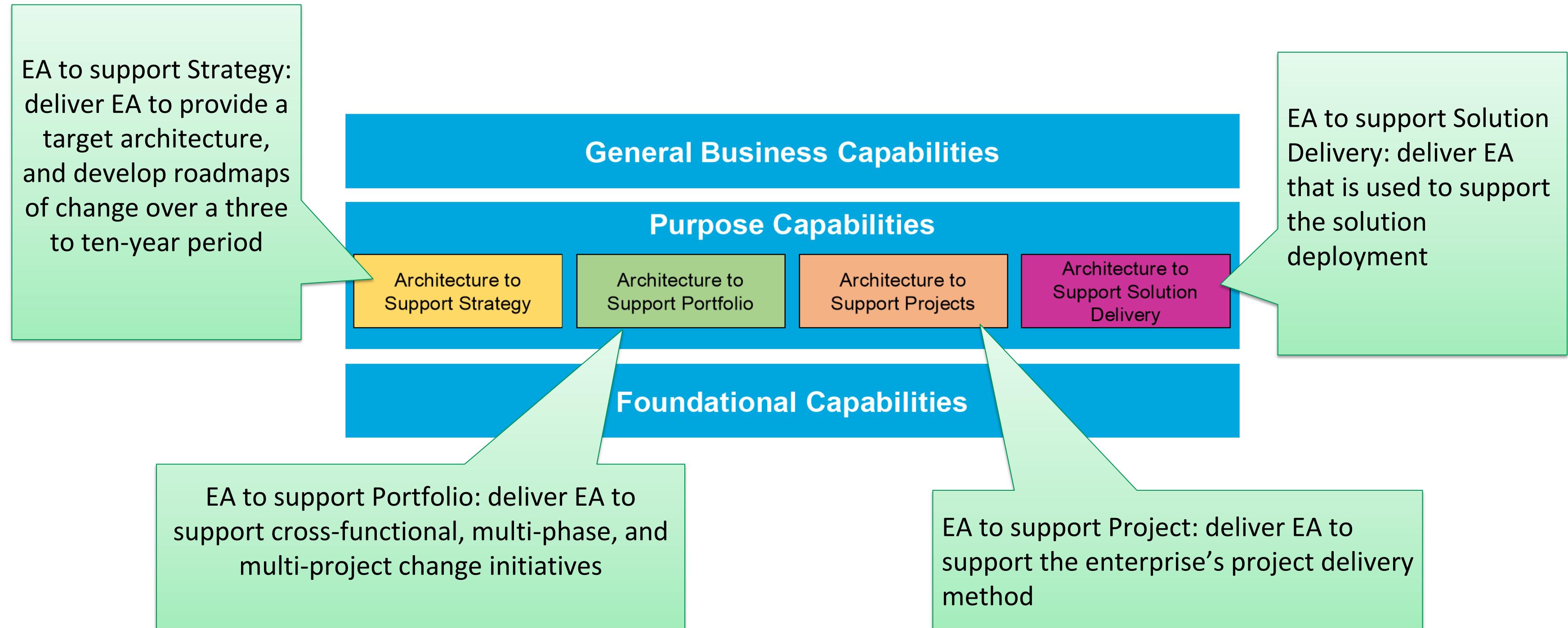
- ❑ Models consistently describe the current and Target Architecture.
- ❑ The primary purpose of the models is to facilitate the architect to understand the system being examined.
- ❑ A secondary purpose is re-use.

1.3 Architecture Capability

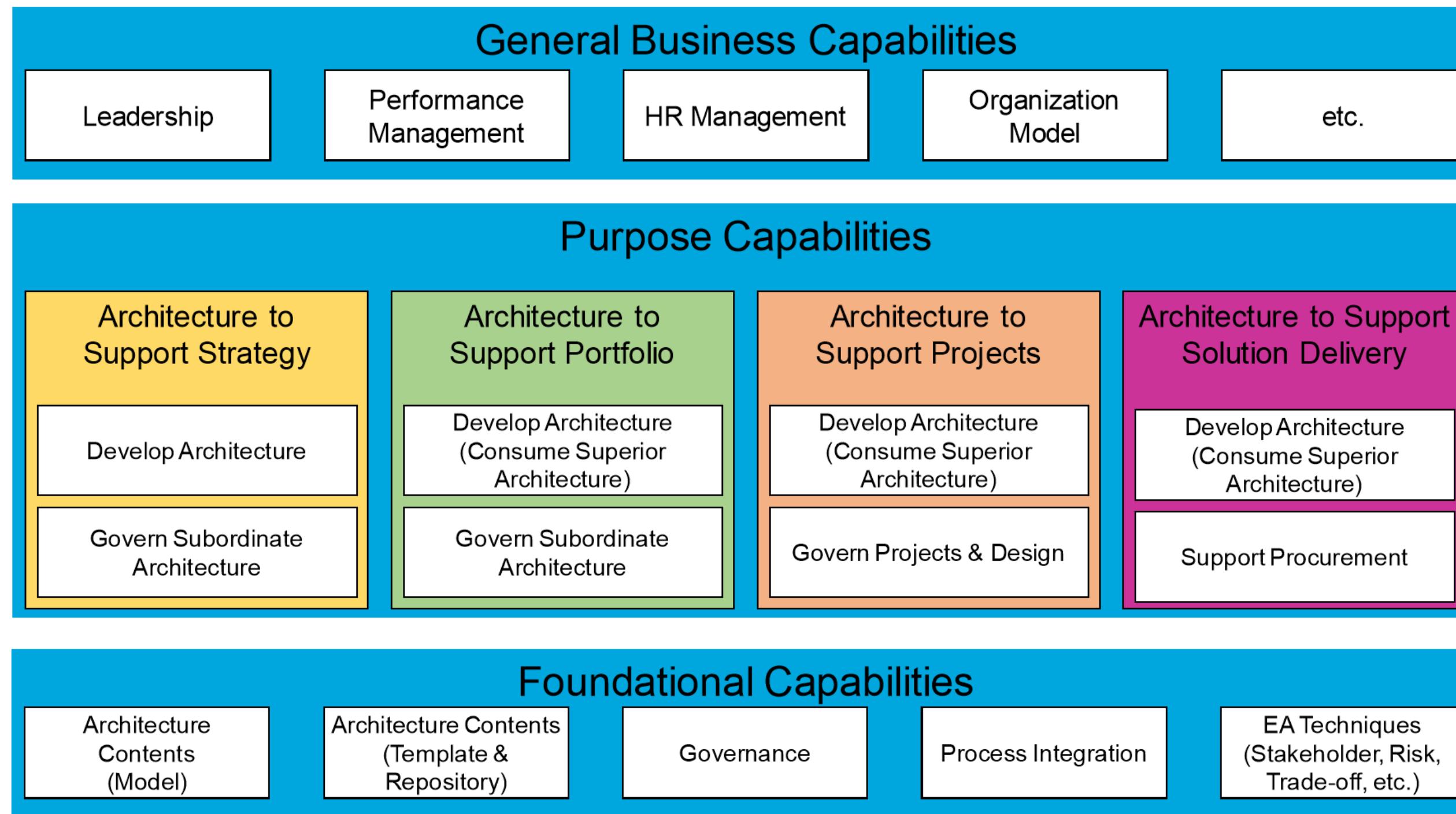
Architecture Capability (aka EA Capability)

- In order to carry out architectural activity effectively within an enterprise, it is necessary to put in place an appropriate business capability for architecture, through organisation structures, roles, responsibilities, skills, and processes.
- An EA Capability is the ability to develop, use, and sustain the architecture of a particular enterprise, and use the architecture to govern change.
- EA Capability is used here as a management concept that “facilitates planning improvements in the ability to do something that leads to enhanced outcomes enabled by the Capability”.

Example: “Four Purpose” EA Capability Model



Example: Decomposition of “Four Purpose” EA Capability Model



1.4 Architecture Governance and the role of an Enterprise Architect

Governance

- ISO/IEC 38500:2015 defines governance as:
“a system that directs and controls the current and future state”.
- Governance is a decision-making process with a defined structure of relationships to direct and control the enterprise to achieve stated goals.



Architecture Governance and the Enterprise Architect Role

Two distinct things must be governed and supported by the Enterprise Architect:

1. The development of the Target Architecture
2. All change within the scope of the Target Architecture.

The Enterprise Architect Role

- The Enterprise Architect supports their organisation's leadership directing and controlling change through the governance of the development of the Target Architecture.
- Governance of all change within the scope of the Target Architecture enables to develop a good target that provides an organisation's best achievable course forward.
- Typically, the Enterprise Architect and implementer are directed, and both are controlled by the stakeholder.

1.5 Architecture Compliance, Levels of Conformance, Reviews, and the Role of the Architect

Architecture Compliance

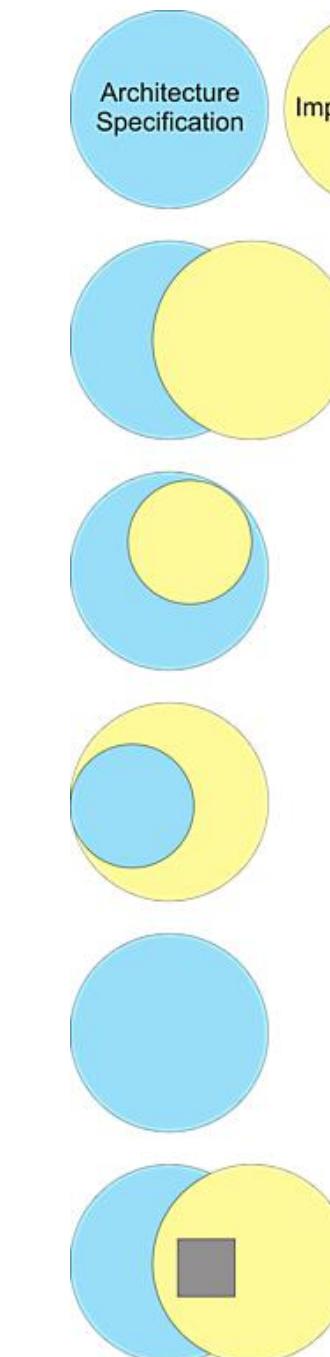
Ensuring the compliance of individual projects with the Enterprise Architecture is an essential aspect of Architecture Governance

There are usually two complementary processes:

1. The **Architecture** function will be required to prepare a series of Project Architectures
2. The **Enterprise and IT Governance** functions will define a formal Architecture Compliance review process for reviewing the compliance of all projects to the Enterprise Architecture

Level of Conformance

- A key relationship between the architecture and the implementation lies in the definitions of the terms "conformant", "compliant", etc
- While terminology usage may differ between organisations, the concepts of levels of conformance illustrated in the figure should prove useful in formulating an IT compliance strategy.



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Irrelevant:

The implementation has no features in common with the architecture specification (so the question of conformance does not arise).

Consistent:

The implementation has some features in common with the architecture specification, and those common features are implemented in accordance with the specification. However, some features in the architecture specification are not implemented, and the implementation has other features that are not covered by the specification.

Compliant:

Some features in the architecture specification are not implemented, but all features implemented are covered by the specification, and in accordance with it.

Conformant:

All the features in the architecture specification are implemented in accordance with the specification, but some more features are implemented that are not in accordance with it.

Fully Conformant:

There is full correspondence between architecture specification and implementation. All specified features are implemented in accordance with the specification, and there are no features implemented that are not covered by the specification.

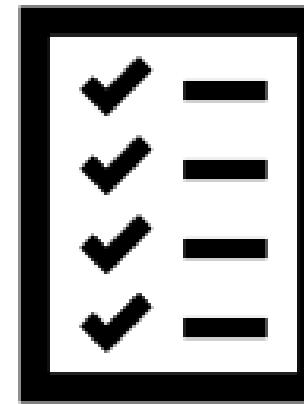
Non-conformant:

Any of the above in which some features in the architecture specification are implemented not in accordance with the specification.

Reviews

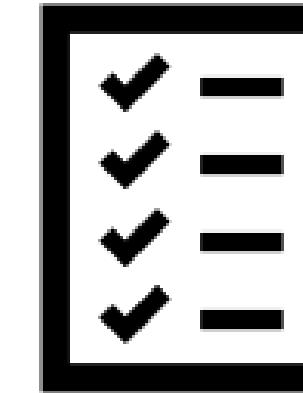
- An Architecture Compliance review is a scrutiny of the compliance of a specific project against established architectural criteria, spirit, and business objectives.
- A formal process for such reviews normally forms the core of an Enterprise Architecture Compliance strategy.

Checklists



Target Checklist

- ✓ Used to execute Architecture Governance.
- ✓ Only stakeholders can approve architecture.



Implementation and Other Change Checklist

- ✓ Designed to assist the Practitioner understand what must be demonstrated during the governance process to address a non-compliance report.

Note on Using the Target Checklist

The last question is “Have the stakeholders approved the views?”

- If the answer is **yes**, the governance process is done.
- If the answer is **no**, then there is a decision on whether the Practitioner should rework the architecture or the Architecture Project should be cancelled.

The Role of the Architect in Architecture Compliance

- ✓ Two governance roles are often performed: the Auditor and the Architect.
- ✓ Compliance assessment is an auditor role. When non-compliance is identified, the architect needs to produce an impact assessment and recommendation on what to do.
- ✓ Impact must be assessed on the same terms as the target was developed. Assessing on any other terms invalidates the assessment and recommendation.

1.6 How an Architecture enables alignment to Organisational Objectives using Agile development as an example

Architecture in an Agile Enterprise

- ❑ Agile development aligns with ADM Phase G, Implementation Governance

A good Architecture (developed in Phases A-F) will identify what products the Enterprise needs, the boundary of the products, and what constraints a product owner has.

- ❑ Architecture will have a set of constraints that limit the choices of the Agile team — often termed as guardrails

Focus on Risk Mitigation

- The Practitioner needs to provide support for the change activity.
- There should be a focus on risk mitigation, to ensure that the project meets its objectives.
- The Practitioner needs to act as the stakeholder's agent.

1.7 The need to Manage Multiple Architecture States

Multiple Architecture States



Current – or Baseline: What you have in place.

Candidate (Candidate Transition & Candidate Target): An unapproved Transition or Target. A working hypothesis.

Transition & Target: What you have in Phase F when ‘the architecture is approved’.

Target: Where the current time-horizon of architecture development ends. That is an approved Target state. There may be a new Target later.

Transition: Reasonable places between Current/Baseline and Target, where it is possible to stop further progress and gain value.

Managing Multiple States (Candidate, Current, Transition, and Target)

- ❑ The Practitioner must track the Architecture states across two characteristics:
 - 1) Time
 - 2) A Conformance Test
- ❑ Tracking conformance facilitates the Implementation Project and operational change governance.

Managing Complex Roadmaps

Complexity increases when you add in:

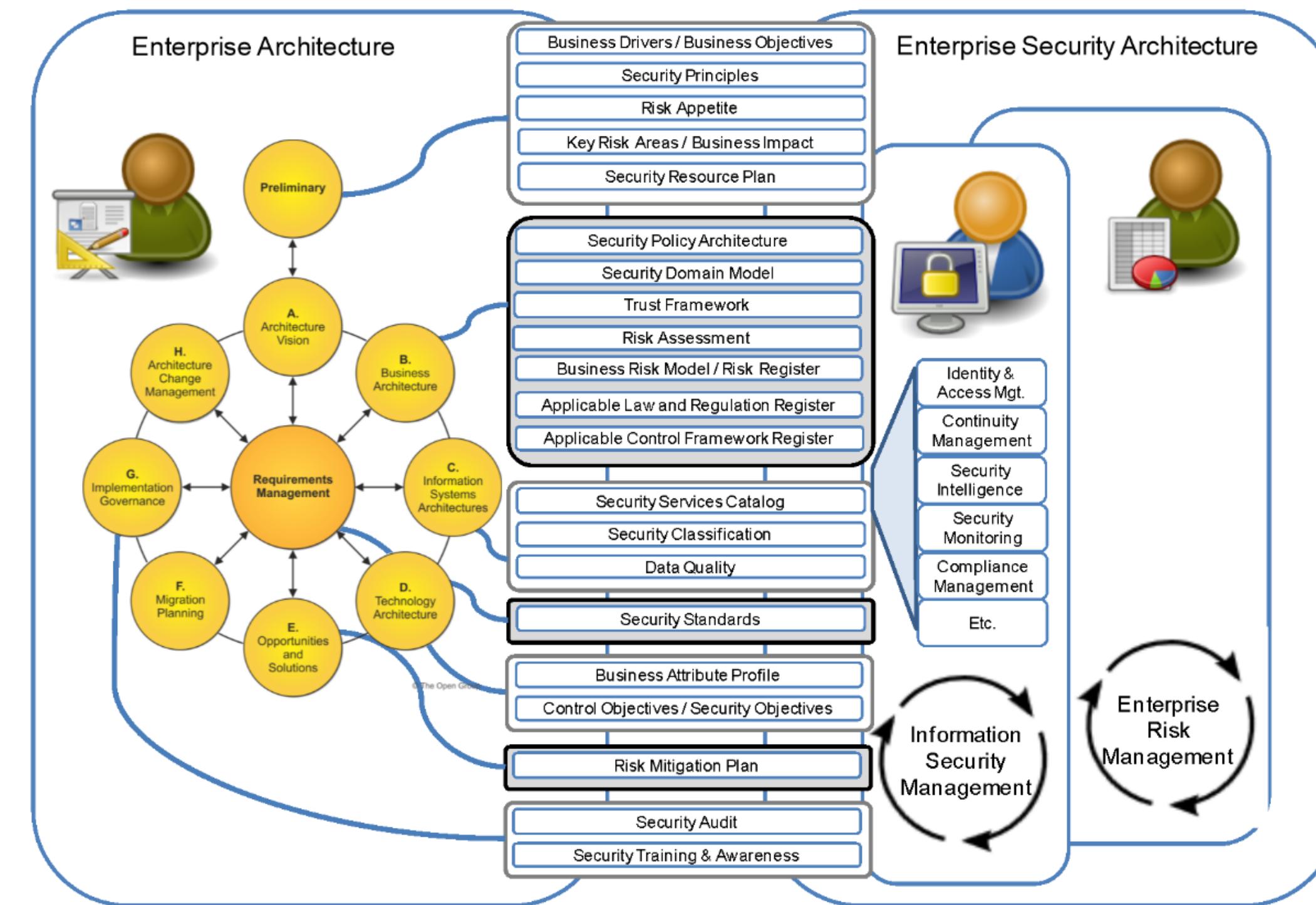
- The four characteristics of the EA Landscape: breadth, depth, time, and recency
- The different Architecture Projects that can work on the same subject at different times and at different levels of detail

Factors adding to the Complexity

- Advancements and changes outside the Enterprise
- Shared services
- Collaboration with suppliers and partners, including portfolio ownership model
- Impenetrable dependencies
- Multiple geopolitical boundaries (fiscal calendars, regulations, cultures)
- Varying rate of maturity and growth of teams
- EA team model (federated, centralised, etc.)
- Availability of multiple solutions or announcement of end-of-life for products currently in use

1.8 Enterprise Security Architecture

Essential Security and Risk Concepts and their Position in the TOGAF ADM



Security Architecture

- A structure of organisational, conceptual, logical, and physical components that interact in a coherent fashion in order to achieve and maintain a state of managed risk and security (or information security).

It is both a driver and enabler of secure, safe, resilient, and reliable behavior, as well as for addressing risk areas throughout the enterprise.



Enterprise Security Architecture

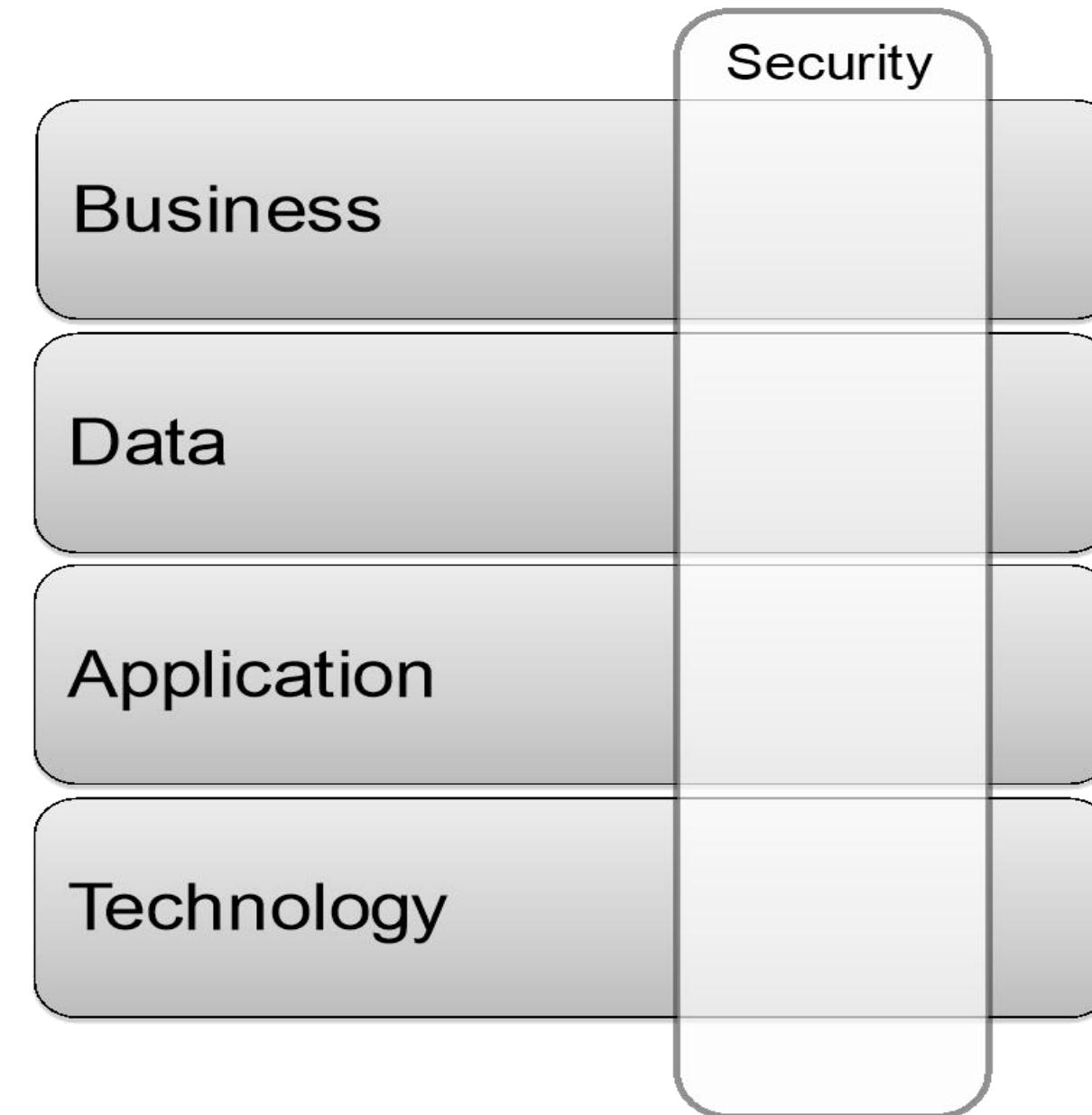
- ❑ An Enterprise Security Architecture does not exist in isolation.
- ❑ A close integration of Security Architecture in the Enterprise Architecture is beneficial
- ❑ It builds on enterprise information that is already available in the Enterprise Architecture, and it produces information that influences the Enterprise Architecture.
- ❑ Doing it right the first time saves costs and increases effectiveness compared to bolting on security afterwards.

1.9 Security, a Cross-Cutting Concern

Security as a Cross-Cutting Concern

- The TOGAF ADM covers the development of the four architecture domains commonly accepted as subsets of an Enterprise Architecture: Business, Data, Application, and Technology.

- The Security Architecture interacts with all four of them and is therefore called cross-cutting.



1.10 Managing Uncertainty in order to optimise Maximum Business Benefit and Minimum Business Loss

Risk and Uncertainty

- Risk is the effect that uncertainty has on the achievement of business objectives.
- Uncertainty typically involves a deficiency of information and leads to inadequate or incomplete knowledge or understanding.
- The uncertainty is concerned with predicting future outcomes, given the limited amount of information available when making a business decision.
- This information can never be perfect, although our expectation is that given better quality information we can make better quality decisions

Decision making based on Risk Management

Every decision is based on assessing:

- the balance between potential opportunities and threats
- the likelihood of beneficial outcomes versus damaging outcomes,
- the magnitude of these potential positive or negative events
- the likelihood associated with each identified outcome. Identifying and assessing these factors is known as “risk assessment” or “risk analysis”

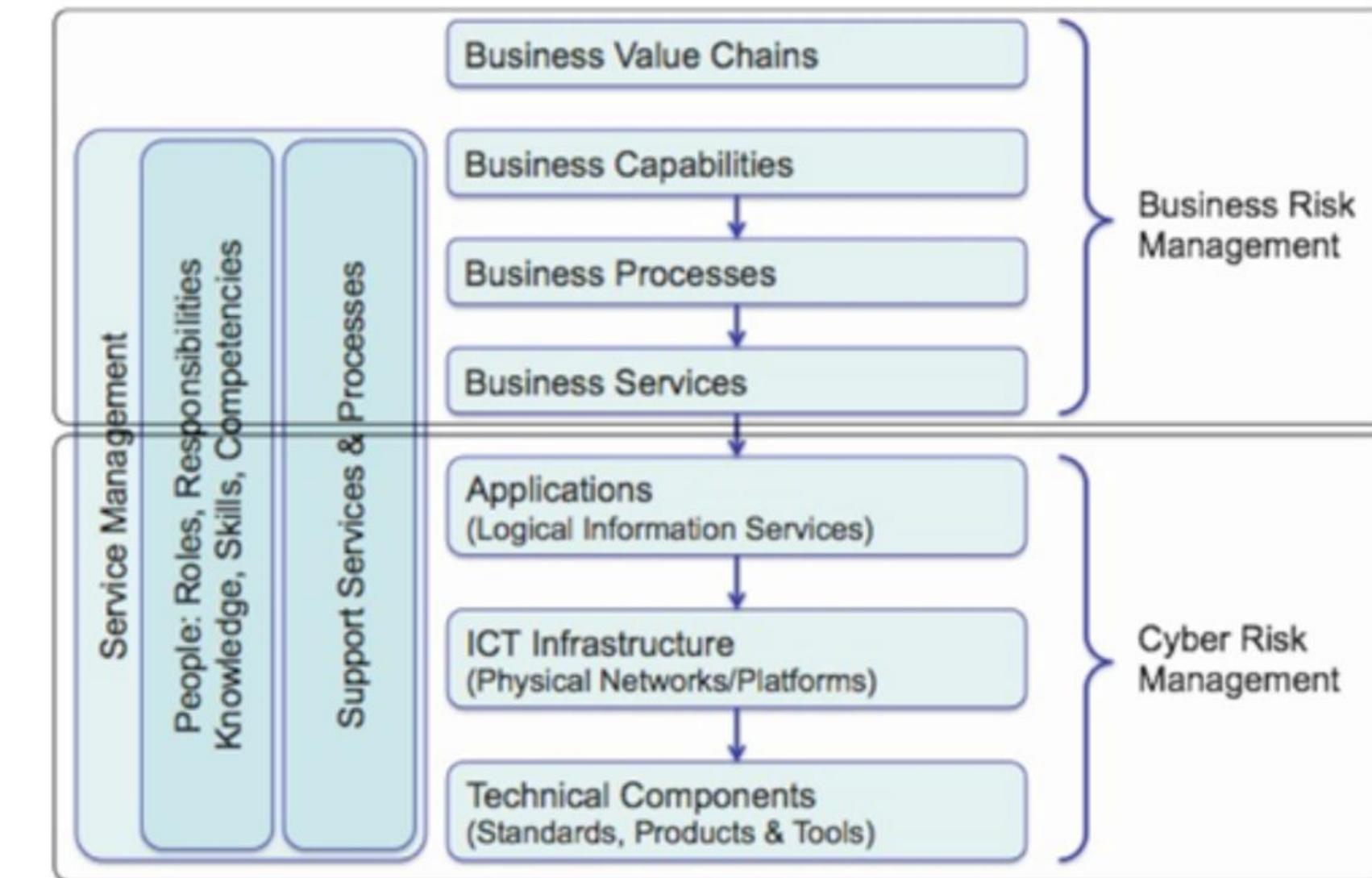
Risk related Concepts

- “Risk management” is the art and science of applying these concepts in the decision-making process.
- Risk can be seen at the strategic long-term level (overall direction of the business), the medium term tactical level (transformation projects and programs), and at the operational level (regular day-to-day operational decisions, processes, and practices).
- The objective of risk management is to optimise business outcomes to maximise business value and minimise business losses.

Risk and Business Stack

- ❑ Risk can be seen at any level in the business stack but is always driven top-down from assessment of business value and its optimisation.

Business Stack

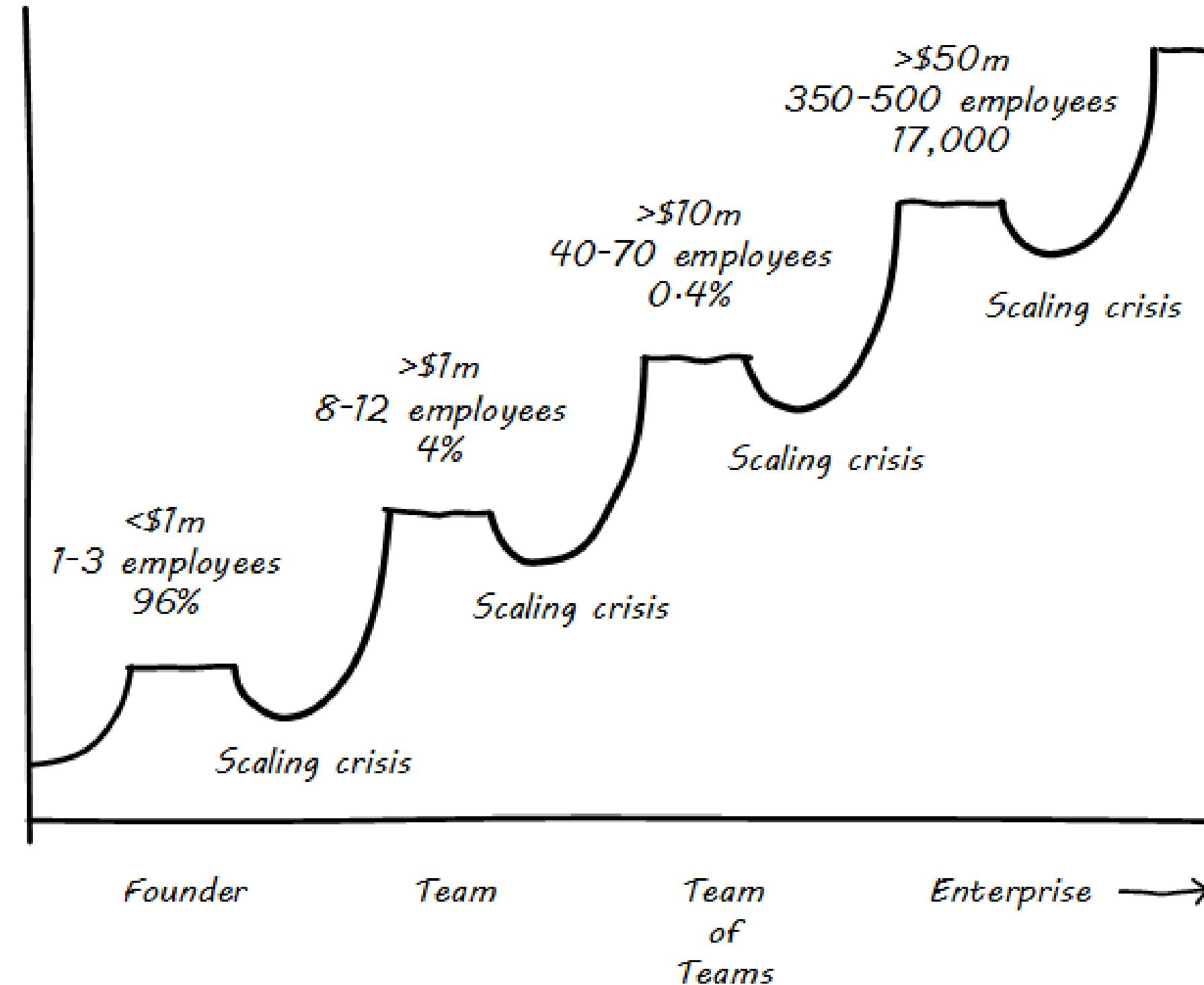


Business Risk *versus* Cyber Risk Areas
(Figure: Copyright© The SABSA Institute)

1.11 The Enterprise Architect and Enterprise Architecture in a Digital Enterprise

Digital Practitioner Body of Knowledge

Scaling Model



Context I – Individual Founder

- The Individual/Founder context addresses “minimum essential concerns they must address to develop and sustain a basic digital product”.
- This context represents the bare minimum requirements of delivering digital value.

