

TOGAF® Version 9

A Pocket Guide



Andrew Josey et al

THE *Open* GROUP

TOGAF® VERSION 9 – A POCKET GUIDE

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TOGAF® Version 9

A P O C K E T G U I D E

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Professor Rachel Harrison, Stratton Edge Consulting
Paul Homan, IBM
Matthew F. Rouse, EDS
Tom van Sante, Getronics
Mike Turner, Capgemini
Paul van der Merwe, Real IRM
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Comments relating to the material contained in this document may be submitted to:

The Open Group
Apex Plaza, Forbury Road
Reading
Berkshire RG1 1AX
United Kingdom

or by electronic mail to:
ogspecc@opengroup.org

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Preface

This Document

This Pocket Guide is based on TOGAF® Version 9 Enterprise Edition. It is intended to help architects focus on the efficient and effective operations of their organization and senior managers understand the basics of the TOGAF framework for enterprise architecture. It is organized as follows:

- Chapter 1 provides a high-level view of TOGAF, enterprise architecture, and the contents and key concepts of TOGAF.
- Chapter 2 provides an introduction to the Architecture Development Method (ADM), the method that TOGAF provides to develop enterprise architectures.
- Chapter 3 provides an overview of key techniques and deliverables of the ADM cycle.
- Chapter 4 provides an overview of the guidelines for adapting the ADM.
- Chapter 5 provides an introduction to the Architecture Content Framework, a structured metamodel for architectural artifacts.
- Chapter 6 provides an introduction to the Enterprise Continuum, a high-level concept that can be used with the ADM to develop an enterprise architecture.
- Chapter 7 provides an introduction to the TOGAF Reference Models, including the TOGAF Foundation Architecture and the Integrated Information Infrastructure Reference Model (III-RM).
- Chapter 8 provides an introduction to the Architecture Capability Framework, a set of resources provided for establishment and operation of an architecture function within an enterprise.
- Appendix A provides an overview of the differences between TOGAF 9 and TOGAF 8.1.1.

The audience for this document is:

- Enterprise architects, business architects, IT architects, data architects, systems architects, solutions architects, and senior managers seeking a first introduction to TOGAF

A prior knowledge of enterprise architecture is not required. After reading this document, the reader seeking further information should refer to the TOGAF 9 documentation¹ available online at www.opengroup.org/architecture/togaf9-doc/arch and also available as TOGAF 9 “The Book”.

About TOGAF Version 9

TOGAF 9 provides a wide-ranging set of revisions to the TOGAF specification to improve the value of the TOGAF framework: It has been designed as an evolution from TOGAF 8.1.1, adding further detail and clarification to what is already proven. Major new features of TOGAF 9 include:

Modular Structure: TOGAF 9 introduces a modular structure. Content that was contained within the TOGAF 8.1.1 Resource Base has been classified and moved into parts that have a defined purpose (as opposed to generic “resources”). The modular structure supports:

- Greater usability – defined purpose for each part; can be used in isolation as a standalone set of guidelines
- Incremental adoption of the TOGAF specification

Content Framework: TOGAF 9 includes a content framework to drive greater consistency in the outputs that are created when following the Architecture Development Method (ADM). The TOGAF content framework provides a detailed model of architectural work products.

1 The Open Group Architecture Framework (TOGAF), Version 9 Enterprise Edition (ISBN: 978-90-8753-094-5, G091v); refer to www.opengroup.org/bookstore/catalog/g091.htm

Extended Guidance: TOGAF 9 features an extended set of concepts and guidelines to support the establishment of an integrated hierarchy of architectures being developed by teams within larger organizations that operate within an overarching architectural governance model. In particular, the following concepts are introduced:

- **Partitioning:** A number of different techniques and considerations on how to partition the various architectures within an enterprise.
- **Architecture Repository:** A logical information model for an Architecture Repository which can be used as an integrated store for all outputs created by executing the ADM.
- **Capability Framework:** A more structured definition of the organization, skills, roles, and responsibilities required to operate an effective enterprise architecture capability. The new TOGAF materials also provide guidance on a process that can be followed to identify and establish an appropriate architecture capability.

Architectural Styles: TOGAF 9, in its new Part III: ADM Guidelines & Techniques, brings together a set of supporting materials that show in detail how the ADM can be applied to specific situations:

- The varying uses of iteration that are possible within the ADM and when each technique should be applied
- The linkages between the TOGAF ADM and Service Oriented Architecture (SOA)
- The specific considerations required to address security architecture within the ADM
- The various types of architecture development required within an enterprise and how these relate to one another

Additional ADM Detail: TOGAF 9 includes additional detailed information supporting the execution of the ADM. Particular areas of enhancement are:

- The Preliminary phase features extended guidance on establishing an enterprise architecture framework and planning for architecture development.
- The Opportunities & Solutions and Migration Planning phases feature a more detailed and robust method for defining and planning enterprise transformation, based on the principles of capability-based planning.

Conventions Used in this Document

The following conventions are used throughout this document in order to help identify important information and avoid confusion over the intended meaning:

- *Ellipsis (...)*
Indicates a continuation; such as an incomplete list of example items, or a continuation from preceding text.
- **Bold**
Used to highlight specific terms.
- *Italics*
Used for emphasis. May also refer to other external documents.

About The Open Group

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The Open Group has over 15 years' experience in developing and operating certification programs and has extensive experience developing and facilitating industry adoption of test suites used to validate conformance to an open standard or specification.

The Open Group publishes a wide range of technical documentation, the main part of which is focused on development of Technical and Product Standards and Guides, but which also includes White Papers, Technical Studies, and Business Titles.

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About the Authors

Andrew Josey, The Open Group

Andrew Josey is Director of Standards within The Open Group. He is currently managing the standards process for The Open Group, and has recently led the standards development projects for TOGAF 9, IEEE Std 1003.1-2008 (POSIX), and the core specifications of the Single UNIX Specification, Version 4. Previously, he has led the development and operation of many of The Open Group's certification development projects, including industry-wide certification programs for the UNIX system, the Linux Standard Base, TOGAF, and IEEE POSIX. He is a member of the IEEE, USENIX, UKUUG, and the Association of Open Group Enterprise Architects.

