IT ARCHITECTURE MANAGEMENT

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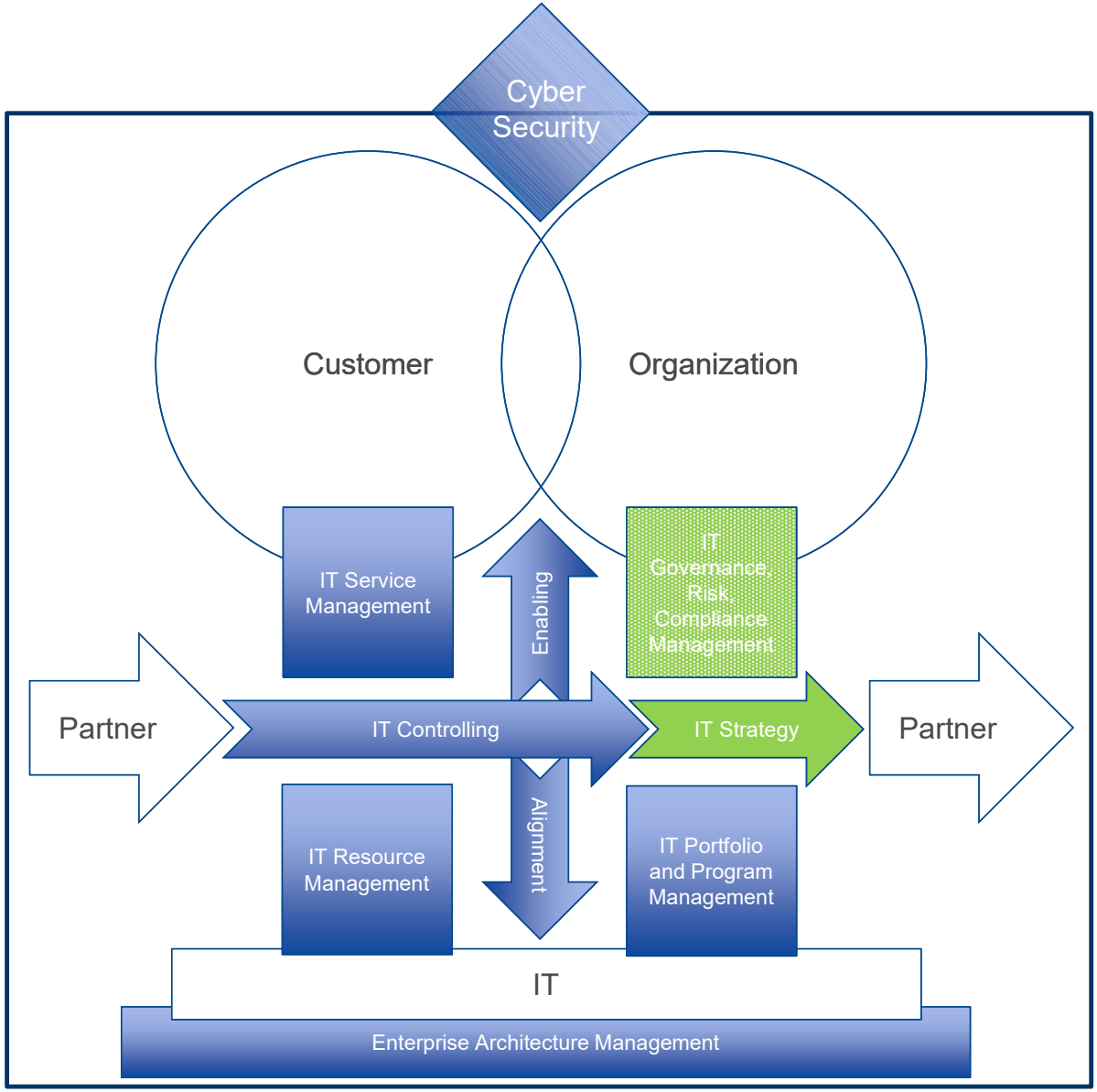
RECAP:
IT MANAGEMENT TASKS

Strategic IT management (SITM) used to focus on the design, implementation, and operations of information technology and systems

Managing IT today is analogous to managing a company within a company

Mueller et al. (2009)



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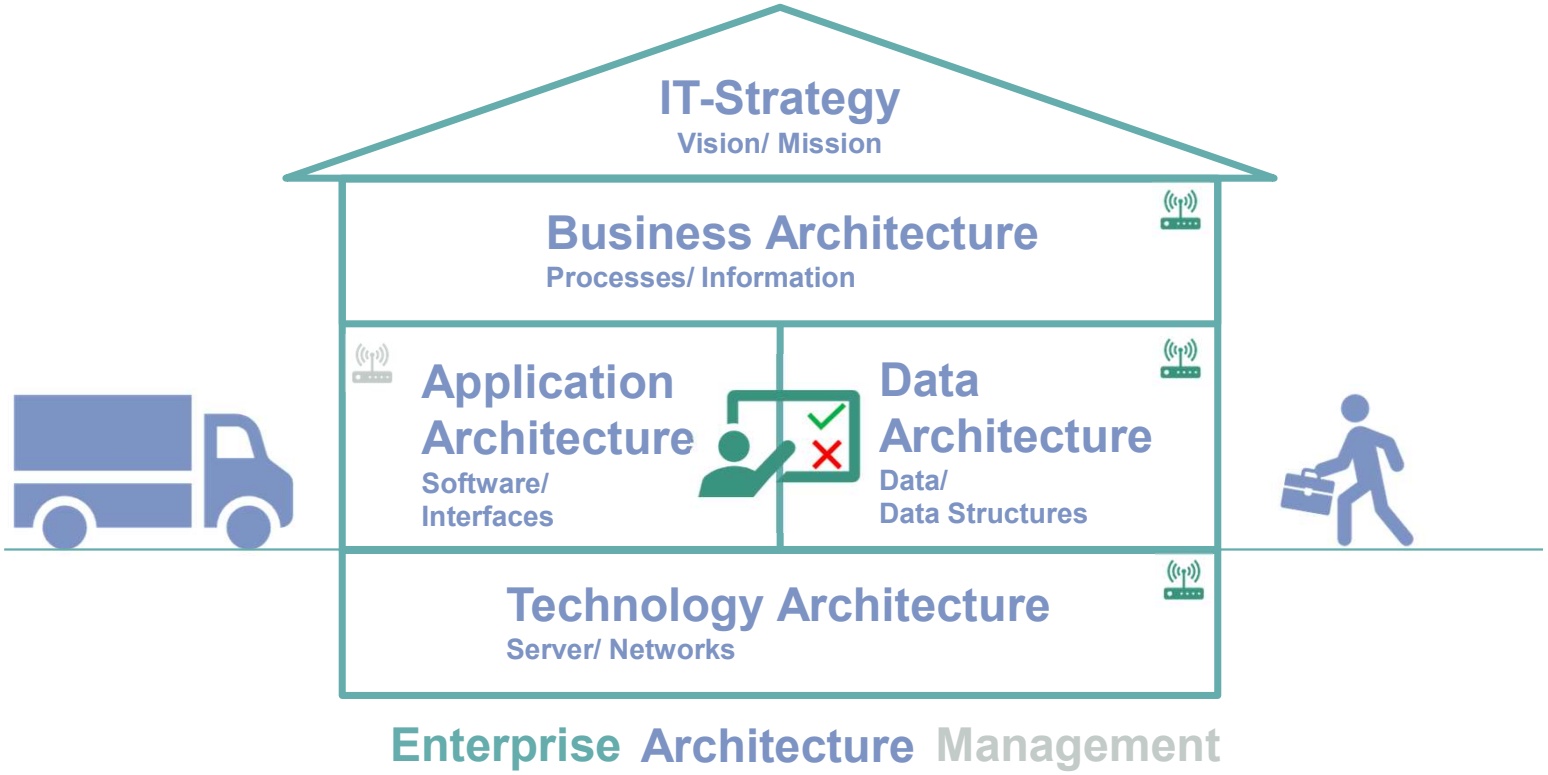
ENTERPRISE ARCHITECTURE MANAGEMENT 1/2

