Study Guide

ArchiMate® 2
Certification

Preparation for the ArchiMate 2 Part 1 and Part 2 Examinations

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Preface

This Document

This document is a Study Guide for the ArchiMate® 2 People Certification program. This is based on Version 2.0.1 of the ArchiMate Certification for People Conformance Requirements.

It gives an overview of every learning objective for the ArchiMate 2 certification syllabus and in-depth coverage on preparing and taking the ArchiMate 2 Examinations. It is specifically designed to help individuals prepare for certification.

The audience for this Study Guide is:

- Individuals who require a basic understanding of the ArchiMate modeling language
- Professionals who are working in roles associated with an architecture project and who need to understand architecture artifacts developed using the ArchiMate modeling language
- Individuals who want to achieve a recognized qualification to demonstrate their knowledge of the ArchiMate modeling language

A prior knowledge of Enterprise Architecture and architecture modeling is advantageous but not required. While reading this Study Guide, the reader should also refer to the ArchiMate 2.1 documentation¹ available on-line at pubs.opengroup.org/architecture/archimate2-doc and also available in book form.

The Study Guide is structured as follows:

- Chapter 1 (Introduction) provides a brief introduction to the ArchiMate Certification Program and the ArchiMate 2 Examinations, as well as how to use this Study Guide.
- Chapter 2 (Foundations of Enterprise Architecture and the ArchiMate Language) introduces Enterprise Architecture and the ArchiMate modeling language.
- Chapter 3 (Enterprise Architecture Modeling using the ArchiMate Language) describes the principles and core concepts of the ArchiMate modeling language and its extensions.
- Chapter 4 (The Business Layer) describes the Business Layer of the ArchiMate modeling language.
- Chapter 5 (The Application Layer) describes the Application Layer of the ArchiMate modeling language.

• Chapter 6 (The Technology Layer) describes the Technology Layer of the ArchiMate modeling language.

• Chapter 7 (Modeling Cross-Layer Dependencies) describes how to model the relationships between elements on different layers of ArchiMate models.

• Chapter 8 (Modeling Relationships) describes how to model relationships between model elements.

• Chapter 9 (ArchiMate Viewpoints) describes how to use the ArchiMate modeling language standard architecture viewpoints to model the concerns of stakeholders.

• Chapter 10 (Language Extension Mechanisms) describes how to create extensions to the ArchiMate modeling language.

• Chapter 11 (The Motivation Extension) describes the Motivation extension of the ArchiMate modeling language.

• Chapter 12 (The Implementation and Migration Extension) describes the Implementation and Migration extension of the ArchiMate modeling language.

• Chapter 13 (Certified Tool Support for the ArchiMate Modeling Language) describes how ArchiMate Certified Tools can be used to support Enterprise Architecture design and modeling activities.

• Chapter 14 (Using ArchiMate with Other Frameworks and Languages) describes how the ArchiMate modeling language can be used with other frameworks and languages to define and model effective Enterprise Architectures.

• Appendix A (Answers to Test Yourself Questions and Exercises) provides the answers to the Test Yourself sections provided at the end of each chapter.

• Appendix B (Test Yourself Examination Paper – Part 1) provides a Test Yourself examination to allow you to assess your knowledge of the ArchiMate modeling language and readiness to take the ArchiMate 2 Part 1 Examination.

• Appendix C (Test Yourself Examination Paper – Part 2) provides a Test Yourself examination to allow you to assess your knowledge of the ArchiMate modeling language and readiness to take the ArchiMate 2 Part 2 Examination.

• Appendix D (Test Yourself Examination Paper Answers – Part 1) provides the answers to the examination in Appendix B.

• Appendix E (Test Yourself Examination Paper Answers – Part 2) provides the answers to the examination in Appendix C.

• Appendix F (ArchiMate 2 Certification Syllabus) provides the ArchiMate 2 Certification Syllabus.

How to Use this Study Guide

The chapters in this Study Guide are arranged to provide coverage of the ArchiMate 2 certification syllabus (see Appendix F) and should be read in order. However, you may wish to
use this Study Guide during review of topics with which you are already familiar, and it is certainly possible to select topics for review in any order. Where a topic requires further information from a later part in the syllabus, a cross-reference is provided.

Within each chapter are “Key Learning Points” and “Summary” sections that help you to easily identify what you need to know for each topic.

Each chapter also has a “Recommended Reading” section that indicates the relevant sections in the ArchiMate documentation that can be read to obtain a further understanding of the subject material.

Each chapter has “Exercises” and “Test Yourself Questions” sections that will help you to check your understanding of the chapter and prepare for the ArchiMate 2 Examinations. The purpose of this is to reinforce Key Learning Points (KLPs) in the chapter. These include a mix of multiple-choice format questions where you must identify one correct answer, open questions, and simple modeling exercises.

Finally, at the end of this Study Guide are two “Test Yourself” practice examination papers that you can use to test your readiness to take the official ArchiMate 2 Part 1 and Part 2 Examinations.

Conventions Used in this Study Guide

The following conventions are used throughout this Study Guide 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.

- (Syllabus reference: Unit X, Learning Outcome Y: Statement) 
  Used at the start of a text block to identify the ArchiMate 2 certification syllabus learning outcome.

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

A Note box is used to highlight useful or interesting information.
About 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. ArchiMate provides instruments to enable Enterprise Architects to describe, analyze, and visualize the relationships among business domains in an unambiguous way.

About The Open Group

The Open Group is a global consortium that enables the achievement of business objectives through IT standards. With more than 400 member organizations, The Open Group has a diverse membership that spans all sectors of the IT community – customers, systems and solutions suppliers, tool vendors, integrators, and consultants, as well as academics and researchers – to:

- 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

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 Open Group 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/bookstore.