Professor Rachel Harrison, Stratton Edge Consulting

Rachel Harrison is a Visiting Professor of Computer Science at the University of Reading and Director of Stratton Edge Consulting. Formerly she was Professor of Computer Science, Head of the Department of Computer Science, and Director of Research for the School of System Engineering at the University of Reading. She obtained an MA in Mathematics from Oxford University, an MSc in Computer Science from UCL, and a PhD in Computer Science from the University of Southampton. Current research interests include enterprise architecture, systems' evolution, software metrics, requirements engineering, and process modeling. Her consultancy services include preparation of the TOGAF Study Guide and its accompanying training course materials for The Open Group. Professor Harrison is a member of the IEEE Computer Society, the ACM, the BCS, and is also a Chartered Engineer.

Paul Homan, IBM

Paul Homan is a Technology Strategy Consultant within IBM's Global Business Services. He is a Certified Master IT Architect, specializing

in enterprise architecture with over 20 years' experience in IT. Highly passionate and practically experienced in architecture, strategy, design authority, and governance areas, Paul is particularly interested in enterprise architecture leadership, requirements management, and business architecture. He joined IBM from end-user environments, having worked as Chief Architect in both the UK Post Office and Royal Mail. He has not only established enterprise architecture practices, but has also lived with the results!

Matthew F. Rouse, EDS

Matthew Rouse is a member of the EDS Global Architecture Capability. Matthew has over 20 years' IS/IT experience in applications development, system architecture, IS/IT strategy, and enterprise architecture. He brings expertise in strategic IS/IT planning and architecture to ensure that enterprises align their IS/IT investments with their business objectives. Matthew is a Chartered IT Professional member of the British Computer Society, a Master Certified IT Architect, and a member of the IEEE Computer Society.

Tom van Sante, Getronics

Tom van Sante is Principal Consultant for Getronics. He started his career in IT over 25 years ago after studying architecture at the Technical University in Delft. Working in a variety of functions, from operations to management, he has always operated on the borders between business and IT. He was involved in the introduction and development of ITIL/ASL/BiSL in the Netherlands. Tom van Sante has worked in numerous appointments for the EU and Dutch ministries advising on the use of IT in modern society. He is currently responsible for the introduction and development of TOGAF within Getronics.

Mike Turner, Capgemini

Mike Turner is an Enterprise Architect at Capgemini and has been focusing exclusively on enterprise architecture for the past six years. Mike spends his time helping organizations to grow enterprise architecture capabilities and assisting organizations in the realization of strategic change through the use of enterprise architecture. Mike has a deep understanding of enterprise architecture frameworks, leading Capgemini's development effort on TOGAF Version 9 and also working in the core team that developed the SAP Enterprise Architecture Framework (a joint initiative between Capgemini and SAP).

Paul van der Merwe, Real IRM

Paul van der Merwe, Consulting & Training Manager at Real IRM, is one of South Africa's most dynamic and insightful enterprise architecture practitioners. A conceptual thinker, he has driven a number of advances in the fields in which he has specialized, among them software development, business intelligence, and enterprise architecture. He presented the first TOGAF certification course in South Africa. He frequently presents on enterprise architecture, the Zachman Framework, and governance, and has trained in these disciplines on three continents. Paul is also a respected academic who presents a post-graduate course in the Department of Informatics at the University of Pretoria.

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Chapter 1

Introduction to TOGAF®

This chapter provides an introduction to TOGAF 9.

Topics addressed in this chapter include:

- An Introduction to TOGAF
- TOGAF, its structure and content
- The kinds of architecture that TOGAF addresses

1.1 Introduction to TOGAF 9

TOGAF is an architecture framework – **The Open Group Architecture Framework**. Put simply, TOGAF is a tool for assisting in the acceptance, production, use, and maintenance of architectures. It is based on an iterative process model supported by best practices and a re-usable set of existing architectural assets.

TOGAF is developed and maintained by The Open Group Architecture Forum. The first version of TOGAF, developed in 1995, was based on the US Department of Defense Technical Architecture Framework for Information Management (TAFIM). Starting from this sound foundation, The Open Group Architecture Forum has developed successive versions of TOGAF at regular intervals and published each one on The Open Group public web site.

This document covers TOGAF Version 9, referred to as “TOGAF 9” within the text of this document. TOGAF 9 was first published in January 2009. TOGAF 9 is an evolution from TOGAF 8.1.1 and a description of the changes is provided in Appendix A.

TOGAF 9 can be used for developing a broad range of different enterprise architectures. TOGAF complements, and can be used in conjunction

with, other frameworks that are more focused on specific deliverables for particular vertical sectors such as Government, Telecommunications, Manufacturing, Defense, and Finance. The key to TOGAF is the method – the TOGAF Architecture Development Method (ADM) – for developing an enterprise architecture that addresses business needs.

1.2 Structure of the TOGAF Document

The TOGAF 9 document is divided into seven parts, as summarized in Table 1.

Table 1: Structure of the TOGAF Document

Part I: Introduction	This part provides a high-level introduction to the key concepts of enterprise architecture and, in particular, to the TOGAF approach. It contains the definitions of terms used throughout TOGAF and release notes detailing the changes between this version and the previous version of TOGAF.
Part II: Architecture Development Method	This part is the core of TOGAF. It describes the TOGAF Architecture Development Method (ADM) – a step-by-step approach to developing an enterprise architecture.
Part III: ADM Guidelines and Techniques	This part contains a collection of guidelines and techniques available for use in applying the ADM.
Part IV: Architecture Content Framework	This part describes the TOGAF content framework, including a structured metamodel for architectural artifacts, the use of re-usable Architecture Building Blocks (ABBs), and an overview of typical architecture deliverables.
Part V: Enterprise Continuum and Tools	This part discusses appropriate taxonomies and tools to categorize and store the outputs of architecture activity within an enterprise.
Part VI: TOGAF Reference Models	This part provides two architectural reference models, namely the TOGAF Technical Reference Model (TRM), and the Integrated Information Infrastructure Reference Model (III-RM).
Part VII: Architecture Capability Framework	This part discusses the organization, processes, skills, roles, and responsibilities required to establish and operate an architecture practice within an enterprise.