ENTERPRISE ARCHITECTURE MANAGEMENT 2/2



EAM: A SEA OF POSSIBILITIES

Types of enterprise architecture framework [edit]

Nowadays there are now countless EA frameworks, many more than in the following listing.

Just a few of the Enterprise Architecture frameworks utilized today, 2011[20]

Consortia-developed frameworks [edit]

- ARCON – A Reference Architecture for Collaborative Networks – not focused on a single enterprise but rather on networks of enterprises[21][22]
- The Cloud Security Alliance (Trusted Cloud Initiative) TCI reference architecture.[23]
- Generalised Enterprise Reference Architecture and Methodology (GERAM)
- RM-ODP – the Reference Model of Open Distributed Processing (ITU-T Rec. X.901-X.904 | ISO/IEC 10746) defines an enterprise architecture framework for structuring the specifications of open distributed systems.
- IDEAS Group – a four-nation effort to develop a common ontology for architecture interoperability
- ISO 19439 Framework for enterprise modelling
- TOGAF – The Open Group Architecture Framework – a widely used framework including an architectural Development Method and standards for describing various types of architecture.

Defense industry frameworks [edit]

- AGATE – the France DGA Architecture Framework
- DNDAF[24] – the DND/CF Architecture Framework (CAN)
- DoDAF – the US Department of Defense Architecture Framework
- MODAF – the UK Ministry of Defence Architecture Framework
- NAF – the NATO Architecture Framework

Government frameworks [edit]

- European Space Agency Architectural Framework (ESAAF) - a framework for European space-based Systems of Systems[25]
- FDIC Enterprise Architecture Framework
- Federal Enterprise Architecture Framework (FEAF) – a framework produced in 1999 by the US Federal CIO Council for use within the US Government (not to be confused with the 2002 Federal Enterprise Architecture (FEA) guidance on categorizing and grouping IT investments, issued by the US Federal Office of Management and Budget)
- Government Enterprise Architecture (GEA) – a common framework legislated for use by departments of the Queensland Government
- Nederlandse Overheid Referentie Architectuur (NORA) – a reference framework from the Dutch Government E-overheid NORA
- NIST Enterprise Architecture Model
- Treasury Enterprise Architecture Framework (TEAF) – a framework for treasury, published by the US Department of the Treasury in July 2000.[26]
- Colombian Enterprise Architecture Framework - MRAE - Marco de Referencia de Arquitectura Empresarial Archived 2021-05-10 at the Wayback Machine a framework for all the Colombian Public Agencies
- India Enterprise Architecture (IndEA) framework - IndEA is a reference framework from Government of India.
- Medicaid Information Technology Architecture (MITA) - US Center for Medicare and Medicaid Services (CMS) framework to foster integrated business and information technology transformation for Medicaid

Open-source frameworks [edit]

Enterprise architecture frameworks that are released as open source:

- ArchiMate
- Lean Architecture Framework (LAF)[27] is a collection of good practices thanks to which the IT environment will respond consistently and quickly to a changing business situation while maintaining its consistent form.
- MEGAF (Mega-modeling Architecture Framework)[28] is an infrastructure for realizing architecture frameworks that conform to the definition of architecture framework provided in ISO/IEC/IEEE 42010.
- Praxeme, an open enterprise methodology, contains an enterprise architecture framework called the Enterprise System Topology (EST)
- TRAK – a general systems-oriented framework based on MODAF 1.2 and released under GPL/GFDL.
- Sherwood Applied Business Security Architecture (SABSA)[29] is an open framework and methodology for Enterprise Security Architecture and Service Management, that is risk based and focuses on integrating security into business and IT management.

Proprietary frameworks [edit]

- ASSIMPLER Framework – an architecture framework, based on the work of Mandar Vanarse at Wipro in 2002
- Avancier Methods (AM)[30] Processes and documentation advice for enterprise and solution architects, supported by training and certification.
- BRM (Build-Run-Manage) Framework - an architecture framework created by Sanjeev "Sunny" Mishra during his early days at IBM in 2000.
- Capgemini Integrated Architecture Framework (IAF) – from Capgemini company in 1993
- Dragon1 - An open Visual Enterprise Architecture Method recently recognized by The Open Group as Architecture Framework
- DYA framework developed by Sogeti since 2004.
- Dynamic Enterprise Enterprise architecture concept based on Web 2.0 technology
- Extended Enterprise Architecture Framework - from Institute For Enterprise Architecture Developments in 2003
- EACOE Framework [3] – an Enterprise Architecture framework, as an elaboration of the work of John Zachman
- IBM Information FrameWork (IFW) – conceived by Roger Evernden in 1996
- Infomet - conceived by Pieter Viljoen in 1990
- Labnaf [31] - Unified Framework for Driving Enterprise Transformations
- Pragmatic Enterprise Architecture Framework (PEAF)[32] - part of Pragmatic Family of Frameworks developed by Kevin Lee Smith, Pragmatic EA, from 2008
- Purdue Enterprise Reference Architecture developed by Theodore J. Williams at the Purdue University early 1990s.
- Risk- and Cost-Driven Architecture (RCDA), developed by CGI since 2015.
- SAP Enterprise Architecture Framework
- Service-oriented modeling framework (SOMF), based on the work of Michael Bell
- Solution Architecting Mechanism (SAM)[33] – A coherent architecture framework consisting of a set of integral modules.[34]
- Zachman Framework – an architecture framework, based on the work of John Zachman at IBM in the 1980s

WHAT IS EA/ EAM?