Readers should note that updates – in the form of Corrigenda – may apply to any publication. This information is published at www.opengroup.org/corrigenda.
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- Raina Wissing
References

The following documents are referenced in this Study Guide:


- ArchiMate® 2.1 Viewpoints Reference Card (PDF), N131, December 2013, published by The Open Group; refer to: www.opengroup.org/bookstore/catalog/n131.htm.

- ArchiMate® Certification for People: Certification Policy, X113, published by The Open Group; refer to: www.opengroup.org/bookstore/catalog/x113.htm.

- ArchiMate® Certification for People: Conformance Requirements, X115, published by The Open Group; refer to: www.opengroup.org/bookstore/catalog/x115.htm.


- Architecture Tool Certification: Certification Policy, X117, January 2012, published by The Open Group; refer to: www.opengroup.org/bookstore/catalog/x117.htm.

- ArchiMate® Language Primer, Marc Lankhorst and the ArchiMate Team, Telematica Instituut, August 2004; refer to: https://doc.novay.nl/dsweb/Get/Document-43839.

- ArchiSurance Case Study, Case Study by Henk Jonkers, Iver Band, and Dick Quartel, SAP, Y121, January 2012, published by The Open Group; refer to: www.opengroup.org/bookstore/catalog/y121.htm.


• Moving Enterprise Architecture forward with TOGAF® and ArchiMate®, Bas van Gils, PhD, EA Consultant, BiZZdesign, Webinar, D044, January 2012, published by The Open Group; refer to: www.opengroup.org/bookstore/catalog/d044.htm.

The following web links are referenced in this Study Guide:

• The Open Group ArchiMate 2 Certification website: www.opengroup.org/certifications/archimate

• The ArchiMate information website: www.opengroup.org/subjectareas/enterprise/archimate
Chapter 1  Introduction

1.1  Key Learning Points

This document is a Study Guide for the ArchiMate modeling language for students planning to become certified within the ArchiMate Certification for People program. It covers both ArchiMate 2 Foundation and ArchiMate 2 Certified. It will familiarize you with all the topics that you need to know in order to pass the ArchiMate 2 Examinations.

It gives an overview of every learning objective for the ArchiMate 2 certification syllabus and in-depth coverage on preparing and taking the ArchiMate 2 Examinations. It is specifically designed to help individuals prepare for certification.

This first chapter will familiarize you with the ArchiMate 2 Certification Program and its principles, as well as give you important information about the structure of the ArchiMate 2 Examinations.

The objectives of this chapter are as follows:

• To provide an understanding of the ArchiMate Certification Program and why you should become certified
• To learn key facts about the ArchiMate 2 Examinations

1.2  The ArchiMate Certification for People Program

(Syllabus Reference: Unit 9, Learning Outcome 1: You should be able to briefly explain the ArchiMate Certification Program.)

Certification is available to individuals who wish to demonstrate they have attained the required knowledge and understanding of the ArchiMate modeling language as defined in the ArchiMate 2.0 Specification or subsequent minor releases.

There are two levels defined for ArchiMate 2 People Certification:

• ArchiMate 2 Foundation
• ArchiMate 2 Certified

This Study Guide covers both of these. Studying for ArchiMate 2 Foundation can be used as a learning objective towards achieving ArchiMate 2 Certified, as the learning outcomes in ArchiMate 2 Foundation are also required in ArchiMate 2 Certified. The difference between the two certification levels is that, in addition to the requirements for ArchiMate 2 Foundation, ArchiMate 2 Certified requires passing an advanced examination.
1.2.1 Certification Document Structure

The documents available to support the program are as shown in Figure 1.

Figure 1: Certification Document Structure

Program description documents, such as this Study Guide, are intended for an end-user audience including those interested in becoming certified. The Program definition documents are intended for trainers, examination developers, and the Certification Authority. All these documents are available from The Open Group website.²

² Available from the ArchiMate 2 Certification website at: www.opengroup.org/certifications/archimate or from The Open Group Bookstore at www.opengroup.org/bookstore.
Why become Certified?

Becoming certified demonstrates publicly that you possess a body of core knowledge about the ArchiMate modeling language as an open, industry standard modeling language for Enterprise Architecture. The Open Group publishes the definitive directory of ArchiMate Certified individuals and issues certificates.

1.2.2 Program Vision and Principles

The vision for the Program is to define and promote a market-driven education and certification program to support the ArchiMate Specification. The Program has been designed with the following principles in mind:

<table>
<thead>
<tr>
<th>Principle</th>
<th>Certification Aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness</td>
<td>The Program is open to applicants from all countries.</td>
</tr>
<tr>
<td>Fairness</td>
<td>Certification is achieved only by passing an examination that is equivalent to that taken by any other candidate.</td>
</tr>
<tr>
<td>Market Relevance</td>
<td>The Program is structured to meet the perceived needs of the market. It includes certification at two levels. Additional levels may be introduced during the life of the Program, as may updated versions of the ArchiMate modeling language.</td>
</tr>
<tr>
<td>Learning Support</td>
<td>Training courses are provided by third parties, according to the needs of the market.</td>
</tr>
<tr>
<td>Quality</td>
<td>Training course providers may choose to seek Open Group accreditation for their courses. Accredited ArchiMate Training Courses (ATCs) are listed on The Open Group website. Only ATCs may use The Open Group logo and include the ArchiMate examinations and practical exercises within the course.</td>
</tr>
<tr>
<td>Best Practice</td>
<td>The Program is designed to follow industry best practice for equivalent certification programs.</td>
</tr>
</tbody>
</table>