Context I Individual/Founder: The Role of Architecture and the Architect

Architecture Role

- Used as a communication medium. Architecture models communicate very well.
- It provides the necessary descriptions to communicate the infrastructure available and its appropriate use for both development and delivery
- Use to support and provide answers to questions about Agile development and continuous delivery.

Architect Role

- A communicator and considered a key enterprise networker.
- Helps to identify existing infrastructure approaches that may be embedded in larger organisations, and to communicate vetted technical requirements to the infrastructure organisation to ensure preparation for new workloads
- Can be approached to provide guidance in these areas on demand, based on their practical experience

Context II - Team

- The team has a single mission and a cohesive identity, but does not need a lot of overhead to get the job done.
- The Team context covers the basic elements necessary for a collaborative product team to achieve success while remaining at a manageable human scale.
- Establishing team collaboration as a fundamental guiding value is essential to successful digital product development.
- The team is all in the same location, and can still communicate informally, but there is enough going on that it needs a more organised approach to getting work done.

Context II Team: The Role of Architecture and the Architect

Architecture Role

- Enterprise Architecture can assist Product Management by providing models that map to a given digital product profile.
- It makes interdependencies explicit, assuring an holistic view of the digital product.
- Used to depict processes and workflows in very simple to very complex levels of detail
- Provides models to depict how operations are expected to run

Architect Role

- Can ensure efficacy of communication and collaboration.
- Helps to communicate risks and mitigations
- Able to deliver this support in an on-demand, service-oriented manner to meet the operating tempo of the team

Context III – Team of Teams

- ❑ The Team of Teams context is a natural evolution of the Teams context, but one where the number of people and digital products involved generates complexity.
- ❑ Coordinating across a team of teams is the main concern.
- ❑ Communication is again key to ensure successful collaboration and value delivery.

Context III Team of Teams: The Role of Architecture and the Architect

Architecture Role

- Enterprise Architecture helps to resolve concerns related to cultural issues in more complex organisations.
- It is used to depict
 - Portfolios of products
 - processes and control mechanisms and to identify and eliminate choke points and for continuous process improvement
 - Interdependencies
 - value generation, and cost
- supporting portfolio management decision-making

Architect Role

- Continues to ensure that risk is understood and communication is effective.
- Ensures that the digital products work together, leverage each other, and are appropriately coupled; thus, modeling and documenting the move from a specific digital product to portfolios of digital products that require interoperability.

Context IV – Enduring Enterprise

- The Enduring Enterprise context is about how to manage an enterprise that has been successful and is now faced with the realities of operating a sustainable business over periods of time longer than the next product cycle.

Context IV Enduring Enterprise: The role of Architecture and the Architect

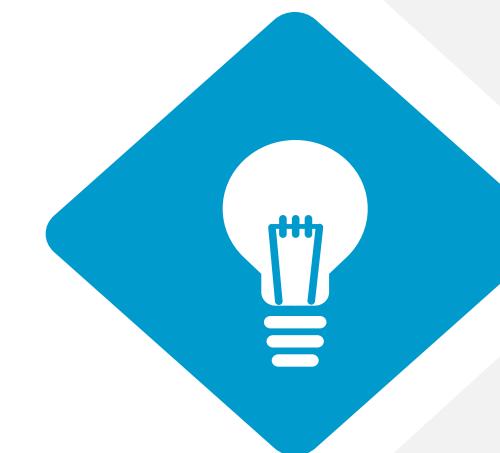
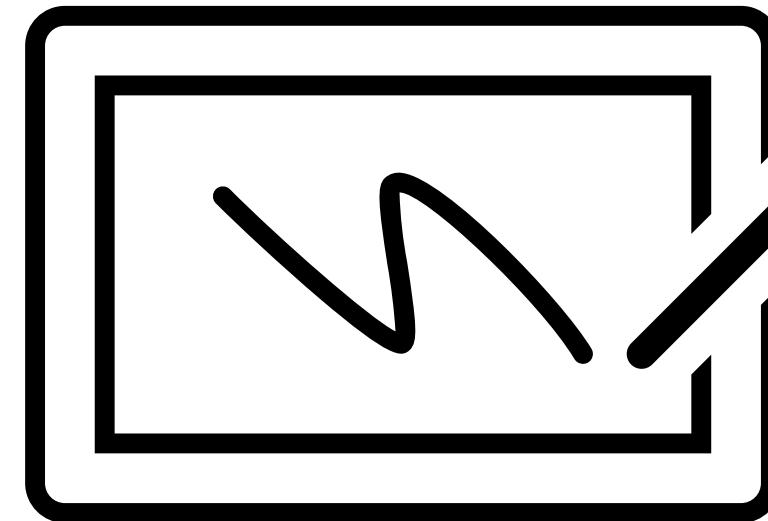
Architecture Role

- Helps managing risk
- Guide on Information Management through data and application architecture

Architect Role

- Supports the Enduring Enterprise in operating a sustainable business over periods of time longer than the next product cycle

Practice with Learning Studies The Context for Enterprise Architecture



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TOGAF® Enterprise Architecture Practitioner Unit 2- Stakeholder Management

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Unit 2

Concepts

2.1

How to identify Stakeholders, their Concerns, Views, and the Communication involved

2.2

The use of Architecture Views

2.3

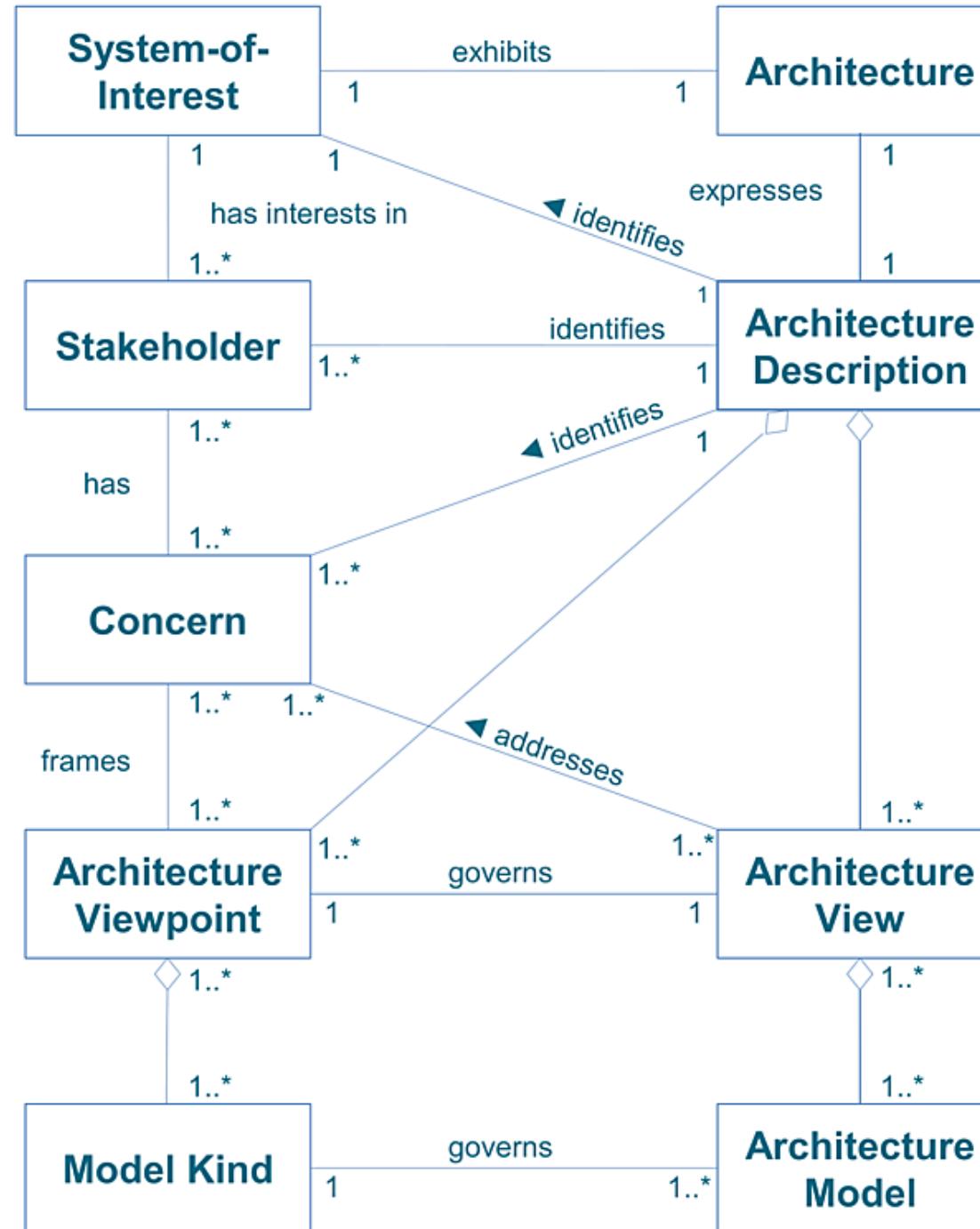
Stakeholder Engagement and Requirements Management

2.4

Using Trade-off to Support Architecture development

2.1 How to identify Stakeholders, their Concerns, Views, and the Communication involved

Modeling approach



- The TOGAF Standard takes a formal modeling approach to understanding stakeholder, concern, and view.

Check the learning studies documents: Page 11

A Practical Perspective

- **Stakeholder:** someone who has approval rights in the Target Architecture being explored by the current Architecture Project, and subsequently has decision rights to the suitability of the implementation
- **Concern:** a consistent set of subjects that capture the stakeholder's interests and act to consolidate requirements
- **View:** a representation of the EA Landscape that addresses a set of stakeholder's concerns; either describe how the architecture addresses the concerns or demonstrate how the associated requirements are met

Source: ADM Practitioners' Guide

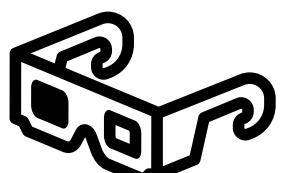
Concerns

- From a practical perspective we consider a concern to be a topic.
- A concern addresses the stakeholder's power, interest, and requirements against this topic.
- This approach surfaces topic-based decision rights and provides the ability to perform a trade-off between competing requirements.
- A consistent set of core concerns aligned to Enterprise priority facilitates a focus on priority.

Sample Stakeholder Map

	Concern 1			Concern 2		
	Power	Interest	Requirement	Power	Interest	Requirement
Stakeholder 1	High	Low		Low	High	
Stakeholder 2	High	High		Low	Low	
Stakeholder N	Low	High		High	Low	

Recommendations to create a Stakeholder/Concern Matrix, Common Stakeholder Classes, Common Concern Classes and stakeholder responsibilities portfolio, are included in the course handout.



Views and Viewpoints

- ❑ A view simply addresses a stakeholder's concern about an architecture.
- ❑ Often it is a potential architecture, and the view serves to help the stakeholder's potential target and associated change, allowing a stakeholder to put things in context and have confidence about the target and the change.
- ❑ When stakeholders understand the architecture, the change, and the trade-offs, implementation governance is possible.
- ❑ Each viewpoint should identify the concern, the stakeholder(s), how the view should be constructed, and the information required to address the question.

2.2 The use of Architecture Views

Developing Architecture Views

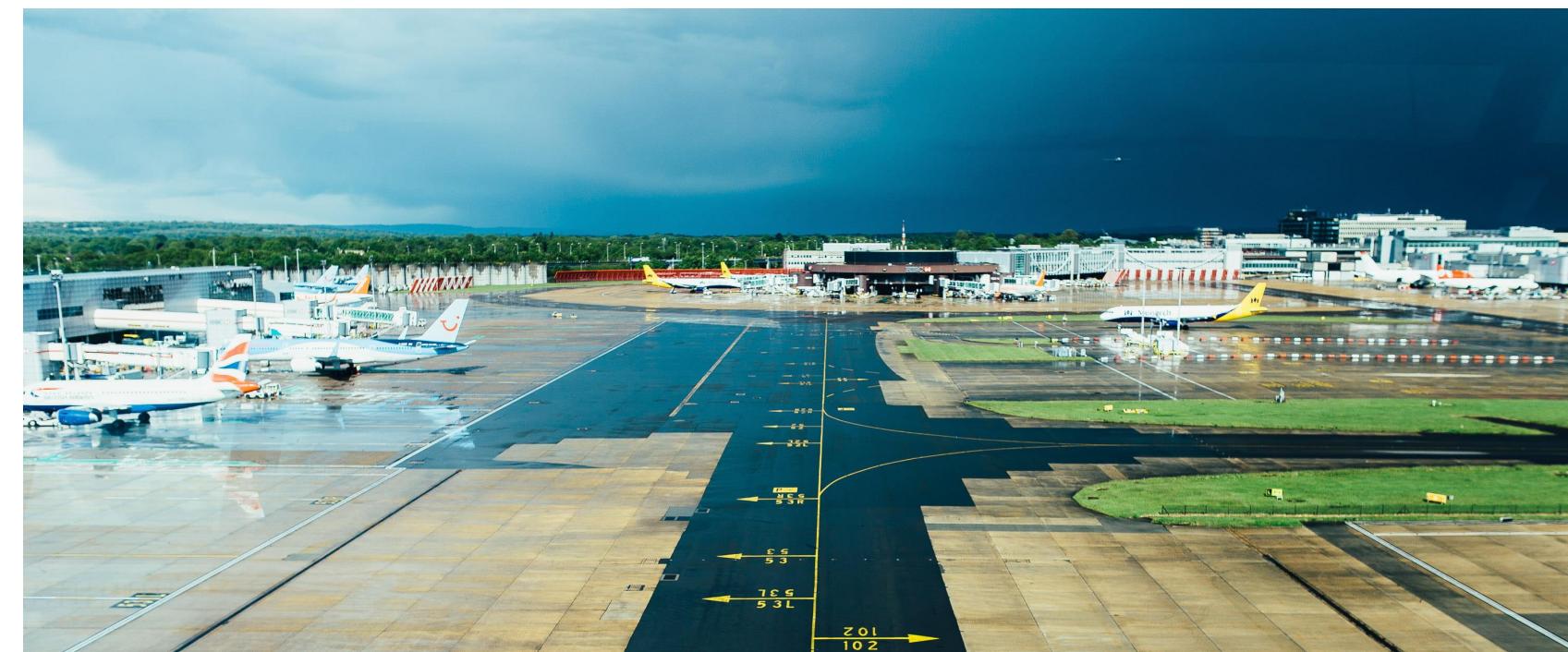
- The choice of which architecture views to develop is one of the key decisions that the architect must make.
- The architect has a responsibility for ensuring:
 - The completeness of the architecture
 - The integrity of the architecture

Exercise: Simple Airport System



Exercise: 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.
- Questions:
 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



Architecture Views

- One architecture view can be developed from the architecture viewpoint of the pilot, which addresses the pilot's concerns.
- Equally, another architecture view can be developed from the architecture viewpoint of the air traffic controller.
- Neither architecture view completely describes the system in its entirety, because the architecture viewpoint of each stakeholder constrains (and reduces) how each sees the overall system.



Architecture Viewpoints

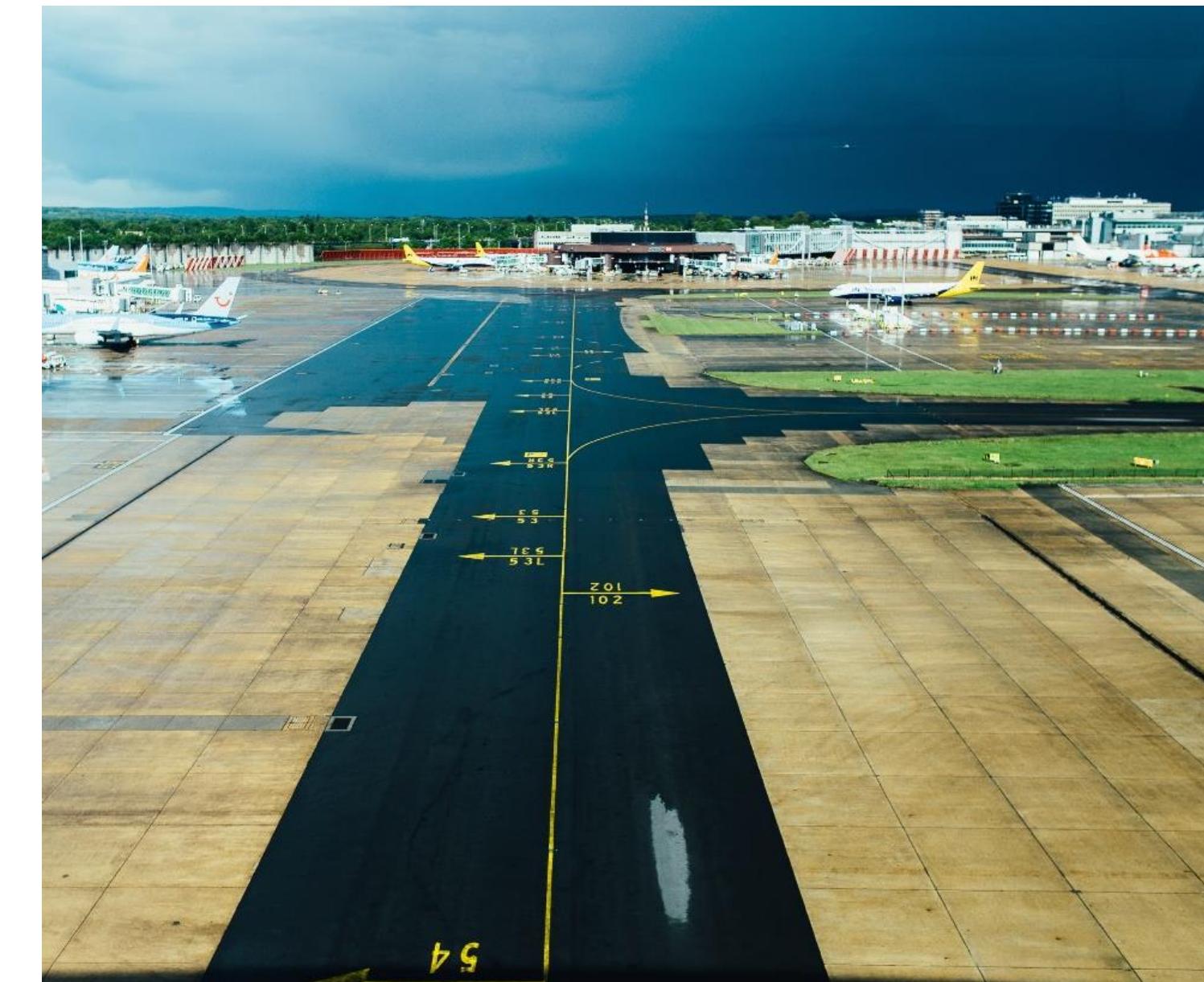
- The architecture viewpoint of the pilot comprises some concerns that are not relevant to the controller, such as passengers and fuel, while the architecture viewpoint of the controller comprises some concerns not relevant to the pilot, such as other planes.

- There are also elements shared between the two architecture viewpoints, such as the communication model between the pilot and the controller, and the vital information about the plane itself.



Common Language

- Fortunately, when controllers talk with pilots, they use a common communication language. (In other words, the models representing their individual architecture viewpoints partially intersect.) Part of this common language is about location and vectors of aircraft, and is essential to safety.



Tools

- Tools exist to assist stakeholders, especially when they are interacting with complex models such as the model of an airspace, or the model of air flight.

- When stakeholders use common tools, such as the radio contact between pilot and controller, a common language is essential.



2.3 Stakeholder Engagement and Requirements Management

Stakeholder Engagement

- ❑ The TOGAF framework places requirements management and stakeholder engagement at the center of architecture development.
- ❑ Practitioners develop EA in accordance with the preferences and priorities of their organisation's stakeholders.
- ❑ Stakeholders own the architecture and the value preference and priority the architecture is expected to enable.

Stakeholder Engagement

- Good Practitioners are passionately engaged in the future of their organisation, as well as participating in defining and realising the target state.
- They typically perform several roles: they will act as Subject Matter Experts (SMEs) and agents for their stakeholders in addition to developing architecture.
- As an SME, the Practitioner is a source of expert advice. As an agent, the Practitioner may speak on behalf of a stakeholder.

Requirements Management

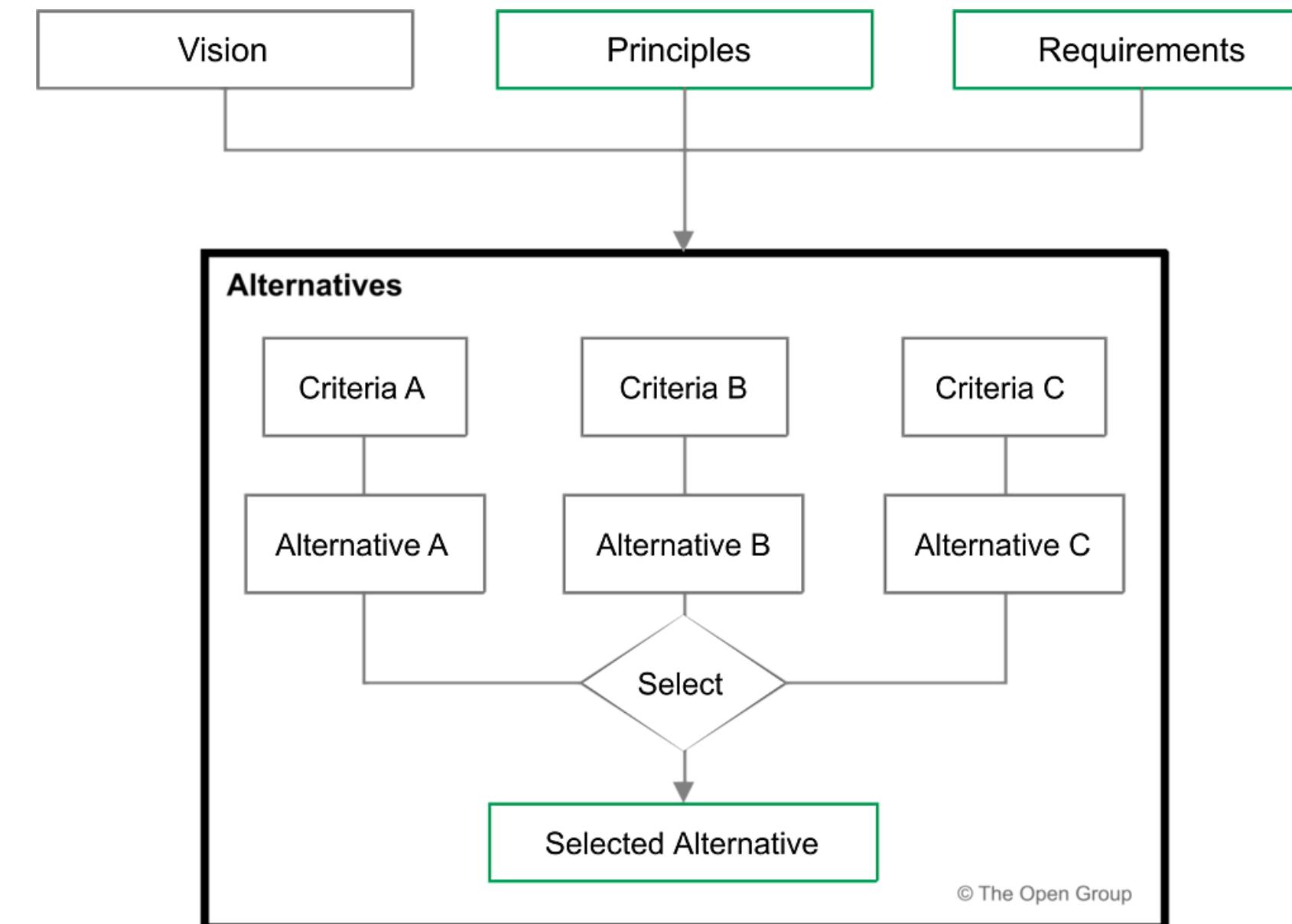
- Effective requirements management is dependent upon:
 - Clear traceability from the organisation's vision
 - Mission
 - Business model
 - Strategies
- through the most detailed statement of requirement.

Effective Engagement

- Effective engagement is based upon effective communication.
- Effective communication is based on the concept of view and viewpoint.
- Different stakeholders have different concerns about the architecture. These concerns must be addressed and represented effectively to the stakeholder to enable the stakeholder to approve the Target Architecture.

2.4 Using Trade-off to Support Architecture development

Architecture Trade-off Method



Method

- The first part of the method uses the vision, principles, requirements, and other information to select sets of criteria fitting for different alternatives.
- The second part of the method defines alternatives based on the criteria and builds understanding of each.
- The third part of the method will either select one of the alternatives, or else combine features from more than one, to create the proposed alternative.

Trade-off

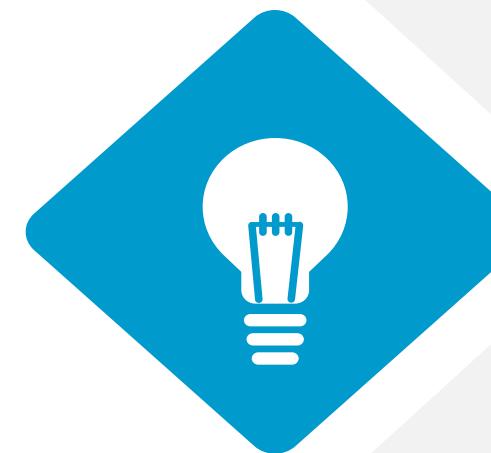
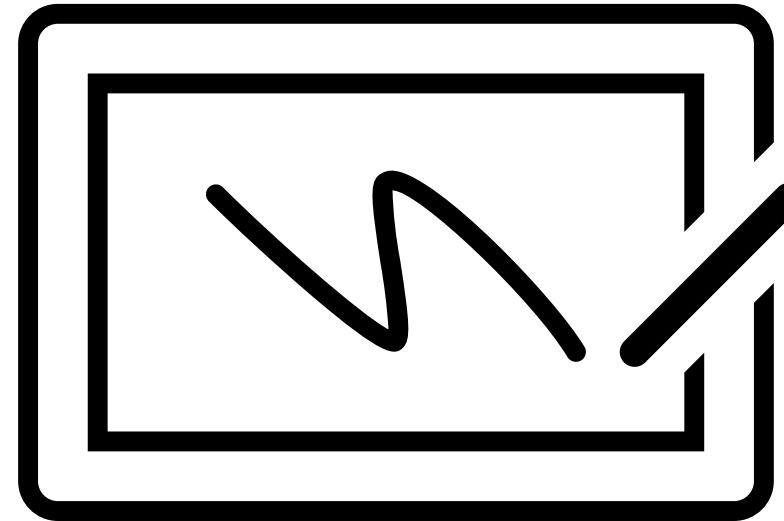
- Trade-off requires a deliberate selection between one stakeholder's preferences as well as between different stakeholders' preferences.
- Effective trade-off requires understanding value preference and priority as well as the scope of change necessary to realise the target.
- Practitioners are most valuable facilitating trade-off between stakeholders and across organisational boundaries allowing different stakeholders to effectively measure preferences, priorities, and costs that they do not intuitively understand.

Trade-off Decisions

- The most common interpretations of trade-off are
 - “a balance achieved between two desirable but incompatible features. A compromise”
 - And
 - “losing one quality, aspect, or amount of something in return for gaining another quality aspect, or amount”.

Practice with Learning Studies

Stakeholder Management



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TOGAF® Enterprise Architecture Practitioner

Unit 3- Phase A, the Starting Point

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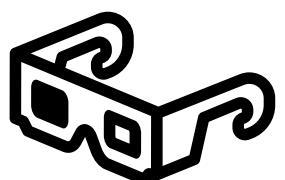
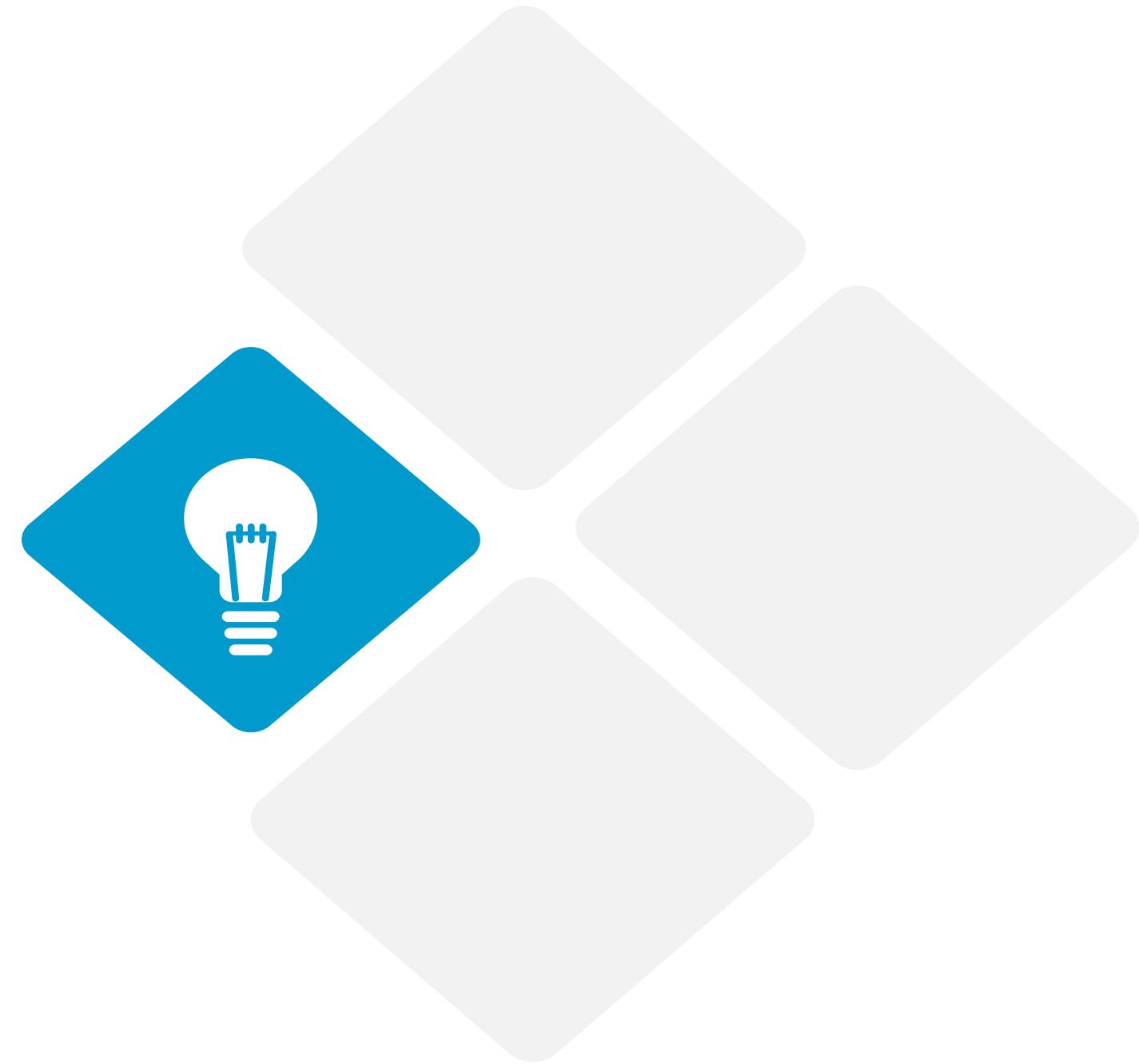
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- §6 The Architecture Development Method

”



Unit 3

Concepts

3.1

Information necessary to execute the Architecture Vision phase

3.2

How to apply Phase A and how it contributes to Architecture Development Work

3.3

Security-specific Architecture Design that is sufficient — Phase A

3.4

Outputs necessary to proceed with the Architecture Development

3.1 Information necessary to execute the Architecture Vision phase

Key Steps to Identify Information

- Identify stakeholders, concerns, and business requirements
- Define scope
- Evaluate capabilities

Identify the Information necessary to execute the Phase (1)

- Identify stakeholders, concerns, and business requirements
Explore the EA Repository for superior architecture constraints and guidance. Do the Stakeholder Map. Be completely clear which stakeholders must be served and what they are worrying about.
- Define scope
- Evaluate capabilities

Identify the Information necessary to execute the Phase (2)

- Identify stakeholders, concerns, and business requirements
- Define scope (of the Architecture Project)

What problem are you solving? In terms of the EA Landscape (breadth and planning-horizon) and in terms of purpose, which will tend to confirm the necessary level of detail? Be completely clear where in the business cycle this architecture will be used.