1.3 What is Architecture in the Context of TOGAF?

ISO/IEC 42010:2007² defines “architecture” as:

“The fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution.”

TOGAF embraces and extends this definition. In TOGAF, “architecture” has two meanings depending upon the context:

1. A formal description of a system, or a detailed plan of the system at a component level to guide its implementation
2. The structure of components, their inter-relationships, and the principles and guidelines governing their design and evolution over time

1.4 What kinds of Architecture does TOGAF deal with?

TOGAF 9 covers the development of four related types of architecture.

These four types of architecture are commonly accepted as subsets of an overall enterprise architecture, all of which TOGAF is designed to support. They are shown in Table 2.

Table 2: Architecture Types Supported by TOGAF

Architecture Type	Description
Business Architecture	The business strategy, governance, organization, and key business processes.
Data Architecture ³	The structure of an organization’s logical and physical data assets and data management resources.
Application Architecture	A blueprint for the individual application systems to be deployed, their interactions, and their relationships to the core business processes of the organization.

² ISO/IEC 42010:2007, Systems and Software Engineering – Recommended Practice for Architectural Description of Software-Intensive Systems, Edition 1 (technically identical to ANSI/IEEE Std 1471-2000).

³ Data Architecture is called Information Architecture in some organizations.

Architecture Type	Description
Technology Architecture	The logical software and hardware capabilities that are required to support the deployment of business, data, and application services. This includes IT infrastructure, middleware, networks, communications, processing, and standards.

1.5 What does TOGAF Contain?

TOGAF reflects the structure and content of an architecture capability within an enterprise, as shown in Figure 1.

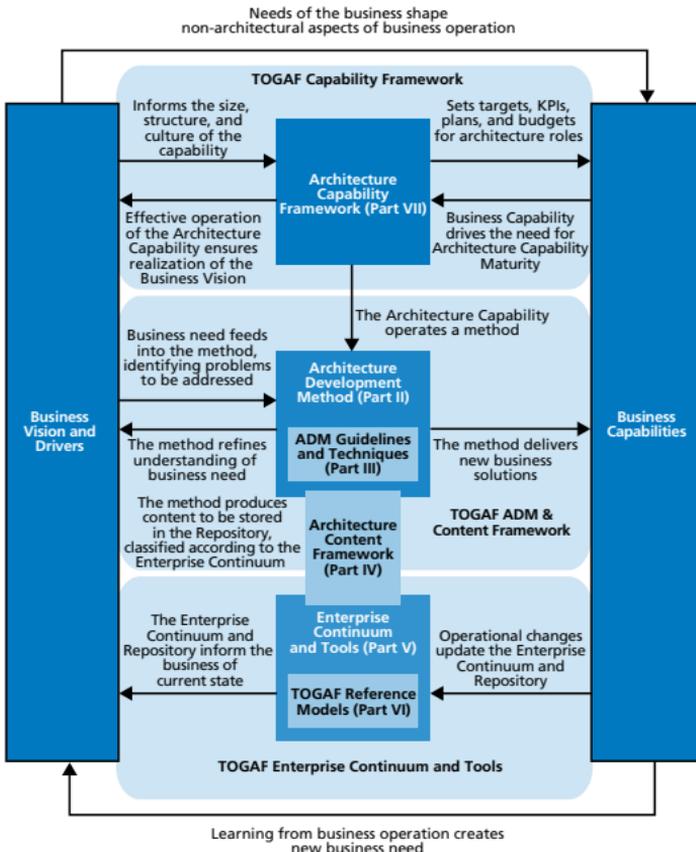


Figure 1: TOGAF Content Overview

Central to TOGAF is the Architecture Development Method (documented in TOGAF 9, Part II). The architecture capability (documented in TOGAF 9, Part VII) operates the method. The method is supported by a number of guidelines and techniques (documented in TOGAF 9, Part III). This produces content to be stored in the repository (documented in TOGAF 9, Part IV), which is classified according to the Enterprise Continuum (documented in TOGAF 9, Part V). The repository is initially populated with the TOGAF Reference Models (documented in TOGAF 9, Part VI).

1.5.1 The Architecture Development Method (ADM)

The **ADM** describes how to derive an organization-specific enterprise architecture that addresses business requirements. The ADM is the major component of TOGAF and provides guidance for architects on a number of levels:

- It provides a number of **architecture development phases** (Business Architecture, Information Systems Architectures, Technology Architecture) in a cycle, as an overall process template for architecture development activity.
- It provides a **narrative of each architecture phase**, describing the phase in terms of objectives, approach, inputs, steps, and outputs. The inputs and outputs sections provide a definition of the architecture content structure and deliverables (a detailed description of the phase inputs and phase outputs is given in the Architecture Content Framework).
- It provides cross-phase summaries that cover requirements management.

The ADM is described further in Chapter 2.

1.5.2 ADM Guidelines and Techniques

ADM Guidelines and Techniques provides a number of guidelines and techniques to support the application of the ADM. The guidelines address adapting the ADM to deal with a number of usage scenarios, including

different process styles (e.g., the use of iteration) and also specific specialty architectures (such as security). The techniques support specific tasks within the ADM (such as defining principles, business scenarios, gap analysis, migration planning, risk management, etc).

ADM Guidelines are described further in Chapter 4. ADM Techniques are described in detail in Chapter 3, together with key deliverables.

1.5.3 Architecture Content Framework

The **Architecture Content Framework** provides a detailed model of architectural work products, including deliverables, artifacts within deliverables, and the Architecture Building Blocks (ABBs) that deliverables represent.

The Architecture Content Framework is described further in Chapter 5.

1.5.4 The Enterprise Continuum

The **Enterprise Continuum** provides a model for structuring a virtual repository and provides methods for classifying architecture and solution artifacts, showing how the different types of artifacts evolve, and how they can be leveraged and re-used. This is based on architectures and solutions (models, patterns, architecture descriptions, etc.) that exist within the enterprise and in the industry at large, and which the enterprise has collected for use in the development of its architectures.

The Enterprise Continuum is described further in Chapter 6.

1.5.5 TOGAF Reference Models

TOGAF provides two reference models for possible inclusion in an enterprise's own Enterprise Continuum, namely the TOGAF **Technical**

Reference Model (TRM) and the **Integrated Information Infrastructure Model (III-RM)**.