- **Enterprise Architecture**
- The fundamental **concepts** or **properties of a system** in its environment embodied in its **elements, relationships**, and in the principles of its **design and evolution**. (ISO/IEC/IEEE 42010:2011)
- The **structure** of components, their **inter-relationships**, and the principles and guidelines governing their **design and evolution** over time. (https://pubs.opengroup.org/togaf-standard/introduction/chap04.html#tag_04_08, letzter Aufruf am 14.01.2025)

- **Enterprise Architecture Management**
- Enterprise architecture management is the **process of translating business vision and strategy** into effective **enterprise change** by creating, communicating and improving **key principles and models** that describe the **enterprise's future state** and enable its **evolution**. (Gartner Research Publication, November 2008; Cannes, France, Symposium/ITxpo 2008)

FRAMEWORK

Quelle: https://www.moebel-jack.de/p/ausstechfoermchen-set-11-teilig-bakery-silbergrau-edelstahl-mit-aufbewahrungsring-11-teilig-20874, letzter Aufruf 14.02.2025

THE OPEN GROUP ARCHITECTURE FRAMEWORK (TOGAF)

TOGAF - BACKGROUND

- TOGAF is based on the "Technical Architecture Framework for Information Management" (TAFIM) of the Department of Defence (DoD).
- TOGAF is presented as an EA framework, whereby this term is understood as a methodological framework for the development of different enterprise architectures.
- TOGAF focuses in particular on information system landscapes.
- TOGAF pursues a generic approach in order to cover a broad spectrum of objectives.
- It can easily be supplemented with components from other frameworks.

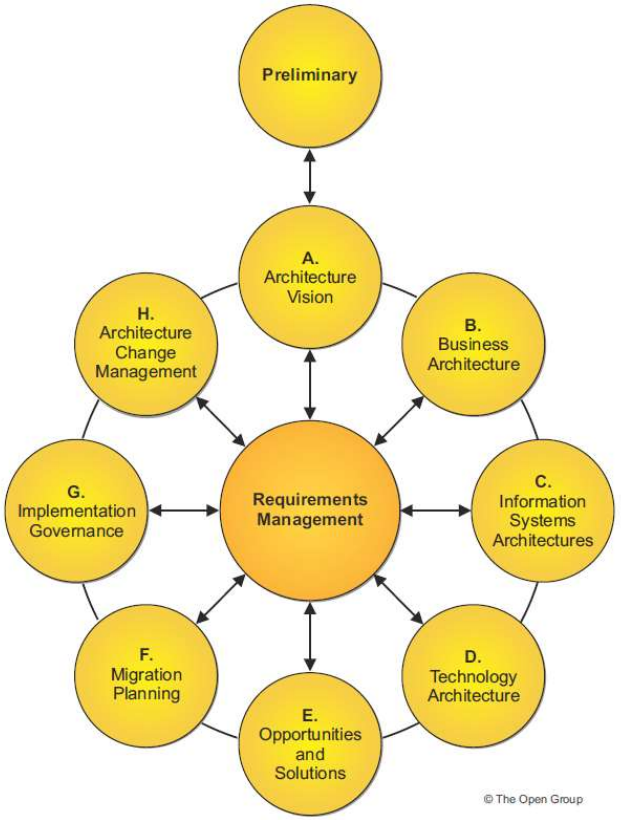
Quelle: Hanschke, I. (2022): Enterprise Architecture Management - Einfach und Effektiv, 3. Auflage

TOGAF - USE OF THE FRAMEWORK

- Essentially, TOGAF offers a methodological framework and a toolbox for the development of different enterprise architectures.
- The creation of a specific enterprise architecture is supported on the basis of a description of predefined components (building blocks) and with the help of a process model (Architecture Development Method, ADM).
- A distinction is made between four sub-architectures:
  - The **business architecture** describes the company's strategies, governance, organization and business processes.
  - The **data architecture** describes the data and its interrelationships as well as principles for the organization and management of resources in the context of the IS landscape.
  - The **application architecture** describes information systems and their relationships with each other and with business processes.
  - The **technology architecture** describes the current technical realization and the future company-specific technical standards such as runtime environments or middleware of information systems as well as the operating infrastructure.

ARCHITECTURE DEVELOPMENT METHOD (ADM)

- The ADM is iterative, over the whole process, between phases, and within phases. For each iteration of the ADM, a fresh decision must be taken as to:
  - The breadth of coverage of the enterprise to be defined
  - The level of detail to be defined
  - The extent of the time period aimed at, including the number and extent of any intermediate time periods
  - The architectural assets to be leveraged
- Architecture development is a continuous, cyclical process, and in executing the ADM repeatedly over time, the architect gradually adds more and more content to the organization's Architecture Repository.



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

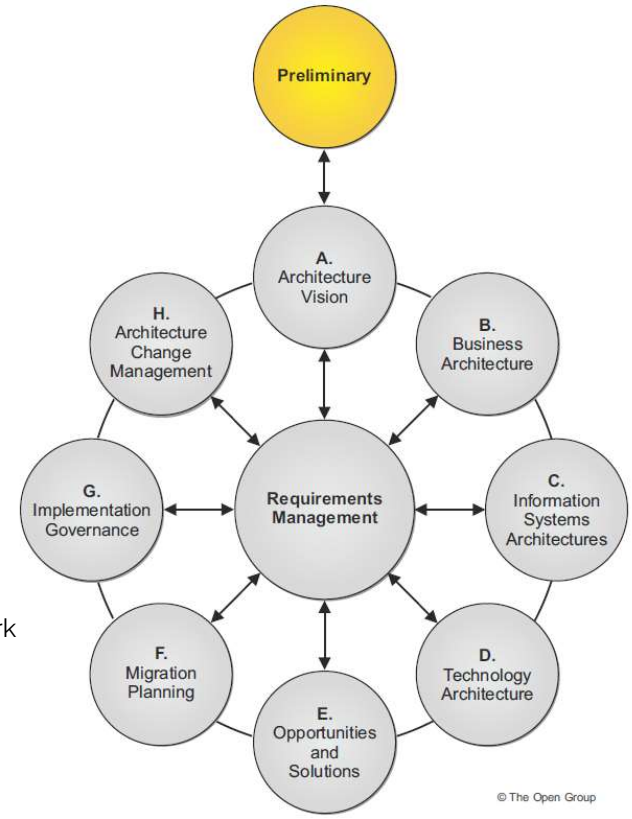
ADM - PRELIMINARY PHASE

Objectives

- Determine the Architecture Capability desired by the organization:
  - Review the organizational context for conducting Enterprise Architecture
  - Identify and scope the elements of the enterprise organizations affected by the Architecture Capability
  - Identify the established frameworks, methods, and processes that intersect with the Architecture Capability
  - Establish Capability Maturity target
- Establish the Architecture Capability:
  - Define and establish the Organizational Model for Enterprise Architecture
  - Define and establisArchitecture Governance
  - Select and implement tools that support the Architecture Capability
  - h the detailed process and resources for Define the Architecture Principles

Output

- Organizational Model for Enterprise Architecture
  - Scope of organizations 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)
  - Architecture Principles
  - Configured and deployed tools
- Initial Architecture Repository populated with framework content
- Restatement of, or reference to, business principles, business goals, and business drivers)
- Architecture Governance Framework



