# The TOGAF® Standard

10th Edition

Content, Capability, and Governance







# The TOGAF® Standard, 10th Edition Content, Capability, and Governance

# The Open Group Publications available from Van Haren Publishing

#### The TOGAF® Standard, 10th Edition:

Introduction and Core Concepts
Architecture Development Method
Content, Capability, and Governance
Leader's Guide
ADM Practitioners' Guide
Business Architecture
Enterprise Agility and Digital Transformation
A Pocket Guide

#### The TOGAF Series:

The TOGAF° Standard, Version 9.2
The TOGAF° Standard, Version 9.2 – A Pocket Guide TOGAF° 9 Foundation Study Guide, 4th Edition TOGAF° 9 Certified Study Guide, 4th Edition TOGAF° Business Architecture Level 1 Study Guide

### The Open Group Series:

The IT4IT™ Reference Architecture, Version 2.1
IT4IT™ for Managing the Business of IT – A Management Guide
IT4IT™ Foundation Study Guide, 2nd Edition
The IT4IT™ Reference Architecture, Version 2.1 – A Pocket Guide
Cloud Computing for Business – The Open Group Guide
ArchiMate® 3.1 Specification – A Pocket Guide
ArchiMate® 3.1 Specification
The Digital Practitioner Pocket Guide
The Digital Practitioner Foundation Study Guide
Open Agile Architecture™ – A Standard of The Open Group

# The Open Group Press:

The Turning Point: A Novel about Agile Architects Building a Digital Foundation Managing Digital

# The Open Group Security Series:

O-TTPS – A Management Guide Open Information Security Management Maturity Model (O-ISM3) Open Enterprise Security Architecture (O-ESA) Risk Management – The Open Group Guide The Open FAIR™ Body of Knowledge – A Pocket Guide

All titles are available to purchase from: www.opengroup.org www.vanharen.net and also many international and online distributors.

# The TOGAF® Standard, 10<sup>th</sup> Edition Content, Capability, and Governance





Title: The TOGAF® Standard, 10th Edition — Content, Capability, and Governance

Series: TOGAF Series
A Publication of: The Open Group

Publisher: Van Haren Publishing, 's-Hertogenbosch - NL, www.vanharen.net

 ISBN Hardcopy:
 978 94 018 0865 1

 ISBN eBook:
 978 94 018 0866 8

 ISBN ePub:
 978 94 018 0867 5

Edition: First edition, first impression, April 2022

Layout and Cover Design: The Open Group

Copyright: © 2022 The Open Group. All rights reserved

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of the copyright owner. Any use of this publication for commercial purposes is subject to the terms of the Annual Commercial License relating to it. For further information, see www.opengroup.org/legal/licensing.

#### The TOGAF® Standard, 10th Edition — Content, Capability, and Governance

Document number: C220

Published by The Open Group, April 2022.

Comments relating to the material contained in this document may be submitted to: The Open Group

Apex Plaza
Reading
Berkshire, RG1 1AX
United Kingdom

or by electronic mail to: ogspecs@opengroup.org

# **Contents**

Volume		Architecture Content	1
Chapter	1	Introduction	3
	1.1	Overview	3
	1.2	TOGAF Content Framework and Enterprise Metamodel	5
	1.2.1	Overview	5
	1.2.2	Content Framework	6
	1.2.3	Enterprise Metamodel	6
	1.2.4	The TOGAF Content Framework	7
	1.3	Content Framework and the TOGAF ADM	9
	1.4	The Enterprise Continuum	10
	1.5	The Architecture Repository	10
Chapter	2	TOGAF Content Framework and Enterprise Metamodel	11
-	2.1	Overview	11
	2.2	TOGAF Enterprise Metamodel Vision	11
	2.2.1	Overview of the TOGAF Enterprise Metamodel	12
	2.3	TOGAF Enterprise Metamodel in Detail	13
	2.4	TOGAF Enterprise Metamodel Entities	14
	2.5	TOGAF Enterprise Metamodel Attributes	17
	2.6	TOGAF Enterprise Metamodel Relationships	27
Chapter	3	Architectural Artifacts	33
	3.1	Basic Concepts	33
	3.1.1	Simple Example of an Architecture Viewpoint and Architecture View	35
	3.2	Developing Architecture Views in the ADM	36
	3.2.1	General Guidelines	36
	3.2.2	Architecture View Creation Process	37
	3.3	Views, Tools, and Languages	38
	3.3.1	Overview	38
	3.4	Architecture Views and Architecture Viewpoints	38
	3.4.1	Example of Architecture Views and Architecture	
		Viewpoints	38
	3.4.2	Architecture Views and Architecture Viewpoints in	
		Enterprise Architecture	39
	3.4.3	Need for a Common Language and Interoperable	
		Tools for Architecture Description	40
	3.5	Conclusions	40
	3.6	Architectural Artifacts by ADM Phase	41
	3.6.1	Preliminary Phase	43