The TOGAF Reference Models are described further in Chapter 7.

1.5.6 The Architecture Capability Framework

The **Architecture Capability Framework** is a set of resources, guidelines, templates, background information, etc. provided to help the architect establish an architecture practice within an organization.

The Architecture Capability Framework is described further in Chapter 8.

Chapter 2

The Architecture Development Method

This chapter describes the Architecture Development Method (ADM), its relationship to the rest of TOGAF, and high-level considerations for its use. It also includes a summary of each phase within the ADM.

Topics addressed in this chapter include:

- An introduction to the ADM
- The phases of the ADM
- The objectives, steps, inputs, and outputs to the ADM phases
- Requirements Management during the ADM cycle
- Scoping the architecture activity

2.1 What is the ADM?

The ADM, a result of contributions from many architects, forms the core of TOGAF. It is a method for deriving organization-specific enterprise architectures and is specifically designed to address business requirements.

The ADM describes:

- A reliable, proven way of developing and using an enterprise architecture
- A method of developing architectures on different levels⁴ (business, application, data, technology) that enable the architect to ensure that a complex set of requirements are adequately addressed
- Guidelines on tools for architecture development

⁴ In TOGAF this is termed as a set of architecture domains.

2.2 What are the Phases of the ADM?

The ADM consists of a number of phases that cycle through a range of architecture domains that enable the architect to ensure that a complex set of requirements is adequately addressed. The basic structure of the ADM is shown in Figure 2.

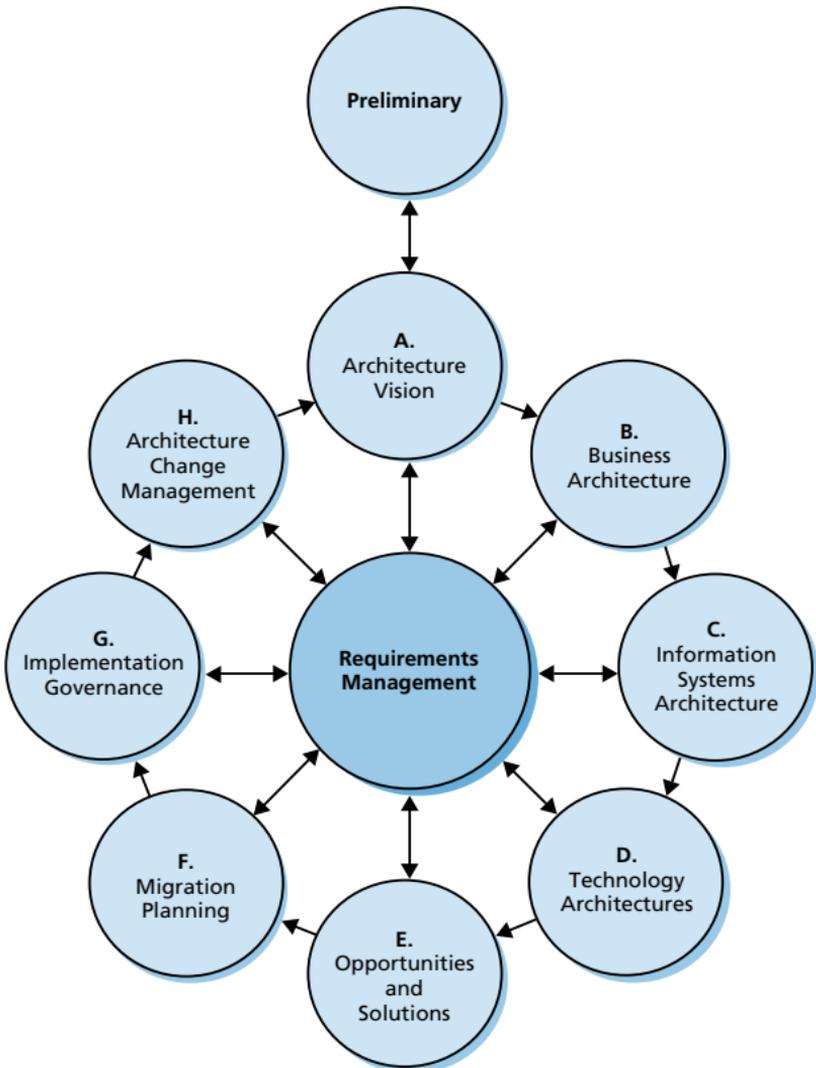


Figure 2: The Architecture Development Method Cycle

The ADM is applied iteratively throughout the entire process, between phases, and within them. Throughout the ADM cycle, there should be frequent validation of results against the original requirements, both those for the whole ADM cycle, and those for the particular phase of the process. Such validation should reconsider scope, detail, schedules, and milestones. Each phase should consider assets produced from previous iterations of the process and external assets from the marketplace, such as other frameworks or models.

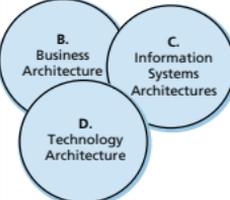
The ADM supports the concept of iteration at three levels:

- **Cycling around the ADM:** The ADM is presented in a circular manner indicating that the completion of one phase of architecture work directly feeds into subsequent phases of architecture work.
- **Iterating between phases:** TOGAF describes the concept of iterating across phases (e.g., returning to Business Architecture on completion of Technology Architecture).
- **Cycling around a single phase:** TOGAF supports repeated execution of the activities within a single ADM phase as a technique for elaborating architectural content.

Further information on iteration is given in TOGAF 9, Part III: ADM Guidelines and Techniques (see Chapter 4).

Table 3: Architecture Development Method Activities by Phase

ADM Phase	Activity
	Prepare the organization for successful TOGAF architecture projects. Undertake the preparation and initiation activities required to meet the business directive for a new enterprise architecture, including the definition of an organization-specific architecture framework and tools, and the definition of principles.
	Every stage of a TOGAF project is based on and validates business requirements. Requirements are identified, stored, and fed into and out of the relevant ADM phases, which dispose of, address, and prioritize requirements.