- Evaluate capabilities

Identify the Information necessary to execute the Phase (3)

- Identify stakeholders, concerns, and business requirements
- Define scope
- Evaluate capabilities (of the EA team)

Take a hard look at the EA team and confirm the ability of the team to deliver on this architecture development project. A good EA team covers gaps in experience, skill, and bias to deliver the architecture that is useful, overcoming weaknesses of few members of the team.

More information through Iteration

- Iterate through all domains performing sufficient architecture development to enable you to communicate to the key stakeholders how the problem can be addressed and what the scope of change is.
- Be clear on the target, the value of the target, and the work to change.
- Completing the outputs of Phase A requires exploring all of the domains – whether the exploration is to understand what should change, or where change is not an option to determine the impact of retaining current architecture.
- There may be multiple potential targets after the initial exploration.

3.2 How to apply Phase A and how it contributes to Architecture Development Work

Phase A: Architecture Vision

– The Starting Point

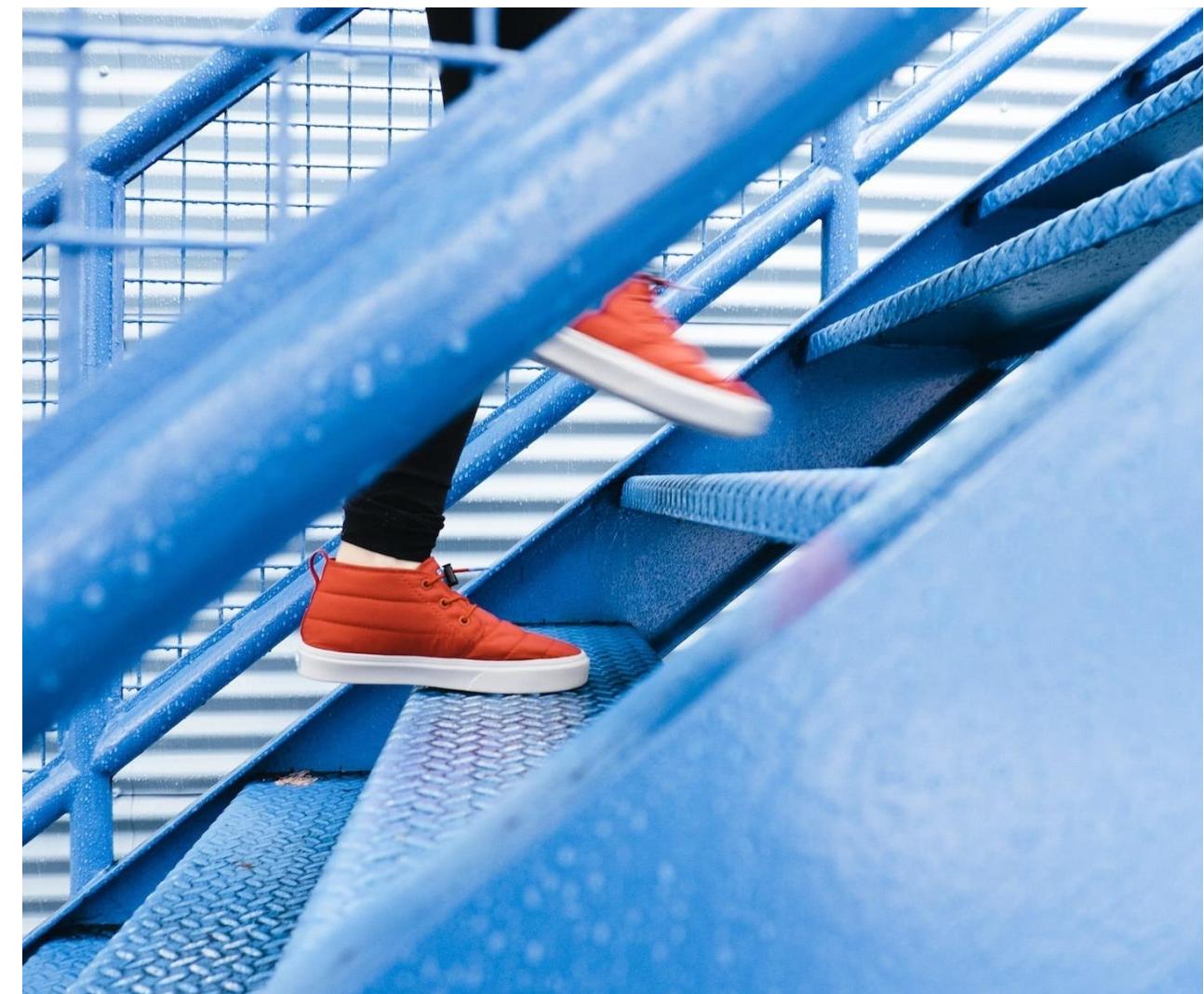
- The set-up essentials of Phase A are:
 - Define the scope of the Architecture Project
 - Identify stakeholders, concerns, and associated requirements
 - Assess the capability of the EA team

- The completion essentials of Phase A:
 - Key stakeholder agreement on a summary of the target and the work to reach the target

Phase A: Architecture

Vision Recommended Steps

- Establish the architecture project
- Identify stakeholders, concerns, and business requirements
- Confirm and elaborate business goals, business drivers, and constraints
- Evaluate capabilities
- Assess readiness for business transformation
- Define scope
- Confirm and elaborate Architecture Principles, including business principles
- Develop Architecture Vision
- Define the Target Architecture value propositions and KPIs
- Identify the business transformation risks and mitigation activities
- Develop Statement of Architecture Work; secure approval



How to apply the Phase

- The level of detail addressed in Phase A will depend on the scope and goals of the Request for Architecture Work, or the subset of scope and goals associated with this iteration of architecture development.

- The order of the steps in Phase A as well as the time at which they are formally started and completed should be adapted to the situation at hand in accordance with the established Architecture Governance.

Check the learning studies documents: Page 15

3.3 Security-specific Architecture Design that is sufficient — Phase A

Phase A: Sufficient Security-specific Architecture

- In Phase A sufficient security-specific architecture design should be carried out to:
 - Satisfy the security stakeholders that the end-state does not represent any unknown or unacceptable risk and aligns with corporate policies, standards, and principles
 - Satisfy business stakeholders – in particular those who control the budget – that the Security Architecture is instrumental in enabling and supporting the overall architecture required to deliver the business opportunities and benefits identified with the right balance between risk, compliance, and business benefits

Stakeholder Approval

- All stakeholders will have security and risk concerns and associated requirements. The stakeholder requirements are gathered to determine the security blueprint needed to address the various concerns the stakeholders have.
- Stakeholders typically have value concerns related to the Security Architecture. Value may be measuring items such as reduced risk and enablement of the overall architecture.
- The viewpoints and business cases must build on Security Principles, drivers, key risks, and risk appetite and should be an integral part of the overall Architecture Vision deliverables.

3.4 Outputs necessary to proceed with the Architecture Development

Phase A: Architecture Vision

– Recommended Outputs

- Approved Statement of Architecture Work
- Refined statements of business principles, business goals, and business drivers
- Architecture Principles
- Capability Assessment
- Tailored Architecture Framework
- Architecture Vision
- Draft Architecture Definition Document
- Communications Plan
- Additional content populating the Architecture Repository

Statement of Architecture Work

- The Statement of Architecture Work defines the scope and approach that will be used to complete an architecture development cycle.
- The Statement of Architecture Work is typically the document against which successful execution of the architecture project will be measured and may form the basis for a contractual agreement between the supplier and consumer of architecture services.

Architecture Vision

- It provides a summary of the changes to the enterprise that will accrue from successful deployment of the Target Architecture.
- The purpose of the Architecture Vision is to provide key stakeholders with a formally agreed outcome. Early agreement on the outcome enables the architects to focus on the detail necessary to validate feasibility.
- Providing an Architecture Vision also supports stakeholder communication by providing a summary version of the full Architecture Definition.

Communication Plan

- ❑ Enterprise Architectures contain large volumes of complex and inter-dependent information.
- ❑ Effective communication of targeted information to the right stakeholders at the right time is a critical success factor for Enterprise Architecture.
- ❑ Development of a Communications Plan for architecture allows for this communication to be carried out within a planned and managed process.

Essential Output

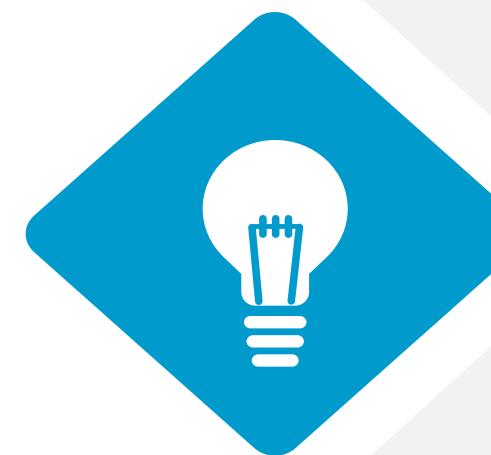
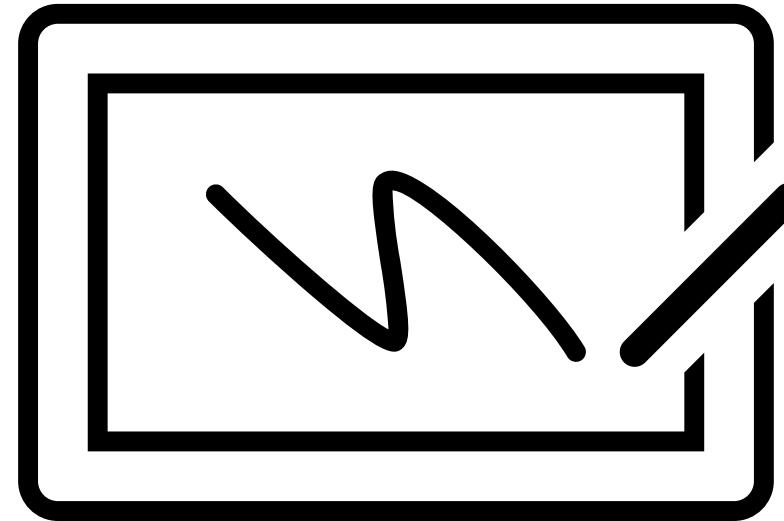
- Stakeholders, sponsor, and management want guidance on planning and executing an effective change, not an architecture,
- What the Enterprise values and consumes is typically different than what the Practitioner produces. Practitioners deliver an essential output.
- The intent is to keep the focus on the outcome being pursued, not what is done.

Phase A Summary: Output & Outcome & Essential Knowledge

Phase	Output & Outcome	Essential Knowledge
Phase A: Architecture Vision	<p>Sufficient documentation to get permission to proceed.</p> <p>Permission to proceed to develop a Target Architecture to prove out a summary target.</p>	<p>The scope of the problem being addressed.</p> <p>Those who have interests that are fundamental to the problem being addressed. (Stakeholders & Concerns)</p> <p>What summary answer to the problem is acceptable to the stakeholders? (Architecture Vision)</p> <p>Stakeholder priority and preference.</p> <p>What value does the summary answer provide?</p>

Practice with Learning Studies

Phase A, the Starting Point



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Unit 4– Architecture Development

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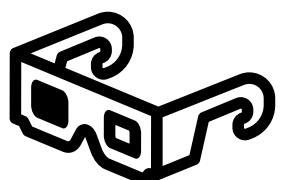
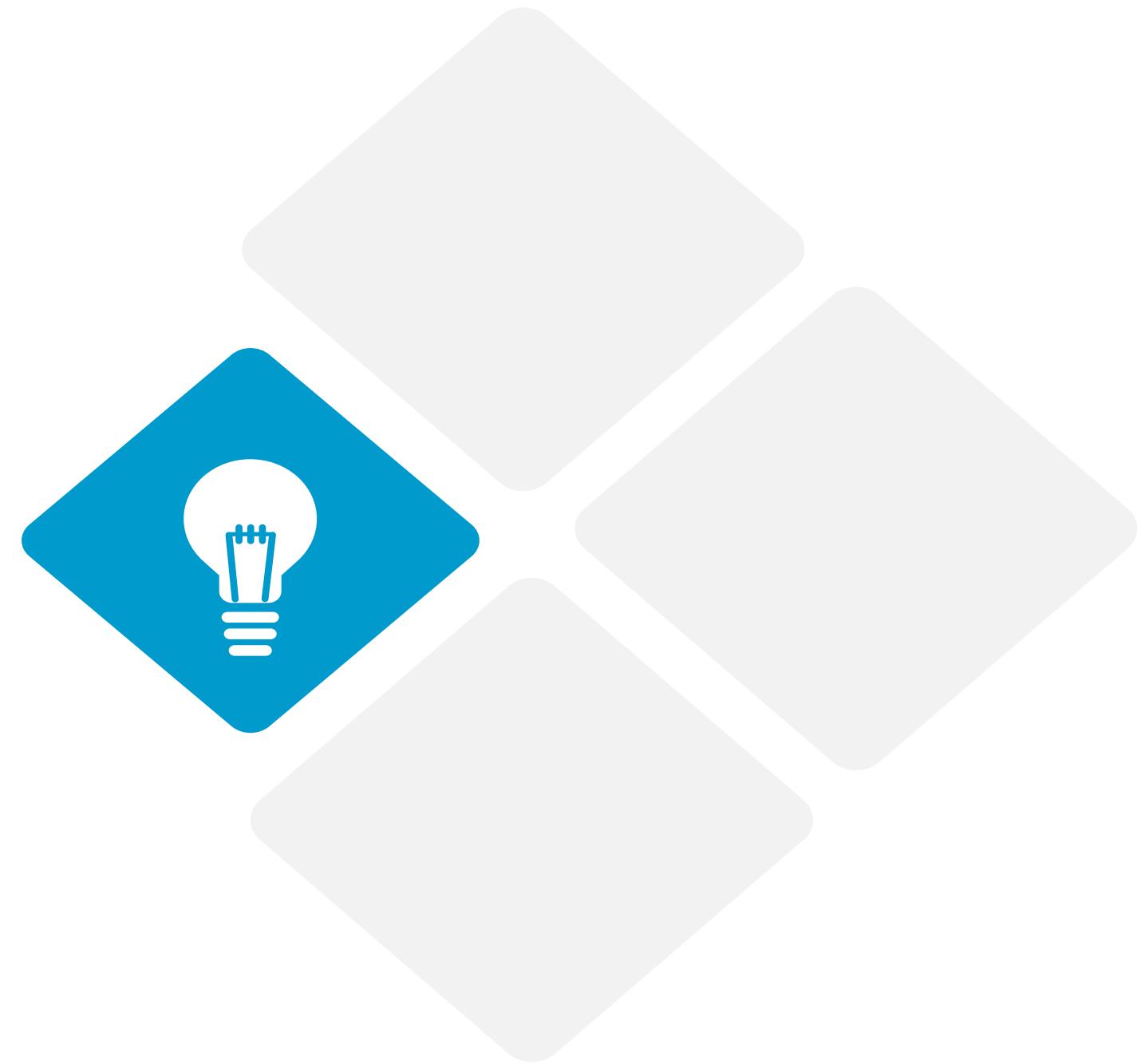
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Unit 4

Concepts

4.1

Steps applicable to all ADM Phases

4.2

Risk and Security considerations during the Architecture Development (ADM Phases B to D)

4.3

Relevant Information to produce outputs valuable to the Architecture Development

4.4,
4.6,4.8

How to apply Phases B, C, and D, and how they contribute to the Architecture Development work

4.5

Information relevant to Phase C (Data and Applications) to produce outputs for the Architecture Development

4.7

Information needed in Phase D to produce outputs relevant to the architecture development

4.9

Outputs of Phases B, C, and D necessary to proceed with the Architecture Development work

4.1 Steps applicable to all ADM Phases

Phase B, C and D – Common Steps

- The steps outlined in the TOGAF Standard to develop architecture in Phases B, C, and D are identical.
- They are identical because the approach to developing an architecture, confirming the work product developed fits, and confirming approval are identical.
- These steps are also mandatory. Steps can be skipped, but the final outcome could be at risk.



Select Reference Models, Viewpoints and Tools

□ Practitioners test with the following questions:

- Given a set of stakeholders and concerns, what information do you need to know about the system being examined to address their concerns?
- Given a set of information, how will you model, represent, capture, and analyse it?
- Are there reference models that allow you to skip to gathering and analysing rather than inventing?
- What information is missing from the EA Landscape right now?

Develop Target, Baseline, and Gap

- Just enough for the purpose.
- Consider the limitation of restricting description to where there is a gap:
 - If part of the EA Landscape will have no change, and is not needed for traceability, what useful reason is there for a Practitioner to spend time describing it?
- A gap is everything that changes.

Identify the Work to Reach the Target Considering Cost and Value

- Without understanding the work required to reach the target, stakeholders will approve the impossible.
- The Practitioner is accountable for guarding value.
- A target provides an increase in value, at a cost of change.

Resolving Impacts

□ The Practitioner:

- Explores the impact of their candidate architecture against other candidate architectures, transition states, the target state, and in-flight Implementation Projects
- Works with the Enterprise risk management process to assess impact to the Enterprise's risk; this is one of the most complex activities for an engaged high-functioning EA team

Approval

- The Practitioner is assisting their organisation select the best possible path against a set of competing preferences over time. They have taken the time to explore options and impacts.
- With an approved Target Architecture:
 - The future is defined
 - Traceability to the objective is available
 - Trade-off has been performed

The EA Repository

- ❑ Practitioners should start and finish with the contents of the EA Repository.
- ❑ Practitioners should apply the following tests:
 - Is the information that will address the question at hand already available?
 - Is there a superior architecture that guides and constrains the task at hand?
 - What is the minimum information needed to cover shortfalls in the EA Repository?

4.2 Risk and Security considerations during the Architecture Development (ADM Phases B to D)

Phase B – Business Architecture

Risk and Security Considerations

- The security elements of Phase B comprise:
 - Business-level trust
 - Risk
 - Controls
- These are independent from specific IT or other systems within the specific scope of the architecture engagement.

Phase C - Information Systems Architectures

Risk and Security Considerations

- The security elements of Phase C comprise functional security services and their security classification.

Phase D – Technology Architecture

Risk and Security Considerations

- In most cases, the development of specific Technology Architecture security artifacts is not necessary, as long as it incorporates the relevant security controls and mechanisms defined in earlier phases.
- The Security Architect must ensure that the required controls are included in the Technology Architecture and verify whether the controls are used in an effective and efficient way.

4.3 Relevant Information to produce outputs valuable to the Architecture Development

Business Principles, Business Goals, Business Drivers

- An understanding of these is essential to align the architecture work with the business.
- These provide the context for architecture work.
- They describe the needs and ways of working of the enterprise.

Relevant Information from Phase A

- The scope of the problem being addressed.
- Stakeholders and their concerns.
- A summary answer to the problem that is acceptable to the stakeholders (the Architecture Vision).

Architecture Development Phase B Inputs

- Reference Materials External to the Enterprise
- Non-Architectural Inputs
 - Request for Architecture Work
 - Business principles, business goals, and business drivers
 - Capability Assessment
 - Communications Plan

Architecture Development Phase B

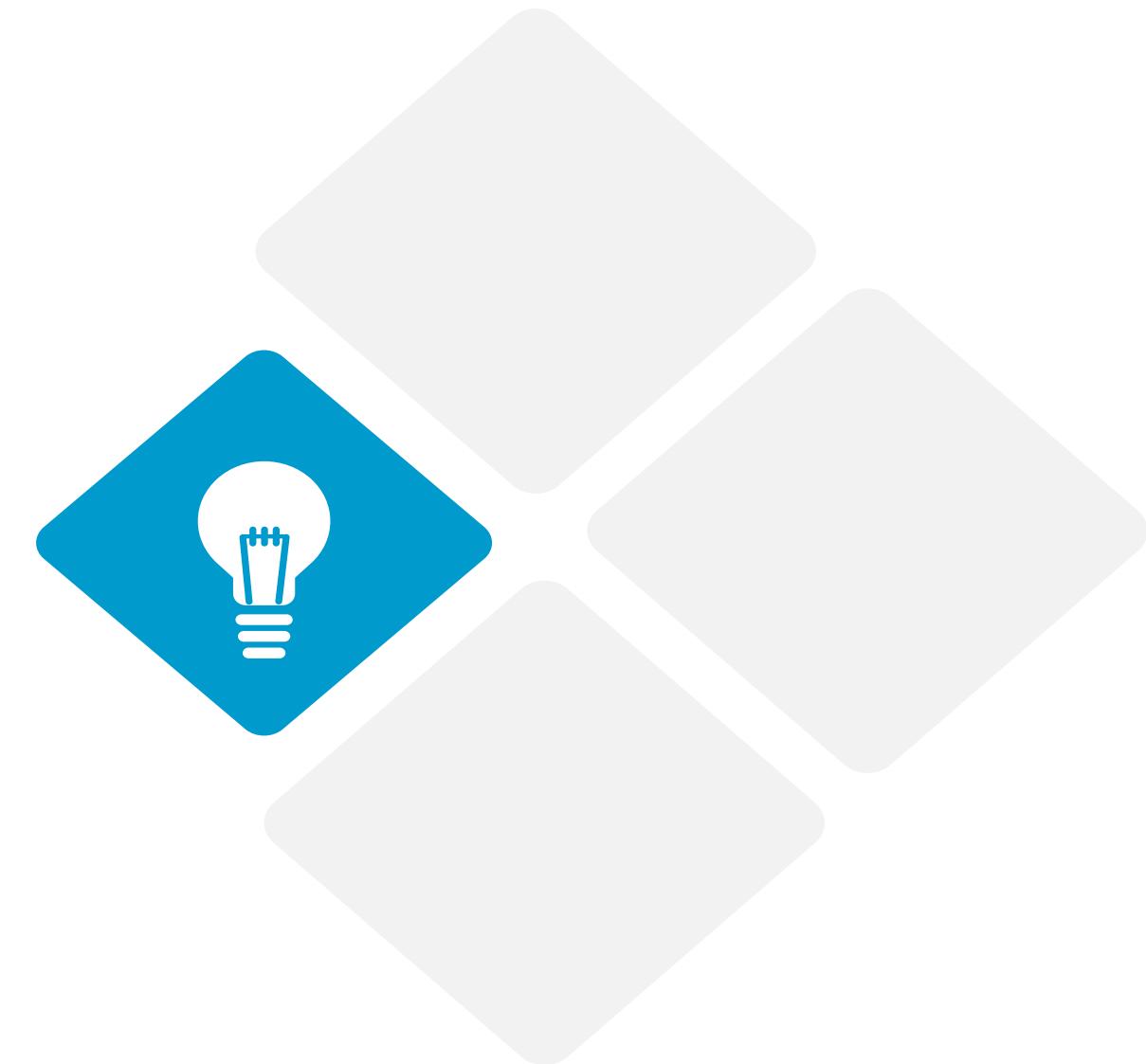
Architectural Inputs

- Organisational Model for Enterprise Architecture
- Tailored Architecture Framework
- Approved Statement of Architecture Work
- Architecture Principles
- Enterprise Continuum
- Architecture Repository
- Architecture Vision
- Draft Architecture Definition Document

“

- The ADM deliverables are listed in the handout, Appendix B.

”



**4.4 4.6 4.8 How to apply Phases B, C,
and D, and how they contribute to the
Architecture Development work**

Outcome & Output

- ❑ A set of domain architectures approved by the stakeholders for the problem being addressed.
- ❑ A set of gaps, and work to clear the gaps understood by the stakeholders.

Essential Knowledge

- How does the current Enterprise fail to meet the preferences of the stakeholders?
- What must change to enable the Enterprise to meet the preferences of the stakeholders? (Gaps)
- What work is necessary to realise the changes, that is consistent with the additional value being created? (Work Package)
- How stakeholder priority and preference adjust in response to value, effort, and risk of change. (Stakeholder Requirements)

Order of Steps

- The order of the steps, as well as the time at which they are formally started and completed, should be adapted to the situation at hand.
All activities that have been initiated in these steps should be closed during the Finalise the Architecture step.

Architecture Repository

- ❑ As part of each phase, the architecture team will need to consider what relevant Architecture resources are available in the organisation's Architecture Repository.

Applying Phase B: Business Architecture

- Scope depends on existing strategy and planning
 - Update and verify
 - bridge between high-level business drivers, strategy, and
 - goals on the one hand, and specific business requirements
 - Existing architecture discovery must include all relevant detail
- If there is no existing strategy or planning:
 - Identify any existing architecture definitions, then verify and update
 - New process definitions may require detailed work

Applying Phase B: Business Architecture

- The level of details will depend on the scope and goals of the overall architecture effort.
New models characterising the needs of the business will need to be defined in detail during Phase B.
- Existing business artifacts to be carried over and supported in the target environment may already have been adequately defined in previous architectural work; but, if not, they too will need to be defined in Phase B.

Applying Phase C: Information Systems Architectures

- ❑ Phase C involves Data and Applications Architecture, in either order.
- ❑ Advocates exist for both sequences.
- ❑ Examples:
 - Spewak's *Enterprise Architecture Planning* recommends a data-driven sequence
 - Major applications systems (ERP, CRM, ...) often combine technology infrastructure and application logic
 - An application-driven approach takes core applications (underpinning mission-critical business processes) as the primary focus of the architecture effort; integration issues often constitute a major challenge

Applying Phase C: Information Systems Architectures

- Key Considerations for Data Architecture include:
 - Data Management
 - Data Migration
 - Data Governance

Applying Phase D: Technology Architecture

- The evolution of new technologies is a major driver for change in enterprises looking for new innovative ways of operating and improving their business.
- The Technology Architecture needs to capture the transformation opportunities available to the enterprise through the adoption of new technology.

4.5 Information relevant to Phase C (Data and Applications) to produce outputs for the Architecture Development

Information Systems Architectures Phase C

Inputs

- Reference Materials External to the Enterprise
- Non-Architectural Inputs
 - Request for Architecture Work
 - Capability Assessment
 - Communications Plan

Information Systems Architectures Phase C

Architectural Inputs

- Organisational Model for Enterprise Architecture
- Scope of organisations impacted
- Tailored Architecture Framework
- Data and Application Principles
- Statement of Architecture Work
- Architecture Vision
- Architecture Repository
- Re-usable building blocks (in particular, definitions of current data)
- Draft Architecture Definition Document
- Draft Architecture Requirements Specification
- Business Architecture components of an Architecture Roadmap

Phase C Essential Knowledge

- ❑ How does the current Enterprise fail to meet the preferences of the stakeholders?
- ❑ What must change to enable the Enterprise to meet the preferences of the stakeholders? (Gaps)
- ❑ What work is necessary to realise the changes, that is consistent with the additional value being created? (Work Package)
- ❑ How stakeholder priority and preference adjust in response to value, effort, and risk of change. (Stakeholder Requirements)

4.7 Information needed in Phase D to produce outputs relevant to the architecture development

Technology Architecture Phase D Inputs

- Reference Materials External to the Enterprise
 - Architecture reference materials
 - Product information on candidate products

- Non-Architectural Inputs
 - Request for Architecture Work
 - Capability Assessment
 - Communications Plan

Technology Architecture Phase D

Architectural Inputs

❑ Organisational Model for Enterprise Architecture, including:

- Scope of organisations impacted
- Maturity assessment, gaps, and resolution approach
- Roles and responsibilities for architecture team(s)
- Constraints on architecture work
- Budget requirements
- Governance and support strategy

❑ Tailored Architecture Framework, including:

- Tailored architecture method
- Tailored architecture content (deliverables and artifacts)
- Configured and deployed tools

Technology Architecture Phase D

Architectural Inputs

- Technology principles, if existing
- Statement of Architecture Work
- Architecture Vision
- Architecture Repository, including:
 - Re-usable building blocks
 - Publicly available reference models
 - Organisation-specific reference models
 - Organisation standards
- Draft Architecture Definition Document, which may include Baseline and/or Target Architectures of any architecture domain
- Draft Architecture Requirements Specification, including:
 - Gap analysis results (from Business, Data, and Application Architectures)
 - Relevant technical requirements from previous phases
- Business, Data, and Application Architecture components of an Architecture Roadmap

Phase D Essential Knowledge

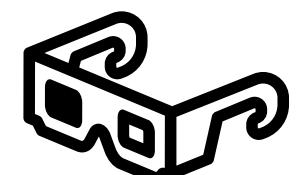
- ❑ How does the current Enterprise fail to meet the preferences of the stakeholders?
- ❑ What must change to enable the Enterprise to meet the preferences of the stakeholders? (Gaps)
- ❑ What work is necessary to realise the changes, that is consistent with the additional value being created? (Work Package)
- ❑ How stakeholder priority and preference adjust in response to value, effort, and risk of change. (Stakeholder Requirements)

**4.9 Outputs of Phases B, C, and D
necessary to proceed with the
Architecture Development work**

Phase B, C and D Outputs

- Refined and updated versions of the Architecture Vision phase deliverables
 - Statement of Architecture Work, updated if necessary
 - Validated principles, or new principles(if created here)
 - Draft Architecture Definition Document
 - Draft Architecture Requirements Specification
 - Business/Data/Application/Technology Architecture components of an Architecture Roadmap

Lists of outputs for each phase are included in the handout.

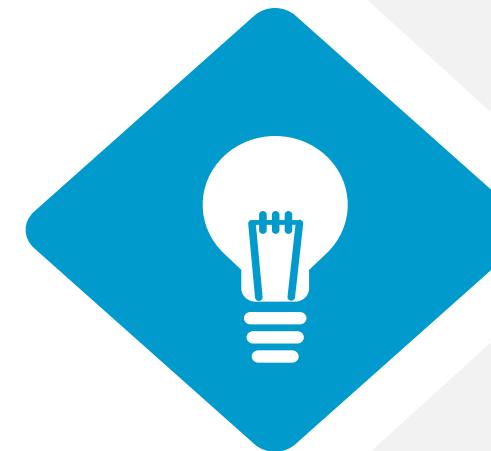
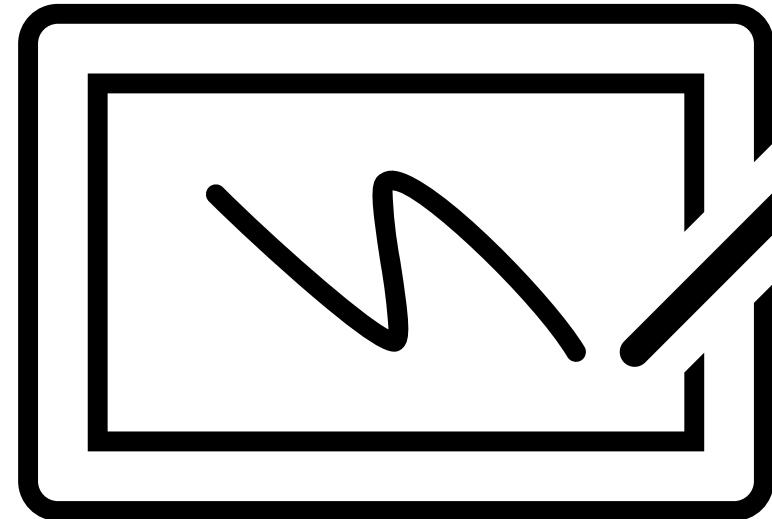


Outcome & Output

- ❑ A set of domain architectures approved by the stakeholders for the problem being addressed.
- ❑ A set of gaps, and work to clear the gaps understood by the stakeholders.