	3.6.2	Phase A: Architecture Vision	44
	3.6.3	Phase B: Business Architecture	45
	3.6.4	Phase C: Data Architecture	51
	3.6.5	Phase C: Application Architecture	54
	3.6.6	Phase D: Technology Architecture	59
	3.6.7	Phase E: Opportunities and Solutions	63
	3.6.8	Requirements Management	63
Chapter	4	Architecture Deliverables	65
-	4.1	Introduction	65
	4.2	Deliverable Descriptions	66
	4.2.1	Architecture Building Blocks	67
	4.2.2	Architecture Contract	67
	4.2.3	Architecture Definition Document	68
	4.2.4	Architecture Principles	69
	4.2.5	Architecture Repository	70
	4.2.6	Architecture Requirements Specification	70
	4.2.7	Architecture Roadmap	71
	4.2.8	Architecture Vision	72
	4.2.9	Business Principles, Business Goals, and Business	70
	4040	Drivers	72
	4.2.10	Capability Assessment	73
	4.2.11	Change Request	74
	4.2.12	Communications Plan	75
	4.2.13	Compliance Assessment	75
	4.2.14	Implementation and Migration Plan	76
	4.2.15	Implementation Governance Model	77
	4.2.16	Organizational Model for Enterprise Architecture	77
	4.2.17	Request for Architecture Work	78
	4.2.18	Requirements Impact Assessment	78
	4.2.19	Solution Building Blocks	79
	4.2.20	Statement of Architecture Work	79
	4.2.21	Tailored Architecture Framework	80
Chapter	5	Building Blocks	81
	5.1	Overview	81
	5.2	Introduction to Building Blocks	81
	5.2.1	Overview	81
	5.2.2	Generic Characteristics	81
	5.2.3	Architecture Building Blocks	82
	5.2.4	Solution Building Blocks	83
	5.3	Building Blocks and the ADM	84
	5.3.1	Basic Principles	84
	5.3.2	Building Block Specification Process in the ADM	85
Chapter	6	Enterprise Continuum	87
	6.1	Overview	87
	6.2	Enterprise Continuum and Architecture Re-Use	87
	6.3	Constituents of the Enterprise Continuum	88
	6.4	Enterprise Continuum in Detail	89

#### Contents

	6.4.1	Architecture Continuum	90
	6.4.2	Solutions Continuum	93
	6.5	The Enterprise Continuum and the ADM	95
	6.6	The Enterprise Continuum and Your Organization	95
	6.6.1	Relationships	
	6.6.2	Your Enterprise	
Chapter	7	Architecture Repository	99
-	7.1	Overview	99
	7.2	Architecture Landscape	100
	7.3	Reference Library	101
	7.3.1	Overview	101
	7.4	Standards Library	102
	7.4.1	Overview	102
	7.4.2	Types of Standard	103
	7.4.3	Standards Lifecycle	103
	7.4.4	Standards Classification within the Standards	10/
	7.5	Library	
	7.5 7.5.1	Governance Repository Overview	
	7.5.1 7.5.2		
	7.5.2 7.6	Contents of the Governance Repository	
	7.6 7.6.1	The Architecture Requirements Repository	
	7.6.1	Overview  Contents of the Architecture Requirements	100
	7.0.2	Repository	106
	7.7	Solutions Landscape	107
	7.8	The Enterprise Repository	107
	7.9	External Repositories	108
	7.9.1	External Reference Models	108
	7.9.2	External Standards	108
	7.9.3	Architecture Board Approvals	108
Volume		Enterprise Architecture Capability and	
Volume		Governance	109
Chapter	1	Introduction	111
Chapter	2	Establishing an Architecture Capability	113
-	2.1	Overview	
	2.2	Phase A: Architecture Vision	114
	2.3	Phase B: Business Architecture	115
	2.4	Phase C: Data Architecture	116
	2.5	Phase C: Application Architecture	116
	2.6	Phase D: Technology Architecture	116
	2.7	Phase E: Opportunities & Solutions	116
	2.8	Phase F: Migration Planning	116
	2.9	Phase G: Implementation Governance	
	2.10	Phase H: Architecture Change Management	117
	2 11	Requirements Management	117