ADM Phase	Activity
 <p>A. Architecture Vision</p>	<p>Set the scope, constraints, and expectations for a TOGAF project. Create the Architecture Vision. Define stakeholders. Validate the business context and create the Statement of Architecture Work. Obtain approvals.</p>
 <p>B. Business Architecture</p> <p>C. Information Systems Architectures</p> <p>D. Technology Architecture</p>	<p>Develop architectures at three levels:</p> <p>Business</p> <p>Information Systems</p> <p>Technology</p> <p>In each case, develop the Baseline and Target Architecture and analyze gaps.</p>
 <p>E. Opportunities and Solutions</p>	<p>Perform initial implementation planning and the identification of delivery vehicles for the building blocks identified in the previous phases. Identify major implementation projects, and group them into Transition Architectures.</p>
 <p>F. Migration Planning</p>	<p>Analyze cost benefits and risk. Develop detailed Implementation and Migration Plan.</p>
 <p>G. Implementation Governance</p>	<p>Provide architectural oversight for the implementation. Prepare and issue Architecture Contracts (Implementation Governance Board). Ensure that the implementation project conforms to the architecture.</p>
 <p>H. Architecture Change Management</p>	<p>Provide continual monitoring and a change management process to ensure that the architecture responds to the needs of the enterprise and maximizes the value of the architecture to the business.</p>

2.3 The ADM in Detail

The following tables summarize the objectives, steps, and the inputs and outputs⁵ of each phase of the ADM cycle.

⁵ Version numbers for specific deliverables have been omitted from this Pocket Guide since TOGAF states that the ADM numbering scheme is an example and that it should be adapted as appropriate.

2.3.1 Preliminary Phase

The Preliminary phase prepares an organization to undertake successful enterprise architecture projects.

An overview of the phase is given below:

Objectives	Steps
<p>To review the organizational context for conducting enterprise architecture</p> <p>To identify the stakeholders, their requirements, and priorities</p> <p>To confirm the commitment of the stakeholders</p> <p>To identify and scope the elements of the enterprise organizations affected and define the constraints and assumptions; this is particularly important for large organizations where there may be a federated architecture environment</p> <p>To define an organization's "architecture footprint"; that is, the people responsible for performing the architecture work, where they are located, and their responsibilities</p> <p>To define the framework and detailed methodologies that are going to be used to develop the enterprise architecture in the organization; this is typically an adaptation of the ADM</p> <p>To set up a governance and support framework to provide business process and architecture governance through the ADM cycle; these will confirm the fitness-for-purpose and ongoing effectiveness of the Target Architecture; normally this includes an initial pilot project</p> <p>To select and implement supporting tools and other infrastructure to support the architecture activity</p> <p>To define the constraining architecture principles</p>	<p>Scope the enterprise organizations impacted</p> <p>Confirm governance and support frameworks</p> <p>Define and establish enterprise architecture team and organization</p> <p>Identify and establish architecture principles</p> <p>Select and tailor architecture framework(s)</p> <p>Implement architecture tools</p>

Inputs	Outputs
TOGAF	Organizational model for enterprise architecture
Other architecture framework(s)	Tailored Architecture Framework, including architecture principles
Business principles, business goals, and business drivers	Initial Architecture Repository
Architecture governance strategy	Restatement of, or reference to, business principles, business goals, and business drivers
IT strategy	Request for Architecture Work
Existing organizational model for enterprise architecture	Governance Framework
Existing architecture framework, if any	
Existing architecture principles, if any	
Existing Architecture Repository, if any	

2.3.2 Phase A: Architecture Vision

Phase A is about project establishment and initiates an iteration of the architecture development cycle, setting the scope, constraints, and expectations for the iteration. It is required in order to validate the business context and to create the approved Statement of Architecture Work.

Objectives	Steps
Obtain management commitment for this particular cycle of the ADM	Establish the architecture project
Define and organize an architecture development cycle	Identify stakeholders, concerns, and business requirements
Validate business principles, goals, drivers, and key performance indicators (KPIs)	Confirm and elaborate business goals, business drivers, and constraints
Define, scope, and prioritize architecture tasks	Evaluate business capabilities
Identify stakeholders, their concerns, and objectives	Assess readiness for business transformation
Define business requirements and constraints	Define scope
Articulate an Architecture Vision and value proposition to respond to the requirements and constraints	Confirm and elaborate architecture principles, including business principles
Create a comprehensive plan in line with the project management frameworks adopted by the enterprise	Develop Architecture Vision
Obtain formal approval to proceed	Define the Target Architecture value propositions and KPIs
Understand the impact on, and of, other parallel architecture development cycles	Identify the business transformation risks and mitigation activities
	Develop enterprise architecture plans and Statement of Architecture Work; secure approval

Inputs	Outputs
Request for Architecture Work Business principles, business goals, and business drivers Organization model for enterprise architecture Tailored Architecture Framework, including architecture principles Populated Architecture Repository; that is, existing architecture documentation (framework description, architecture descriptions, existing baseline descriptions, etc.)	Approved Statement of Architecture Work Refined statements of business principles, business goals, and business drivers Architecture principles Capability assessment Tailored Architecture Framework Architecture Vision, including: <ul style="list-style-type: none"> – Refined key high-level stakeholder requirements – Baseline Business Architecture (vision) – Baseline Data Architecture (vision) – Baseline Application Architecture (vision) – Baseline Technology Architecture (vision) – Target Business Architecture (vision) – Target Data Architecture (vision) – Target Application Architecture (vision) – Target Technology Architecture (vision) Communications Plan Additional content populating the Architecture Repository

2.3.3 Phase B: Business Architecture

Phase B is about development of a Business Architecture to support an agreed Architecture Vision.