Practice with Learning Studies

Architecture Development



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TOGAF® Enterprise Architecture Practitioner

Unit 5 – Implementing the Architecture

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Unit 5

Concepts

5.1

Risk and Security considerations for Phases E, F, and G

5.2

Steps (Phase E) to create the Implementation and Migration Strategy

5.3

Basic Approaches to Implementation

5.4

Identifying and Grouping Work Packages

5.5

Creating and Documenting Transition Architectures

5.6

The Impact of Migration Projects on the Organisation and the Coordination Required

Unit 5

Concepts

- 5.7 Why and how Business Value is assigned to each Work Package**
- 5.8 How to Prioritise the Migration Projects (Phase F)**
- 5.9 Confirm the Architecture Roadmap (Phase F)**
- 5.10 The outputs of Phase F necessary to Proceed with the Architecture Implementation**
- 5.11 Inputs to Phase G Implementation Governance**
- 5.12 How Implementation Governance is executed (Phase G)**

Unit 5

Concepts

5.13

Outputs to support Architecture Governance

5.14

How Architecture Contracts are used to communicate with Implementers

5.1 Risk and Security considerations for Phases E, F, and G

Risk and Security – Phase E: Opportunities and Solutions

- Ensure the stakeholders' security and risk concerns are addressed in the analysis. Confirm that risk owners are consulted.
- The value expected to be delivered by work packages should include measures related to security and risk value to ensure the roadmap addresses the complete set of business goals and drivers.
- The security building blocks defined in the previous phases become SBBs in this phase so that more specific implementation-oriented requirements and specifications are defined.
- The Security Services Catalog of the Baseline Security Architecture probably contains existing security services or security building blocks that meet the requirements.

Risk and Security –

Phase F: Migration Planning

- ❑ The migration strategy should include a risk assessment and a Risk Mitigation Plan.
- ❑ In Phase F, the Risk Mitigation Plan is limited to the transition.
- ❑ Migration of live environments should always include regression planning so that there is a way to reverse out a failed migration. This is an essential part of risk management.
- ❑ In addition, migration planning should include a security impact analysis to understand any security impacts of the target state of the change.

Risk and Security —

Phase G: Implementation Governance

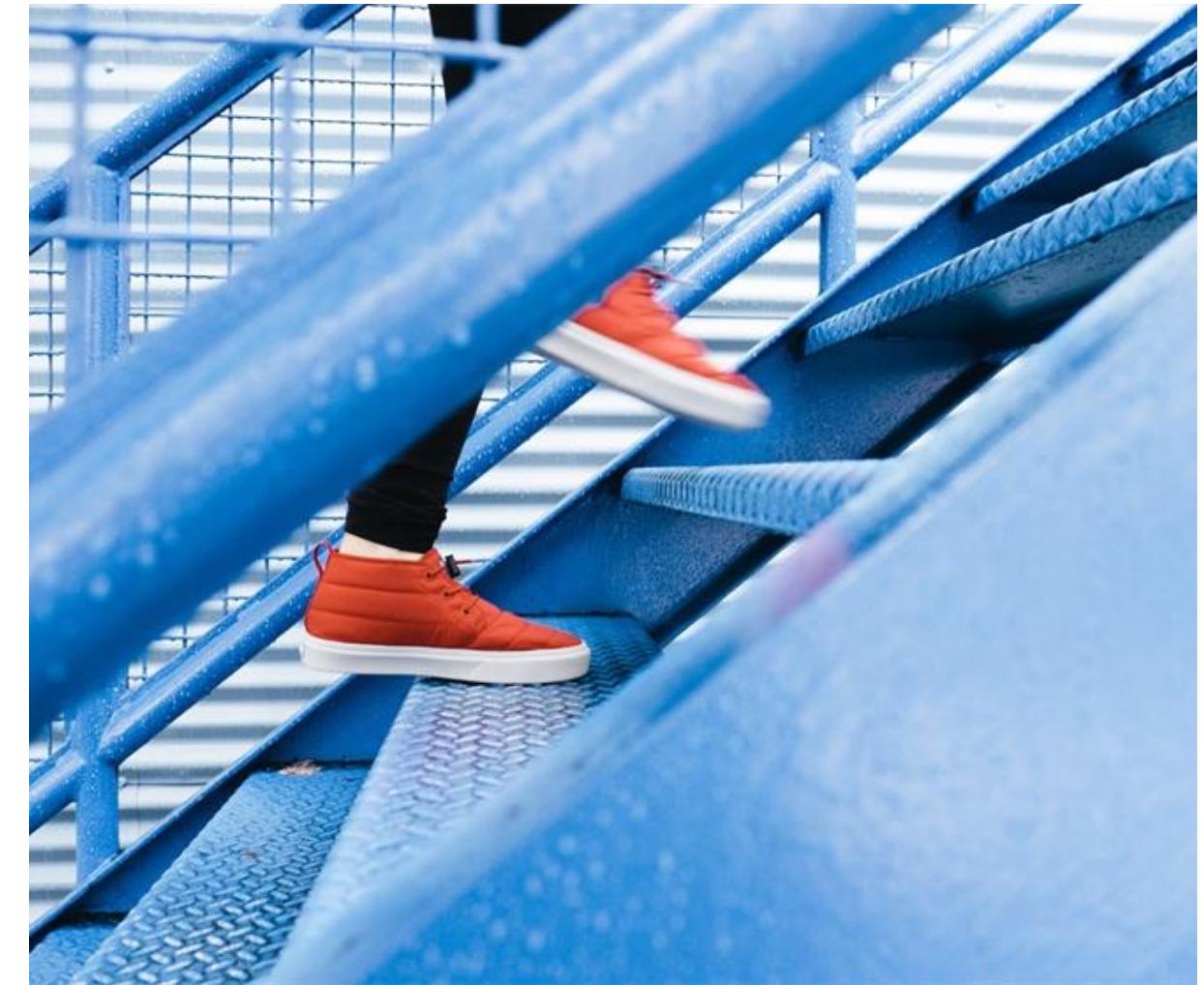
- Security Architecture implementation governance provides assurance that the detailed design and implemented processes and systems adhere to the overall Security Architecture.
- This ensures that deviations from Architecture Principles and implementation guidelines don't create any unacceptable risk.

5.2 Steps (Phase E) to create the Implementation and Migration Strategy

Phase E: Opportunities and Solutions

– The Steps (1)

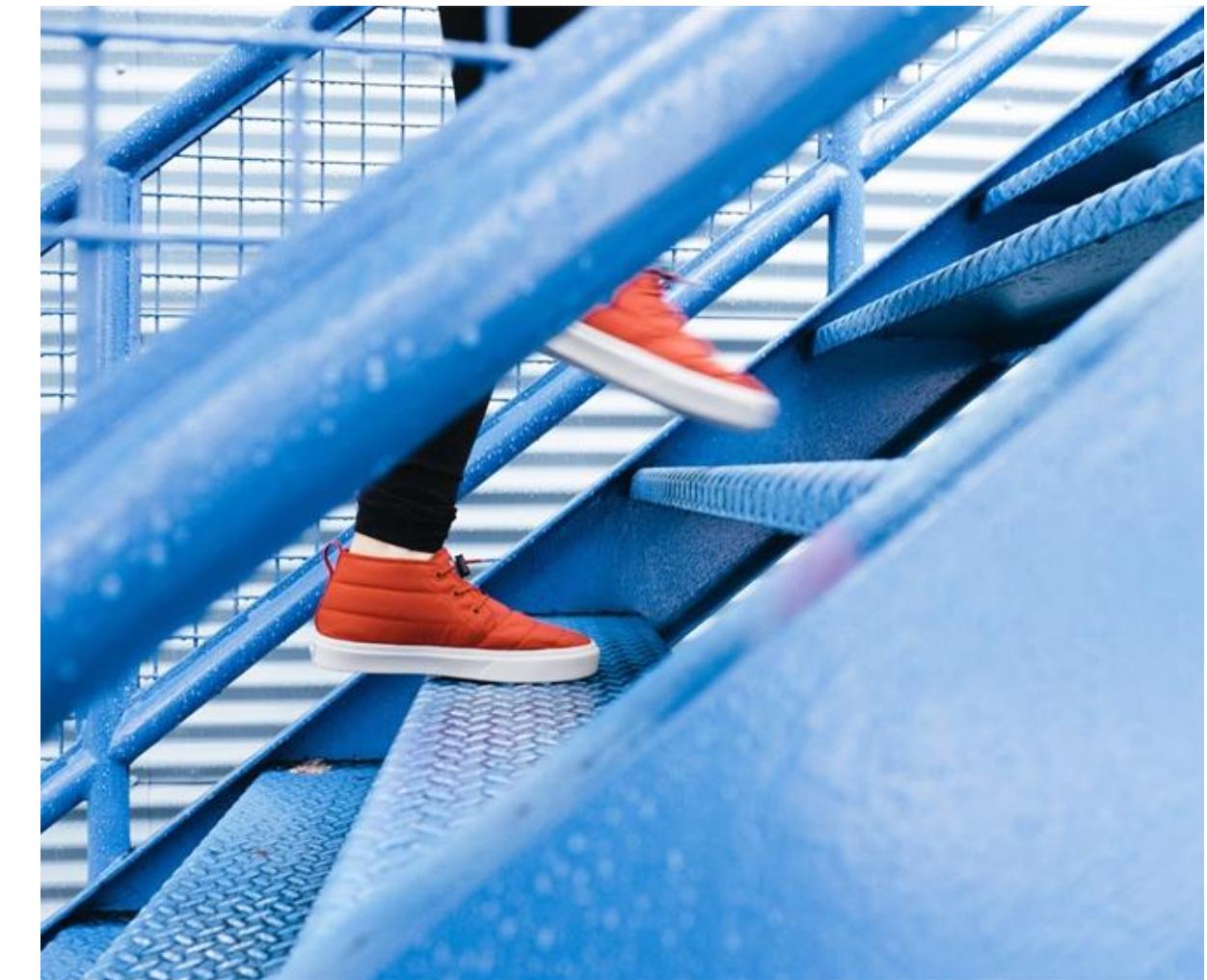
- Determine/confirm key corporate change attributes
- Determine business constraints for implementation
- Review and consolidate gap analysis results from Phases B to D
- Review consolidated requirements across related business functions
- Consolidate and reconcile interoperability requirements
- Refine and validate dependencies



Phase E: Opportunities and Solutions

– The Steps (2)

- Confirm readiness and risk for business transformation
- Formulate Implementation and Migration Strategy
- Identify and group major work packages
- Identify Transition Architectures
- Create the Architecture Roadmap & Implementation and Migration Plan



5.3 Basic Approaches to Implementation

Implementation Approaches

- There are three basic approaches as follows:
 - Greenfield: a completely new implementation
 - Revolutionary: a radical change (i.e., switch on, switch off)
 - Evolutionary: a strategy of convergence, such as parallel running or a phased approach to introduce new capabilities



Implementation Approaches (Cont'd)

- The most common implementation methodologies are:
 - Quick win (snapshots)
 - Achievable targets
 - Value chain method

5.4 Identifying and Grouping Work Packages

Identify and Group Work Packages (1)

- ❑ Using the Consolidated Gaps, Solutions, and Dependencies matrix together with the Implementation Factor catalog, logically group the various activities into work packages.
- ❑ Fill in the "Solution" column in the Consolidated Gaps, Solutions, and Dependencies matrix to recommend the proposed solution mechanisms.
- ❑ Indicate for every gap/activity whether the solution should be oriented towards a new development, or be based on an existing product, and/or use a solution that can be purchased.

Identify and Group Work Packages (2)

- ❑ Classify every current system that is under consideration as:
 - Mainstream: part of the future information system
 - Contain: expected to be replaced or modified in the planning horizon (next 3 years)
 - Replace: to be replaced in the planning horizon
- ❑ Supporting top-level work packages should then in turn be decomposed into increments to deliver the capability increments.

Identify and Group Work Packages (3)

- Analyse and refine work packages or increments with respect to their business transformation issues and the strategic implementation approach.
- Finally, group the work packages into portfolios and projects within a portfolio, taking into consideration the dependencies and the strategic implementation approach.

5.5 Creating and Documenting Transition Architectures

Transition Architectures

- ❑ Applicable when the scope of change to implement the Target Architecture requires an incremental approach
- ❑ Identifies one or more clear targets along the roadmap to realising the Target Architecture
- ❑ Development of Transition Architectures must be based upon the preferred implementation approach, the Consolidated Gaps, Solutions, and Dependencies matrix, the listing of projects and portfolios, as well as the enterprise's capacity for creating and absorbing change.
- ❑ Determine where the difficult activities are, and unless there are compelling reasons, implement them after other activities that most easily deliver missing capability.

5.6 The Impact of Migration Projects on the Organisation and the Coordination Required

Phase F: Migration Planning – The Steps

- ❑ Confirm management framework interactions for Implementation and Migration Plan
- ❑ Assign a business value to each work package
- ❑ Estimate resource requirements, project timings, and availability/delivery vehicle Prioritise the migration projects through the conduct of a cost/benefit assessment and risk validation
- ❑ Confirm Architecture Roadmap and update Architecture Definition Document
- ❑ Complete the Implementation and Migration Plan
- ❑ Complete the architecture development cycle and document lessons learned

Phase F Summary Output & Outcome and Essential Knowledge

Phase	Output & Outcome	Essential Knowledge
Phase F: Implementation and Migration Plan	An approved set of projects, containing the objective and any necessary constraints, resources required, and start and finish dates.	Resources available to undertake the change. How stakeholder priority and preference adjust in response to value, effort, and risk of change. (Stakeholder Requirements)

Walk Through Architecture to Support Project: Finalise Scope and Budget

- For each project in the portfolio:
- Finalise estimates and timeline
- Update Enterprise roadmap
- Populate governance and approval plan

Walk Through Architecture to Support Project: Prepare for Solution Delivery Governance

- Program context:
- Initiate completion of architecture work
- Define target Solution Architectures
- Finalise effort and resource estimates
- Define variance measures in project-specific governance model
- Update risk matrix

Realising the Solution

- ❑ Contractually, this is the post-rollout, warranty period. It is the period of putting the solution in the hands of the beneficiaries (customers, end-users, support personnel, partners, etc.).
- ❑ At the end of this period, initiate a gap analysis between the realised architecture and the Baseline Architecture to be used for solution delivery.
- ❑ Document the lessons learned, mainly the gaps in the description of the superior architecture that were filled while delivering the Solution Architecture.

Closure

- The realised solution is the new baseline, and becomes the basis for evolving and analysing the roadmap to the Target Architecture.
- The Architecture Practitioner performs an assessment to justify closure of the current architecture project.
- Involve all stakeholders, decision-makers, and implementers to complete the assessment, and gain the sign-off to close the effort.

5.7 Why and how Business Value is assigned to each Work Package

Phase F: Migration Planning

Assign a Business Value to Each Work Package

- Establish what constitutes business value within the organisation, how value can be measured, and then apply this to each one of the projects and project increments.
- Use the work packages as a basis of identifying projects that will be in the Implementation and Migration Plan.
- The identified projects will be fully developed in other steps in Phase F.
- Risks should then be assigned to the projects and project increments by aggregating risks identified in the Consolidated Gaps, Solutions, and Dependencies Matrix (from Phase E).
- Estimate the business value for each project using the Business Value Assessment Technique.

Issues to Address in this Activity

- Performance Evaluation Criteria
- Return-on-Investment Criteria
- Business Value**
- Critical Success Factors (CSFs)
- Measures of Effectiveness (MOE)
- Strategic Fit

Communication with Implementers

- Implementers need to understand their project.
 1. Where their project fits within the roadmap, and its role in producing value.
 2. What work packages and gaps they are responsible for, as well as associated gaps they are not responsible for.
 3. How conformance will be assessed.

Managing the Current Approach towards Implementing the Change

- The Practitioner's job is to show that a sufficient level of scrutiny led to the deliverables of the Architecture Project for the solution delivery architecture to succeed.
- Prove to the stakeholders that when the Architecture Project is consumed by the solution delivery architecture, their requirements have been met and changes to the Enterprise will be guided and constrained efficiently.
- Identify and secure approval for the resources necessary to begin allocating the budget for the solution delivery architecture to begin.

5.8 How to Prioritise the Migration Projects (Phase F)

Prioritise the Migration Projects Cost/Benefit Assessment

- Prioritise the projects by ascertaining their business value against the cost of delivering them.
- The approach is to first determine, as clearly as possible, the net benefit of all of the SBBs delivered by the projects, and then verify that the risks have been effectively mitigated and factored in.

Prioritise the Migration Projects Risk Validation

- Review the risks to ensure that the risks for the project deliverables have been mitigated as much as possible. The project list is then updated with risk-related comments.
- Have the stakeholders agree upon a prioritisation of the projects.
- Formally review the risk assessment and revise it as necessary ensuring that there is a full understanding of the residual risk associated with the prioritisation and the projected funding line.

5.9 Confirm the Architecture Roadmap (Phase F)

Confirm the Architecture Roadmap

- ❑ Update the Architecture Roadmap including any Transition Architectures.
- ❑ Review the work to date to assess what the time-spans between Transition Architecture should be, taking into consideration the increments in business value and capability and other factors, such as risk.
- ❑ Once the capability increments have been finalised, consolidate the deliverables by project.
- ❑ This will result in a revised Architecture Roadmap.

Update the Architecture Definition Document

- If the implementation approach has shifted as a result of confirming the implementation increments, update the Architecture Definition Document.
- This may include assigning project objectives and aligning projects and their deliverables with the Transition Architectures to create/update an Architecture Definition Increments Table.

5.10 The outputs of Phase F necessary to Proceed with the Architecture Implementation

Phase F: Migration Planning Outputs

Implementation and Migration Plan

- ❑ Implementation and Migration Plan, Approved, including:
 - Implementation and Migration Strategy
 - Project and portfolio breakdown of the implementation:
 - Allocation of work packages to project and portfolio
 - Capabilities delivered by projects
 - Relationship to Target Architecture and any Transition Architectures
 - Milestones and timing
 - Work breakdown structure
- ❑ Project charters (optional):
 - Related work packages
 - Business value
 - Risk, issues, assumptions, dependencies
 - Resource requirements and costs
 - Benefits of migration
 - Estimated costs of migration options

Phase F: Migration Planning

Summary Outcome

- An approved set of projects, containing the objective and any necessary constraints, resources required, and start and finish dates.

5.11 Inputs to Phase G Implementation Governance

Phase G: Implementation Governance

Inputs

- Reference Materials External to the Enterprise
 - Architecture reference materials
- Non-Architectural Inputs
 - Request for Architecture Work
 - Capability Assessment

Phase G: Implementation Governance

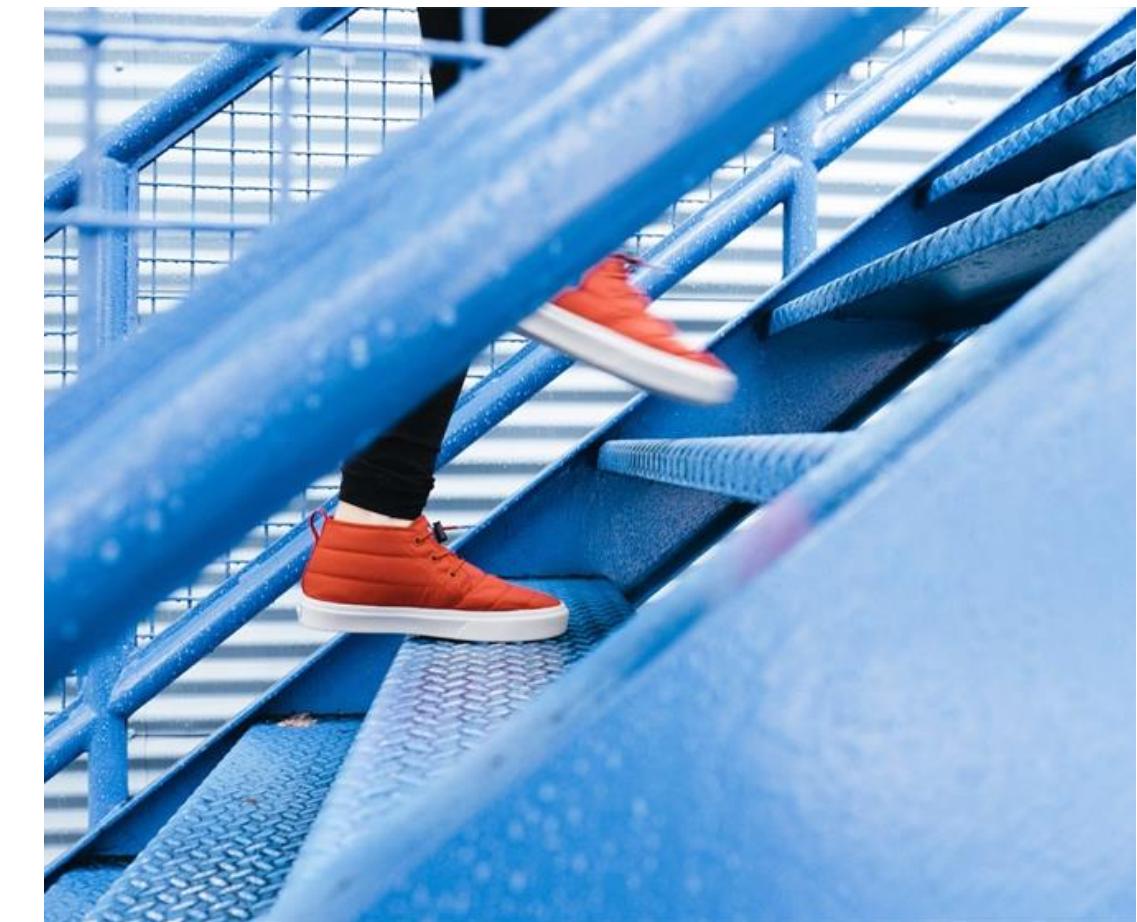
Architectural Inputs

- Organisational Model for Enterprise Architecture, including:
- Tailored Architecture Framework, including:
- Statement of Architecture Work
- Architecture Vision
- Architecture Repository, including:
 - Architecture Definition Document
 - Architecture Requirements Specification, including:
 - Architecture Roadmap
 - Architecture Governance Framework
 - Implementation Governance Model
 - Architecture Contract (standard)
- Request for Architecture Work identified during Phases E and F
- Implementation and Migration Plan

5.12 How Implementation Governance is executed (Phase G)

Phase G: Implementation Governance Steps

- Confirm scope and priorities for deployment with development management
- Identify deployment resources and skills
- Guide development of solutions deployment
- Perform Enterprise Architecture Compliance reviews
- Implement business and IT operations
- Perform post-implementation review and close the implementation



Phase G Summary

Output & Outcome and Essential Knowledge

Phase	Output & Outcome	Essential Knowledge
Phase G: Implementation Governance	Completion of the projects to implement the changes necessary to reach the adjusted target state.	Purpose and constraints on the implementation team. (Gap, Architecture Requirement Specification, Control) How stakeholder priority and preference adjust in response to success, value, effort, and risk of change. (Stakeholder Requirements)

Supporting Change

- ❑ Support of the change activity needs to be provided.
- ❑ Stakeholders often have little confidence that the project will deliver the expected value with the expected cost and the projected time.
- ❑ The lack of confidence means the architecture has more uncertainty, or risk, associated with realising the organisation's objectives.
- ❑ At this point, the focus should be on risk mitigation.

Phase G: Implementation Governance

Guidance

- ❑ Guidance is provided to the Implementation Project.
- ❑ The Practitioner must:
 - focus on the scope of the Implementation Project
 - facilitate good decision-making in the context not of project benefits realisation but of Enterprise benefits realisation
 - ensure the stakeholders and implementers understand the implications of their choices regarding Enterprise benefits not driving them to make different choices

Implementation Projects and Other Change

- The TOGAF Standard provides two key concepts to govern Implementation Projects and other change: the Architecture Contract and the Architecture Requirements Specification.
- The Architecture Contract is used to direct and control the implementation team to work towards a thought-out future.
- The Architecture Requirements Specification is used to direct and control the creativity of the implementation team.

5.13 Outputs to support Architecture Governance

Phase G: Implementation Governance

Outputs

- Architecture Contract (signed), as recommended in the architecture-compliant implemented architectures
- Compliance Assessments
- Change Requests
- Architecture-compliant solutions deployed including:
 - The architecture-compliant implemented system
 - Populated Architecture Repository
 - Architecture compliance recommendations and dispensations
 - Recommendations on service delivery requirements
 - Recommendations on performance metrics
 - Service-Level Agreements (SLAs)
 - Architecture Vision, updated post-implementation
 - Architecture Definition Document, updated post-implementation
 - Business and IT operating models for the implemented solution
 - Architecture Building Blocks (ABBs)

Phase G: Implementation Governance

Summary Outcome

- ❑ Completion of the projects to implement the changes necessary to reach the adjusted target state.

5.14 How Architecture Contracts are used to communicate with Implementers

Communicating with Implementers

- Implementers are typically poorly served. It is common to see implementers handed with a set of diagrams that represent the architecture.
- From these diagrams the implementers are expected to figure out the gaps they should fill, the architecture specifications they must conform to, and the controls they must implement.
- Implementers are better served when they are explicitly provided context, gap, architecture specification, and control.

Critical Items to an Implementer

- **Implementation Project context:** where does the project fit within the roadmap, what value or value dependency will the project provide?
- **Scope:** what work packages and gaps is the Implementation Project responsible for, as well as what gaps associated with any architecture components associated with the project scope is the project not responsible for?
- **Conformance:** what is the set of specific architecture specifications and controls the Implementation Project will be assessed against?

Further on Communicating with Implementers

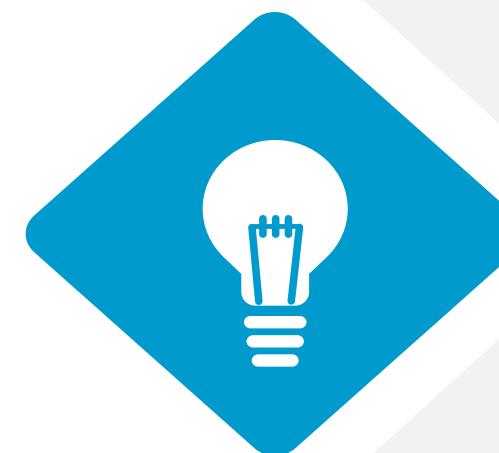
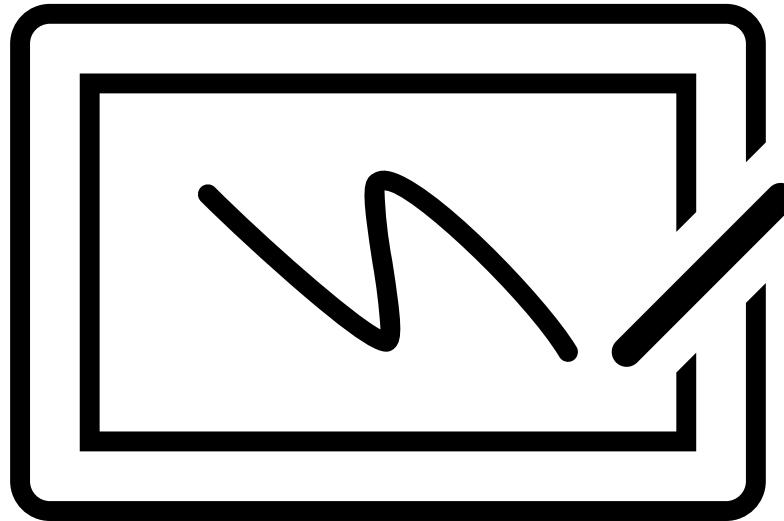
- John Carver's policy governance approach has two imperative practices that are recommended:
 - First, specifications should be exclusionary, highlighting what is prohibited, rather than mandating what is permitted.
 - Second, specification compliance should be assessed through a reasonable interpretation test by a reasonable person.

Contract between Architecting Function and Business Stakeholders

- A business stakeholder's Architecture Contract may include:
 - Introduction and background
 - The nature of the agreement
 - Scope
 - Strategic requirements
 - Architecture deliverables that meet the business requirements
 - Conformance requirements
 - Architecture adopters
 - Time window
 - Architecture business metrics
 - SLA
 - This contract is also used to manage changes to the Enterprise Architecture in Phase H.

Practice with Learning Studies

Implementing the Architecture



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TOGAF® Enterprise Architecture Practitioner

Unit 6 – Architecture Change Management

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Unit 6

Concepts

6.1

Inputs triggering Change Management — Change Requests

6.2

**Activities necessary for effective Change Management
(Stakeholder Management)**

6.3

Outputs relevant to proceed with a Change

6.1 Inputs triggering Change Management – Change Requests

Phase H: Architecture Change Management

Inputs

- Reference Materials External to the Enterprise
- Architecture reference materials
- Non-Architectural Inputs
- Request for Architecture Work

Phase H: Architecture Change Management

Architectural Inputs

- Organisational Model for Enterprise Architecture
- Tailored Architecture Framework
- Statement of Architecture Work
- Architecture Vision
- Architecture Repository
- Architecture Definition Document
- Architecture Requirements Specification
- Architecture Roadmap
- Change Request — technology changes
- Change Request — business changes
- Change Request — from lessons learned
- Implementation Governance Model
- Architecture Contract (signed)
- Compliance Assessments
- Implementation and Migration Plan

Inputs triggering Change Management

- Phase H requires the Practitioner to identify:
 - Bottom-up drivers for change
 - Change due to improvements in available technologies or conditions controlling the operations or environment of the Enterprise
- Then initiate the architecture work for the next target transition state (top-down driver)

Change Request

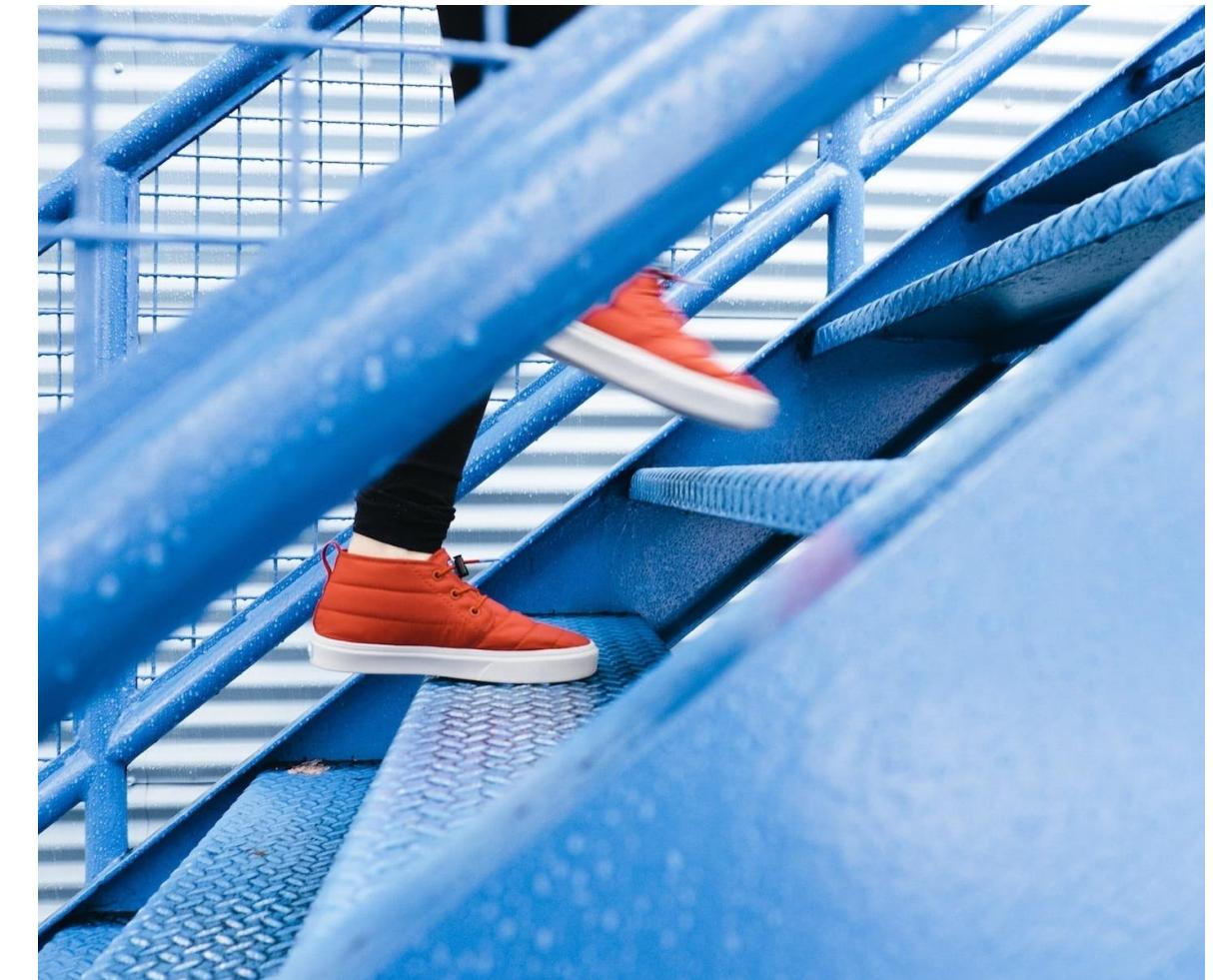
- ❑ During implementation of an architecture, it is possible that the original Architecture Definition and requirements are not suitable or are not sufficient to complete the implementation of a solution.
 - In such cases, it is necessary for implementation projects to either deviate from the suggested architectural approach or to request scope extensions
- ❑ In addition, external factors — such as market factors, changes in business strategy, and new technology opportunities — may open up opportunities to extend and refine the architecture.