Chapter	3	Architecture Governance	119					
•	3.1	Introduction						
	3.1.1	Levels of Governance within the Enterprise						
	3.1.2	Nature of Governance						
	3.1.3	Technology Governance						
	3.1.4	IT Governance						
	3.1.5	Architecture Governance: Overview						
	3.2	Architecture Governance Framework						
	3.2.1	Architecture Governance Framework — Conceptual	120					
	0.2.1	Structure	123					
	3.2.2	Architecture Governance Framework —	120					
	5.2.2	Organizational Structure	126					
	3.3	Architecture Governance in Practice						
	3.3.1							
		Architecture Governance — Key Success Factors	120					
	3.3.2	Elements of an Effective Architecture Governance Strategy	129					
Chantar	4	Avalaitantuva Danud	404					
Chapter	4	Architecture Board						
	4.1	Role	_					
	4.2	Responsibilities						
	4.3	Setting Up the Architecture Board						
	4.3.1	Triggers						
	4.3.2	Size of the Board						
	4.3.3	Board Structure	134					
	4.4	Operation of the Architecture Board	134					
	4.4.1	General	134					
	4.4.2	Preparation	135					
	4.4.3	Agenda	135					
Chapter	5	Architecture Contracts	137					
•	5.1	Role	137					
	5.2	Contents	139					
	5.2.1	Statement of Architecture Work	139					
	5.2.2	Contract between Architecture Design and	120					
	E 0 0	Development Partners	139					
	5.2.3	Contract between Architecting Function and	4.40					
	E 0	Business Stakeholders						
	5.3	Relationship to Architecture Governance	140					
Chapter	6	Architecture Compliance						
	6.1	Introduction						
	6.2	Terminology: The Meaning of Architecture Compliance						
	6.3	Architecture Compliance Reviews						
	6.3.1	Purpose	143					
	6.3.2	Timing	144					
	6.3.3	Governance and Personnel Scenarios	145					
	6.4	Architecture Compliance Review Process	146					
	6.4.1	Overview	146					
	6.4.2	Roles	147					
	6.4.3	Steps	148					

#### Contents

6.5	Architecture Compliance Review Checklists	149
6.5.1	Hardware and Operating System Checklist	149
6.5.2	Software Services and Middleware Checklist	150
6.5.3	Applications Checklists	152
6.5.4	Information Management Checklists	154
6.5.5	Security Checklist	155
6.5.6	System Management Checklist	156
6.5.7	System Engineering/Overall Architecture	
	Checklists	157
6.5.8	System Engineering/Methods & Tools Checklist	160
6.6	Architecture Compliance Review Guidelines	161
6.6.1	Tailoring the Checklists	161
6.6.2	Conducting Architecture Compliance Reviews	162
	Index	163

# **List of Figures**

1-1	Relationships between Deliverables, Artifacts, and	
	Building Blocks	
1-2	Example — Architecture Definition Document	
1-3	Content Framework by ADM Phase	
1-4	Content Framework Overview	8
2-1	Using the Content Framework to Structure the TOGAF	
	Enterprise Metamodel	12
2-2	Relationships between Entities in the TOGAF Enterprise	
	Metamodel	13
3-1	Basic Architectural Concepts	33
3-2	Example Architecture View — The Open Group Business	
	Domains	35
3-3	Interactions between Metamodel, Building Blocks,	
	Diagrams, and Stakeholders	41
3-4	Artifacts Associated with the Enterprise Metamodel	42
5-1	Key ADM Phases/Steps at which Building Blocks are	
	Evolved/Specified	85
6-1	Enterprise Continuum	88
6-2	Architecture Continuum	90
6-3	Solutions Continuum	93
6-4	Relationships between Architecture and Solutions	
	Continua	95
7-1	Overview of Architecture Repository	99
7-2	Architecture Continuum	101
3-1	Architecture Governance Framework — Conceptual	
	Structure	123
3-2	Architecture Governance Framework — Organizational	
	Structure	126
6-1	Levels of Architecture Conformance	141
6-2	Architecture Compliance Review Process	146

## **Preface**

#### The Open Group

The Open Group is a global consortium that enables the achievement of business objectives through technology standards. With more than 870 member organizations, we have a diverse membership that spans all sectors of the technology community — customers, systems and solutions suppliers, tool vendors, integrators and consultants, as well as academics and researchers.

The mission of The Open Group is to drive the creation of Boundaryless Information Flow™ achieved by:

- Working with customers to capture, understand, and address current and emerging requirements, establish policies, and share best practices
- Working with suppliers, consortia, and standards bodies to develop consensus and facilitate interoperability, to evolve and integrate specifications and open source technologies
- Offering a comprehensive set of services to enhance the operational efficiency of consortia
- Developing and operating the industry's premier certification service and encouraging procurement of certified products

Further information on The Open Group is available at www.opengroup.org.