1.2.3 ArchiMate 2 Foundation

The purpose of certification for ArchiMate 2 Foundation is to provide validation that the Candidate has gained knowledge of the notation, terminology, structure, and concepts of the ArchiMate modeling language. The learning objectives at this level focus on knowledge and comprehension. Certification for ArchiMate 2 Foundation is achieved by passing the ArchiMate 2 Part 1 Examination. This is a simple multiple-choice examination with 40 questions.³

³ For the latest information on examinations, see the ArchiMate 2 Certification website at: www.opengroup.org/certifications/archimate.
1.2.4 **ArchiMate 2 Certified**

The purpose of certification for ArchiMate 2 Certified is to provide validation that, in addition to the knowledge and comprehension of ArchiMate 2 Foundation, the Candidate is able to analyze and apply this knowledge. The learning objectives at this level therefore focus on application and analysis. Certification for ArchiMate 2 Certified is achieved by passing the ArchiMate 2 Part 2 Examination. This is a scenario based, gradient scored examination with 8 questions.

1.2.5 **Certification Syllabus Overview**

Individuals certified at both levels will have demonstrated their understanding of:

- The basic concepts and key terminology of Enterprise Architecture and the ArchiMate modeling language
- The principles and core concepts underlying the ArchiMate core language and extensions
- The concepts from the ArchiMate layers and extensions
- The ArchiMate relationships
- ArchiMate views and viewpoints
- Adapting the ArchiMate modeling language
- ArchiMate Certified Tools to support modeling and analysis
- The relationship of the ArchiMate modeling language to other languages and frameworks

Here is a high-level summary of the learning objectives:

### Basic Concepts and Definitions

The Candidate must be able to:

- Describe what an enterprise is
- Explain the purpose of an Enterprise Architecture
- Explain what architecture is in the context of the ArchiMate modeling language
- List the different types of architecture that the ArchiMate modeling language deals with

### Language Principles

The Candidate must be able to:

- Briefly explain the structure and the ideas underlying the ArchiMate modeling language
- Identify the core concepts of the ArchiMate modeling language and their relationships
- Explain the aspects and layers in the ArchiMate Framework
• Explain the basic structure of the ArchiMate Motivation extension and its relationship to the ArchiMate core concepts

• Explain the basic structure of the ArchiMate Implementation and Migration extension and its relationship to the ArchiMate core and motivation concepts

Concepts

The Candidate must be able to understand and explain the use of:

• The ArchiMate concepts from the Business Layer
• The ArchiMate concepts from the Application Layer
• The ArchiMate concepts from the Technology Layer
• The ArchiMate concepts from the Motivation extension
• The ArchiMate concepts from the Implementation and Migration extension

Relationships

The Candidate must be able to understand and explain the use of:

• The relationships between the Application Layer and the Business Layer
• The relationships between the Technology Layer and the Application Layer
• The structural relationships of the ArchiMate modeling language
• The dynamic relationships of the ArchiMate modeling language
• The Grouping, Junction, and Specialization relationships
• The additional relationships in the Motivation extension
• The concept of derived relationships

Viewpoints and Visualization

The Candidate must be able to:

• Explain the concepts of view, viewpoint, and stakeholder
• Explain the viewpoint classification of the ArchiMate modeling language
• Give examples of different types of viewpoints relating to the ArchiMate core, and explain how they can be used
• Give examples of viewpoints relating to the Motivation extension, and explain how they can be used
• Give examples of viewpoints relating to the Implementation and Migration extension, and explain how they can be used

Language Extension Mechanisms

The Candidate must be able to understand and explain:

• The principle of adding attributes to ArchiMate concepts or relationships for specific purposes

• How to define specializations of ArchiMate concepts, and give examples of specialized concepts

Tool Support for the ArchiMate Modeling Language

The Candidate must be able to briefly explain:

• How ArchiMate 2 Certified Tools can be used to support modeling and analysis with the ArchiMate modeling language

The ArchiMate Modeling Language and Other Frameworks and Languages

The Candidate must be able to briefly explain:

• How the ArchiMate modeling language (core and extensions) relates to the TOGAF Standard

• How the ArchiMate modeling language can be used in combination with detailed design languages, such as BPMN or UML

ArchiMate Certification Program

The Candidate must be able to:

• Explain the ArchiMate Certification Program

What is the relationship between ArchiMate 2 Foundation and ArchiMate 2 Certified?

The learning outcomes for ArchiMate 2 Foundation are identical to those for ArchiMate 2 Certified. The difference is that, in addition to the requirements for ArchiMate 2 Foundation, ArchiMate 2 Certified requires passing an advanced examination that demonstrates a deeper level of understanding.

1.2.6 Self-Study Paths

The self-study paths to achieve certification in the ArchiMate Certification for People program are summarized in Figure 2. The chosen path depends on whether you want to first become certified to ArchiMate 2 Foundation or proceed directly to ArchiMate 2 Certified.
What is the Relationship between ArchiMate 2 Foundation and ArchiMate 2 Certified?

Candidates are able to choose whether they wish to become certified in a stepwise manner by starting with ArchiMate 2 Foundation and then at a later date ArchiMate 2 Certified, or bypass ArchiMate 2 Foundation and go directly to ArchiMate 2 Certified.

For those going directly to ArchiMate 2 Certified there is a choice of taking the two examinations separately or a Combined examination. The advantage of taking the two examinations over the single Combined examination is that if you pass Part 1 but fail Part 2 you can still qualify for ArchiMate 2 Foundation.