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

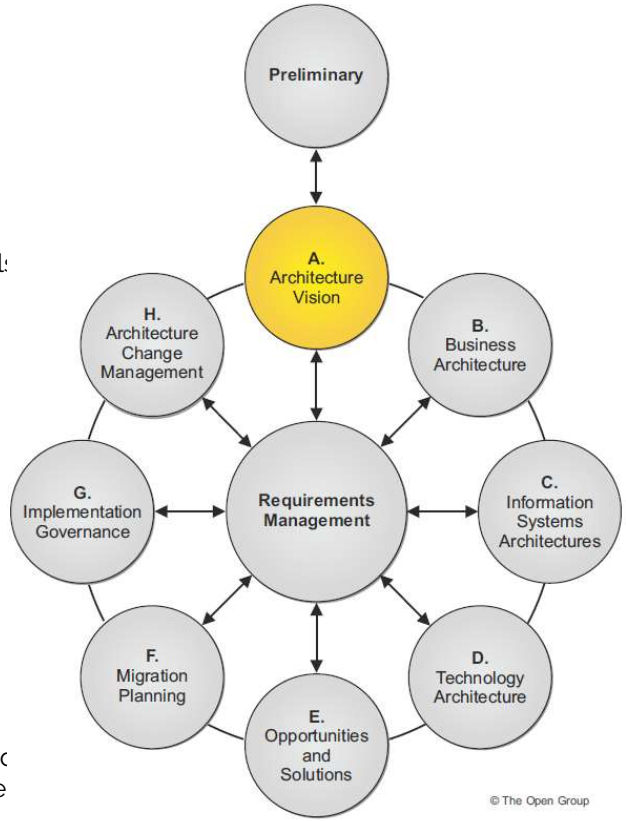
ADM - ARCHITECTURE VISION

Objectives

- Develop a high-level aspirational vision of the capabilities and business value to be delivered as a result of the proposed Enterprise Architecture
- Obtain approval for a Statement of Architecture Work that defines a program of works to develop and deploy the architecture outlined in the Architecture Vision

Output

- Approved Statement of Architecture Work including in particular:
  - Architecture project description and scope
  - Overview of Architecture Vision
  - Architecture project plan and schedule
- Refined statements of business principles, business goals and business drivers
- Architecture Principles
- Capability Assessment
- Tailored Architecture Framework for the engagement, including:
  - Tailored architecture method
  - Tailored architecture content (deliverables and artifacts)
  - Configured and deployed tools
- Architecture Vision including:
  - Problem description
  - Objective of the Statement of Architecture Work
  - Summary views
  - Business scenario (optional)
  - Refined key high-level stakeholder requirements
- Draft Architecture Definition Document, which may include Baseline and/or Target Architectures of any architecture domain
- Communications Plan
- Additional content populating the Architecture Repository



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

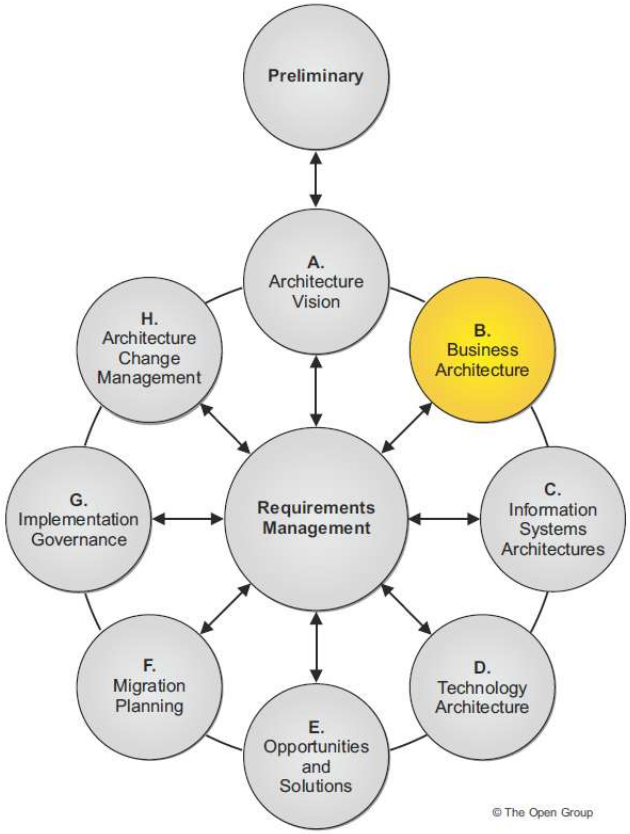
ADM - BUSINESS ARCHITECTURE

Objectives

- Develop the Target Business Architecture that describes how the enterprise needs to operate to achieve the business goals, and respond to the strategic drivers set out in the Architecture Vision, in a way that addresses the Statement of Architecture Work and stakeholder concerns
- Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Business Architectures

Output

- Refined and updated versions of the Architecture Vision phase deliverables including:
  - Statement of Architecture Work
  - Validated business principles, business goals, and business drivers
  - Architecture Principles
- Draft Architecture Definition Document including:
  - Baseline Business Architecture
  - Target Business Architecture including:
    - Organization structure, Business goals and objectives, Business functions, Business capabilities, Business services Products, Business processes, Business roles, Business data model, Correlation of organization/business functions and business capabilities
- Business Architecture components of an Architecture Roadmap



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

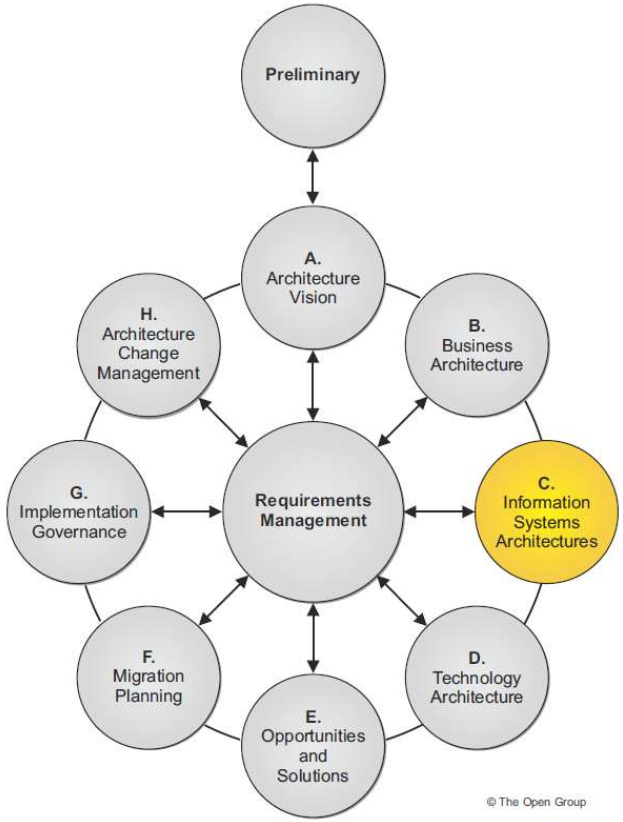
ADM - INFORMATION SYSTEMS ARCHITECTURE (DATA)

Objectives

- Develop the Target Information Systems Architectures, describing how the enterprise's Information Systems Architecture will enable the Business Architecture and the Architecture Vision, in a way that addresses the Statement of Architecture Work and stakeholder concerns
- Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Information Systems (Data and Application) Architectures