Objectives	Steps
Describe the Baseline Business Architecture Develop a Target Business Architecture Analyze the gaps between the Baseline and Target Architectures Select architecture viewpoints to demonstrate how stakeholder concerns are addressed in the Business Architecture Select tools and techniques for viewpoints	Select reference models, viewpoints, and tools Develop Baseline Business Architecture Description Develop Target Business Architecture Description Perform gap analysis Define roadmap components Resolve impacts across the Architecture Landscape Conduct formal stakeholder review Finalize the Business Architecture Create Architecture Definition Document

Inputs	Outputs
Request for Architecture Work Business principles, business goals, and business drivers Capability Assessment Communications Plan Organization model for enterprise architecture Tailored Architecture Framework Approved Statement of Architecture Work Architecture principles, including business principles, when pre-existing Enterprise Continuum Architecture Repository Architecture Vision, including: <ul style="list-style-type: none"> – Refined key high-level stakeholder requirements – Baseline Business Architecture (vision) – Baseline Data Architecture (vision) – Baseline Application Architecture (vision) – Baseline Technology Architecture (vision) – Target Business Architecture (vision) – Target Data Architecture (vision) – Target Application Architecture (vision) – Target Technology Architecture (vision) 	Statement of Architecture Work, updated if necessary Validated business principles, business goals, and business drivers Elaborated Business Architecture principles Draft Architecture Definition Document containing content updates: <ul style="list-style-type: none"> – Baseline Business Architecture (detailed), if appropriate – Target Business Architecture (detailed) – Views corresponding to selected viewpoints addressing key stakeholder concerns Draft Architecture Requirements Specification including content updates: <ul style="list-style-type: none"> – Gap analysis results – Technical requirements – Updated business requirements Business Architecture components of an Architecture Roadmap

2.3.4 Phase C: Information Systems Architectures

Phase C is about documenting the fundamental organization of an organization's IT systems, embodied in the major types of information and the application systems that process them. There are two steps in this phase, which may be developed either sequentially or concurrently:

- Data Architecture
- Application Architecture

2.3.4.1 Data Architecture

Objectives	Steps
Define the types and sources of data needed to support the business, in a way that can be understood by the stakeholders	Select reference models, viewpoints, and tools Develop Baseline Data Architecture Description Develop Target Data Architecture Description Perform gap analysis Define roadmap components Resolve impacts across the Architecture Landscape Conduct formal stakeholder review Finalize the Data Architecture Create Architecture Definition Document
Inputs	Outputs
Request for Architecture Work Capability Assessment Communications Plan Organization model for enterprise architecture Tailored Architecture Framework Data principles Statement of Architecture Work Architecture Vision Architecture Repository Draft Architecture Definition Document, containing: <ul style="list-style-type: none"> – Baseline Business Architecture (detailed) – Target Business Architecture (detailed) – Baseline Data Architecture (vision) – Target Data Architecture (vision) – Baseline Application Architecture (detailed or vision) – Target Application Architecture (detailed or vision) – Baseline Technology Architecture (vision) – Target Technology Architecture (vision) Draft Architecture Requirements Specification, including: <ul style="list-style-type: none"> – Gap analysis results – Relevant technical requirements Business Architecture components of an Architecture Roadmap	Statement of Architecture Work, updated if necessary Validated data principles, or new data principles Draft Architecture Definition Document, containing content updates: <ul style="list-style-type: none"> – Baseline Data Architecture – Target Data Architecture – Data Architecture views corresponding to the selected viewpoints, addressing key stakeholder concerns Draft Architecture Requirements Specification, including content updates: <ul style="list-style-type: none"> – 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 – Updated business requirements – Updated application requirements Data Architecture components of an Architecture Roadmap

2.3.4.2 Application Architecture

Objectives	Steps
Define the kinds of application systems necessary to process the data and support the business	Select reference models, viewpoints, and tools Develop Baseline Application Architecture Description Develop Target Application Architecture Description Perform gap analysis Define roadmap components Resolve impacts across the Architecture Landscape Conduct formal stakeholder review Finalize the Application Architecture Create Architecture Definition Document
Inputs	Outputs
Request for Architecture Work Capability Assessment Communications Plan Organization model for enterprise architecture Tailored Architecture Framework Application principles Statement of Architecture Work Architecture Vision Architecture Repository Draft Architecture Definition Document, containing: <ul style="list-style-type: none"> – Baseline Business Architecture (detailed) – Target Business Architecture (detailed) – Baseline Data Architecture (detailed or vision) – Target Data Architecture (detailed or vision) – Baseline Application Architecture (vision) – Target Application Architecture (vision) – Baseline Technology Architecture (vision) – Target Technology Architecture (vision) Draft Architecture Requirements Specification, including: <ul style="list-style-type: none"> – Gap analysis results – Relevant technical requirements Business and Data Architecture components of an Architecture Roadmap	Statement of Architecture Work, updated if necessary Validated application principles, or new application principles Draft Architecture Definition Document, containing content updates: <ul style="list-style-type: none"> – Baseline Application Architecture – Target Application Architecture – Application Architecture views corresponding to the selected viewpoints, addressing key stakeholder concerns Draft Architecture Requirements Specification, including content updates: <ul style="list-style-type: none"> – Gap analysis results – Application interoperability requirements – Relevant technical requirements that will apply to this evolution of the architecture development cycle – Constraints on the Technology Architecture – Updated business requirements – Updated data requirements Application Architecture components of an Architecture Roadmap

2.3.5 Phase D: Technology Architecture

Phase D is about documenting the fundamental organization of the IT systems, embodied in the hardware, software, and communications technology.

Objectives	Steps
To develop a Target Technology Architecture that will form the basis of the subsequent implementation and migration planning	Select reference models, viewpoints, and tools Develop Baseline Technology Architecture Description Develop Target Technology Architecture Description Perform gap analysis Define roadmap components Resolve impacts across the Architecture Landscape Conduct formal stakeholder review Finalize the Technology Architecture Create Architecture Definition Document
Inputs	Outputs
Request for Architecture Work Capability Assessment Communications Plan Organization model for enterprise architecture Tailored Architecture Framework Technology principles Statement of Architecture Work Architecture Vision Architecture Repository Draft Architecture Definition Document, containing: <ul style="list-style-type: none"> – Baseline Business Architecture (detailed) – Target Business Architecture (detailed) – Baseline Data Architecture (detailed) – Target Data Architecture (detailed) – Baseline Application Architecture (detailed) – Target Application Architecture (detailed) – Baseline Technology Architecture (vision) – Target Technology Architecture (vision) Draft Architecture Requirements Specification, including: <ul style="list-style-type: none"> – Gap analysis results – Relevant technical requirements Business, Data, and Application Architecture components of an Architecture Roadmap	Statement of Architecture Work, updated if necessary Validated technology principles or new technology principles (if generated here) Draft Architecture Definition Document, containing content updates: <ul style="list-style-type: none"> – Baseline Technology Architecture – Target Technology Architecture – Technology Architecture views corresponding to the selected viewpoints, addressing key stakeholder concerns Draft Architecture Requirements Specification, including content updates: <ul style="list-style-type: none"> – Gap analysis report – Requirements output from Phases B and C – Updated technology requirements Technology Architecture components of an Architecture Roadmap

2.3.6 Phase E: Opportunities and Solutions

Phase E is the first phase which is directly concerned with implementation. It describes the process of identifying delivery vehicles (projects, programs, or portfolios) that deliver the Target Architecture identified in previous phases.