1.2.7 The Certification Process

This Study Guide is aimed at preparing you to become certified at either certification level. An overview of the certification process is shown in Figure 3 (using a simple flowchart notation).
Candidate wishes to become certified

Candidate self-studies or attends ATC

Candidate takes the examination(s) at
Exam Provider or ATC

Exam Provider sends test results to CA

CA checks results and prerequisites

CA notifies Candidate of success and
issues credentials

Candidate uses credentials to enter
into Trademark License Agreement

CA lists Candidate in
Certification Directory

Trademark License Agreement

Figure 3: Certification Process

The process for becoming certified as shown in Figure 3 is as follows:

1. Candidate wishes to become certified.

To achieve ArchiMate certification, Candidates must possess a thorough knowledge and understanding of those elements of the ArchiMate modeling language identified in the Conformance Requirements as being mandatory.
2. Candidate self-studies or attends ATC.

A Candidate can self-study or attend an ATC. The two key inputs to the learning process are the ArchiMate Specification itself and the Conformance Requirements. The Conformance Requirements identify which elements of the ArchiMate Specification must be known to achieve certification.

3. Candidate takes the examination(s) at Examination Provider or ATC.

Certification is achieved by passing the applicable examination(s) delivered either at The Open Group Examination Provider or as part of an ATC.

Candidates who fail to meet the required pass mark will be informed of this and are encouraged to undergo further study and re-sit the examination at a later date. Candidates who fail an examination are not allowed to re-sit an examination again for a period of one (1) month.

4. Certification Authority (CA) checks results and prerequisites.

Examination results of all Candidates are sent to the Certification Authority for review. The Certification Authority will check to ensure that the pass mark has been met. The Certification Authority will also ensure that Candidates have not failed an examination within the previous month.

5. CA notifies Candidate of success and issues credentials.

The Certification Authority will notify the Candidate in writing of the decision. If the decision is to accept the application for certification, the Certification Authority will also issue credentials to the successful Candidate that will enable the Candidate to access the Certification Authority’s website to accept the terms of, and enter into, a Trademark License Agreement (TMLA) with the Certification Authority.

6. Candidate uses credentials to enter into Trademark License Agreement.

The Candidate then uses the credentials to access the Certification Authority’s website to enter into a TMLA with the Certification Authority and to obtain the artwork of the applicable Program Logo.

7. CA lists Candidate in Certification Directory.

The Certification Authority will then make a Certificate available to the Candidate in electronic form and enter the Candidate’s Certification Record into the Certification Directory. The credentials also allow the Certified Person to control to whom the Certification Record is disclosed and to update contact and employer information in the Certification Record.

1.2.7.1 ArchiMate 2 Examination Coverage by Topic

The ArchiMate 2 certification syllabus is contained in Appendix F. Certain topic areas are weighted as more important than others and thus have more questions. The topic areas covered by the examinations together with the number of questions per area in each examination are provided in Table 2 and Table 3. It should be noted that some areas of the syllabus are non-examinable (Topics 7 and 9).
Table 2: ArchiMate 2 Part 1 Examination Coverage

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topic</th>
<th>No. of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic Concepts and Definitions</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Language Principles</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Concepts</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>Relationships</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>Viewpoints and Visualization</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Language Extensions Mechanisms</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Tool Support for ArchiMate</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>ArchiMate and Other Frameworks and Languages</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>ArchiMate Certification Program</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3: ArchiMate 2 Part 2 Examination Coverage

<table>
<thead>
<tr>
<th>Area</th>
<th>Topics by Learning Unit Ref (LU)</th>
<th>No. of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Layer</td>
<td>LU1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>LU2.1, LU2.2, LU2.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LU3.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LU4.3, LU4.4, LU4.5, LU4.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LU5.1, LU5.2, LU5.3</td>
<td></td>
</tr>
<tr>
<td>Application Layer</td>
<td>LU1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>LU2.1, LU2.2, LU2.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LU3.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LU4.3, LU4.4, LU4.5, LU4.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LU5.1, LU5.2, LU5.3</td>
<td></td>
</tr>
<tr>
<td>Technology Layer</td>
<td>LU1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>LU2.1, LU2.2, LU2.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LU3.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LU4.3, LU4.4, LU4.5, LU4.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LU5.1, LU5.2, LU5.3</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>Topics by Learning Unit Ref (LU)</td>
<td>No. of Questions</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Multiple Layers, consisting of questions involving two or three Core layers and relationships between them</td>
<td>LU1, LU2.1, LU2.2, LU2.3, LU3.1, LU3.2, LU3.3, LU4.1, LU4.2, LU4.3, LU4.4, LU4.5, LU4.7, LU5.1, LU5.2, LU5.3</td>
<td>3</td>
</tr>
<tr>
<td>Extensions, consisting of questions involving either extension with realization of Core elements, or realization of Motivation elements by Implementation and Migration elements</td>
<td>LU1, LU2, LU3.4, LU3.5, LU4.3, LU4.4, LU4.5, LU4.6, LU4.7, LU5.1, LU5.2, LU5.4, LU5.5</td>
<td>2</td>
</tr>
</tbody>
</table>

**Format of the Examination Questions**

The examination questions are multiple-choice questions. These are very similar in format to the Test Yourself practice examinations included in Appendix B and Appendix C. Note that the exact format for display is test center-specific and will be made clear on the screens when taking the examination.

**Tips when Taking the Examination**

Ensure you take the tutorial provided prior to the commencement of the examination. It explains how the examination will work and does not use any of the allotted time for the examination. Please read each question carefully before reading the answer options. Be aware that some questions may seem to have more than one right answer, but you are to look for the one that makes the most sense and is the most correct. For questions where you are unsure of an answer you can mark them and come back later if you have time. Remember to answer all questions, as leaving unanswered questions reduces your maximum possible score.

**What do I need to bring with me to take the Examination?**

You should consult with the test center prior to attendance regarding the forms of picture ID you are required to bring with you to verify your identification.

**Can I refer to materials while I take the Examination?**

This depends on the examination. The ArchiMate 2 Part 1 examination is closed book. The ArchiMate 2 Part 2 examination is open book. Where an examination is open book, a copy of the reference text is provided with the examination.
What is the pass mark?