6.2 Activities necessary for effective Change Management (Stakeholder Management)

Phase H: Architecture Change Management

Steps

- Establish value realisation
- Deploy monitoring tools
- Manage risks
- Provide analysis for architecture change management
- Develop change requirements to meet performance targets
- Manage governance process
- Activate the process to implement change



Effective Change Management

- ❑ Match the change decisions with the business cycle allocating resources.
- ❑ Identify the bottom-up drivers for change
- ❑ Define “just enough architecture” and characteristics of the EA Landscape
- ❑ Align the EA team with the organisation’s planning, budgeting, operational, and change processes

6.3 Outputs relevant to proceed with a Change

Phase H: Architecture Change Management

Outputs

- Architecture updates (for maintenance changes)
- Changes to architecture framework and principles (for maintenance changes)
- New Request for Architecture Work to move to another cycle (for major changes)
- Statement of Architecture Work, updated if necessary
- Architecture Contract, updated if necessary
- Compliance Assessments, updated if necessary

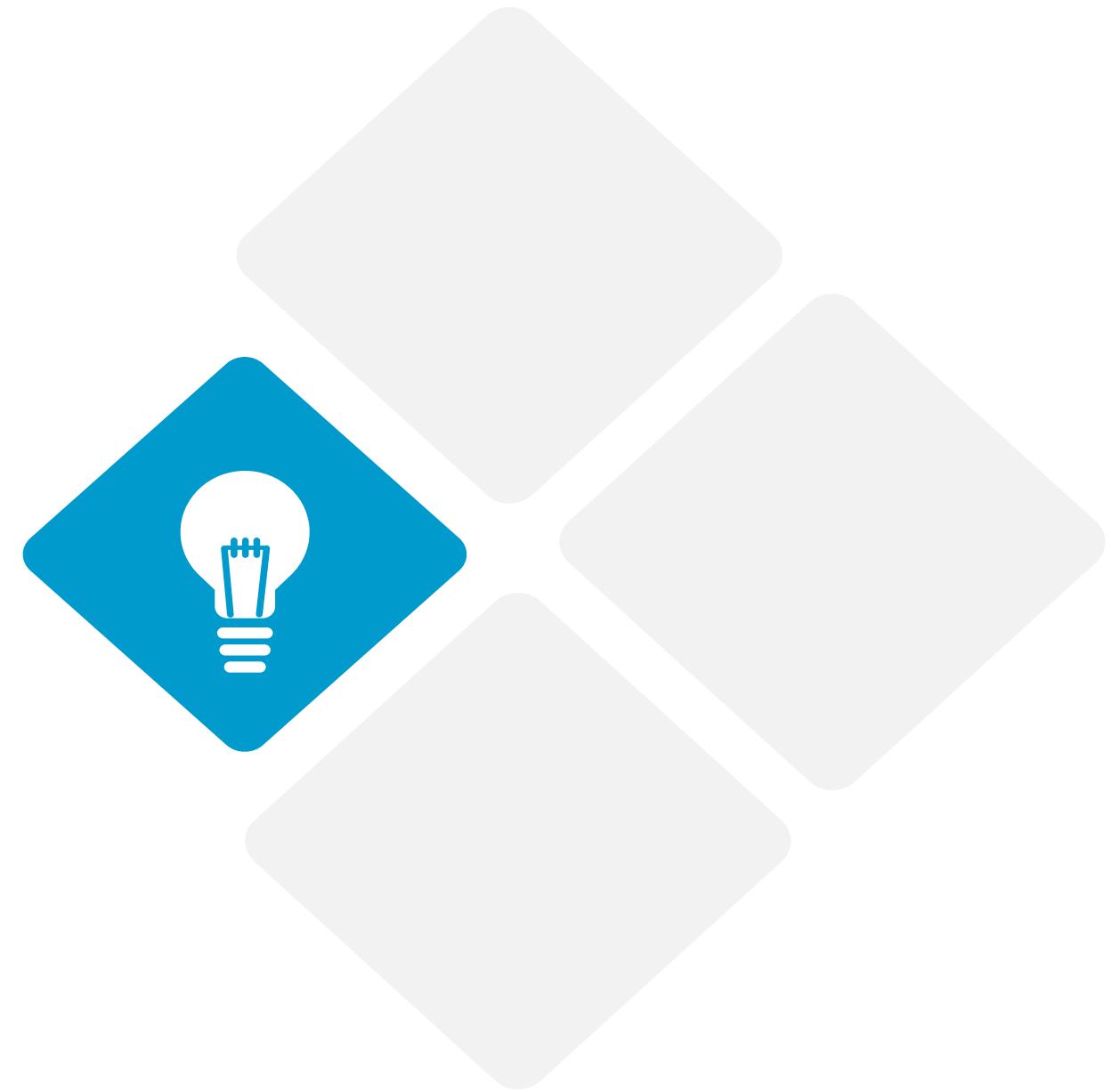
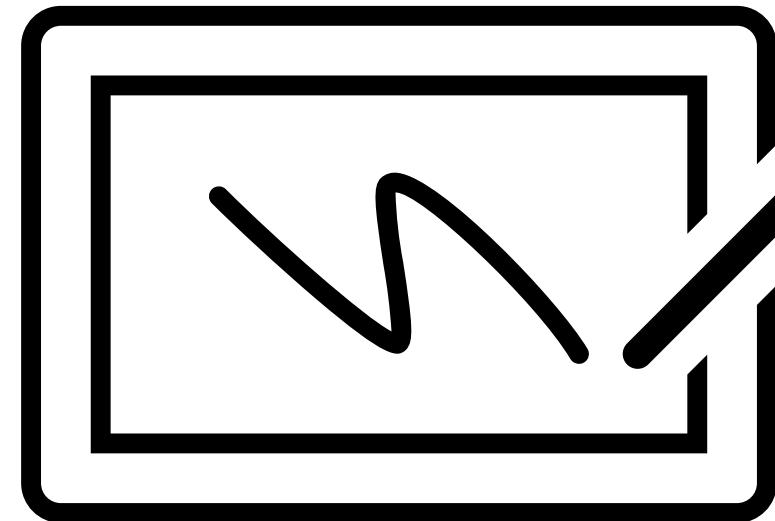
Phase H: Architecture Change Management

Summary Outcome

- ❑ Direction to proceed and start developing a Target Architecture that addresses perceived, real, or anticipated shortfalls in the Enterprise relative to stakeholder preferences.

Practice with Learning Studies

Architecture Change Management



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TOGAF® Enterprise Architecture Practitioner

Unit 7 – Requirements Management

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Unit 7

Concepts

7.1

The inputs that feed the Requirements Management Phase

7.2

How the Requirements Management steps correspond to ADM Phase Steps

7.3

The Purpose of the outputs of Requirements Management

7.1 The inputs that feed the Requirements Management Phase

Requirements Management Inputs

- A populated Architecture Repository
- Organisational Model for Enterprise Architecture, including:
 - Scope of organisations impacted
 - Maturity assessment, gaps, and resolution approach
 - Roles and responsibilities for architecture team(s)
 - Constraints on architecture work
 - Budget requirements
 - Governance and support strategy
- Tailored Architecture Framework, including:
 - Tailored architecture method
 - Tailored architecture content (deliverables and artifacts)
 - Configured and deployed tools
- Statement of Architecture Work
- Architecture Vision
- Architecture requirements, populating an Architecture Requirements Specification
- Requirements Impact Assessment

Effective Requirements Management

- Effective requirements management is dependent upon clear traceability from the organisation's vision, mission, business model, and strategies through the most detailed statement of requirement.
- When engaging with stakeholders, Practitioners must maintain the complete set of every stakeholder's preference, and the implications of those preferences.

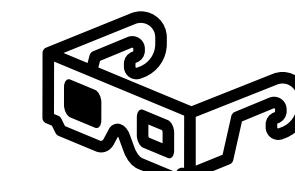
7.2 How the Requirements Management steps correspond to ADM Phase Steps

Architecture Requirements Management

Steps and the ADM Phase Steps

Requirements Management Steps		ADM Phase Steps
Step 1		Identify requirements (typically by analyzing how business goals/objectives can be met through the design of value streams, business scenarios, user experiences, or the provision of management information) and document them in the Architecture Requirements Specification and Requirements Repository.
Step 2	Establish baseline requirements: determine priorities, confirm stakeholder agreement to priorities, and document them in the Architecture Requirements Specification and Requirements Repository.	
Step 3	Monitor baseline requirements.	
Step 4		Identify new and changed requirements: a. Remove or re-assess priorities b. Add requirements and re-assess priorities c. Modify existing requirements
Step 5	Identify changed requirements and record priorities: a. Identify changed requirements and ensure the requirements are prioritized by the architect(s) responsible for the current phase, and by the relevant stakeholders b. Record new priorities	

- Objectives of the Requirements Management Phase:
 - Ensure that the Requirements Management process is sustained and operates for all relevant ADM phases
 - Manage architecture requirements identified during any execution of the ADM cycle or a phase
 - Ensure that relevant architecture requirements are available for use by each phase as the phase is executed
- The steps are matched to each ADM phase.
- The complete table is included in the handout.



7.3 The Purpose of the outputs of Requirements Management

Architecture Requirements Management

Outputs

- Requirements Impact Assessment
- Updated Architecture Requirements Specification: Architecture Requirements Specification), if necessary

Requirements Impact Assessment Purpose

- Throughout the ADM, new information is collected relating to an architecture, new facts may come to light that invalidate existing aspects of the architecture.
- A Requirements Impact Assessment assesses the current architecture requirements and specification to identify changes that should be made and the implications of those changes.

Architecture Requirements Specification

Purpose

□ The Architecture Requirements Specification:

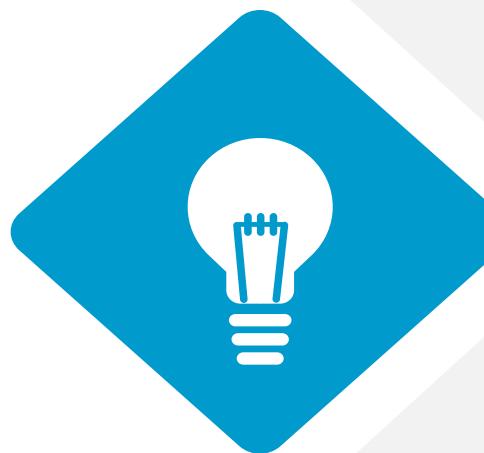
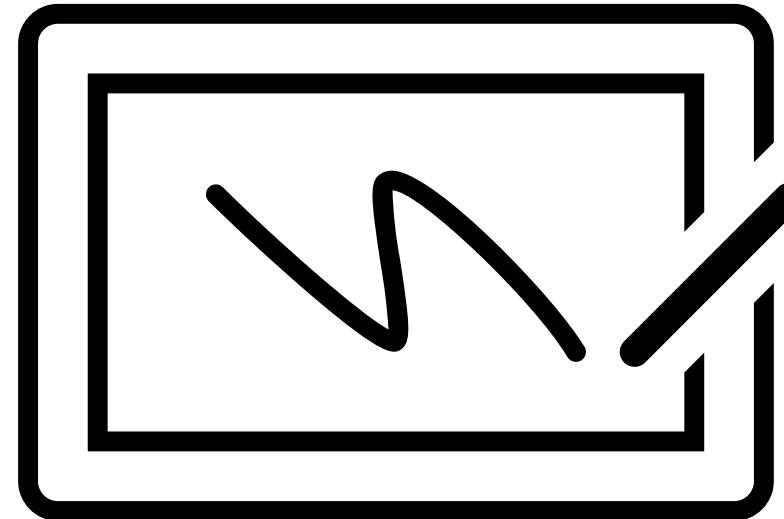
- Provides a set of quantitative statements that outline what an implementation project must do in order to comply with the architecture
- Will typically form a major component of an implementation contract or contract for more detailed Architecture Definition

The Requirements Management Process

- When new requirements arise, or existing ones are changed, a Requirements Impact Statement is generated, which identifies the phases of the ADM that need to be revisited to address the changes.
- The statement goes through various iterations until the final version, which includes the full implications of the requirements (e.g., costs, timescales, and business metrics) on the architecture development.
- Once requirements for the current ADM cycle have been finalised then the Architecture Requirements Specification should be updated.

Practice with Learning Studies

Requirements Management



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TOGAF® Enterprise Architecture Practitioner

Unit 8 – Supporting the ADM Work

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Unit 8

Concepts

8.1

How The Open Group TOGAF Library can be used to support the Practitioner's Work

8.2

Business Scenarios

8.3

The purpose of Compliance Assessments

8.4

How Migration Planning techniques are used to review and consolidate the Gap Analysis results from earlier Phases

8.5

How a Repository can be structured using the TOGAF Architecture Repository as an example

8.6

What to expect in a well-run Architecture Repository

Unit 8

Concepts

8.7

How the concepts of Architecture Levels are used to organise the Architecture Landscape

8.8

Different Levels of Architecture that exist in an Organisation

8.9

Determining the Level that an Architecture is being Developed at

8.10

The Role of Architecture Building Blocks (ABBs)

8.11

Guidelines and Techniques for Business Architecture

8.12

Applying Gap Analysis

Unit 8

Concepts

8.13 How Iteration can be used in Architecture Practices

8.14 How the Implementation Factor Catalog can be used

8.15 The Content Framework and the Enterprise Metamodel

8.16 When the Architecture Content Framework (ACF) needs to be filled throughout the ADM Cycles

8.17 Using an Enterprise Metamodel

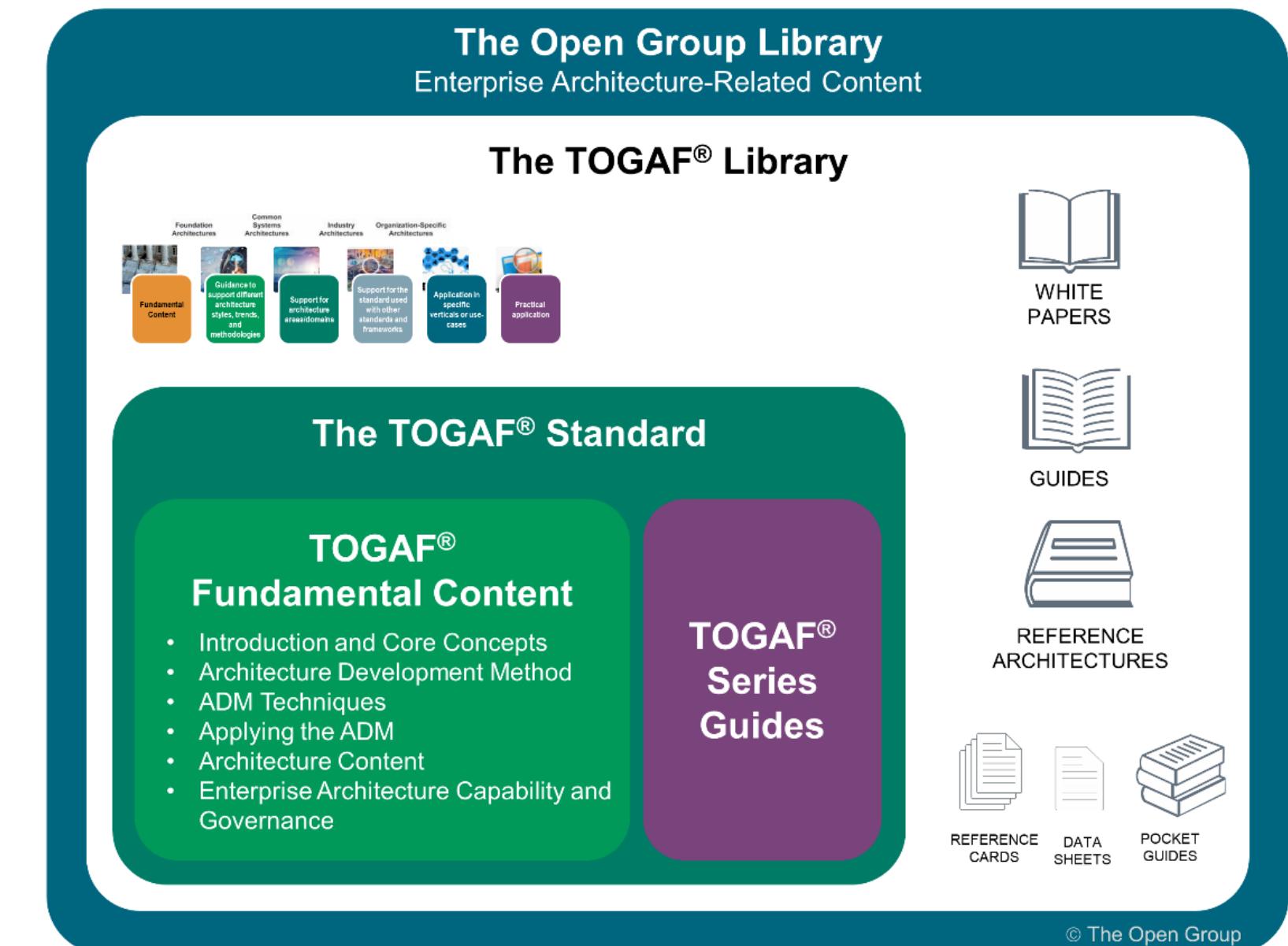
8.18 Using a Taxonomy

8.19 How Risk Assessment can be used

8.1 How The Open Group TOGAF Library can be used to support the Practitioner's Work

TOGAF Library

- ❑ Accompanying the standard are additional resources contained in the TOGAF Library.
- ❑ Whereas the TOGAF Series Guides are proven, stable, best practices, the TOGAF Library also provides emerging ideas, guidelines, templates, patterns, and other forms of reference material to accelerate the creation of new architectures for the enterprise.



8.2 Business Scenarios

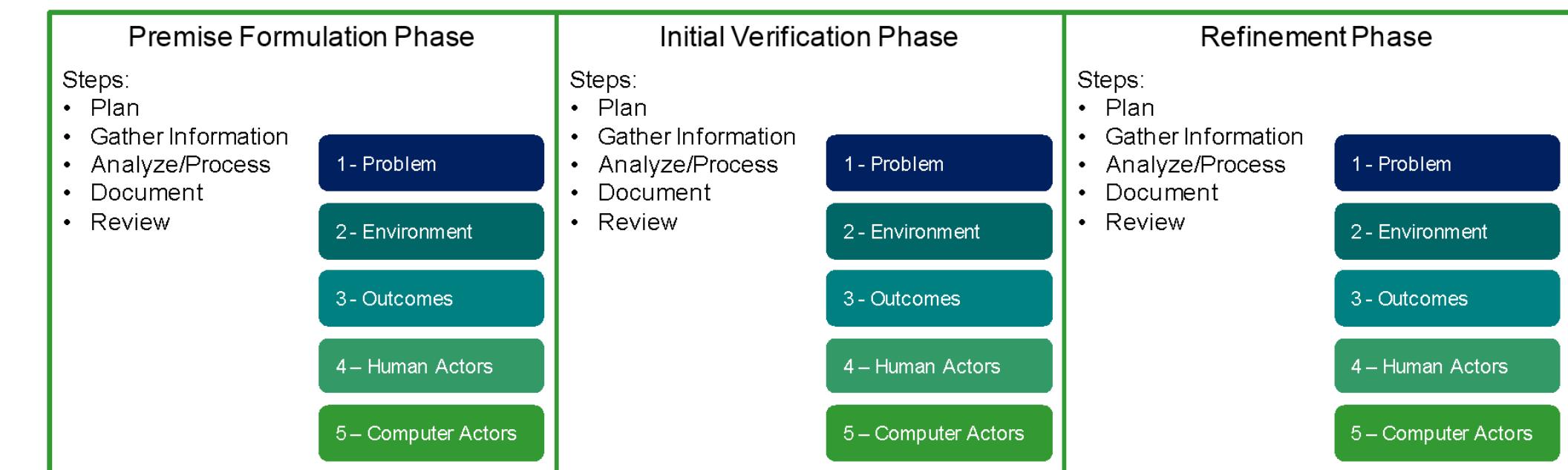
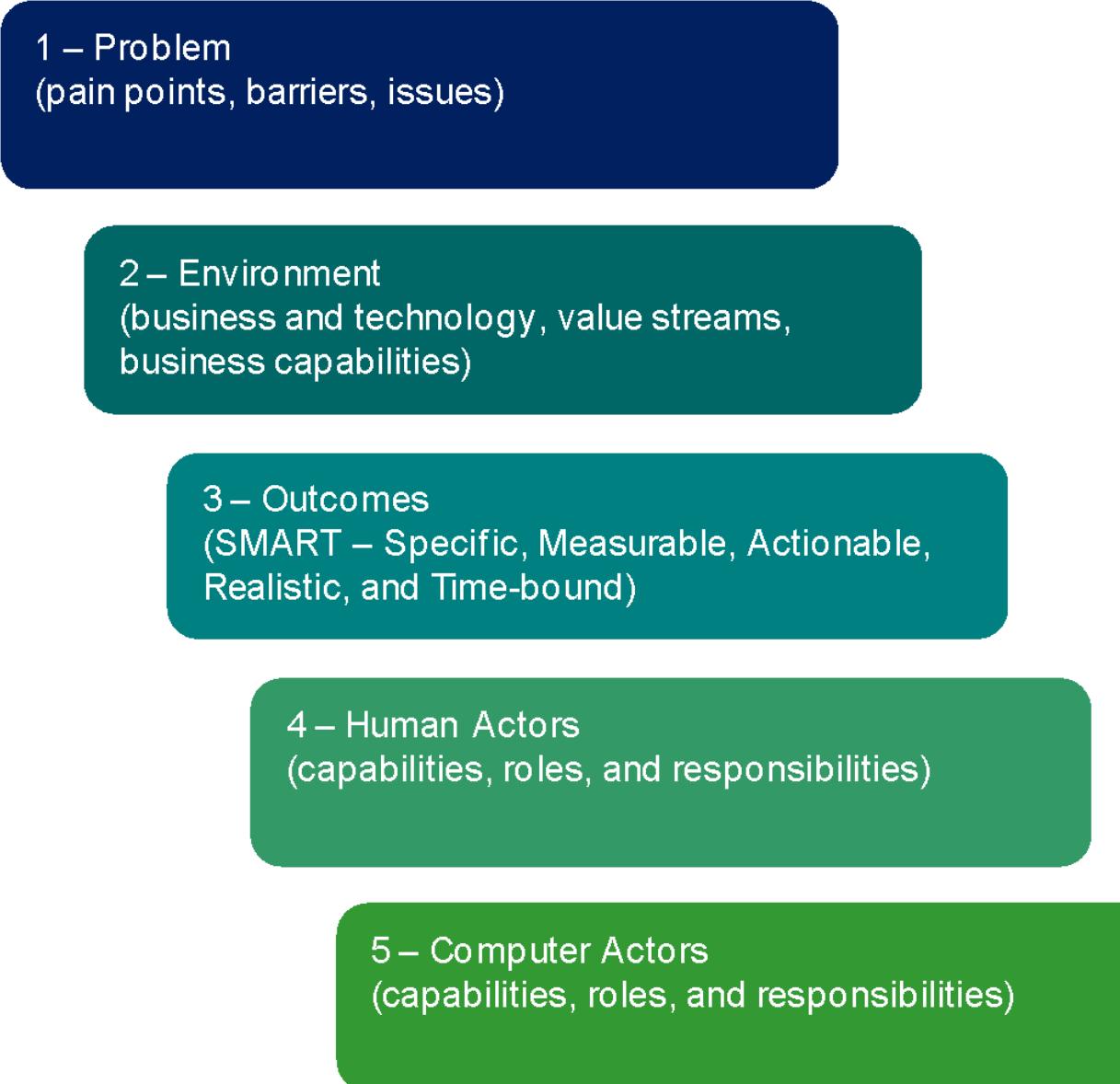
Business Scenario Purpose

- ❑ It is a technique to help identify and understand the business requirements that an architecture must address.

The Method

- ❑ Identify, document, and rank the problem that is driving the scenario
- ❑ Document, as high-level architecture models, the business and technical environments where the problem situation is occurring
- ❑ Identify and document desired objectives; the results of handling the problems successfully (ensure the objectives are SMART)
- ❑ Identify human actors (participants) and their place in the business model
- ❑ Identify computer actors (computing elements) and their place in the technology model
- ❑ Check for fitness-for-purpose, and refine only if necessary

Creating a Business Scenario



8.3 The purpose of Compliance Assessments

The Purpose of Compliance Assessments in the TOGAF ADM

- ❑ Best practice compliance assessments are tightly linked with the TOGAF concept of an Architecture Contract.
- ❑ TOGAF Phase G identifies two areas where compliance is assessed:
 - The first is the scope of the project
 - Second is the actual implementation, whether designed or the performance change.
- ❑ Phase H contains a further value-based compliance assessment.

Compliance Assessment Goals

- ❑ Catch errors in the project architecture early, and thereby reduce the cost and risk of changes required later in the lifecycle.
- ❑ Ensure the application of best practices to architecture work
- ❑ Provide an overview of the compliance of an architecture to mandated enterprise standards
- ❑ Communicate to management the status of the project

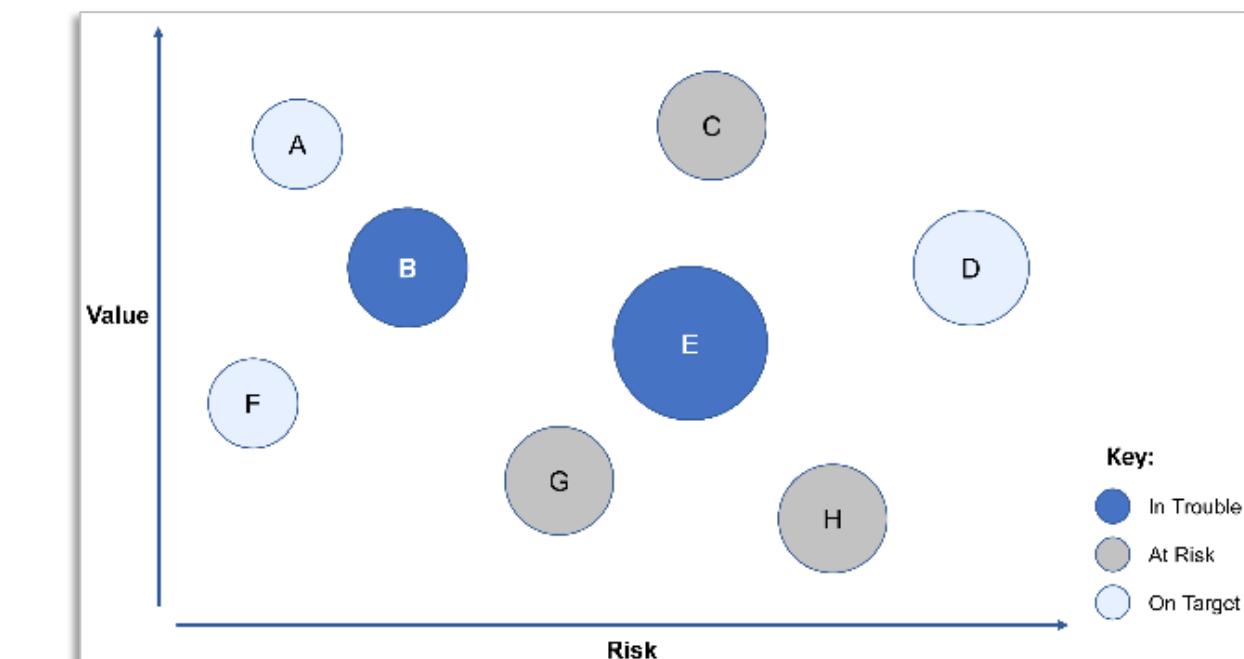
8.4 How Migration Planning techniques are used to review and consolidate the Gap Analysis results from earlier Phases

Migration Planning Techniques

- Implementation Factor Catalog
- Consolidated Gaps, Solutions, & Dependencies Matrix
- Architecture Definition Increments Table
- Transition Architecture State Evolution Table
- Business Value Assessment Technique

Implementation Factor Catalog		
Factor	Description	Deduction
<Name of Factor>	<Description of Factor>	<Impact on Migration Plan>
Change in Technology	Shut down the message centers, saving 700 personnel, and have them replaced by email.	<ul style="list-style-type: none"> • Need for personnel training, re-assignment • Email has major personnel savings and should be given priority
Consolidation of Services		
Introduction of New Customer Service		

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Migration Planning Techniques

Implementation Factor Catalog

- This is used to document factors impacting the architecture Implementation and Migration Plan.

Consolidated Gaps, Solutions, & Dependencies Matrix

- This is used by the architect to group the gaps identified in the domain architecture gap analysis results and assess potential solutions and dependencies to one or more gaps.

Migration Techniques

Architecture Definition Increments Table

- ❑ This is used by the architect to plan a series of Transition Architectures outlining the status of the Enterprise Architecture at specified times.