Objectives	Steps
<p>To review the target business objectives and capabilities, consolidate the gaps from Phases B to D, and then organize groups of building blocks to address these capabilities</p> <p>To confirm the enterprise's capability for undergoing change</p> <p>To derive a series of Transition Architectures that deliver continuous business value (e.g., capability increments) through the exploitation of opportunities to realize the building blocks</p> <p>To generate and gain consensus on an outline Implementation and Migration Strategy</p>	<p>Determine/confirm key corporate change attributes</p> <p>Determine business constraints for implementation</p> <p>Review and consolidate gap analysis results from Phases B to D</p> <p>Review IT requirements from a functional perspective</p> <p>Consolidate and reconcile interoperability requirements</p> <p>Refine and validate dependencies</p> <p>Confirm readiness and risk for business transformation</p> <p>Formulate high-level Implementation and Migration Strategy</p> <p>Identify and group major work packages</p> <p>Identify Transition Architectures</p> <p>Create portfolio and project charters and update the architectures</p>

Inputs	Outputs
Product Information Request for Architecture Work Capability Assessment Communications Plan Planning Methodologies Organization model for enterprise architecture Tailored Architecture Framework Statement of Architecture Work Architecture Vision Architecture Repository Draft Architecture Definition Document Draft Architecture Requirements Specification Change Requests for existing programs and projects	Statement of Architecture Work, updated if necessary Architecture Vision, updated if necessary Draft Architecture Definition Document, including content updates for: <ul style="list-style-type: none"> – Identification of increments – Interoperability and co-existence requirements – Implementation and Migration Strategy – Inclusion of project list and project charters Draft Architecture Requirements Specification, updated if necessary Capability Assessment, including content updates for: <ul style="list-style-type: none"> – Enterprise Architecture Maturity Profile – Transformation Readiness Report Transition Architectures, including: <ul style="list-style-type: none"> – Consolidated Gaps, Solutions, and Dependencies Assessment – Risk Register – Impact analysis – project list – Dependency Analysis Report – Implementation Factor Assessment and Deduction Matrix Implementation and Migration Plan (outline)

2.3.7 Phase F: Migration Planning

Phase F addresses migration planning; that is, how to move from the Baseline to the Target Architectures by finalizing a detailed Implementation and Migration Plan.

Objectives	Steps
To ensure that the Implementation and Migration Plan is coordinated with the various management frameworks in use within the enterprise	Confirm management framework interactions for the Implementation and Migration Plan
To prioritize all work packages, projects, and building blocks by assigning business value to each and conducting a cost/business analysis	Assign a business value to each project Estimate resource requirements, project timings, and availability/delivery vehicle
To finalize the Architecture Vision and Architecture Definition Documents, in line with the agreed implementation approach	Prioritize the migration projects through the conduct of a cost/benefit assessment and risk validation
To confirm the Transition Architectures defined in Phase E with the relevant stakeholders	Confirm Transition Architecture increments/phases and update Architecture Definition Document
To create, evolve, and monitor the detailed Implementation and Migration Plan, providing necessary resources to enable the realization of the Transition Architectures, as defined in Phase E	Generate the Architecture Implementation Roadmap (time-lined) and Migration Plan Establish the architecture evolution cycle and document lessons learned
Inputs	Outputs
Request for Architecture Work	Implementation and Migration Plan (detailed)
Capability Assessment	Finalized Architecture Definition Document
Communications Plan	Finalized Architecture Requirements Specification
Organization model for enterprise architecture	Finalized Architecture Roadmap
Governance Models and Frameworks	Transition Architecture
Tailored Architecture Framework	Re-Usable Architecture Building Blocks
Statement of Architecture Work	Requests for Architecture Work for the architecture aspects of implementation projects (if any)
Architecture Vision	Architecture Contracts for implementation projects
Architecture Repository	Implementation Governance Model
Draft Architecture Definition Document, including:	Change Requests arising from lessons learned
– Strategic Migration Plan	
– Impact analysis – project list and charters	
Draft Architecture Requirements Specification	
Change Requests for existing programs and projects	
Consolidated and validated Architecture Roadmap	
Transition Architectures	
Implementation and Migration Plan (outline)	

2.3.8 Phase G: Implementation Governance

Phase G defines how the architecture constrains the implementation projects, monitors it while building it, and produces a signed Architecture Contract.

Objectives	Steps
Formulate recommendations for each implementation project	Confirm scope and priorities for deployment with development management
Govern and manage an Architecture Contract covering the overall implementation and deployment process	Identify deployment resources and skills
Perform appropriate governance functions while the system is being implemented and deployed	Guide development of solutions deployment
Ensure conformance with the defined architecture by implementation projects and other projects	Perform enterprise architecture compliance reviews
Ensure that the program of solutions is deployed successfully, as a planned program of work	Implement business and IT operations
Ensure conformance of the deployed solution with the Target Architecture	Perform post-implementation review and close the implementation
Mobilize supporting operations that will underpin the future working lifetime of the deployed solution	

Inputs	Outputs
Request for Architecture Work Capability Assessment Organization model for enterprise architecture Tailored Architecture Framework Statement of Architecture Work Architecture Vision Architecture Repository Architecture Definition Document Architecture Requirements Specification Architecture Roadmap Transition Architecture Implementation Governance Model Architecture Contract Request for Architecture Work identified in Phases E and F Implementation and Migration Plan	Architecture Contract (signed) Compliance Assessments Change Requests Impact Analysis – Implementation Recommendations Architecture-compliant solutions deployed, including: <ul style="list-style-type: none"> – 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 – Transition Architecture, updated post-implementation – Business and IT operating models for the implemented solution

2.3.9 Phase H: Architecture Change Management

Phase H ensures that changes to the architecture are managed in a controlled manner.