You should check with The Open Group for the latest information on the examination. At the time of writing the pass mark for the Part 1 examination is 60% and the pass mark for the Part 2 examination is 70%.

If I fail, how soon can I retake the Examination?

You should consult the current policy on The Open Group website. At the time of this writing, the policy states that individuals who have failed the examination are not allowed to retake the examination within one (1) month of the first sitting.

1.2.8 Preparing for the Examination

You can prepare for the examination by working through this Study Guide section-by-section. A mapping of the sections of this Study Guide to the ArchiMate 2 certification syllabus is given in Appendix E. After completing each section, you should read the referenced sections from the ArchiMate documentation together with any other recommended reading. Then you should complete the Exercises and the Test Yourself Questions. Once you have completed all the sections in this Study Guide, you can then attempt the Test Yourself practice examination papers in Appendix B and Appendix C. This is designed to give a thorough test of your knowledge. If you have completed all the prescribed preparation and can attain a pass mark for the Test Yourself examination papers, then it is likely you are ready to sit the examination(s).

1.3 Summary

The ArchiMate 2 People Certification Program is a knowledge-based certification program. It has two levels: ArchiMate 2 Foundation and ArchiMate 2 Certified, respectively.

This Study Guide will prepare you for both levels of certification.

Preparing for the examination(s) includes the following steps:

- You should work through this Study Guide step-by-step.
- At the end of each chapter, you should read the sections of the ArchiMate documentation and other references listed under Recommended Reading, and complete the Exercises and the Test Yourself Questions.
- Once you have completed all the chapters in this Study Guide, you should attempt the Test Yourself practice examination papers given in Appendix B and Appendix C.
- If you can attain the target score for the Test Yourself practice examination papers, then you have completed your preparation.
1.4 **Recommended Reading**

The following are recommended sources of further information for this chapter:

- ArchiMate® Certification for People: Program Summary Datasheet, February 2013, published by The Open Group; refer to [www.opengroup.org/certifications/archimate](http://www.opengroup.org/certifications/archimate).

- ArchiMate® 2 Foundation Datasheet, February 2013, published by The Open Group; refer to [www.opengroup.org/certifications/archimate](http://www.opengroup.org/certifications/archimate).

- ArchiMate® 2 Certified Datasheet, January 2014, published by The Open Group; refer to [www.opengroup.org/certifications/archimate](http://www.opengroup.org/certifications/archimate).

- ArchiMate® Certification for People: Certification Policy, X113, published by The Open Group; refer to: [www.opengroup.org/bookstore/catalog/x113.htm](http://www.opengroup.org/bookstore/catalog/x113.htm).

- ArchiMate® Certification for People: Conformance Requirements, X115, published by The Open Group; refer to: [www.opengroup.org/bookstore/catalog/x115.htm](http://www.opengroup.org/bookstore/catalog/x115.htm).

- The Open Group ArchiMate 2 Certification website: [www.opengroup.org/certifications/archimate](http://www.opengroup.org/certifications/archimate)

- The ArchiMate information website: [www.opengroup.org/subjectareas/enterprise/archimate](http://www.opengroup.org/subjectareas/enterprise/archimate)

1.5 **Exercises**

There are no exercises for this chapter.

1.6 **Test Yourself Questions**

Q1: How many certification levels are there in the ArchiMate 2 People Certification Program?

A. 1  
B. 2  
C. 3  
D. 4

Q2: Which one of the following is the entry-level certification for an individual?

A. ArchiMate 2 Certified  
B. ArchiMate 2 Foundation  
C. ArchiMate 2 Professional  
D. ArchiMate 2 Architect

Q3: Which one of the following describes three principles of the ArchiMate 2 People Certification Program?

A. Integrity, Scalability, Flexibility  
B. Objectivity, Robustness, Simplicity  
C. Openness, Fairness, Quality
D. Knowledge-based, Valuable, Simplicity
E. All of these

Q4: Which of the following topic areas is not included in the ArchiMate 2 certification syllabus?
   A. Architecture in the context of the ArchiMate modeling language
   B. The different architectures that the ArchiMate modeling language addresses
   C. The dynamic relationships of the ArchiMate modeling language
   D. Using the ArchiMate modeling language for Architecture Governance
   E. The relationship with the TOGAF Standard

Q5: Which of the following statements about the retake policy for ArchiMate 2 Examinations is correct?
   A. Candidates who fail cannot take an examination again within one (1) month.
   B. Candidates who fail cannot take an examination again within five (5) days.
   C. Candidates who fail cannot take an examination again within seven (7) days.
   D. Candidates who fail cannot take an examination again within three (3) months.
Chapter 2  Foundations of Enterprise Architecture and the ArchiMate Language

2.1 Key Learning Points

This chapter provides an introduction to the basic concepts of Enterprise Architecture and the ArchiMate modeling language.

Key Points Explained

This chapter will help you to:

- Describe what an enterprise is
- Explain the purpose of an Enterprise Architecture
- Explain what architecture is in the context of the ArchiMate modeling language
- Define key terms and concepts related to Enterprise Architecture
- Describe how the TOGAF Standard and the ArchiMate modeling language are related and how they can be used together to conduct Enterprise Architecture activities

2.2 Introduction to the ArchiMate Specification

2.2.1 What is ArchiMate?

ArchiMate, 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 modeling language provides a notation to enable Enterprise Architects to describe, analyze, and visualize the relationships among business 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 infrastructure. This insight helps stakeholders to design, assess, and communicate the consequences of decisions and changes within and between these business domains.
2.2.2 Structure of the ArchiMate Specification

The ArchiMate 2.1 Specification is The Open Group Standard for the ArchiMate architecture modeling language. It contains the formal definition of the ArchiMate visual design language, together with concepts for specifying inter-related architectures, and specific viewpoints for typical stakeholders (see Section 9.2 of this document for information on viewpoints). It also includes a chapter addressing considerations regarding language extensions.

