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ArchiMate® 3.0

A Pocket Guide

Andrew Josey et al.

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Preface

This Document

This is the Pocket Guide to the ArchiMate® 3.0 Specification, an Open Group Standard. It is intended to help architects by providing a reference for the ArchiMate graphical modeling language and also assist managers in understanding the basics of the ArchiMate language. It is organized as follows:

- Chapter 1 provides a high-level introduction to the ArchiMate Specification and its relationship to Enterprise Architecture.
- Chapter 2 describes the high-level structure of the ArchiMate language, including an introduction to layering, and the ArchiMate Framework.
- Chapter 3 describes the Generic Metamodel for the language.
- Chapter 4 describes the relationships that the ArchiMate language includes to model the links between elements.
- Chapter 5 describes the Motivation Elements, which includes concepts such as goal, principle, and requirement.
- Chapter 6 describes the Strategy Elements, which includes concepts such as resource, capability, and course of action.
- Chapter 7 describes the Business Layer, which includes the modeling concepts relevant in the business domain.
- Chapter 8 describes the Application Layer, which includes modeling concepts relevant for software applications.
- Chapter 9 describes the Technology Layer, which includes modeling concepts relevant for system software applications and infrastructure.
- Chapter 10 describes the Physical Elements, which include concepts relevant for the modeling of physical concepts like machines and physical installations.
- Chapter 11 describes the relationships between different layers of the language.
- Chapter 12 describes the Implementation and Migration Elements, which include concepts to support modeling Enterprise Architecture-enabled transformation.

- Chapter 13 introduces the concept of ArchiMate Viewpoints.
- Appendix A contains a summary of the changes from ArchiMate 2.1 to ArchiMate 3.0.
- A Glossary of terms and Index are provided.

The audience for this document is:

- Enterprise architects, business architects, IT architects, application architects, data architects, software architects, systems architects, solutions architects, infrastructure architects, process architects, domain architects, product managers, operational managers, and senior managers seeking a first introduction to the ArchiMate modeling language.

After reading this document, the reader seeking further information should refer to the ArchiMate documentation[1] available online at www.opengroup.org/archimate.

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.

1 ArchiMate® 3.0 Specification, Open Group Standard (C162), published by The Open Group, June 2016; refer to: www.opengroup.org/bookstore/catalog/c162.htm.

In addition to typographical conventions, the following convention is used to highlight segments of text:

A Note box is used to highlight useful or interesting information.

About The Open Group

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- Capture, understand, and address current and emerging requirements, and establish policies and share best practices
- Facilitate interoperability, develop consensus, and evolve and integrate specifications and open source technologies
- Offer a comprehensive set of services to enhance the operational efficiency of consortia
- Operate the industry's premier certification service

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Chapter 1
Introduction

This chapter provides an introduction to the ArchiMate Specification, an Open Group Standard.
Topics addressed in this chapter include:

- An introduction to the ArchiMate Specification
- A brief overview of the ArchiMate Specification
- The ArchiMate language and its relationship to Enterprise Architecture and the TOGAF Standard

1.1 Introduction to the ArchiMate Specification

The ArchiMate Specification, an Open Group Standard, is an open and independent modeling language for Enterprise Architecture that is supported by different tool vendors and consulting firms. The ArchiMate language enables Enterprise Architects to describe, analyze, and visualize the relationships among architecture domains in an unambiguous way.

Just as an architectural drawing in classical building architecture describes the various aspects of the construction and use of a building, the ArchiMate Specification offers a common language for describing the construction and operation of business processes, organizational structures, information flows, IT systems, and technical and physical infrastructure. This insight helps stakeholders to design, assess, and communicate the consequences of decisions and changes within and between these architecture domains.

This document is the Pocket Guide to the ArchiMate 3.0 Specification, referred to simply as the "ArchiMate Specification" within this document. The ArchiMate 3.0 Specification is a major update to the ArchiMate 2.1 Specification, and was published as an Open Group Standard in June 2016. New features included in Version 3.0 include elements for modeling the enterprise at a strategic level, such as capability, resource,

and outcome. It also includes support to model the physical world of materials and equipment. Furthermore, the consistency and structure of the language have been improved, definitions have been aligned with other standards, and its usability has been enhanced in various other ways.

Development of the ArchiMate Language

The ArchiMate language was created in the period 2002-2004 in the Netherlands by a project team from the Telematica Instituut in co-operation with several partners from government, industry, and academia, including Ordina, Radboud Universiteit Nijmegen, the Leiden Institute for Advanced Computer Science (LIACS), and the Centrum Wiskunde & Informatica (CWI). The development included tests in organizations such as ABN AMRO, the Dutch Tax and Customs Administration, and the Stichting Pensioenfonds ABP.