Output

- Refined and updated versions of the Architecture Vision phase deliverables
  - Statement of Architecture Work
  - Validated data principles
- Draft Architecture Definition Document
  - Baseline Data Architecture
  - Target Data Architecture:
    - Business data model
    - Logical data model
    - Data management process models
    - Data Entity/Business Function matrix
- Draft Architecture Requirements Specification including such Data Architecture requirements as:
  - Gap analysis results
  - Data interoperability requirements
  - Relevant technical requirements that will apply to this evolution of the architecture development cycle
  - Constraints on the Technology Architecture about to be designed
- Data Architecture components of an Architecture Roadmap



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

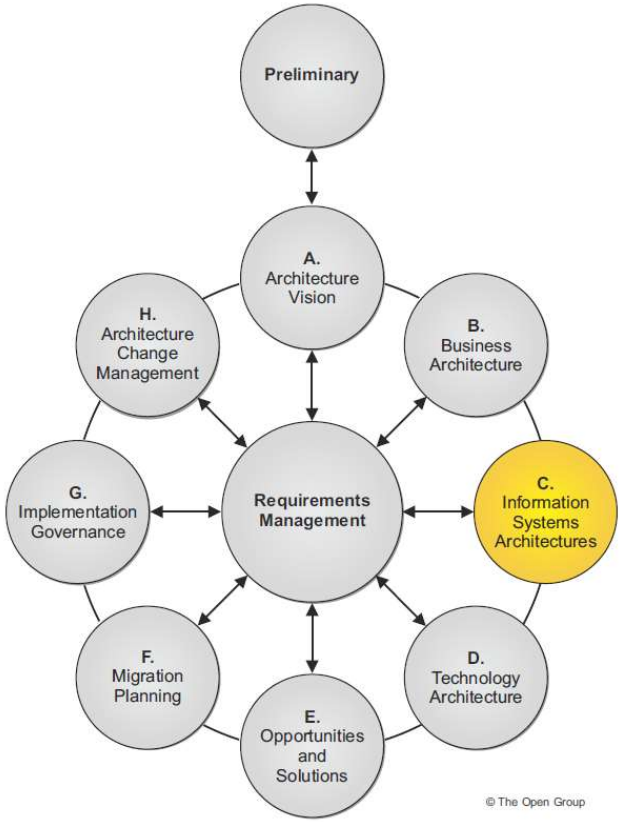
ADM - INFORMATION SYSTEMS ARCHITECTURE (APPLICATION)

Objectives

- Develop the Target Application Architecture that enables the Business Architecture and the Architecture Vision, in a way that addresses the Statement of Architecture Work and stakeholder concerns
- Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Application Architectures

Output

- Refined and updated versions of the Architecture Vision phase deliverables, where applicable:
  - Statement of Architecture Work
  - Validated application principles, or new application principles
- Draft Architecture Definition Document including:
  - Baseline Application Architecture, Approved, if appropriate
  - Target Application Architecture, Approved
  - Views corresponding to the selected viewpoints, addressing key stakeholder concerns
- Draft Architecture Requirements Specification including such Application Architecture requirements as:
  - Gap analysis results
  - Applications interoperability requirements
  - Relevant technical requirements that will apply to this evolution of the architecture development cycle
  - Constraints on the Technology Architecture about to be designed
  - Updated business requirements, if appropriate
  - Updated data requirements, if appropriate
- Application Architecture components of an Architecture Roadmap



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

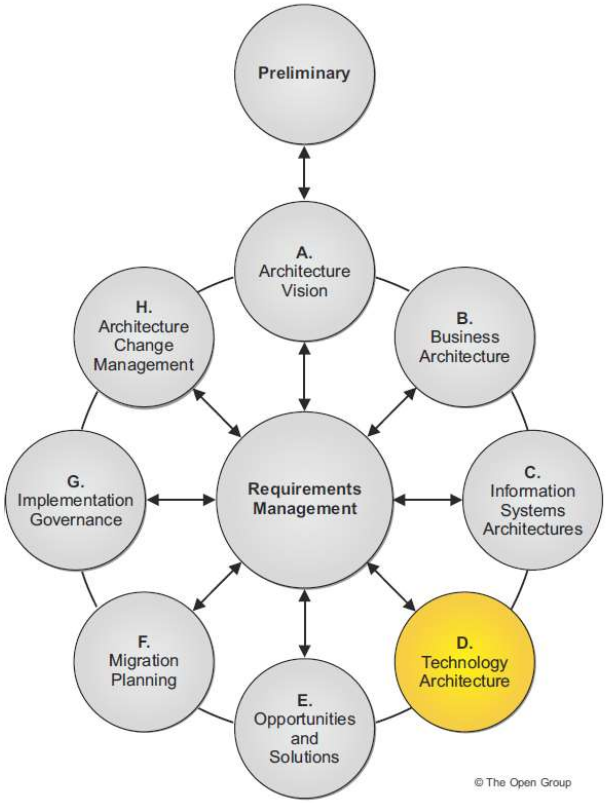
ADM - TECHNOLOGY ARCHITECTURE

Objectives

- Develop the Target Technology Architecture that enables the Architecture Vision, target business, data, and application building blocks to be delivered through technology components and technology services, in a way that addresses the Statement of Architecture Work and stakeholder concerns
- Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Technology Architectures

Output

- Refined and updated versions of the Architectur Vision phase deliverables
  - Statement of Architecture Work
  - Validated technology principles, or new technolog principles
- Draft Architecture Definition
  - Baseline Technology Architecture, Approved, if appropriate
  - Target Technology Architecture
    - Technology Components and their relationship to information systems
    - Technology platforms and their decomposition, showing the combinations of technology required to realize a particular technology "stack"
    - Environments and locations — a grouping of the required technology into computing environments (e.g., development, production)
    - Expected processing load and distribution of load across technology components
    - Physical (network) communications
    - Hardware and network specifications
- Draft Architecture Requirements Specification
  - Gap analysis results
  - Requirements output from Phases B and C
  - Updated technology requirements
- Technology Architecture components of an Architecture Roadmap



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

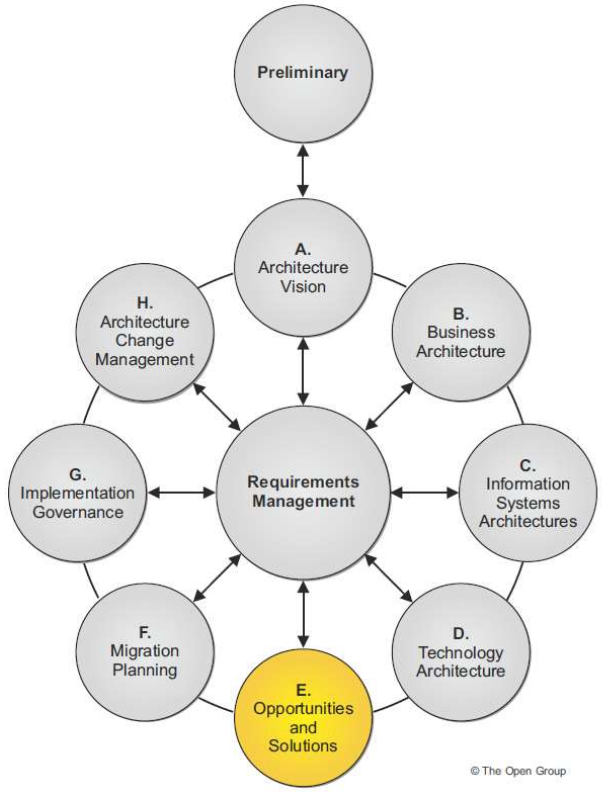
ADM - OPPORTUNITIES AND SOLUTIONS

Objectives

- Generate the initial complete version of the Architecture Roadmap, based upon the gap analysis and candidate Architecture Roadmap components from Phases B, C, and D
- Determine whether an incremental approach is required, and if so identify Transition Architectures that will deliver continuous business value
- Define the overall Solution Building Blocks (SBBs) to finalize the Target Architecture based on the ABBs