The contents of the specification include the following:

- The overall modeling framework that the ArchiMate modeling language uses
- The structure of the modeling language
- A detailed breakdown of the constituent elements of the modeling framework covering the three layers (Business/Application/Technology), cross-layer dependencies and alignment, and relationships within the framework
- Architectural viewpoints including a set of standard viewpoints
- Optional extensions to the framework
- Commentary around future direction of the specification
- Notation overviews and summaries

The ArchiMate 2.1 Specification is a maintenance update, addressing comments raised since the introduction of the ArchiMate 2.0 Specification in early 2012. It is an evolution from the ArchiMate 1.0 Specification.

2.3 What is an Enterprise?

(Syllabus Reference: Unit 1, Learning Outcome 1: You should be able describe what an enterprise is.)
Enterprise Architecture and the TOGAF Standard

In this Study Guide, we refer to the TOGAF Version 9.1 Standard for definitions of the key terminology and concepts related to Enterprise Architecture (EA). TOGAF is a standard EA framework used to improve business efficiency. It provides an Architecture Development Method (ADM), an Architecture Content Framework (ACF), and a set of tools and techniques for establishing an Enterprise Architecture Capability.

The ArchiMate Specification draws on the TOGAF 9.1 Standard for the definition of an “enterprise”. The TOGAF Standard defines an “enterprise” as any collection of organizations that has a common set of goals. For example, an enterprise could be a government agency, a whole corporation, a division of a corporation, a single department, or a chain of geographically distant organizations linked together by common ownership.

The term “enterprise” in the context of “Enterprise Architecture” can be used to denote both an entire enterprise, encompassing all of its information systems, and a specific domain within the enterprise. In both cases, the architecture crosses multiple systems and multiple functional groups within the enterprise.

An extended enterprise frequently includes partners, suppliers, and customers. If the goal is to integrate an extended enterprise, then the enterprise comprises the partners, suppliers, and customers, as well as internal business units. For example, an organization with an on-line store that uses an external fulfillment house for dispatching orders would extend its definition of the enterprise in that system to include the fulfillment house.

2.4 What is Architecture in the Context of the ArchiMate Modeling Language?

(Syllabus Reference: Unit 1, Learning Outcome 3: You should be able to explain what architecture is in the context of the ArchiMate modeling language.)

The TOGAF Standard and the ArchiMate modeling language concepts of architecture have a common foundation that is based on the ISO/IEC 42010:2007 definition of “Architecture”:

“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.”
What is Enterprise Architecture?

There are many definitions of Enterprise Architecture. Most focus on structure and organization. Three definitions are given below:

Enterprise Architecture is:

1. The organizing logic for business processes and IT infrastructure reflecting the integration and standardization requirements of the firm’s operating model.

   [Source: MIT Center for Information Systems Research]

2. A conceptual blueprint that defines the structure and operation of an organization. The intent of an Enterprise Architecture is to determine how an organization can most effectively achieve its current and future objectives.

   [Source: SearchCIO.com]

3. The process of translating business vision and strategy into effective enterprise change by creating, communicating, and improving the key requirements, principles, and models that describe the enterprise's future state and enable its evolution.

   [Source: Gartner Group, IT Glossary, 2009]

2.5 Why do I Need Enterprise Architecture?

(Syllabus Reference: Unit 1, Learning Outcome 2: You should be able to explain the purpose of an Enterprise Architecture.)

The purpose of Enterprise Architecture is to optimize across the enterprise the often fragmented legacy of processes (both manual and automated) into an integrated environment that is responsive to change and supportive of the delivery of the business strategy. Effective management and exploitation of information through IT is a key factor to business success, and an indispensable means to achieving competitive advantage. An Enterprise Architecture addresses this need, by providing a strategic context for the evolution of the IT system in response to the constantly changing needs of the business environment.

The advantages that result from a good Enterprise Architecture can bring important business benefits, including:

- A more efficient business operation:
  - Lower business operation costs
  - More agile organization
  - Business capabilities shared across the organization
  - Lower change management costs

---

— More flexible workforce
— Improved business productivity

• A more efficient IT operation:
  — Lower software development, support, and maintenance costs
  — Increased portability of applications
  — Improved interoperability and easier system and network management
  — Improved ability to address critical enterprise-wide issues, such as security
  — Easier upgrade and exchange of system components

• Better return on existing investment, reduced risk for future investment:
  — Reduced complexity in the business and IT
  — Maximum return on investment in existing business and IT infrastructure
  — The flexibility to make, buy, or out-source business and IT solutions
  — Reduced risk overall in new investments and their costs of ownership

• Faster, simpler, and cheaper procurement:
  — Simpler buying decisions, because the information governing procurement is readily available in a coherent plan
  — Faster procurement process, maximizing procurement speed and flexibility without sacrificing architectural coherence
  — The ability to procure heterogeneous, multi-vendor open systems
  — The ability to secure more economic capabilities

2.6 Key Enterprise Architecture Concepts and Terms

An Enterprise Architecture is typically developed because key people have concerns that need to be addressed by the business and IT systems within the organization. Such people are commonly referred to as the “stakeholders” in the system. The architect works to address the stakeholders’ concerns, by:

• Identifying and refining the stakeholders’ requirements
• Developing views of the architecture that show how the concerns and the requirements are going to be addressed
• Showing the trade-offs that are going to be made in reconciling the potentially conflicting concerns of different stakeholders

Without an Enterprise Architecture, it is unlikely that all the stakeholder concerns and requirements would be considered and met.
2.6.1 Stakeholders

Stakeholders are people who have key roles in, or concerns about, the system; for example, users, developers, etc. Stakeholders can be individuals, teams, organizations, etc.