Objectives	Steps
<p>Ensure that Baseline Architectures continue to be fit-for-purpose</p> <p>Assess the performance of the architecture and make recommendations for change</p> <p>Assess changes to the framework and principles set up in previous phases</p> <p>Establish an architecture change management process for the new enterprise architecture baseline that is achieved with completion of Phase G</p> <p>Maximize the business value from the architecture and ongoing operations</p> <p>Operate the Governance Framework</p>	<p>Establish Value Realization process</p> <p>Deploy Monitoring Tools</p> <p>Manage Risks</p> <p>Provide Analysis for Architecture Change Management</p> <p>Develop Change Requirements to meet Performance Targets</p> <p>Manage Governance Process</p> <p>Activate the process to implement Change</p>
Inputs	Outputs
<p>Request for Architecture Work identified in Phases E and F</p> <p>Organization model for enterprise architecture</p> <p>Tailored Architecture Framework</p> <p>Statement of Architecture Work</p> <p>Architecture Vision</p> <p>Architecture Repository</p> <p>Architecture Definition document</p> <p>Architecture Requirements Specification</p> <p>Architecture Roadmap</p> <p>Change Requests due to technology changes</p> <p>Change Requests due to business changes</p> <p>Change Requests from lessons learned</p> <p>Transition Architecture</p> <p>Implementation Governance Model</p> <p>Architecture Contract (signed)</p> <p>Compliance Assessments</p> <p>Implementation and Migration Plan</p>	<p>Architecture updates</p> <p>Changes to architecture framework and principles</p> <p>New Request for Architecture Work, to initiate another cycle of the ADM</p> <p>Statement of Architecture Work, updated if necessary</p> <p>Architecture Contract, updated if necessary</p> <p>Compliance Assessments, updated if necessary</p>

2.3.10 Requirements Management

The process of managing architecture requirements applies to all phases of the ADM cycle. The Requirements Management process is a dynamic process, which addresses the identification of requirements for the enterprise, storing them, and then feeding them in and out of the relevant ADM phases. As shown in Figure 2, this process is central to driving the ADM process.

The ability to deal with changes in the requirements is crucial to the ADM process, since architecture by its very nature deals with uncertainty and change, bridging the divide between the aspirations of the stakeholders and what can be delivered as a practical solution.

Objectives	Steps
<p>To provide a process to manage architecture requirements throughout the phases of the ADM cycle</p> <p>To identify requirements for the enterprise, store them, and feed them in and out of the relevant ADM phases, which dispose of, address, and prioritize requirements</p>	<p>Identify/document requirements</p> <p>Baseline requirements</p> <p>Monitor baseline requirements</p> <p>Identify changed requirements; remove, add, modify, and re-assess priorities</p> <p>Identify changed requirements and record priorities; identify and resolve conflicts; generate requirements impact statements</p> <p>Assess impact of changed requirements on current and previous ADM phases</p> <p>Implement requirements arising from Phase H</p> <p>Update the requirements repository</p> <p>Implement change in the current phase</p> <p>Assess and revise gap analysis for past phases</p>

Inputs	Outputs
<p>The inputs to the Requirements Management process are the requirements-related outputs from each ADM phase.</p> <p>The first high-level requirements are produced as part of the Architecture Vision.</p> <p>Each architecture domain then generates detailed requirements.</p> <p>Deliverables in later ADM phases contain mappings to new types of requirements (for example, conformance requirements).</p>	<p>Changed requirements</p> <p>Requirements Impact Assessment, which identifies the phases of the ADM that need to be revisited to address any changes. The final version must include the full implications of the requirements (e.g., costs, timescales, and business metrics).</p>

2.4 Scoping the Architecture Activity

The ADM defines a recommended sequence for the various phases and steps involved in developing an organization-wide enterprise architecture, but the ADM cannot determine scope: this must be determined by the organization itself.

There are many reasons to constrain (or restrict) the scope of the architectural activity to be undertaken, most of which relate to limits in:

- The organizational authority of the team producing the architecture
- The objectives and stakeholder concerns to be addressed within the architecture
- The availability of people, finance, and other resources

The scope chosen for the architecture activity should ideally allow the work of all architects within the enterprise to be effectively governed and integrated. This requires a set of aligned “architecture partitions” that ensure architects are not working on duplicate or conflicting activities. It also requires the definition of re-use and compliance relationships between architecture partitions. The division of the enterprise and its architecture-related activity is addressed in TOGAF 9, Part III: ADM Guidelines and Techniques (see Chapter 4).

Table 4 shows the four dimensions in which the scope may be defined and limited.

Table 4: Dimensions for Limiting the Scope of the Architecture Activity

Dimension	Considerations
Enterprise Scope or Focus	<p>What is the full extent of the enterprise, and how much of that extent should the architecting effort focus on?</p> <p>Many enterprises are very large, effectively comprising a federation of organizational units that could be considered enterprises in their own right.</p> <p>The modern enterprise increasingly extends beyond its traditional boundaries, to embrace a fuzzy combination of traditional business enterprise combined with suppliers, customers, and partners.</p>
Architecture Domains	<p>A complete enterprise architecture description should contain all four architecture domains (Business, Data, Application, Technology), but the realities of resource and time constraints often mean there is not enough time, funding, or resources to build a top-down, all-inclusive architecture description encompassing all four architecture domains, even if the enterprise scope is chosen to be less than the full extent of the overall enterprise.</p>
Vertical Scope or Level of Detail	<p>To what level of detail should the architecting effort go?</p> <p>How much architecture is “enough”?</p> <p>What is the appropriate demarcation between the architecture effort and other, related activities (system design, system engineering, system development)?</p>
Time Period	<p>What is the time period that needs to be articulated for the Architecture Vision, and does it make sense (in terms of practicality and resources) for the same period to be covered in the detailed architecture description? If not, how many intermediate Target Architectures are to be defined, and what are their time periods?</p>