The Open Group publishes a wide range of technical documentation, most of which is focused on development of Standards and Guides, but which also includes white papers, technical studies, certification and testing documentation, and business titles. Full details and a catalog are available at www.opengroup.org/library.

#### **This Document**

This document is a compilation of two documents within the TOGAF® Standard:

- TOGAF Standard Architecture Content
  - This document describes the TOGAF Content Framework and a structured metamodel for architectural artifacts, the use of re-usable Architecture Building Blocks (ABBs), and an overview of typical architecture deliverables.
- TOGAF Standard Enterprise Architecture Capability and Governance
  - This document discusses the organization, processes, skills, roles, and responsibilities required to establish and operate an architecture function within an enterprise and describes an Enterprise Architecture governance framework.

#### The TOGAF Standard

The TOGAF Standard is an open, industry consensus framework for Enterprise Architecture.

It is a foundational framework, which means that it is applicable to the development of any kind of architecture in any context. This foundational framework is supplemented by The Open Group TOGAF Library, an extensive and growing portfolio of guidance material, providing practical guidance in the application of the TOGAF framework in specific contexts.

#### The TOGAF Documentation

The TOGAF documentation consists of a set of documents:

- The TOGAF Standard, which describes the generally applicable approach to Enterprise and IT Architecture
- The TOGAF Library, a portfolio of additional guidance material, which supports the practical application of the TOGAF approach

#### **Intended Audience**

The TOGAF Standard is intended for Enterprise Architects, Business Architects, IT Architects, Data Architects, Systems Architects, Solution Architects, and anyone responsible for the architecture function within an organization.

#### **Acknowledgements**

The Open Group is grateful for the contribution of many individuals and organizations in the development of the TOGAF Standard. See the TOGAF Standard — Introduction and Core Concepts for details.

Figure 3-1 is reprinted and adapted from Figure 2 of ISO/IEC/IEEE 42010:2011, Systems and Software Engineering — Architecture Description, with permission from IEEE<sup>®</sup>. Copyright© 2011, by IEEE. The IEEE disclaims any responsibility or liability resulting from the placement and use in the described manner.

<sup>1.</sup> The TOGAF Library (see www.opengroup.org/togaf-library) is a structured library of resources that support the TOGAF Standard.

## **Trademarks**

ArchiMate, DirecNet, Making Standards Work, Open O logo, Open O and Check Certification logo, The Open Group, TOGAF, UNIX, UNIXWARE, and the Open Brand X logo are registered trademarks and Boundaryless Information Flow, Build with Integrity Buy with Confidence, Commercial Aviation Reference Architecture, Dependability Through Assuredness, Digital Practitioner Body of Knowledge, DPBoK, EMMM, FACE, the FACE logo, FHIM Profile Builder, the FHIM logo, FPB, Future Airborne Capability Environment, IT4IT, the IT4IT logo, O-AA, O-DEF, O-HERA, O-PAS, Open Agile Architecture, Open FAIR, Open Footprint, Open Process Automation, Open Subsurface Data Universe, Open Trusted Technology Provider, OSDU, Sensor Integration Simplified, SOSA, and the SOSA logo are trademarks of The Open Group.

CMMI is a registered trademark of CMMI Institute.

COBIT is a registered trademark of the Information Systems Audit and Control Association (ISACA) and the IT Governance Institute.

Energistics is a registered trademark of Energistics in the United States.

IEEE is a registered trademark of the Institute of Electrical and Electronics Engineers, Inc.

ITIL, MSP, and PRINCE2 are registered trademarks of AXELOS Limited.

Object Management Group, OMG, and UML are registered trademarks and BPMN, Business Process Modeling Notation, and Unified Modeling Language are trademarks of the Object Management Group.

PMBOK is a registered trademark of the Project Management Institute, Inc. which is registered in the United States and other nations.

Zachman is a registered trademark of Zachman International, Inc.

The Open Group acknowledges that there may be other company names and products that might be covered by trademark protection and advises the reader to verify them independently.

# **Referenced Documents**

Please	refer	to	the	TOGAF	Standard	_	Introduction	and	Core	Concepts:	Appendix	Α	for	documents
referen	ced in	the	TO:	GAF Sta	andard.									

# The TOGAF Standard

The TOGAF® Standard, 10th Edition — Architecture Content

The Open Group

# **Chapter 1: Introduction**

This chapter provides an introduction to the guidance provided in the TOGAF Standard — Architecture Content (this document).