Output

- Refined and updated version of the Architecture Vision phase deliverables including:
  - Architecture Vision, including definition of types and degrees of interoperability
  - Statement of Architecture Work
- Draft Architecture Definition Document
  - Baseline & Target Business Architecture
  - Baseline & Target Data Architecture
  - Baseline & Target Application Architecture
  - Baseline & Target Technology Architecture
  - Transition Architecture, number and scope as necessary
- Draft Architecture Requirements Specificatio
- Capability Assessments
- Architecture Roadmap
- Implementation and Migration Plan, Draft



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

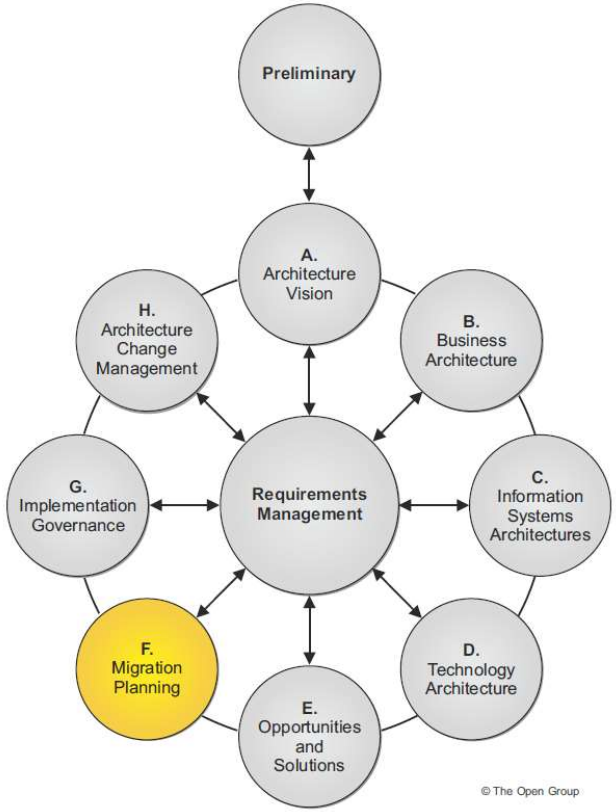
ADM - MIGRATION PLANNING

Objectives

- Finalize the Architecture Roadmap and the supporting Implementation and Migration Plan
- Ensure that the Implementation and Migration Plan is co-ordinated with the enterprise's approach to managing and implementing change in the enterprise's overall change portfolio
- Ensure that the business value and cost of work packages and Transition Architectures is understood by key stakeholders

Output

- Implementation and Migration Plar
- Finalized Architecture Definition Document
- Finalized Architecture Requirements Specification
- Finalized Architecture Roadmap
- Re-Usable ABBs
- Requests for Architecture Work
- Implementation Governance Mode
- Change Requests for the Architecture Capability arising from lessons learned



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

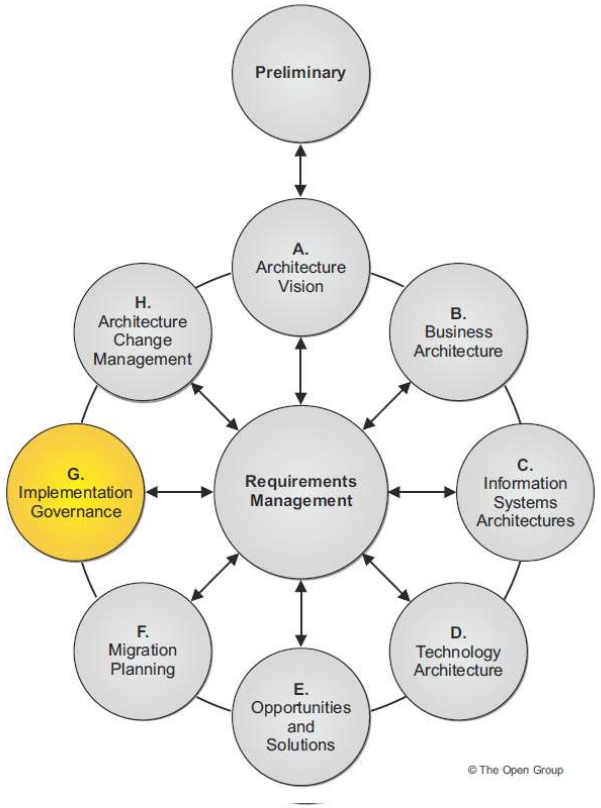
ADM - IMPLEMENTATION GOVERNANCE

Objectives

- Ensure conformance with the Target Architecture by implementation projects
- Perform appropriate Architecture Governance functions for the solution and any implementation-driven architecture Change Requests

Output

- 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)



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

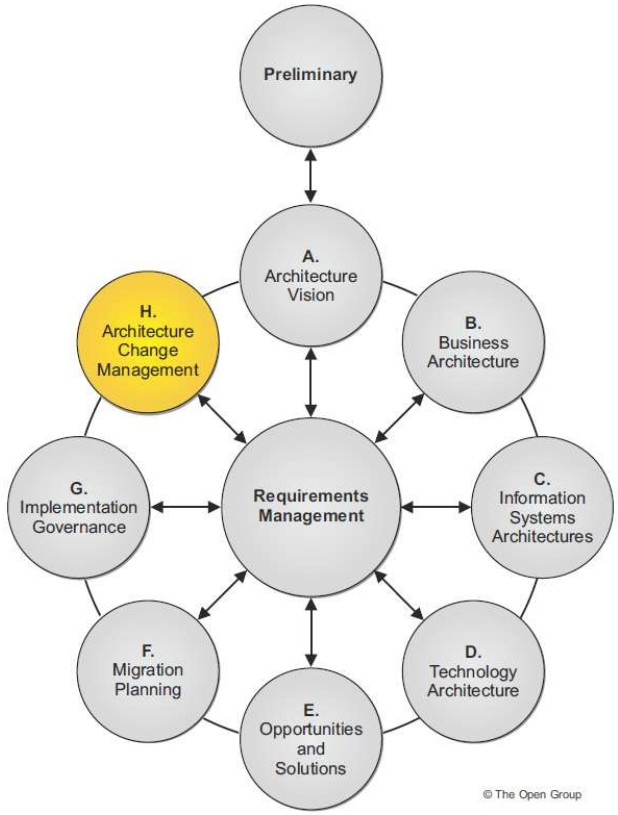
ADM - ARCHITECTURE CHANGE MANAGEMENT

Objectives

- Ensure that the architecture development cycle is maintained
- Ensure that the Architecture Governance Framework is executed
- Ensure that the Enterprise Architecture Capability meets current requirements