A system has one or more stakeholders. Each stakeholder typically has interests in, or concerns relative to, that system. Figure 4 shows a typical set of stakeholders for an Enterprise Architecture, with defined categories of stakeholder type.

![Figure 4: A Typical Set of Stakeholders for an Enterprise Architecture](image)

2.6.2 Concerns

Concerns are key interests that are crucially important to stakeholders, and determine the acceptability of the system.

They may include performance, reliability, security, distribution, evolvability, etc. A Security Architect could have the following concerns: authentication, authorization, audit, assurance, availability, asset protection, administration, risk management.

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5 Source: TOGAF 9.1, Chapter 24, Figure 24-1.
2.7 The ArchiMate Modeling Language and Enterprise Architecture

Architecture descriptions are formal descriptions of a system, organized in a way that supports reasoning about the structural and behavioral properties of the system and its evolution. They define the components or building blocks that make up the overall information system, and provide a plan from which products can be procured, and subsystems developed, that will work together to implement the overall system. The Enterprise Architecture enables you to manage your overall IT investment in a way that meets the needs of your business.

The role of the ArchiMate Specification is to provide a graphical language for the representation of Enterprise Architectures over time (i.e., including transformation and migration planning), as well as their motivation and rationale. 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.

2.8 The TOGAF Standard and the ArchiMate Modeling Language

The TOGAF Standard and the ArchiMate modeling language complement each other with respect to process and language, as shown in Figure 5.

![Figure 5: The TOGAF Standard and the ArchiMate Modeling Language](image)

Enterprise Architecture frameworks vary in the aspects they cover. They may have, among others, any combination of the following components:

- A process (“way of working”) for creating architectures
- A classification for viewpoints
- A set of viewpoints
- A language for describing architectures (defining concepts and relationships, but also a notation)

The TOGAF Standard includes a process – the TOGAF Architecture Development Method (ADM) – and describes viewpoints (and also techniques, reference models) and the types of
building blocks that make up an architecture, but does not prescribe the use of a specific modeling language. The ArchiMate Specification describes viewpoints and a well-defined language. Both have a firm common foundation in their use of viewpoints on a single underlying model. The TOGAF Standard defines an Architecture Repository and includes a number of reference models. Content described in the ArchiMate modeling language can be stored in a repository, and the ArchiMate modeling language notation can be used to represent reference models.

2.8.1 ArchiMate Core, Extensions, and the TOGAF ADM

(Syllabus Reference: Unit 8, Learning Outcome 1: You should be able to explain how the ArchiMate modeling language (core and extensions) relate to the TOGAF Standard.)

The ArchiMate 2.0 Specification consists of the ArchiMate Core (the core language), that focuses on the description of the four architecture domains defined by the TOGAF Standard (Business, Data, Application, and Technology Architectures, as well as their inter-relationships), and extensions to model the motivations for the architecture, and its implementation and migration planning. Figure 6 shows how the ArchiMate Core, the Motivation extension, and the Implementation and Migration extension relate to the phases of the TOGAF ADM.

Figure 6: The Relationship between ArchiMate Core, Extensions, and the TOGAF ADM
The Motivation extension concepts within the ArchiMate Specification 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. It is also relevant to the Architecture Change Management phase of the TOGAF ADM, since the phase deals with changing requirements.

The Implementation and Migration extension of the ArchiMate Specification adds concepts to support the implementation and migration of architectures through the Opportunities and Solutions, Migration Planning, and Implementation Governance phases of the TOGAF ADM.

2.9 Summary

This chapter has introduced the basic concepts of Enterprise Architecture and the ArchiMate modeling language. This has included answering questions, such as:

- “What is an enterprise?”
  - A collection of organizations that share a common set of goals, such as a government agency, part of a corporation, or a corporation in its entirety.
  - Large corporations may comprise multiple enterprises.
  - An “extended enterprise” can include partners, suppliers, and customers.
- “What is an architecture?”
  - An architecture is defined as “the fundamental organization of something, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution.”

The role of the ArchiMate Specification is to provide a language for describing Enterprise Architecture and also for visualizing Enterprise Architecture via ArchiMate models. It is a graphical modeling language with portable semantics. It also provides viewpoints tailored to different stakeholders. The TOGAF Standard and the ArchiMate modeling language complement each other with respect to process and language.

2.9.1 Key Concepts

This section contains a summary of the key concepts for this chapter together with the ArchiMate Specification reference.⁶