#### 1.1 Overview

Architects executing the Architecture Development Method (ADM) will produce a number of outputs as a result of their efforts, such as process flows, architectural requirements, project plans, or project compliance assessments. The Content Framework provides a structural model for architectural content that allows the major work products that an architect creates to be consistently defined, structured, and presented.

The Content Framework provided here is intended to allow the TOGAF framework to be used as a stand-alone framework for architecture within an enterprise. However, other Content Frameworks exist (such as the Zachman<sup>®</sup> Framework) and it is anticipated that some enterprises may opt to use an external framework in conjunction with the TOGAF framework. In these cases, the TOGAF Content Framework provides a useful reference and starting point for TOGAF content to be mapped to other Content Frameworks.

The Architecture Content Framework uses the following three categories to describe the type of architectural work product within the context of use:

- A **deliverable** is a work product that is contractually specified and in turn formally reviewed, approved, and signed off by the stakeholders
  - Deliverables represent the output of projects and those deliverables that are in documentation form will typically be archived at completion of a project, or transitioned into an Architecture Repository as a reference model, standard, or snapshot of the Architecture Landscape at a point in time.
- An artifact is an architectural work product that describes an aspect of the architecture
  - Artifacts are generally classified as catalogs (lists of things), matrices (showing relationships between things), and diagrams (pictures of things). Examples include a requirements catalog, application interaction matrix, and a value chain diagram. An architectural deliverable may contain many artifacts and artifacts will form the content of the Architecture Repository.
- A **building block** represents a potentially re-usable component of enterprise capability that can be combined with other building blocks to deliver architectures and solutions
  - Building blocks can be defined at various levels of detail, depending on what stage of architecture development has been reached. For instance, at an early stage, a building block can simply consist of a name or an outline description. Later on, a building block may be decomposed into multiple supporting building blocks and may be accompanied by a full specification. Building blocks can relate to "architectures" or "solutions".

Overview Introduction

 Architecture Building Blocks (ABBs) typically describe what is required of SBBs at a more logical or supplier-independent level; those requirements may include services to be performed, data resources, and capabilities needed. ABBs include logical business, application, and technology components

 Solution Building Blocks (SBBs) represent physical or supplier-specific components that have the capability to realize part or all of a more logical ABB. There are business, application, and technology SBBs.

The relationships between deliverables, artifacts, and building blocks are shown in Figure 1-1.

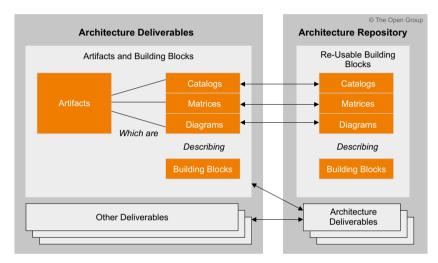


Figure 1-1 Relationships between Deliverables, Artifacts, and Building Blocks

For example, an Architecture Definition Document is a deliverable that documents an Architecture Description. This document will contain a number of complementary artifacts that are architecture views of the building blocks relevant to the architecture. For example, a process flow diagram (an artifact) may be created to describe the target call handling process (a building block). This artifact may also describe other building blocks, such as the actors involved in the process (e.g., a Customer Services Representative). An example of the relationships between deliverables, artifacts, and building blocks is illustrated in Figure 1-2.

Introduction Overview

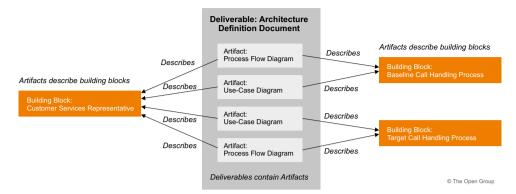


Figure 1-2 Example — Architecture Definition Document

#### 1.2 TOGAF Content Framework and Enterprise Metamodel

#### 1.2.1 Overview

The TOGAF ADM provides lifecycle management to create and manage architectures within an enterprise. At each phase within the ADM, a discussion of inputs, outputs, and steps describes a number of architecture work products.

An essential task when establishing the enterprise-specific Enterprise Architecture Capability in the Preliminary Phase of the ADM is to define:

- A categorization 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; this is referred to as 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 analyzed in order to create the Architecture Description; this Enterprise Metamodel depicts this information in the form of a formal model
- The specific artifacts to be developed (see Chapter 4)

The Content Framework chosen is likely to be influenced by:

- The Architecture Framework selected as the basis for the Enterprise Architecture Capability
- The chosen software tool used to support the Enterprise Architecture Capability