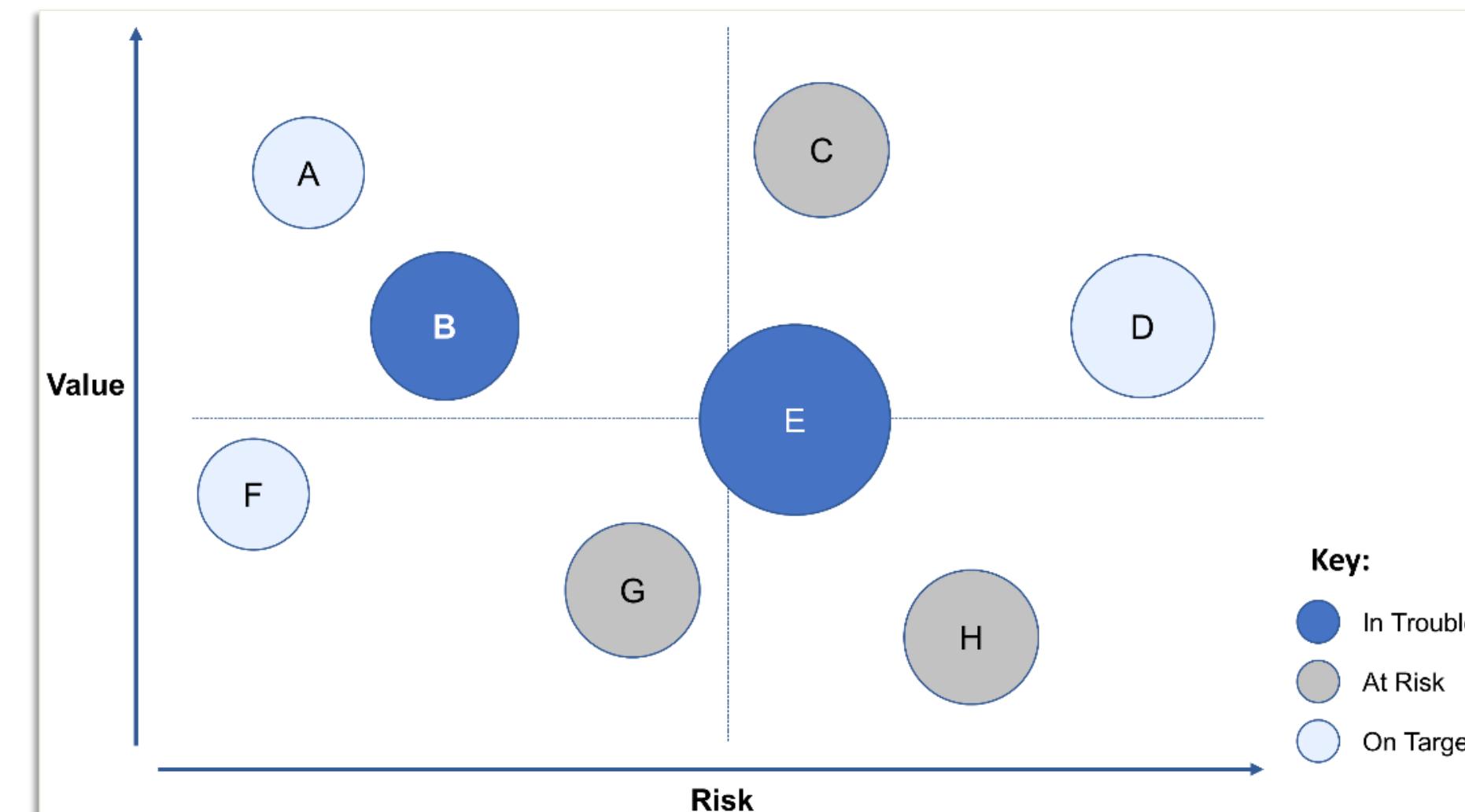
Transition Architecture State Evolution Table

- ❑ This is used by the architect to show the proposed state of the architectures at various levels using the defined taxonomy (e.g., the TOGAF TRM).

Migration Techniques

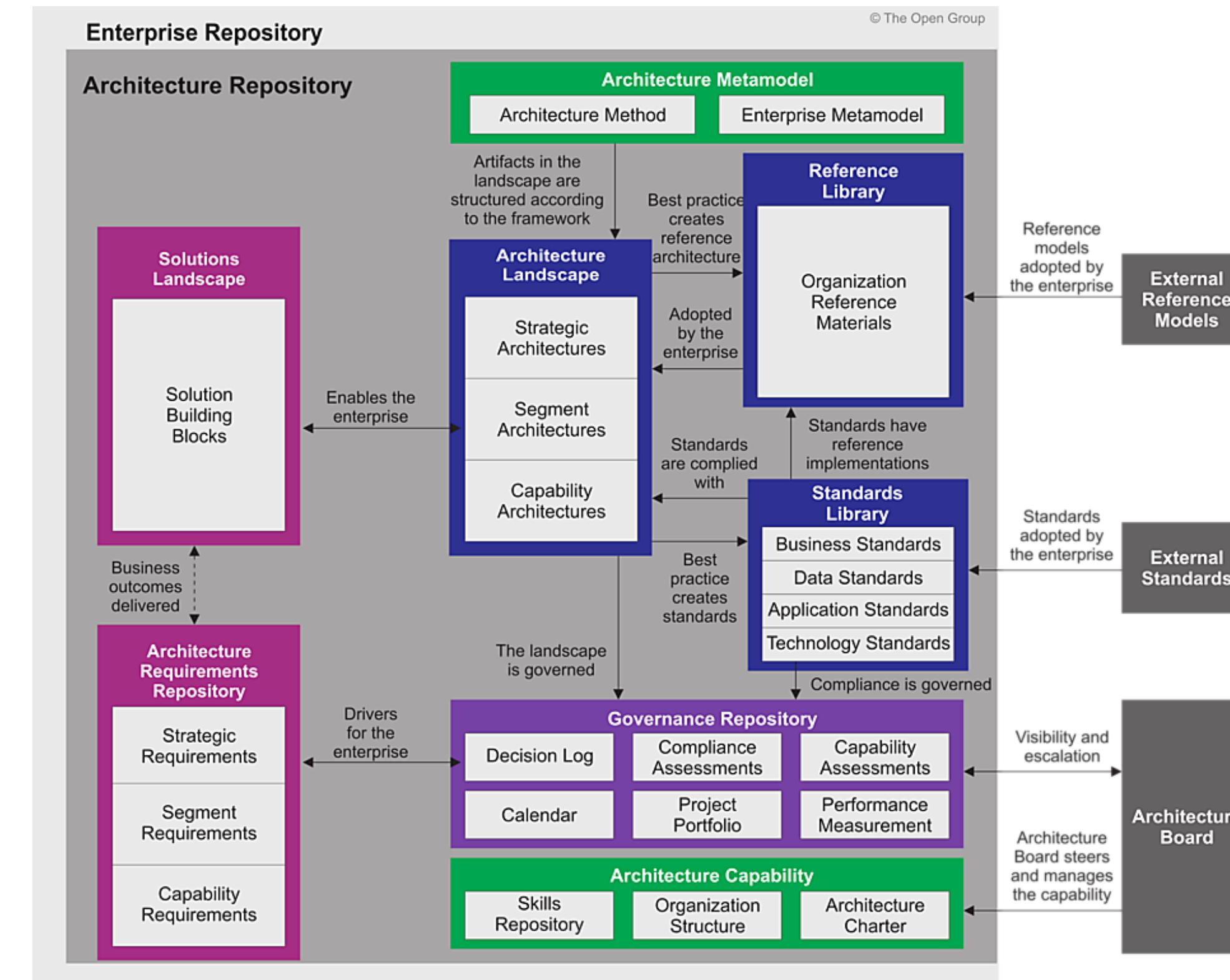
Business Value Assessment Technique

- ❑ This is used to assess business value by drawing up a matrix based on a value index dimension and a risk index dimension.



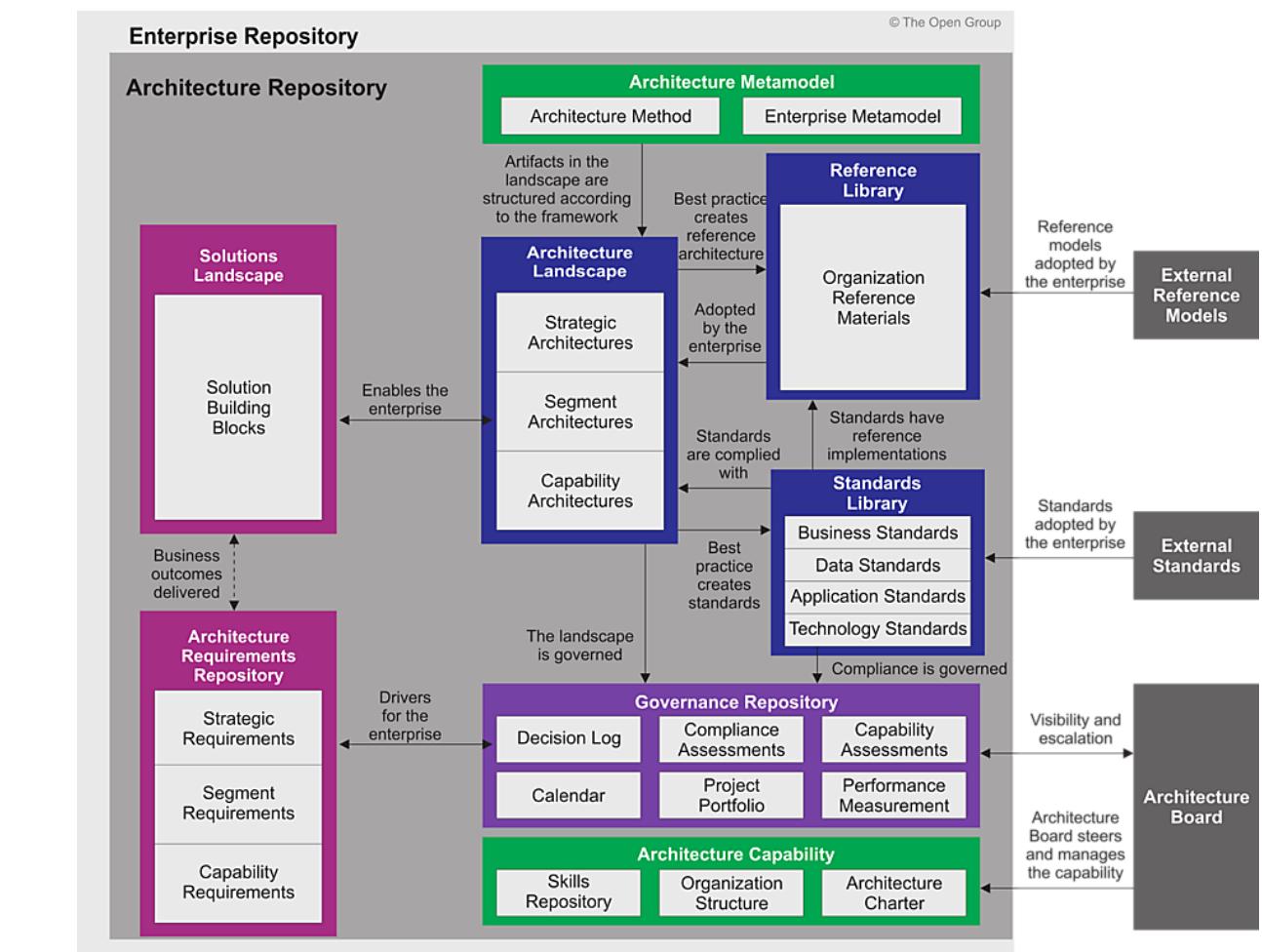
8.5 How a Repository can be structured using the TOGAF Architecture Repository as an example

The TOGAF Architecture Repository



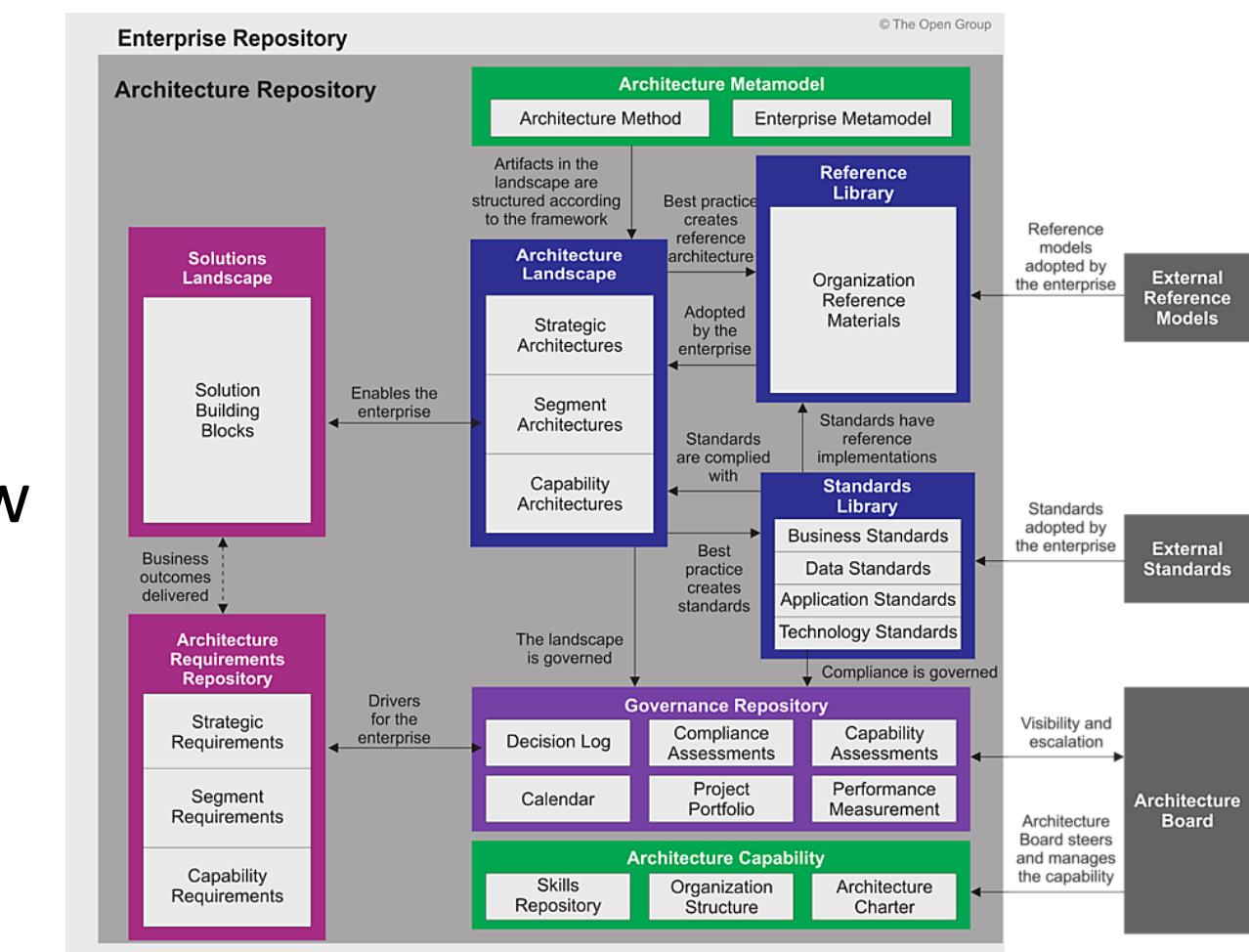
Classes of Architectural Information (1)

- The **Architecture Metamodel** describes the organisationally tailored application of an architecture framework, including a method for architecture development and a metamodel for architecture content
- The **Architecture Capability** defines the parameters, structures, and processes that support governance of the Architecture Repository
- The **Architecture Landscape** presents an architectural representation of assets in use, or planned, by the enterprise at particular points in time
- The **Standards Library** captures the standards with which new architectures must comply, which may include industry standards, selected products and services from suppliers, or shared services already deployed within the organisation



Classes of Architectural Information (2)

- The **Reference Library** provides guidelines, templates, patterns, and other forms of reference material that can be leveraged in order to accelerate the creation of new architectures for the enterprise
- The **Governance Repository** provides a record of governance activity across the enterprise
- The **Architecture Requirements Repository** provides a view of all authorised architecture requirements which have been agreed with the Architecture Board
- The **Solutions Landscape** presents an architectural representation of the SBBs supporting the Architecture Landscape which have been planned or deployed by the enterprise



8.6 What to expect in a well-run Architecture Repository

Recommendations

Supporting Tool:

- A high-functioning team should be supported by modeling and analytic software, as well as a document management system
- A Practitioner requires linkage between any models and documentation, as well as a space to perform analysis.

Sufficient Detail:

- A well run repository will contain sufficient detail to demonstrate that views for stakeholders are derived from the architecture.
- All Stakeholders' concerns must be addressed.

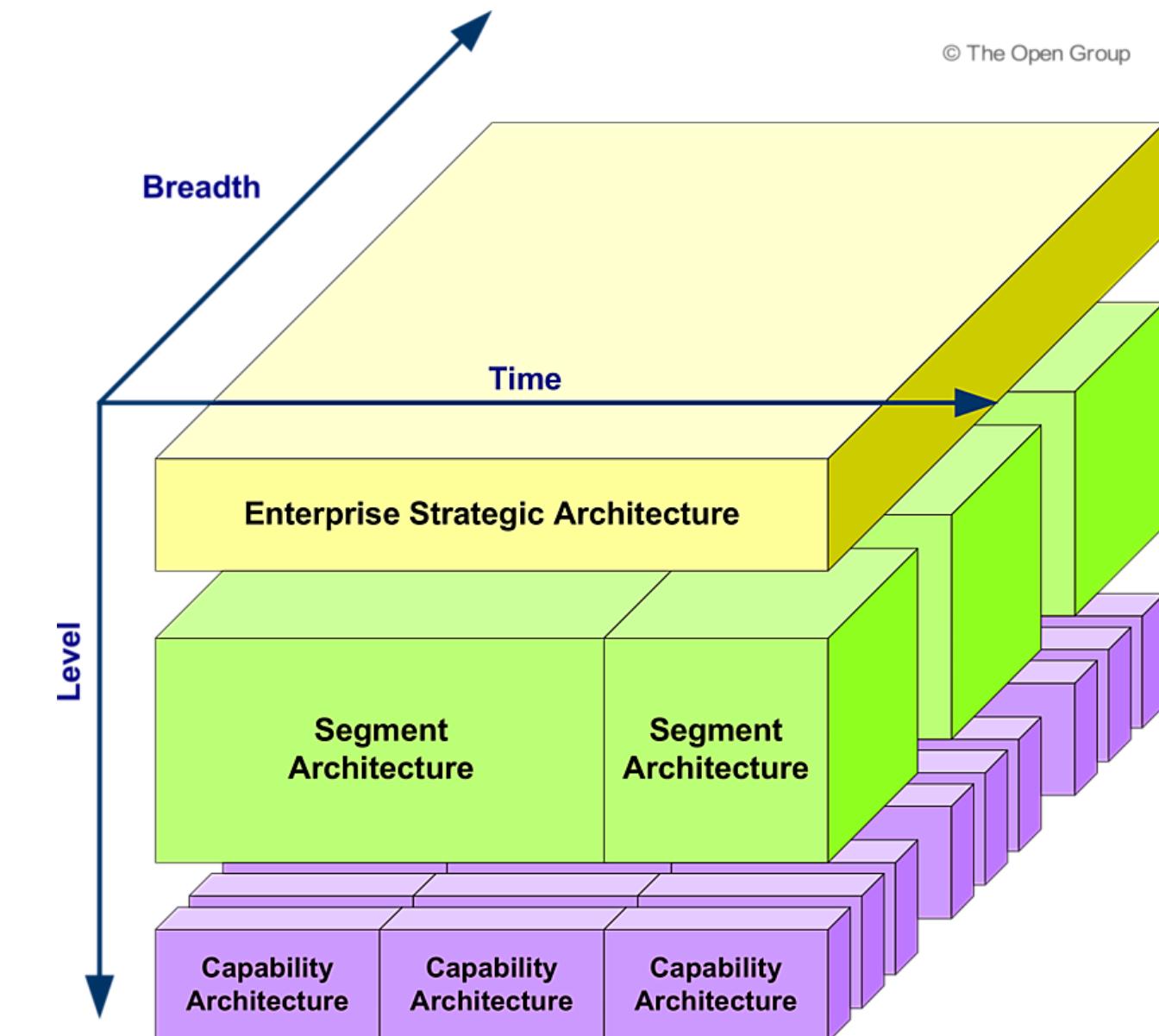
Recommendations

- Focus on the three most powerful components of an EA Repository, the Architecture Requirements Specification, controls, and gaps.
- Focus on good information management including good information presentation practice.

8.7 How the concepts of Architecture Levels are used to organise the Architecture Landscape

The Concepts

- In a typical enterprise, many architectures will be described in the Architecture Landscape at any point in time.
- To address this complexity, the TOGAF Standard uses the concepts of levels and the Enterprise Continuum to provide a conceptual framework for organising the Architecture Landscape.
- Levels provide a framework for dividing the Architecture Landscape into three levels of granularity



Developing Architecture at Different Levels

- Each architecture typically does not exist in isolation and must therefore sit within a governance hierarchy. Broad, summary architectures set the direction for narrow and detailed architectures.
- Two strategies can be applied:
 - Architectures at different levels can be developed through iterations within a single cycle of the ADM process
 - Architectures at different levels can be developed through a hierarchy of ADM processes, executed concurrently

Organising the Architecture Landscape (1)

- **Breadth:** the breadth (subject matter) area is generally the primary organising characteristic for describing an Architecture Landscape. Architectures are functionally decomposed into a hierarchy of specific subject areas or segments.
- **Depth:** with broader subject areas, less detail is needed to ensure that the architecture has a manageable size and complexity. More specific subject matter areas will generally permit (and require) more detailed architectures.

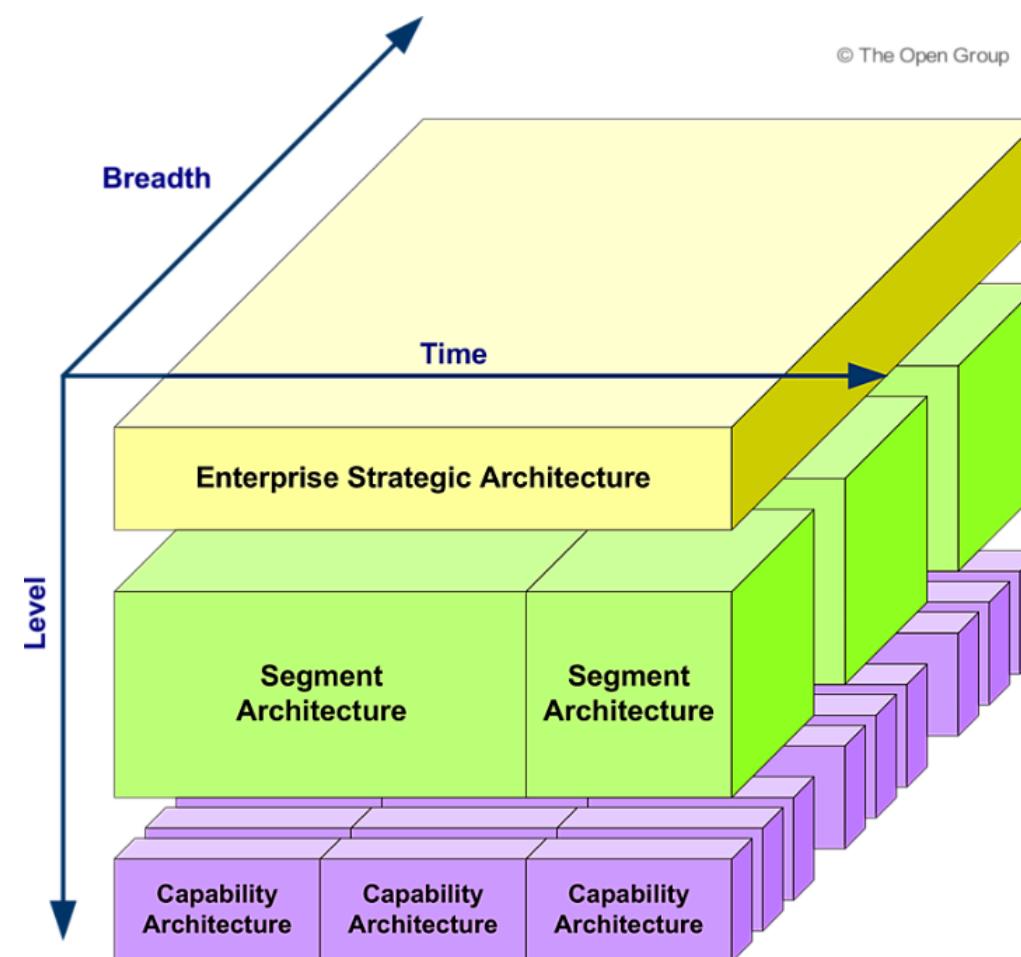
Organising the Architecture Landscape (2)

- **Time:** for a specific breadth and depth an enterprise can create a Baseline Architecture and a set of Target Architectures that stretch into the future. Broader and less detailed architectures will generally be valid for longer periods of time and can provide a vision for the enterprise that stretches further into the future

- **Recency:** finally, each architecture view will progress through a development cycle where it increases in accuracy until finally approved. After approval, an architecture will begin to decrease in accuracy if not actively maintained. In some cases recency may be used as an organising factor for historic architectures.

8.8 Different Levels of Architecture that exist in an Organisation

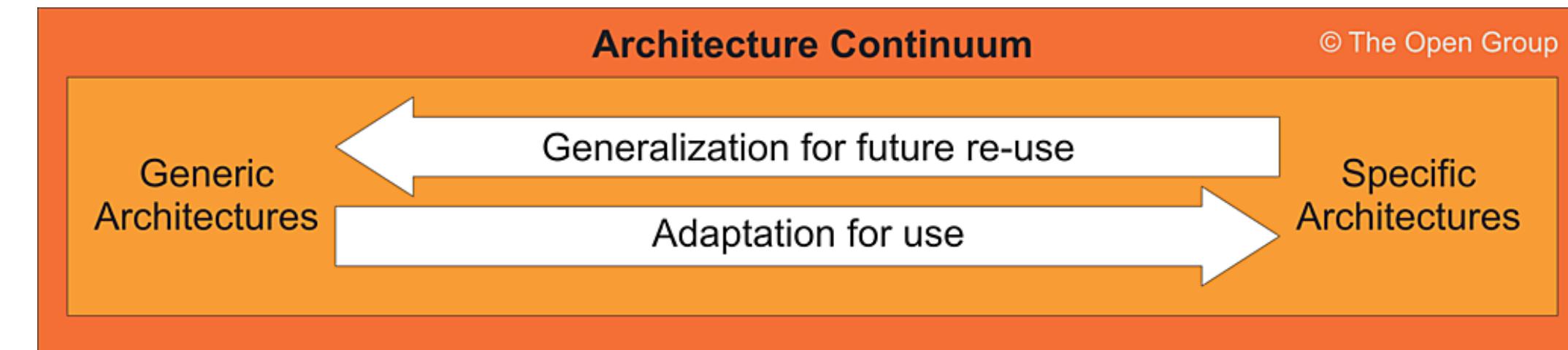
Architecture Landscape



- **(Enterprise) Strategic Architecture** provides an organising framework for operational and change activity and allows for direction setting at an executive level.
- **Segment Architecture** provides an organising framework for operational and change activity and allows for direction setting and the development of effective architecture roadmaps at a program or portfolio level.
- **Capability Architecture** provides an organising framework for change activity and the development of effective architecture roadmaps realising capability increments.

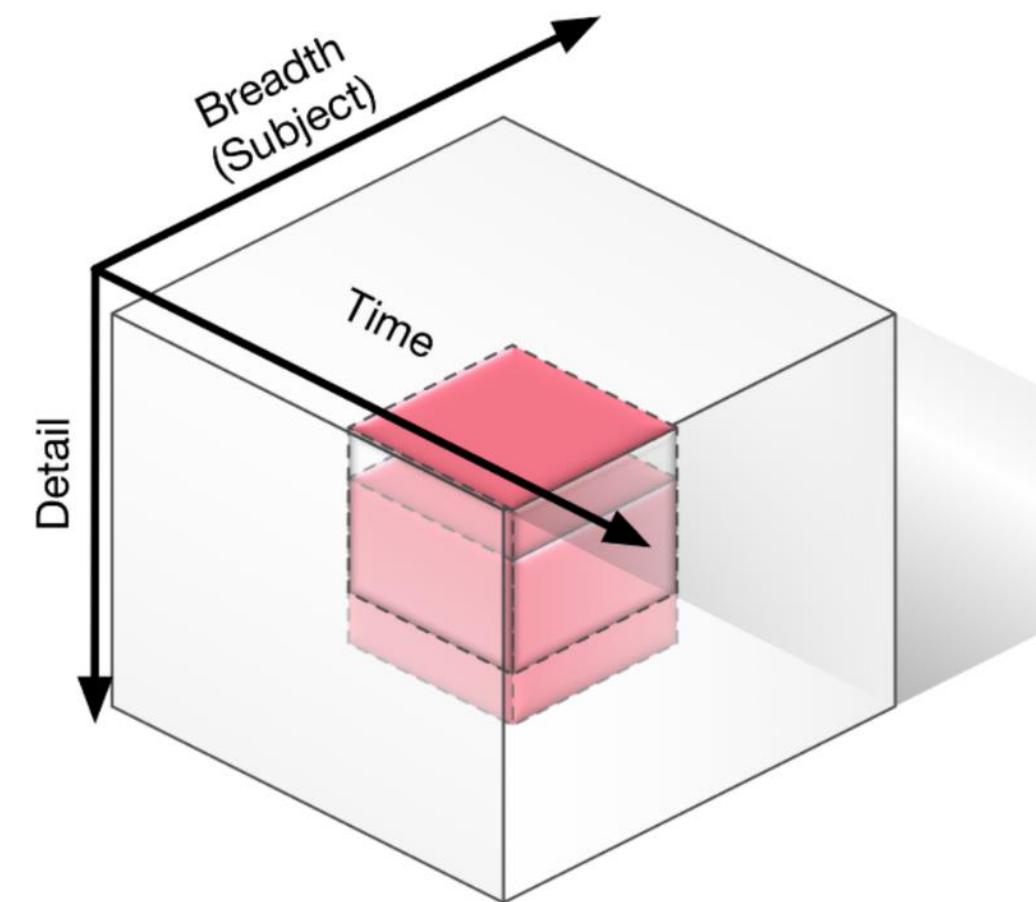
The Architecture Continuum

- ❑ Provides a method of dividing each level of the Architecture Landscape by abstraction.
- ❑ Offers a consistent way to define and understand the generic rules, representations, and relationships in an architecture, including traceability and derivation relationships
- ❑ Shows the relationships from foundation elements to organisation-specific architecture.



8.9 Determining the Level that an Architecture is being Developed at

EA Landscape with an Architecture Project



- Looking at the figure, the essential point is that the Architecture Project covers a specific portion of the EA Landscape – the portion defined regarding breadth, planning horizon, and detail. Prior work may already exist within the scope.