Output

- 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



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

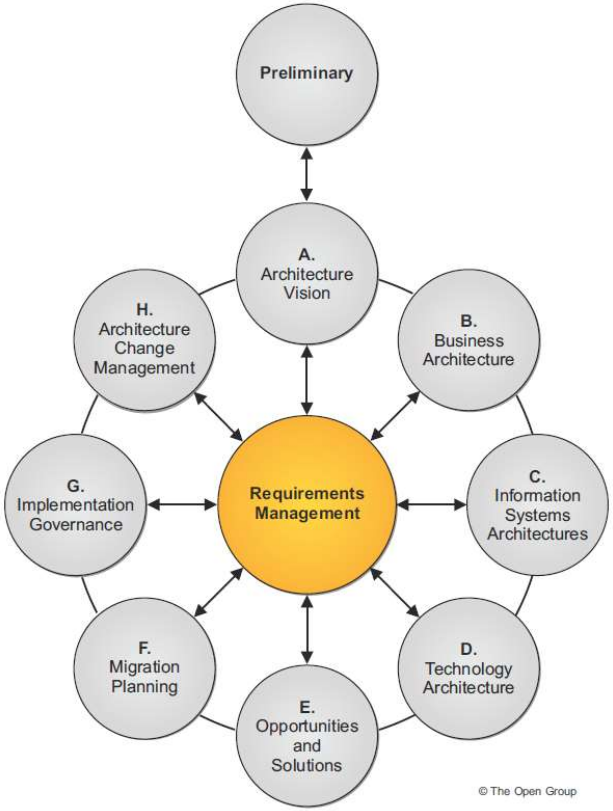
ADM - REQUIREMENTS

Objectives

- 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

Output

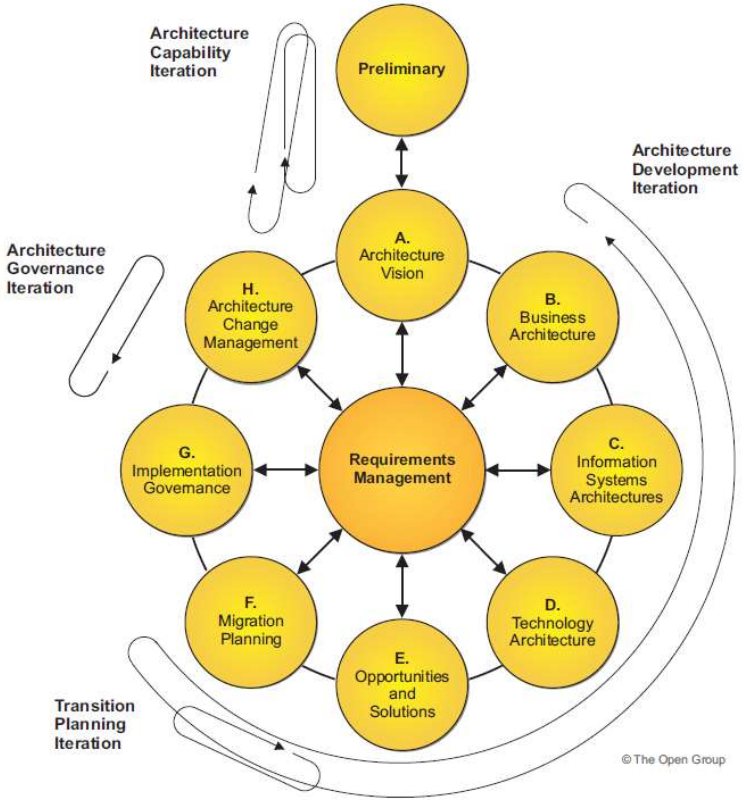
- Requirements Impact Assessment
- Updated Architecture Requirements Specification if necessary



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

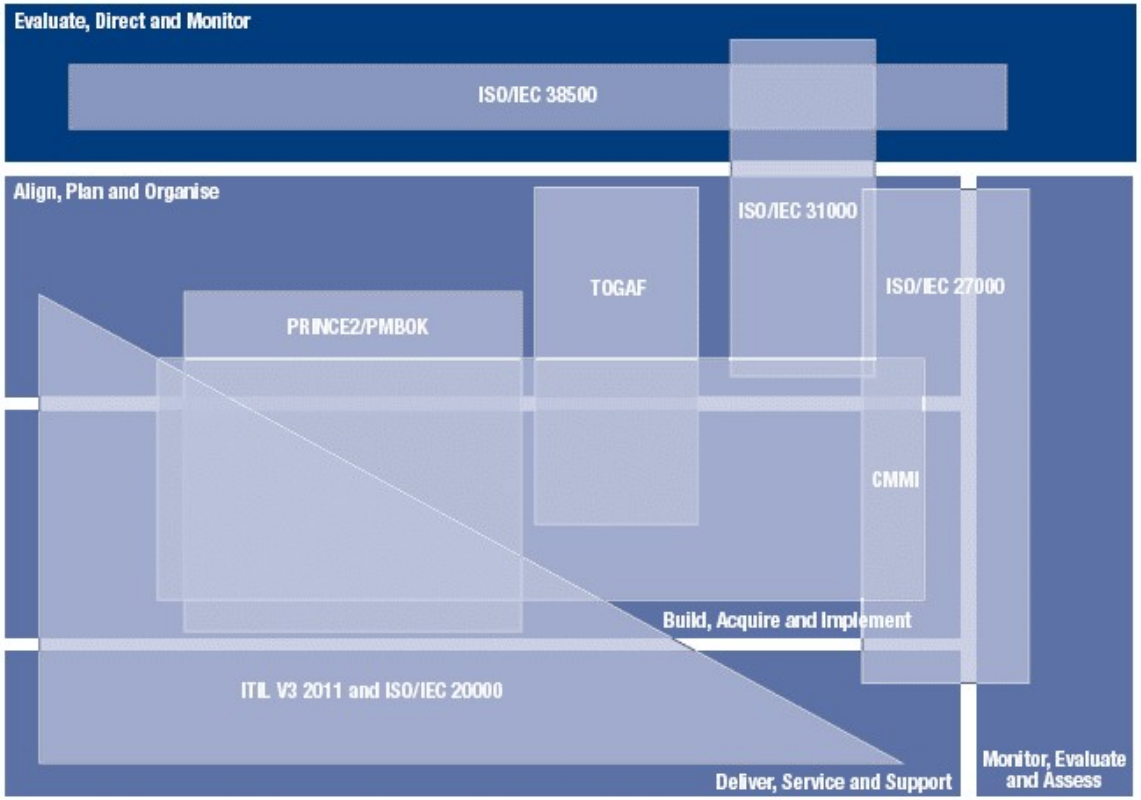
ADM - ITERATIVE PROCEDURE

- **Architecture Capability** iterations support the creation and evolution of the required Architecture Capability.
  This includes the initial mobilization of the architecture activity for a given purpose or architecture engagement type by establishing or adjusting the architecture approach, principles, scope, vision, and governance.
- **Architecture Development** iterations allow the creation of architecture content by cycling through, or integrating, Business, Information Systems, and Technology Architecture phases.
  These iterations ensure that the architecture is considered as a whole. In this type of iteration stakeholder reviews are typically broader. As the iterations converge on a target, extensions into the Opportunities & Solutions and Migration Planning phases ensure that the architecture's implementability is considered as the architecture is finalized.
- **Transition Planning** iterations support the creation of formal change roadmaps for a defined architecture.
- **Architecture Governance** iterations support governance of change activity progressing towards a defined Target Architecture.