In 2008, the ownership and stewardship of the ArchiMate language was transferred from the ArchiMate Foundation to The Open Group. Since 2009, The Open Group ArchiMate Forum has developed successive versions and published them on The Open Group public website.

1.2 ArchiMate Specification Overview

The ArchiMate Specification is The Open Group Standard for the ArchiMate architecture modeling language. It contains the formal definition of the visual design language.

The contents of the specification include the following:

- The introduction, including the objectives, overview, conformance requirements, normative references, and terminology
- Definitions of the general terms used in the specification
- The structure of the modeling language
- The generic metamodel of the language
- The relationships in the language
- A detailed breakdown of the modeling framework covering the motivation elements, strategy elements, the three layers (Business/Application/Technology), and the physical elements

- Cross-layer dependencies and alignment, and relationships within the framework
- Implementation and migration elements for expressing the implementation and migration aspects of an architecture
- The concepts of stakeholders, viewpoints, and views, and also the ArchiMate viewpoint mechanism
- Mechanisms for customizing the language for specialized or domain-specific purposes
- Notation overviews and summaries
- Informative descriptions of the relationship of the ArchiMate language to other standards, including the TOGAF framework, Business Process Modeling Notation (BPMN), Unified Modeling Language (UML), and Business Motivation Model (BMM)

The ArchiMate 3.0 Specification is the latest major update to the specification and is an evolution from the ArchiMate 2.1 and earlier.

1.3 The ArchiMate Language and Enterprise Architecture

The role of the ArchiMate Specification is to provide a graphical language for the representation of Enterprise Architectures over time (i.e., including strategic, transformation, and migration planning), as well as the motivation and rationale for the architecture. The ArchiMate modeling language provides a uniform representation for diagrams that describe Enterprise Architectures, and offers an integrated approach to describe and visualize the different architecture domains together with their underlying relations and dependencies.

The design of the ArchiMate language started from a set of relatively generic concepts (objects and relations), which have been specialized for application at the different architectural layers for an Enterprise Architecture. The most important design restriction on the ArchiMate language is that it has been explicitly designed to be as compact as possible, yet still usable for most Enterprise Architecture modeling tasks.

In the interest of simplicity of learning and use, the language has been limited to the concepts that suffice for modeling the proverbial 80% of practical cases.

1.3.1 The ArchiMate Language and the TOGAF ADM

The ArchiMate language consists of the ArchiMate core language, that includes the Business, Application, and Technology layers, and elements to model the Strategy and Motivation for an architecture, as well as its Implementation and Migration. Figure 1 shows a simplified mapping of how the ArchiMate language can be used in relation to the phases of the TOGAF ADM.

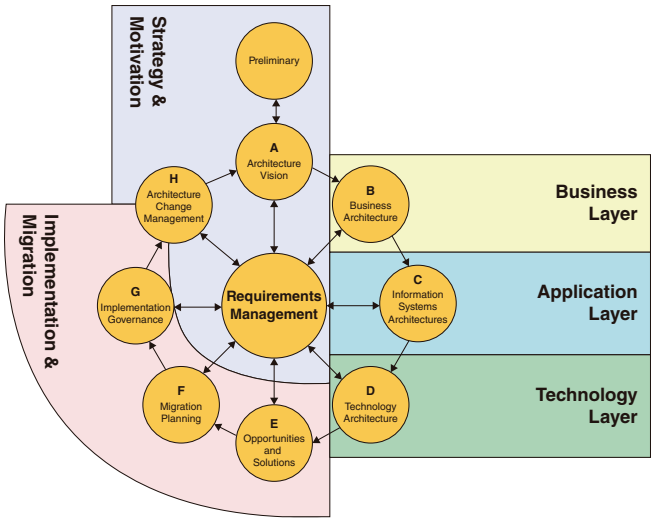

Figure 1: The Relationship between the ArchiMate Language and the TOGAF ADM

The Business, Application, and Technology layers support the description of the architecture domains defined by the TOGAF framework (business, information systems, and technology, as well as their inter-relationships).

The strategy and motivation elements in the ArchiMate language can be used to support the Requirements Management, Preliminary Phase, and Architecture Vision phases of the TOGAF ADM, which establish the high-level business goals, architecture principles, and initial business requirements. They are also relevant to the Architecture Change Management phase of the TOGAF ADM, since the phase deals with changing requirements. Although not shown in the figure, it should be noted that these elements could also be used in other ADM phases, such as Phases B, C, and D.