8.10 The Role of Architecture Building Blocks (ABBs)

Architecture Building Blocks

- ❑ Architecture Building Blocks (ABBs) relate to the Architecture Continuum and are defined or selected as a result of the application of the ADM.
- ❑ They are used to capture architecture requirements; e.g., Business, Data, Application, and Technology requirements
- ❑ They direct and guide the development of SBBs

8.11 Guidelines and Techniques for Business Architecture

Applying Business Capabilities

- ❑ The business capability map found or developed in the Architecture Vision phase provides a self-contained view of the business that is independent of the current organisational structure, business processes, information systems and applications, and the rest of the product or service portfolio
- ❑ Those business capabilities should be mapped back to the organisational units, value streams, information systems, and strategic plans within the scope of the Enterprise Architecture project.
- ❑ This relationship mapping provides greater insight into the alignment and optimisation of each of those domains

Example: Business Capability Map

Strategic	Business Planning	Market Planning	Partner Management
	Capital Management	Policy Management	Government Relations Management
Core	Account Management	Product Management	Distribution Management
	Customer Management	Channel Management	Agent Management
Supporting	Financial Management	HR Management	Procurement Management
	Information Management	Training Management	Operations Management

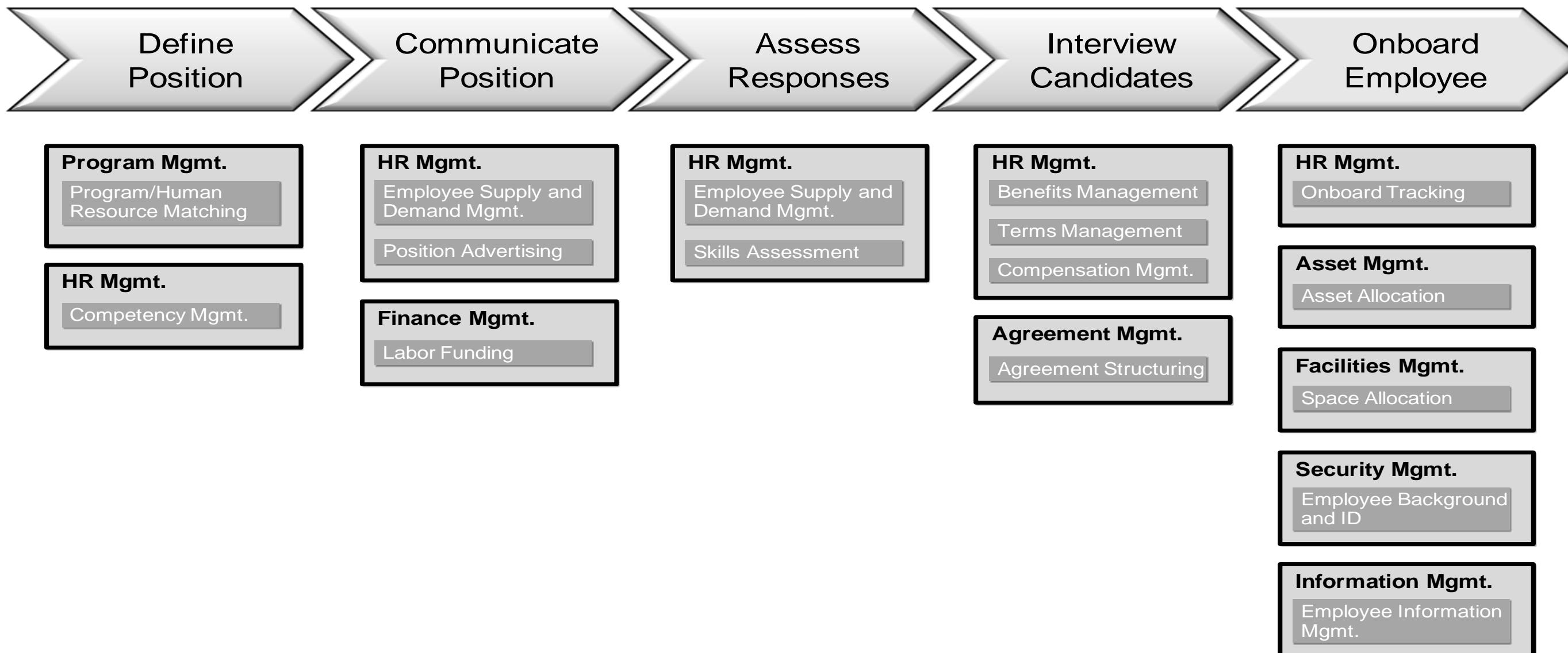
Example: Business Capabilities Heat Map

Strategic	Business Planning (L)	Market Planning (H)	Partner Management (M)
	Capital Management (L)	Policy Management (L)	Government Relations Management (H)
Core	Account Management (L)	Product Management (L)	Distribution Management (L)
	Customer Management (Y)	Channel Management (L)	Agent Management (N)
Supporting	Financial Management (L)	HR Management (H)	Procurement Management (L)
	Information Management (M)	Training Management (M)	Operations Management (L)

Applying Value Streams

- ❑ Value streams provide valuable stakeholder context into why the organisation needs business capabilities, while business capabilities provide what the organisation needs for a particular value stage to be successful.
- ❑ Start with the initial set of value stream models for the business documented in the Architecture Vision phase. Within the scope of the specific Enterprise Architecture project, if sufficiently larger in breadth, there may be a need for new value streams not already in the repository.
- ❑ A new or existing value stream can be analysed within the scope of the project through heat mapping (by value stream stage) or by developing use-cases around a complete definition of the value stream

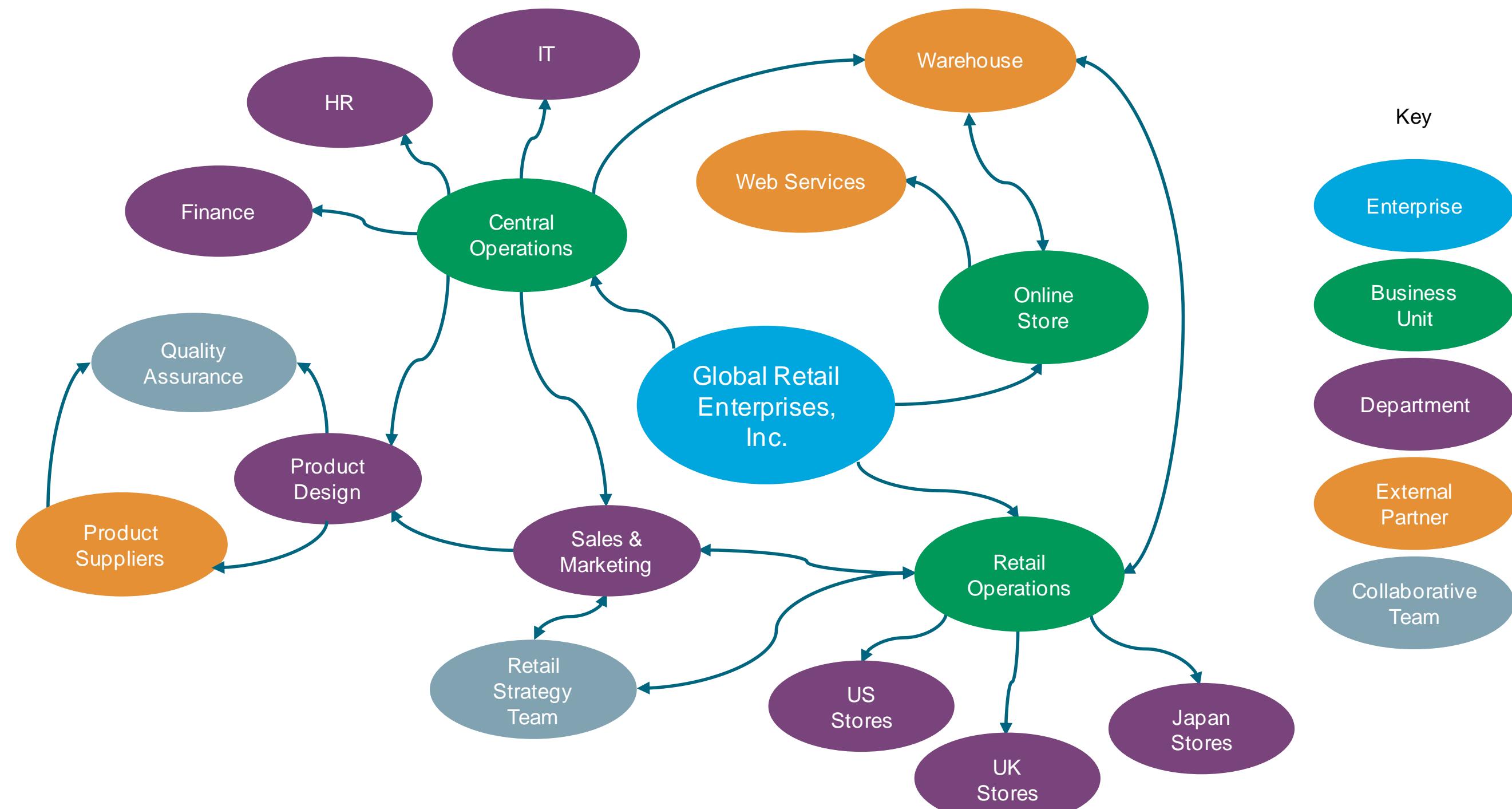
Example: Mapping Capabilities to Value Stream Stages



Applying Organisation Mapping

- ❑ An organisation map shows the key organisational units, partners, and stakeholder groups that make up the enterprise ecosystem.
- ❑ The map should depict the working relationship between those entities, as distinct from an organisational chart that only shows hierarchical reporting relationships.
- ❑ The business unit is the main concept used to establish organisation maps.
- ❑ This map is a key element of Business Architecture because it provides the organisational context for the whole Enterprise Architecture effort.

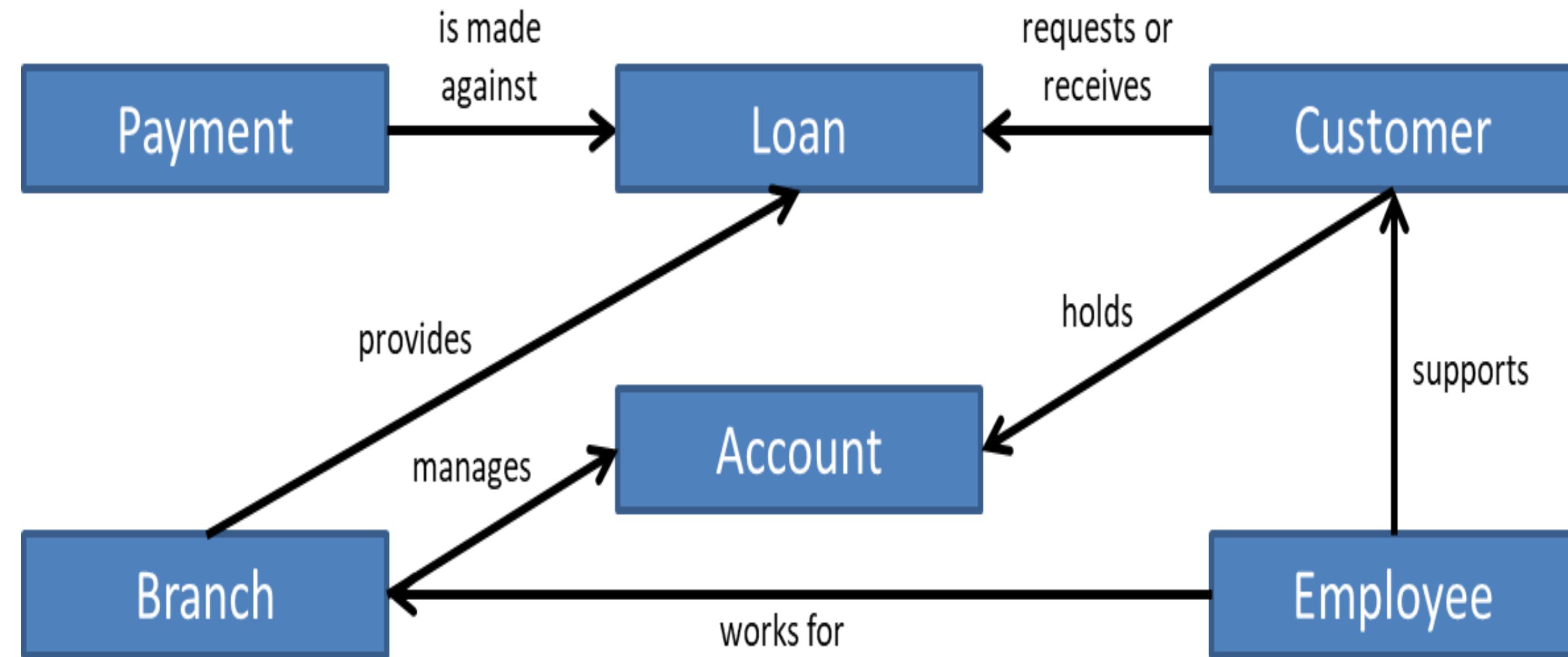
Example: Organisation Map



Applying Information Maps

- ❑ Characterising information in the Business Architecture phase starts with the elements that matter most to the business, such as product, customer, factory, etc.
- ❑ Relationships among the information domains can then be added to the map as the next level of understanding for a good baseline information map.
- ❑ The most significant benefit then comes with building matrices between information and business capabilities.
- ❑ These information maps and relationships to business capabilities will then apply in later architecture phases on data characterisation, applications, and infrastructure.

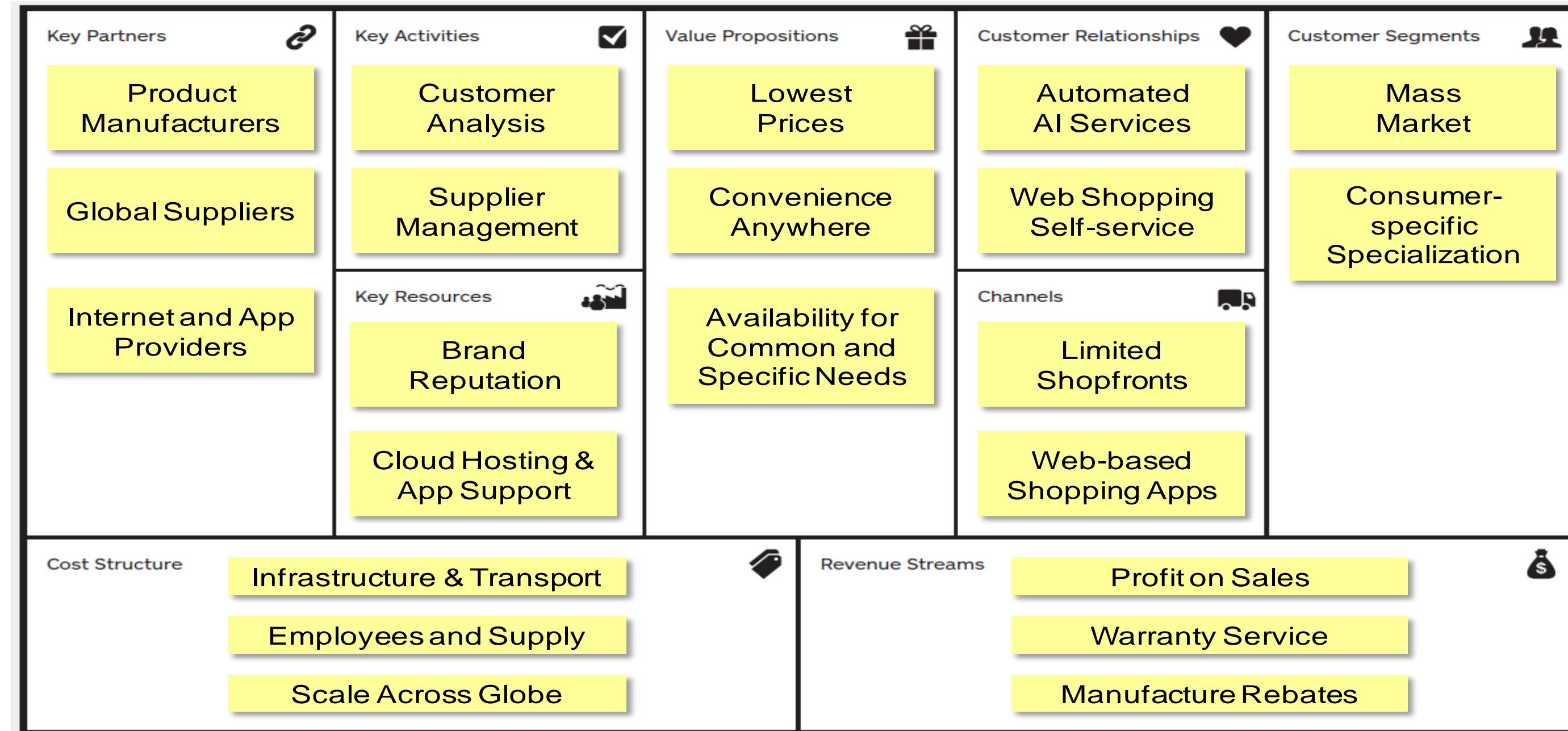
Example: Simple Information Map



Applying Modeling Techniques

- ❑ The modeling and mapping techniques are extensions that implement the business capabilities, value streams, and organisation maps.
- ❑ **Activity Models** (also called **Business Process Models**) describe the enterprise's business activities, the data and/or information exchanged between activities (internal exchanges), and the data and/or information exchanged with other activities that are outside the scope of the model (external exchanges)
- ❑ **Use-Case Models** describe the business process of an enterprise in terms of use-cases and actors corresponding to business processes and organisational participants (people, organisations, etc.)
- ❑ **Logical Data Model** (or **Class Model**) Logical data models describe the entities, their attributes, and the acceptable values for these attributes as well as the relationships between the various entities.
- ❑ **Business Models** Business models provide a powerful construct to help focus and align an organisation around its strategic vision and execution

Example: Business Model Canvas



8.12 Applying Gap Analysis

Gap Analysis

- ❑ A key step in developing an architecture is to identify changes between the baseline and target architectures using Gap Analysis.
- ❑ The Gap Analysis technique is used to consider what may have been forgotten or missed, as well as what is needed.
- ❑ A gap is simply anything that changes.

Steps

- ❑ Draw up a matrix with all the ABBs of the Baseline Architecture on the vertical axis, and all the ABBs of the Target Architecture on the horizontal axis
- ❑ Add to the Baseline Architecture axis a final row labelled "New", and to the Target Architecture axis a final column labelled "Eliminated"
- ❑ Where an ABB is available in both the Baseline and Target Architectures, record this with "Included" at the intersecting cell
- ❑ Where an ABB from the Baseline Architecture is missing in the Target Architecture, each must be reviewed
- ❑ Where an ABB from the Target Architecture cannot be found in the Baseline Architecture, mark it at the intersection with the "New" row as a gap that needs to be filled, either by developing or procuring the building block

ADM Phases B, C and D

Develop Target, Baseline, and Gap

- Just enough for the purpose.
- If the current state is accepted, the only reason to describe the baseline is to develop gaps.
- Consider the limitation of restricting description to where there is a gap.
- Description using the same technique at the same level of detail enables identification of gaps: a gap is everything that changes.

8.13 How Iteration can be used in Architecture Practices

Iteration in Practice

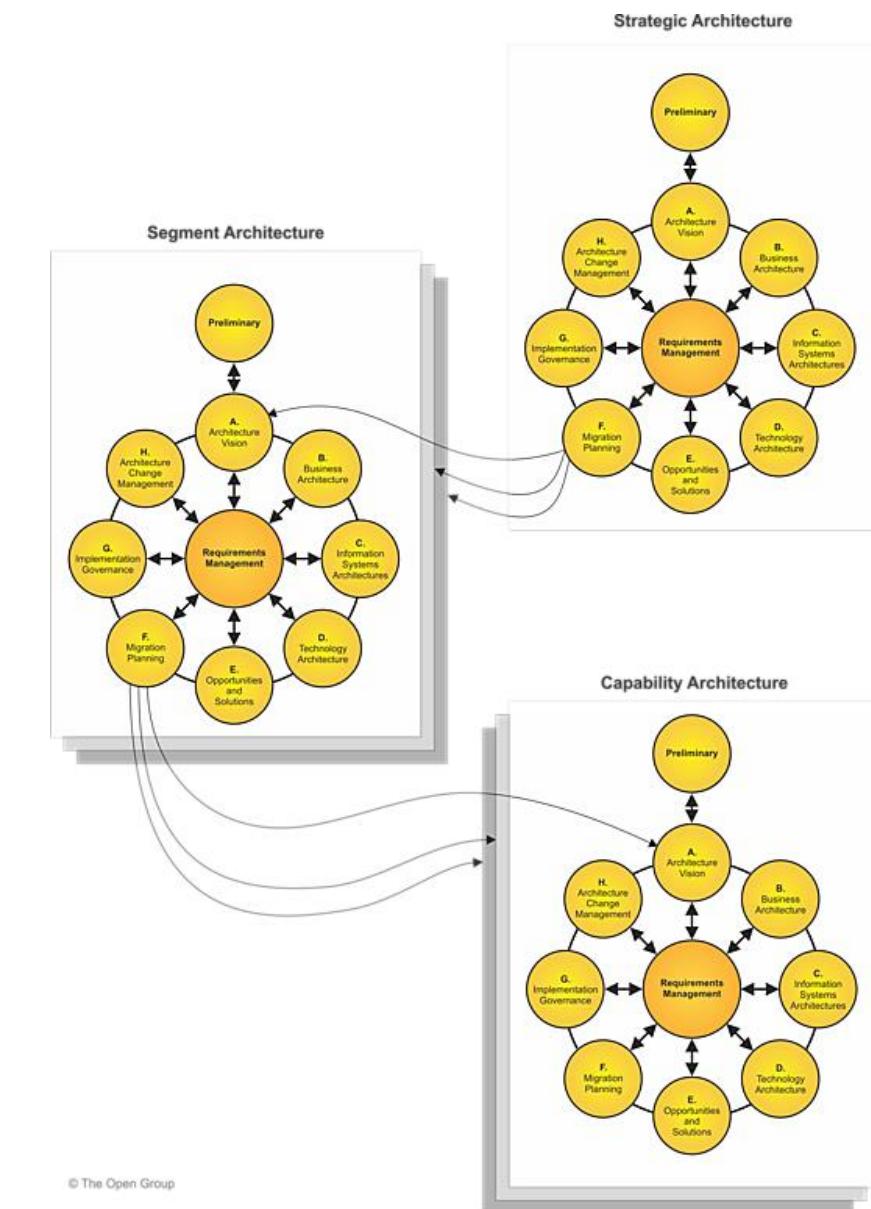
- ❑ Iteration can be used in two different ways
 1. Iteration of the ADM
 - Described in terms of activity, re-sequencing and looping the ADM
 2. Iteration in terms of Information Flow
 - By exploring the EA Landscape based on information required. If the information required is available move on, else produce the material by exercising an ADM phase

Iteration of the ADM

- ❑ The ADM supports iteration in a number of ways.
 1. Iteration to describe a comprehensive Architecture Landscape through multiple ADM cycles based upon individual initiatives bound to the scope of the Request for Architecture Work
 2. Iteration to describe the integrated process of developing an architecture where the activities described in different ADM phases interact to produce an integrated architecture
 3. Iteration to describe the process of managing change to the organisation's Architecture Capability

1. Iteration to Develop a Comprehensive Architecture Landscape

- Projects will exercise through the entire ADM cycle, commencing with Phase A.
 - Each cycle of the ADM will be bound by a Request for Architecture Work
 - The architecture output will populate the Architecture Landscape, either extending the landscape described, or changing the landscape where required
- Separate projects may operate their own ADM cycles concurrently, with relationships between the different projects.
- One project may trigger the initiation of another project.



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Suggested Iteration Cycles (Target First)

		Architecture Development			Transition Planning		Architecture Governance	
TOGAF Phase		Iteration 1	Iteration 2	Iteration n	Iteration 1	Iteration n	Iteration 1	Iteration n
Preliminary		Informal	Informal	Informal				Light
Architecture Vision		Informal	Informal	Informal	Informal	Informal		Light
Business Architecture	Baseline	Informal	Core	Core	Informal	Informal		Light
	Target	Core	Light	Core	Informal	Informal		Light
Application Architecture	Baseline	Informal	Core	Core	Informal	Informal		Light
	Target	Core	Light	Core	Informal	Informal		Light
Data Architecture	Baseline	Informal	Core	Core	Informal	Informal		Light
	Target	Core	Light	Core	Informal	Informal		Light
Technology Architecture	Baseline	Informal	Core	Core	Informal	Informal		Light
	Target	Core	Light	Core	Informal	Informal		Light
Opportunities and Solutions		Light	Light	Light	Core	Core	Informal	Informal
Migration Planning		Light	Light	Light	Core	Core	Informal	Informal
Implementation Governance					Informal	Informal	Core	Core
Change Management		Informal	Informal	Informal	Informal	Informal	Core	Core

■ Core: primary focus activity for the iteration

■ Light: secondary focus activity for the iteration

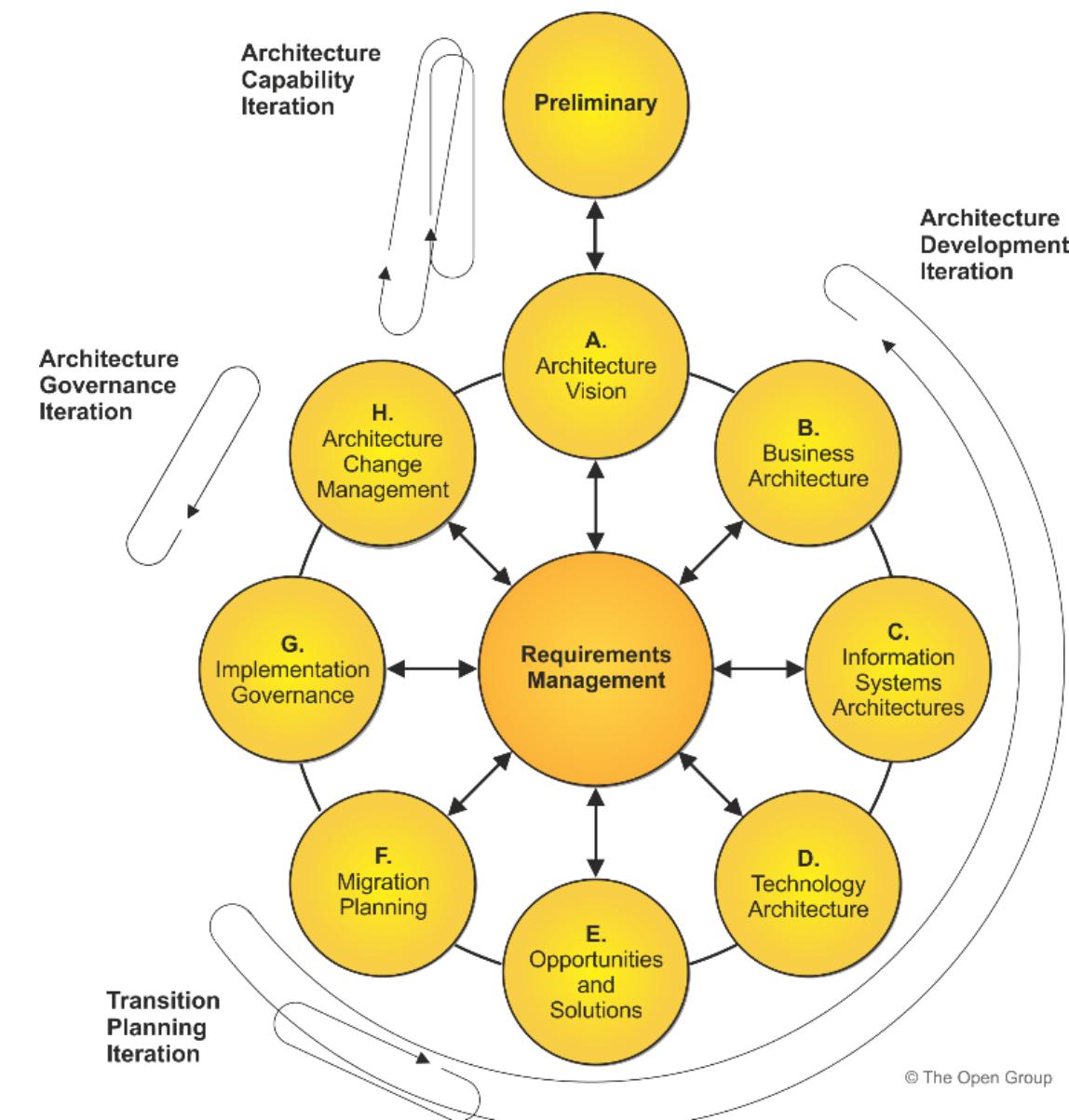
□ Informal: potential activity for the iteration, not formally mentioned in the method

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2. Iteration within an ADM Cycle (Architecture Development Iteration)

- ❑ Projects may:

- Operate multiple ADM phases concurrently
- Cycle between ADM phases, in planned cycles covering multiple phases
- Return to previous phases to update work products with new information

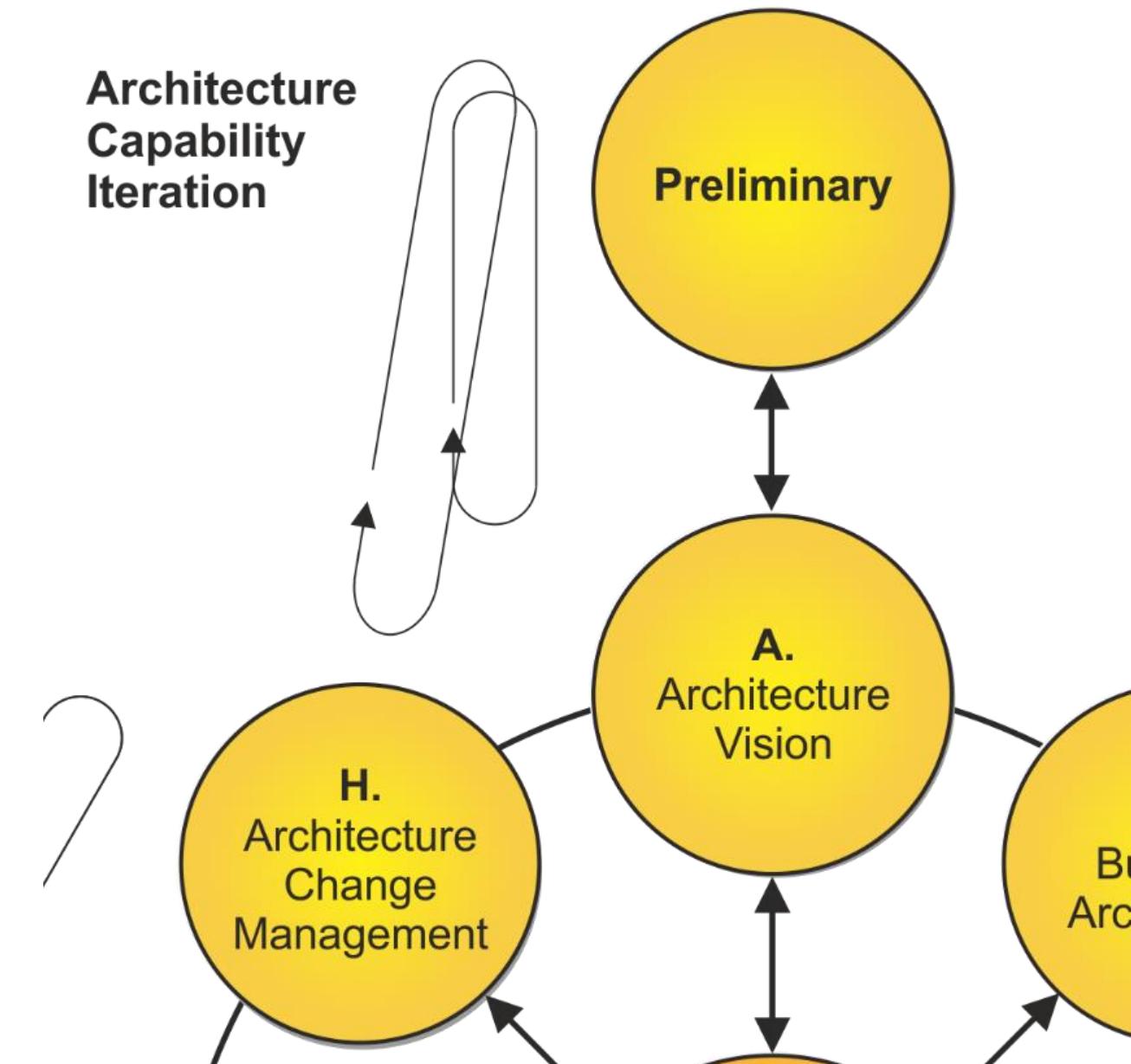


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3. Iteration to manage the Architecture Capability (Architecture Capability Iteration)

- Projects may require:

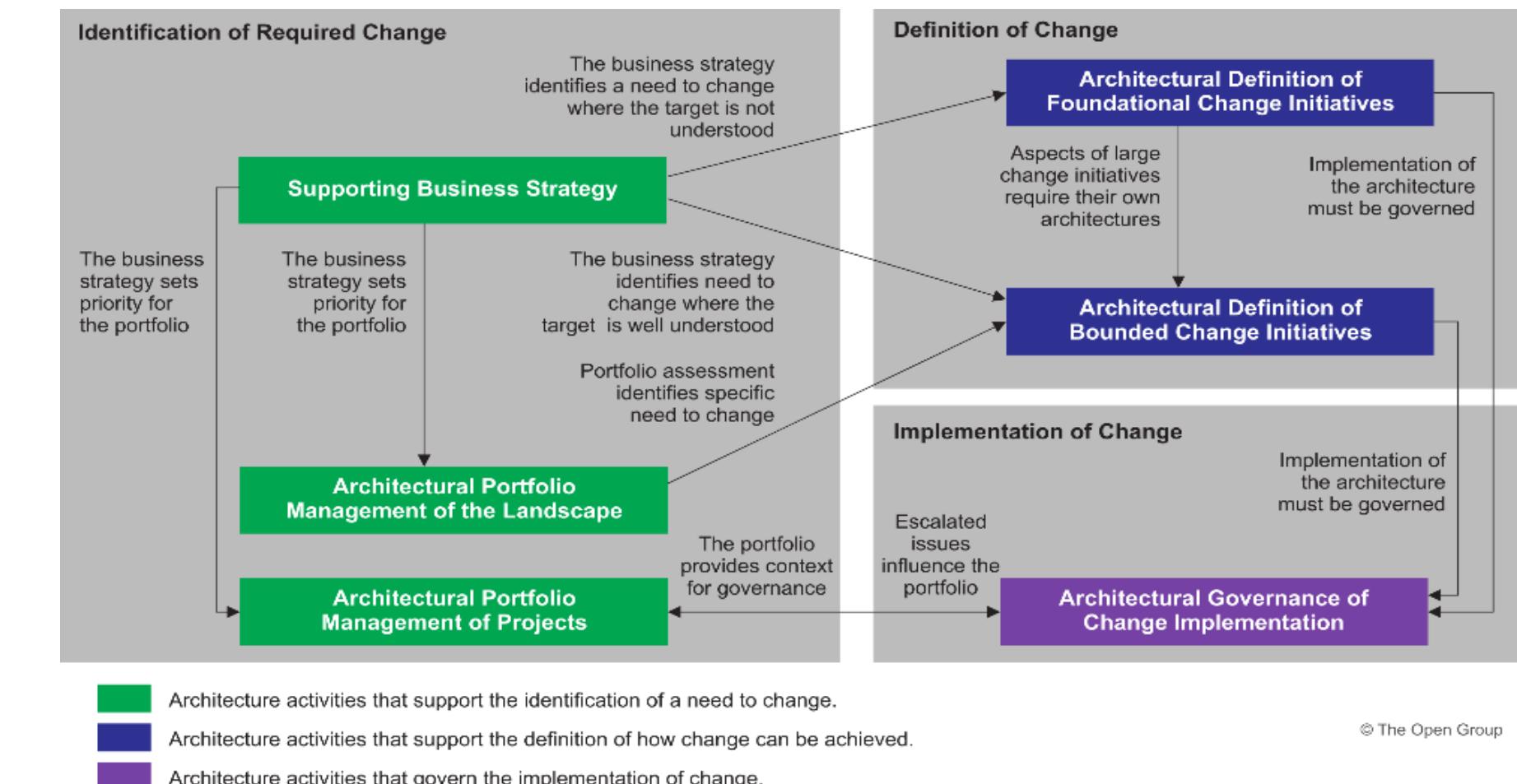
- a new iteration of the Preliminary Phase to (re-) establish aspects of the Architecture Capability identified in Phase A to address a Request for Architecture Work
- a new iteration of the Preliminary Phase to adjust the organisation's Architecture Capability as a result of identifying new or changed requirements for Architecture Capability as a result of a Change Request in Phase H



Classes of Architecture Engagement

- ❑ The standard defines approaches for three areas of engagement for architects:

- Identification of Change Required
- Definition of Change
- Implementation of Change



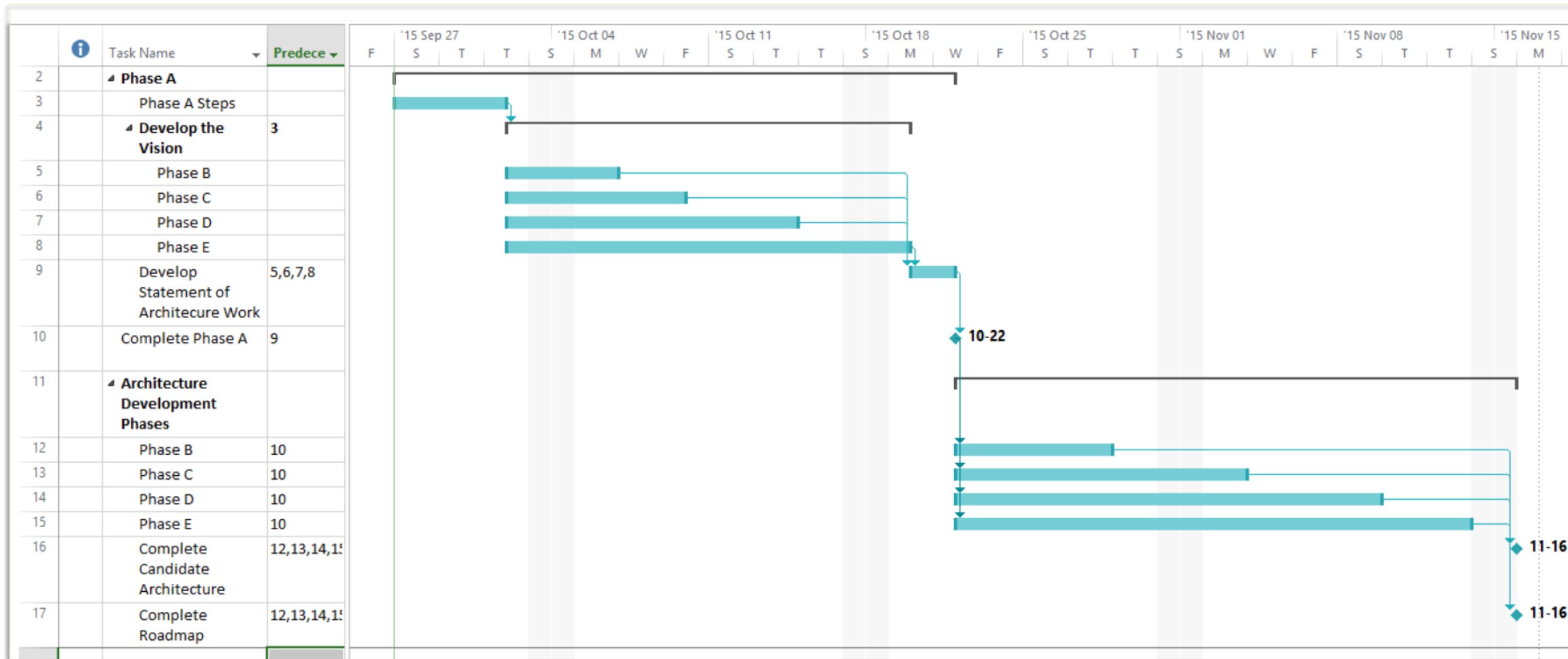
Iteration Focus for Classes of Architecture Engagement (Extract)

Engagement	Iteration Focus	Scope
Supporting Business Strategy	Architecture Capability Architecture Development (Baseline First)	Broad, shallow consideration given to the Architecture Landscape in order to address a specific strategic question and define terms for more detailed architecture efforts to address strategy realisation.
Architectural Portfolio Management of the Landscape	Architecture Capability Architecture Development (Baseline First)	Focus on physical assessment of baseline applications and technology infrastructure to identify improvement opportunities, typically within the constraints of maintaining business as usual.
Architectural Portfolio Management of Projects	Transition Planning Architecture Governance	Focus on projects, project dependencies, and landscape impacts to align project sequencing in a way that is architecturally optimised.

Iteration in Terms of Information Flow

- ❑ Iteration within the TOGAF ADM is often in terms of re-sequencing and looping.
- ❑ Iteration can also be done in terms of information flow, where iteration is driven by the information needs of the project.
- ❑ If the information required is not available then it is produced by exercising a TOGAF ADM phase.

Example



8.14 How the Implementation Factor Catalog can be used

Implementation Factor Catalog

- This catalog is used to document the factors impacting the Implementation and Migration Plan.
- This is created at the start of Phase E to act as a repository for implementation and migration decisions.

This catalog is revisited during Phase E as further information is found.

Implementation Factor Catalog		
Factor	Description	Deduction
<Name of Factor>	<Description of Factor>	<Impact on Migration Plan>
Change in Technology	Shut down the message centers, saving 700 personnel, and have them replaced by email.	<ul style="list-style-type: none">• Need for personnel training, re-assignment• Email has major personnel savings and should be given priority
Consolidation of Services		
Introduction of New Customer Service		

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Consolidated Gaps, Solutions, & Dependencies Matrix

- ❑ This matrix is used as a planning tool when creating work packages.
- ❑ It allows the architect to group the gaps identified in the domain architecture gap analysis results and assess potential solutions and dependencies to one or more gaps.

Consolidated Gaps, Solutions, and Dependencies Matrix				
No.	Architecture	Gap	Potential Solutions	Dependencies
1	Business	New Order Processing Process	Use COTS software tool process Implement custom solution	Drives applications (2)
2	Application	New Order Processing Application	COTS software tool X Develop in-house	
3	Information	Consolidated Customer Information Base	Use COTS customer base Develop customer data mart	

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Architecture Definition Increments Table

- This table is used to plan a series of Transition Architectures outlining the status of the Enterprise Architecture at specified times.

- This can be used to assign incremental project deliverables across the Transition Architectures

Architecture Definition - Project Objectives by Increment (Example Only)				
Project	April 2018/2019	April 2019/2020	April 2020/2021	Comments
	Transition Architecture 1: Preparation	Transition Architecture 2: Initial Operational Capability	Transition Architecture 3: Benefits	
Enterprise e-Services Capability	Training and Business Process	e-Licensing Capability	e-Employment Benefits	
IT e-Forms	Design and Build			
IT e-Information Environment	Design and Build Information Environment	Client Common Data Web Content Design and Build	Enterprise Common Data Component Management Design and Build	
...

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8.15 The Content Framework and the Enterprise Metamodel

The Need for the Content Framework and the Enterprise Metamodel

- An essential task when establishing the enterprise-specific Enterprise Architecture Capability in the Preliminary Phase of the ADM is to define:
 - A categorisation framework to be used to structure the Architecture Descriptions, the work products used to express an architecture, and the collection of models that describe the architecture: the Content Framework
 - An understanding of the types of entities within the enterprise and the relationships between them that need to be captured, stored, and analysed in order to create the Architecture Description; this Enterprise Metamodel depicts this information as a formal model

The Value of an Enterprise Metamodel

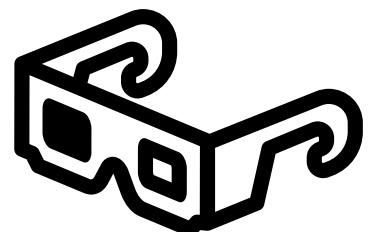
- ❑ It gives architects a starter set of the types of thing to investigate and to cover in their models
- ❑ It provides a form of completeness-check for any architecture modeling language, or architecture metamodel, that is proposed for use in an enterprise
- ❑ It can help ensure:
 - Consistency
 - Completeness
 - Traceability

Modeling Approaches

- ❑ A list of example modeling approaches is included in the handout.

These examples are provided as a starting point for a Practitioner who needs to consistently describe some part of an Enterprise.

- ❑ It is useful to describe something consistently.
- ❑ The approaches may have a formal or informal metamodel, notation, or supporting method.



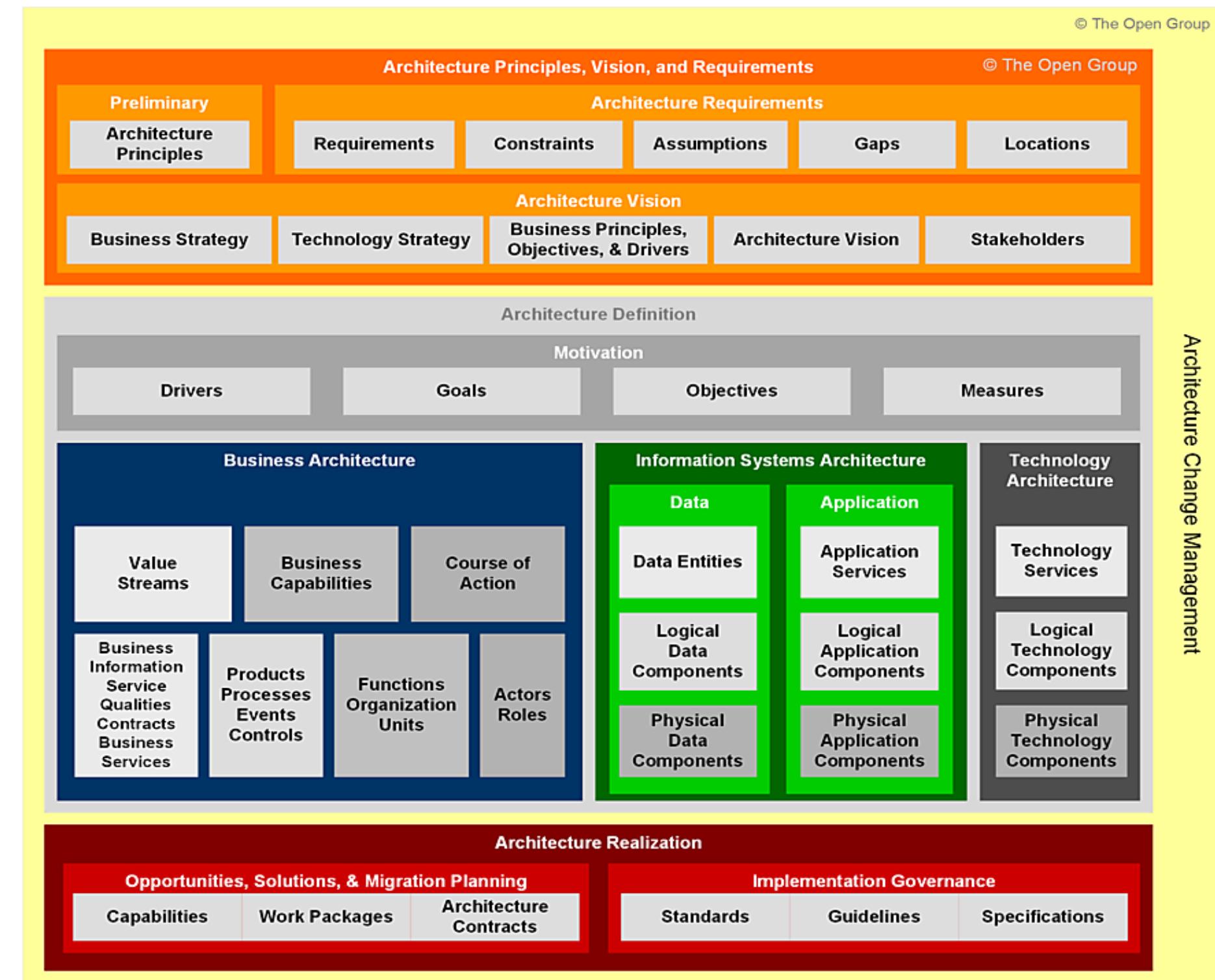
8.16 When the Architecture Content Framework (ACF) needs to be filled throughout the ADM Cycles

Filling the ACF throughout the ADM cycles

- ❑ At each stage, the ADM requires information as inputs and will create outputs as a result of executing a number of steps.

- ❑ The Content Framework provides an underlying structure for the ADM that defines inputs and outputs in more detail and puts each deliverable into the context of the holistic architecture view of the enterprise.

The TOGAF Content Framework



The TOGAF Content Framework

- **Architecture Principles, Vision, Motivation, and Requirements** models are intended to capture the surrounding context of formal architecture models, including general Architecture Principles, strategic context that forms input for architecture modeling, and requirements generated from the architectureThe relevant aspects of the business context that have given rise to the Request for Architecture work are typically investigated, refined, validated, and recorded in the Preliminary and Architecture Vision phases.

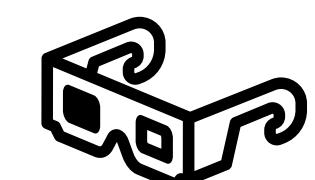
- **Business Architecture** captures architecture models of the business, looking specifically at factors that motivate the enterprise, its structure, and its capabilities

The TOGAF Content Framework

- ❑ **Information Systems Architecture** models capture architecture models of IT systems, looking at applications and data in line with the TOGAF ADM phases
- ❑ **Technology Architecture** models capture technology assets that are used to implement and realise information system solutions
- ❑ **Architecture Realisation/Transformation** models capture change roadmaps showing transition between architecture states and binding statements that are used to steer and govern an implementation of the architecture
- ❑ **Architecture Change Management** models capture value realisation management events, internal and external, that impact the Enterprise Architecture and the generation of requirements for action

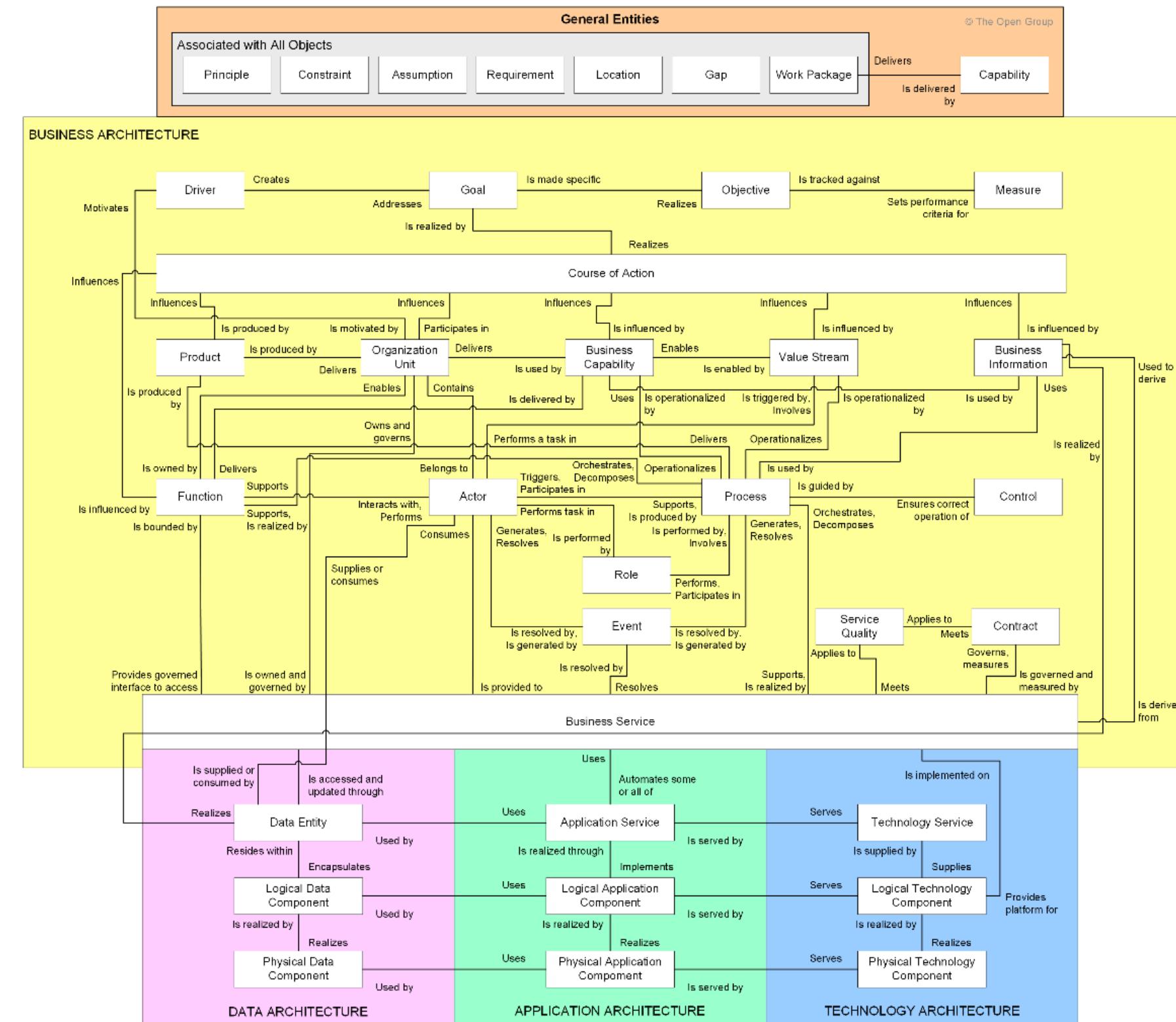
Mapping EA Capability Development with ADM Phases

Topic	Mapping to TOGAF ADM Phase
Enterprise Context and EA Context	<p>Partial Strategic Level Phase B</p> <p>Enterprise context:</p> <ul style="list-style-type: none"> ■ Goals, objectives, initiatives, competitive, and tactic analysis ■ Operating model (partners, suppliers) ■ Explore what-if scenarios and scorecards <p>EA context specific for the EA Capability:</p> <ul style="list-style-type: none"> ■ Goals
Business Objectives for the EA Capability	<p>Capability Level Phase A</p> <p>For the EA Capability:</p> <ul style="list-style-type: none"> ■ Provide initial goals and objectives ■ Select a reference EA Capability and maturity model ■ Candidate EA Capability ■ Candidate operating model ■ EA Capability gap and priority roadmap
Architecture Governance	<p>Partial Segment/Capability Level Phase B</p> <p>For the Enterprise:</p> <ul style="list-style-type: none"> ■ Enterprise Risk Management Model ■ Governance Model <p>For the EA Capability:</p> <ul style="list-style-type: none"> ■ Risk Management Model ■ Governance Model <small>■ Extend candidate operating model to include EA governance</small>



8.17 Using an Enterprise Metamodel

The TOGAF Enterprise Metamodel



Enterprise Metamodel – Entities (Extract)

Metamodel Entity	Description
Actor	A person, organization, or system that has a role that initiates or interacts with activities; for example, a sales representative who travels to visit customers. Actors may be internal or external to an organization. In the automotive industry, an original equipment manufacturer would be considered an actor by an automotive dealership that interacts with its supply chain activities.
Application Service	The automated elements of a business service. An application service may deliver or support part or all of one or more business services.
Assumption	A statement of probable fact that has not been fully validated at this stage, due to external constraints. For example, it may be assumed that an existing application will support a certain set of functional requirements, although those requirements may not yet have been individually validated.

Enterprise Metamodel – Attributes (Extract)

Metamodel Entity	Attribute	Description
All Metamodel Entities	ID	Unique identifier for the architecture entity.
	Name	Brief name of the architecture entity.
	Description	Textual description of the architecture entity.
	Category	User-definable categorization taxonomy for each metamodel entity.
	Source	Location from where the information was collected.
	Owner	Owner of the architecture entity.
Capability	Business value	Describes how this capability provides value to the enterprise.
	Increments	Lists possible maturity/quality levels for the capability.

Enterprise Metamodel

– Relationships (Extract)

Source Entity	Target Entity	Name
Actor	Actor	Decomposes
Actor	Business Service	Consumes
Actor	Data Entity	Supplies or consumes
Actor	Event	Generates
Actor	Event	Resolves
Actor	Function	Interacts with
Actor	Function	Performs

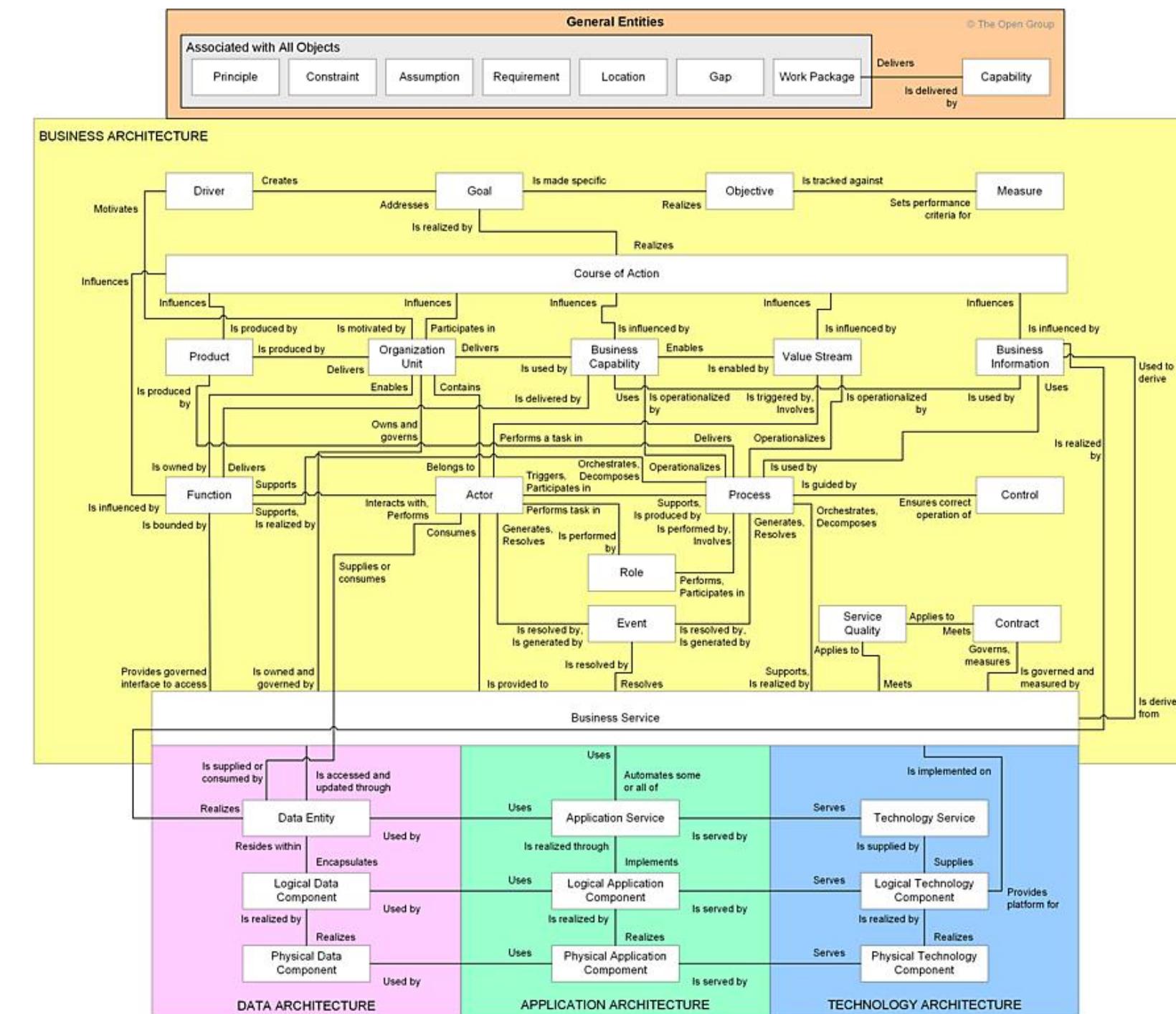
8.18 Using a Taxonomy

TOGAF Enterprise Metamodel Taxonomy

- ❑ The TOGAF Enterprise Metamodel provides a good starting point for a taxonomy for the majority of enterprises.
- ❑ It defines a list of common components and common possible relationships the enterprise may want to keep track of (motivation, role, event, activity, location, resource, platform services) and a set of relationships.

Entities, Attributes and Relationships

- ## □ The TOGAF Enterprise Metamodel describes Entities, Attributes and Relationships



8.19 How Risk Assessment can be used

Generally Accepted Areas of Concern for the Security Architect

- Asset Protection
- Risk Assessment**
- Access Control
- Audit
- Availability

Definition: Risk Assessment

- ❑ Determining what risks we face, measuring them to determine their likelihood and impact, and then accepting, mitigating, or transferring the risk according to the organisation's risk appetite
- ❑ Source: *TOGAF Series Guide: Integrating Risk and Security within a TOGAF® Enterprise Architecture*, §3.2.1

Risk Classification Scheme

- ❑ There are no hard and fast rules with respect to measuring effect and frequency. The following guidelines are based upon existing risk management best practices:

- Effect
- Frequency
- Classification scheme

Corporate Risk Impact Assessment					
Effect	Frequency				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

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E= Extremely High Risk, H = High Risk,
M = Moderate Risk, L = Low Risk

The Act of Assessing Risk

- ❑ A risk assessment is the activity of determining the risks that are relevant to an asset or objective
- ❑ A qualitative risk assessment delivers a listing of relevant risk scenarios with a high-level prioritisation (high-medium-low), whereas a quantitative approach seeks for numeric determination of the risk.
- ❑ A deliverable of a risk assessment is the Business Risk Model.
- ❑ *Source: TOGAF Series Guide: Integrating Risk and Security within a TOGAF® Enterprise Architecture, §5.3.4*

Risk Mitigation Plan

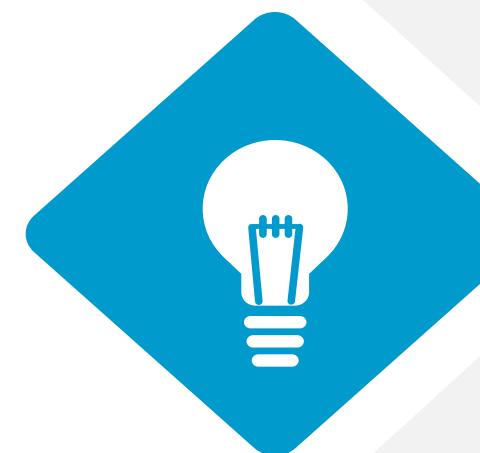
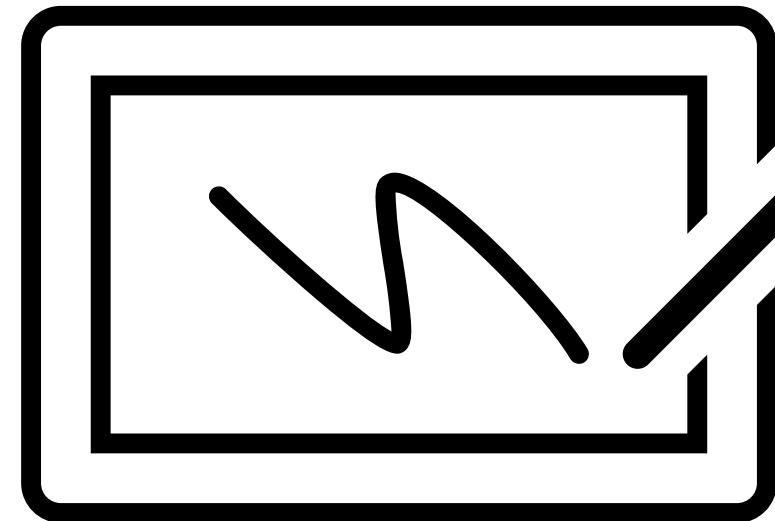
- ❑ The Risk Mitigation Plan contains activities to mitigate risks. It is the implementation of the risk mitigation strategy, which could aim to increase the level of control, transfer the risk to another party, avoid the risk by changing the business activity, delay the risk, compensate for the risk, etc.
- ❑ The broader sense of risk is addressed by the Enterprise Risk Management (ERM) process in phase E.
- ❑ The scope includes the latest information security risks as identified during the risk assessments that are done earlier in Phase B.

Phase F: Migration Planning

- ❑ Migration is itself a business process that needs to be secured
- ❑ The migration strategy should include a risk assessment and a Risk Mitigation Plan.
- ❑ In Phase F, the Risk Mitigation Plan is limited to the transition.
- ❑ In addition, migration planning should include a security impact analysis to understand any security impacts of the target state of the change.

Practice with Learning Studies

Requirements Management



Summary

Learning Units Completed

- Unit 1 – The Context for Enterprise Architecture
- Unit 2 – Stakeholder Management
- Unit 3 – Phase A, the Starting Point
- Unit 4 – Architecture Development
- Unit 5 – Implementing the Architecture
- Unit 6 – Architecture Change Management
- Unit 7 – Requirements Management
- Unit 8 – Supporting the ADM Work





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