Quelle: The Open Group, TOGAF Standard, Document Number: C220, TOGAF 10

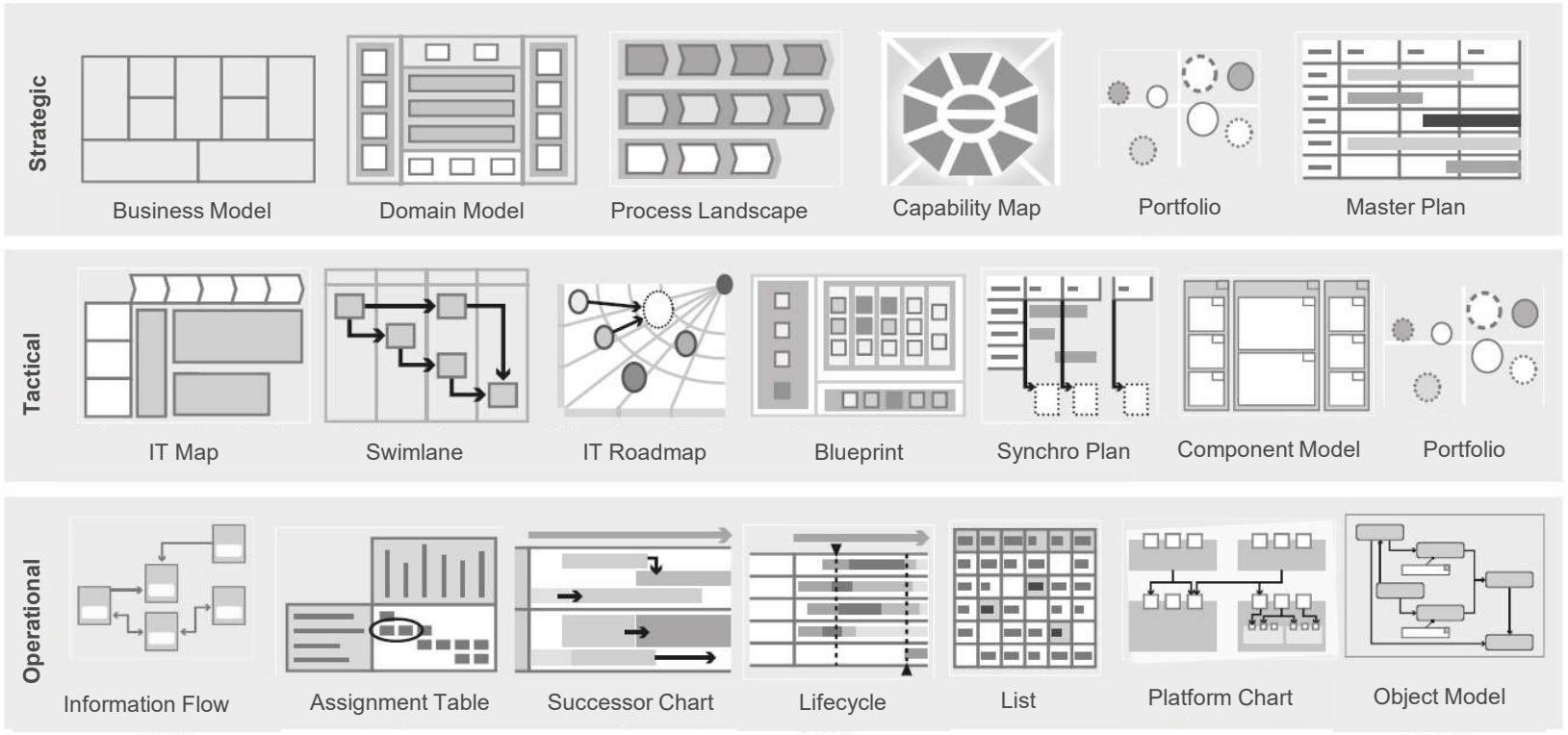
TOGAF IN CONTEXT



Quelle: https://blog.itil.org/2013/10/governance-over-it-service-management-processes-using-cobit-5-0/, letzter Aufruf: 26.02.2025

EAM: TRANSPARENCY AT ALL LEVELS

- Which business processes are affected by the failure of an IT system?
- Who is responsible for which business processes or IT systems?
- What dependencies exist between IT systems?
- What effects do business or IT ideas have?



Quelle: Hanschke, I. (2022): Enterprise Architecture Management - Einfach und Effektiv, 3. Auflage

EAM IN ACTION: IT-ROADMAP 1/2

- **Brief description:** Design of the target development of the IS landscape and the roadmap for implementation as a binding orientation framework for projects and maintenance measures.
- **Stakeholder groups:** CIO/IT manager (A), IT strategist (C), IS development planner (R), IT architect (C), business architect (C) RACI (R – Responsible, A – Accountable, C – Consulted, I – Informed)
- **Objectives:**
  - Manage and/or reduce IT complexity: reduce IT complexity through continuous IT consolidation and thus reduce IT costs in the long term
  - Business-IT alignment and strategic alignment of IT: Align IT strategically, taking into account the business and IT objectives in IS development planning and also increase business-IT alignment in this way
  - Contribution to the further development of the business: The target image and the roadmap for implementation are systematically derived from the corporate strategy, business requirements, "pains" and trends. Tailor-made IT support solutions are identified for all areas of activity.

Quelle: Hanschke, I. (2022): Enterprise Architecture Management - Einfach und Effektiv, 3. Auflage

EAM IN ACTION: IT-ROADMAP 2/2

- Inclusion of IT consolidation measures (see deployment scenarios "Consolidation of the IS landscape" and "Standardization and homogenization" as well as "Operational infrastructure consolidation").
- IT consolidation measures reduce IT complexity. This leads to a sustainable reduction in costs.
- Clear focus in the design of the target structure in the direction of business support, elimination of "pains" and preparation and alignment of IT.
- By deriving the target structure from the corporate and IT strategy as well as business requirements and "pains", business support is optimized and IT is strategically aligned with the objectives.
- A functional reference model, combined with service orientation and the consistent use of an integration architecture, supports the agility of IT. See the "Flexibilization of IT" deployment scenario.