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⁶ As noted in Chapter 1 of the ArchiMate Specification, the specification does not provide its own set of defined terms, but follows those provided by the TOGAF Standard. Any conflict between the concepts here and the applicable official TOGAF 9.1 definition is unintentional.
<table>
<thead>
<tr>
<th>Concept</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>TOGAF 9.1 §3.8 Architecture</td>
</tr>
<tr>
<td>1. A formal description of a system, or a detailed plan of the system at component level to guide its implementation.</td>
<td></td>
</tr>
<tr>
<td>2. The structure of components, their inter-relationships, and the principles and guidelines governing their design and evolution over time.</td>
<td></td>
</tr>
<tr>
<td>Concerns</td>
<td>TOGAF 9.1 §3.30 Concerns</td>
</tr>
<tr>
<td>The key interests that are crucially important to the stakeholders in a system, and determine the acceptability of the system. Concerns may pertain to any aspect of the system’s functioning, development, or operation, including considerations such as performance, reliability, security, distribution, and evolvability.</td>
<td></td>
</tr>
<tr>
<td>Enterprise</td>
<td>TOGAF 9.1 §3.34 Enterprise</td>
</tr>
<tr>
<td>The highest level (typically) of description of an organization and typically covers all missions and functions. An enterprise will often span multiple organizations.</td>
<td></td>
</tr>
<tr>
<td>Enterprise Architecture</td>
<td>TOGAF 9.1 §1.2 Executive Overview</td>
</tr>
<tr>
<td>A description of organizational business operation and underlying IS/IT support for that operation. Use of architecture discipline at the most abstracted layers of an organization. Enterprise Architecture typically applies to ongoing communication and management of change and will typically comprise business structure, the IS/IT landscape, identification of strategic improvement opportunities, and identification of large-scale transformation activities.</td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>TOGAF 9.1 §3.46 Method</td>
</tr>
<tr>
<td>A defined, repeatable approach to address a particular type of problem.</td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>TOGAF 9.1 §3.48 Model</td>
</tr>
<tr>
<td>A representation of a subject of interest. A model provides a smaller scale, simplified, and/or abstract representation of the subject matter. A model is constructed as a “means to an end”. In the context of Enterprise Architecture, the subject matter is a whole or part of the enterprise and the end is the ability to construct “views” that address the concerns of particular stakeholders; i.e., their “viewpoints” in relation to the subject matter.</td>
<td></td>
</tr>
<tr>
<td>Stakeholder</td>
<td>TOGAF 9.1 §3.68 Stakeholder</td>
</tr>
<tr>
<td>An individual, team, or organization (or classes thereof) with interests in, or concerns relative to, the outcome of the architecture. Different stakeholders with different roles will have different concerns.</td>
<td></td>
</tr>
</tbody>
</table>

### 2.10 Recommended Reading

The following are recommended sources of further information for this chapter:

- ArchiMate 2.1 Specification, Chapter 1 (Introduction)
2.11 Exercise 1: Enterprise Architecture Concepts

In your own words, provide short answers to these questions.

1. What is an architecture?

2. What is an enterprise?

3. What is the purpose of Enterprise Architecture?

4. When performing Enterprise Architecture activities, what audience are you working to satisfy?

5. When performing Enterprise Architecture activities, what are the things you are trying to address?

6. What is the relationship between the TOGAF Standard and the ArchiMate Specification?

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7. (Refer to Chapter 2 of the ArchiMate 2.1 Specification) Complete the first column in the following table, by entering the relevant number(s) to identify the mapping of ArchiMate elements (layers and extensions) that are related to the phases of the TOGAF ADM. Each TOGAF phase may have *more than one* related ArchiMate element.

<table>
<thead>
<tr>
<th>Mapping</th>
<th>TOGAF ADM Phase</th>
<th>ArchiMate Element</th>
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<td>..........</td>
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<td>Business Architecture</td>
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<td>..........</td>
<td>Information Systems Architecture: Data</td>
<td>5. Implementation and Migration Extension</td>
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<td>..........</td>
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<td>..........</td>
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<td>..........</td>
<td>Migration Planning</td>
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<td>..........</td>
<td>Implementation Governance</td>
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<td>..........</td>
<td>Architecture Change Management</td>
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<td>..........</td>
<td>Requirements Management</td>
<td></td>
</tr>
</tbody>
</table>

### 2.12 Test Yourself Questions

**Q1:** Which of the following best describes an enterprise?

A. A collection of organizations with a common set of goals  
B. A corporation with more than 10,000 employees  
C. Any organization whose stock is traded  
D. Any organization with an ecommerce site

**Q2:** Which of the following best describes the purpose of an Enterprise Architecture?

A. To enable an organization to exploit the latest trends in IT  
B. To enable the CIO to provide effective control of the business units  
C. To optimize processes into an integrated environment responsive to change and supportive of the business strategy
D. To provide a strict set of standards that all actors must adhere to

Q3: Which of the following best describes the ArchiMate modeling language?
   A. It provides a uniform representation for diagrams describing Enterprise Architecture.
   B. It includes an integrated approach for describing and visualizing different architecture domains and the relationships between them.
   C. It represents Enterprise Architectures as they change over time.
   D. It addresses different stakeholders.
   E. All of the above.

Q4: An extended enterprise might contain which of the following entities?
   A. Trading Partners
   B. Customers
   C. Suppliers
   D. All of these are part of an extended enterprise.

Q5: Which of the following is an advantage that results from Enterprise Architecture?
   A. Better return on existing investment
   B. More efficient business operation
   C. More efficient IT operation
   D. All of these are advantages of Enterprise Architecture.

Q6: Complete the sentence: One of the main benefits of Enterprise Architecture planning is that you can better understand ....
   A. systems and their dynamics
   B. customers and their needs
   C. applications and their interfaces
   D. stakeholders and their concerns

Q7: Complete the sentence: An architecture has .................. who have concerns about the system being designed.
   A. architects
   B. executives
   C. shareholders
   D. stakeholders

Q8: Complete the sentence: Enterprise Architecture describes how and in what way information, information systems, and technology will support an organization’s ....
   A. business model
   B. business objectives and goals
   C. strategy
   D. IT strategy
Q9: Which of the following phases of the TOGAF ADM does the Motivation extension of the ArchiMate modeling language address?

B. Opportunities & Solutions, Migration Planning, Implementation Governance 
C. Business Architecture, Information Systems Architectures, Technology Architecture 
D. Preliminary, Business Architecture, Migration Planning 

Q10. Which of the following phases of the TOGAF ADM does the Implementation and Migration extension of the ArchiMate modeling language address?

B. Opportunities & Solutions, Migration Planning, Implementation Governance 
C. Business Architecture, Information Systems Architectures, Technology Architecture 
D. Preliminary, Business Architecture, Migration Planning
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