The implementation and migration elements of the ArchiMate language support the implementation and migration of architectures through the Opportunities and Solutions, Migration Planning, and Implementation Governance phases of the TOGAF ADM.

Chapter 2
Language Structure

This chapter describes the construction of the ArchiMate language.
Topics addressed in this chapter include:

- The top-level language structure
- Layering
- The ArchiMate Framework

2.1 Top-Level Language Structure

Figure 2 outlines the top-level hierarchical structure of the language:

- A model is a collection of concepts. A concept is an element, a relationship, or a relationship connector.
- An element is a behavior element, a structure element, a motivation element, or a composite element.

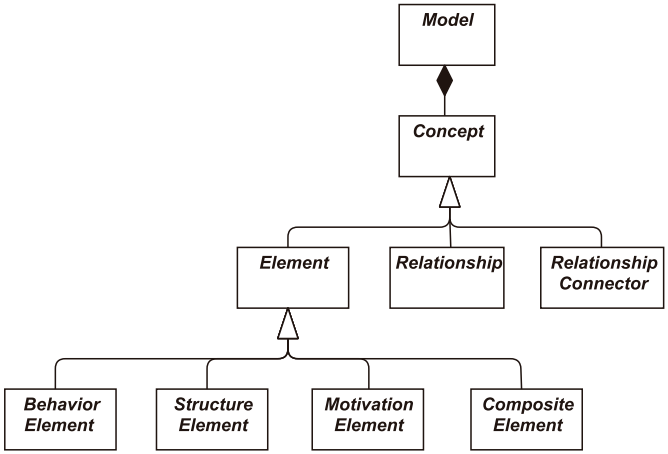

Figure 2: Top-Level Hierarchy of ArchiMate Concepts

Figure 2 describes *abstract* concepts; they are not intended to be used directly in models. To signify this, they are depicted in white with labels in italics. Further note that implementation and migration elements are instances of core elements.

2.2 Layering of the ArchiMate Language

The ArchiMate core language defines a structure of generic elements and their relationships, which can be specialized in different layers. Three layers are defined within the ArchiMate core language as follows:

1. The *Business Layer* depicts business services offered to customers, which are realized in the organization by business processes performed by business actors.
2. The *Application Layer* depicts application services that support the business, and the applications that realize them.
3. The *Technology Layer* depicts technology services such as processing, storage, and communication services needed to run the applications, and the computer and communication hardware and system software that realize those services. Physical elements are added for modeling physical equipment, materials, and distribution networks to this layer.

The general structure of models within the different layers is similar. The same types of elements and relationships are used, although their exact nature and granularity differ.

In alignment with service-orientation, the most important relationship between layers is formed by "serving" relationships, which show how the elements in one layer are served by the services of other layers. (Note, however, that services need not only serve elements in another layer, but also can serve elements in the same layer.) A second type of link is formed by realization relationships: elements in lower layers may realize comparable elements in higher layers; e.g., a "data object" (Application Layer) may realize a "business object" (Business Layer); or an "artifact" (Technology Layer) may realize either a "data object" or an "application component" (Application Layer).

2.3 Use of Colors and Notational Cues

In the metamodel pictures within this Pocket Guide (e.g., Figure 30) and the ArchiMate 3.0 Specification, shades of grey are used to distinguish elements belonging to the different aspects of the ArchiMate Framework, as follows:

- White for abstract (i.e., non-instantiable) concepts
- Light grey for passive structures
- Medium grey for behavior
- Dark grey for active structures

In ArchiMate models, there are no formal semantics assigned to colors and the use of color is left to the modeler. However, they can be used freely to stress certain aspects in models. For instance, in many of the example models presented in this Guide, colors are used to distinguish between the layers of the ArchiMate Core Framework (see Section 2.4), as follows:

- Yellow for the Business Layer
- Blue for the Application Layer
- Green for the Technology Layer

They can also be used for visual emphasis.

In addition to the colors, other notational cues can be used to distinguish between the layers of the framework. A letter 'M', 'S', 'B', 'A', 'T', 'P', or 'I' in the top-left corner of an element can be used to denote a Motivation, Strategy, Business, Application, Technology, Physical, or Implementation & Migration element, respectively.

The standard notation also uses a convention with the shape of the corners of its symbols for different element types, as follows:

- Square corners are used to denote structure elements (see Section 3.1.1).
- Round corners are used to denote behavior elements (see Section 3.1.2).