

Curriculum for

Certified Professional for  
Software Architecture (CPSA)<sup>®</sup>  
*Advanced Level*

**Module  
EAM**

**Enterprise Architecture Management**

LocalBuild-EN-20230517



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## List of Learning Goals

- LG 6-1: What should the participants be able to do?
- LG 6-2: What should the participants understand?
- LG 6-3: What should the participants know?

## Introduction: General information about the iSAQB Advanced Level

### What is taught in an Advanced Level module?

- The iSAQB Advanced Level offers modular training in three areas of competency with flexibly configurable training paths. It takes individual affinity and priorities into account.
- The certification requires the creation of a written solution for a predefined case study. The assessment and oral exam is conducted by experts appointed by the iSAQB.

### What can Advanced Level (CPSA-A) graduates do?

CPSA-A graduates can:

- Independently and methodically design medium to large IT systems
- In IT systems of medium to high criticality, assume technical and content-related responsibility
- Conceptualize, design, and document actions to achieve quality requirements and support development teams in the implementation of these actions
- Control and execute architecture-relevant communication in medium to large development teams

### Prerequisites for the CPSA-A certification

- Successful training and certification as a Certified Professional for Software Architecture, Foundation Level® (CPSA-F)
- At least three years of full-time professional experience in the IT sector; participation on the design and development of at least two different IT systems
  - Exceptions are allowed on application (e.g., collaboration on open source projects)
- Training and further education within the scope of iSAQB Advanced Level training courses with a minimum of 70 credit points from at least three different areas of competence
- Successful completion of the CPSA-A certification exam



## Essentials

### Curriculum Structure and Recommended Durations

Content	Recommended minimum duration (minutes)
1. Basic terms used in Enterprise Architecture Management	120
2. EAM Approaches	390
3. Repositories and Metamodels	180
4. Architecture Governance	210
5. Interaction Between Software Architecture and Enterprise Architecture	150
Total	960 (16h)

(All times include exercises.)

### Duration, Teaching Method and Further Details

The times stated are recommendations. The duration of a training course on the EAM module should be at least 3 days, but may be longer. Training providers may differentiate themselves by changing the duration, teaching method, type and structure of the exercises, course structure, etc. In particular, the curriculum provides no specifications on the nature of the examples and exercises.

Licensed training courses for the EAM module contribute the following credit points towards admission to the final Advanced Level certification exam:

Methodical Competence:	30 Points
Technical Competence:	0 Points
Communicative Competence:	0 Points

### Prerequisites

Participants **should** have the following prerequisite knowledge:

- Fundamentals of architecture development: Importance and delimitation of architecture, procedures, influences and requirements, architecture decisions, models and documentation with views, as taught at the CPSA-F Foundation Level.

Knowledge in the following areas may be **helpful** for understanding some concepts:

- Practical experience in the architecture field and an insight into at least one modern technology or platform for development of distributed applications.
- Knowledge of typical challenges in the field of enterprise architectures:
  - Definition of (IT) enterprise objectives
  - Strategic (IT) planning

- (IT) portfolio management.
- Application Lifecycle Management
- IT-Infrastructure-Library (ITIL)

## Structure of the Curriculum

The individual sections of the curriculum are described according to the following structure:

- **Terms/principles:** Essential core terms of this topic.
- **Teaching/practice time:** Defines the minimum amount of teaching and practice time that must be spent on this topic or its practice in an accredited training course.
- **Learning goals:** Describes the content to be conveyed including its core terms and principles.

This section therefore also outlines the skills to be acquired in corresponding training courses.

## Supplementary Information, Terms, Translations

To the extent necessary for understanding the curriculum, we have added definitions of technical terms to the [iSAQB glossary](#) and complemented them by references to (translated) literature.



# 1. Basic terms used in Enterprise Architecture Management

Duration: 90 min	Practice time: 30 min
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## 1.1. Terms and Principles

Enterprise Architecture Management (EAM), Solution Architecture, Software Architecture, Corporate Strategy, IT Strategy, Architecture Governance, Architecture Domains (Business Architecture, Application Architecture, Data Architecture, Infrastructure Architecture), Architecture Roadmap, Migration Planning, Capabilities, Architecture Frameworks (e.g. TOGAF, etc.), Repository

## 1.2. Learning Goals

### LZ 1-1: EAM definition and the relation to other management areas.

- Be able to name and explain the goals and benefits of EAM.
- Understand EAM as a bridge between strategic business planning and application projects.
- Understand the interaction of EAM and other strategic management tasks (e.g. corporate and strategic planning, IT strategy, IT management, process management, project management, innovation management, change management, etc.).
- Explain the distinction between corporate, IT, and architecture governance.
- Explain the distinction between EAM and other architecture areas, e.g. IT architecture, solution architecture and software architecture.
- Know and distinguish roles and tasks of architecture management, e.g. enterprise architect, domain architect, solution architect, software architect.

### LZ 1-2: EAM basic terms.

- Be able to explain the terms used in ISO 42010: Stakeholders, Concerns, Architecture Views, Architecture Models.
- Understand architecture domains, including essential elements of the domains, e.g:
  - Business architecture
  - Application architecture (a.k.a. Information system architecture)
  - Information system architecture (a.k.a. application architecture)
  - Data architecture (a.k.a. information architecture)
  - Technology architecture (a.k.a. infrastructure architecture)
- Understand the distinction and interrelationships between architectural domains.
- Understand the relationship between the architecture domains and software architecture.
- Know architecture principles and their benefits and consequences.
- Know the definition of capabilities (a.k.a. business domains).
- Know what an enterprise architecture roadmap is.
  - Know baseline, target, and transition IT enterprise architectures.

- Differentiate between an enterprise and software system implementation roadmap.

### **LZ 1-3: Overview of EAM frameworks and tools.**

- Know different enterprise architecture frameworks and their benefits, e.g. TOGAF.
- Know architecture repositories and their use, benefits, and challenges in enterprise architecture.
- Know different architecture frameworks and their classification, e.g.:
  - Architecture frameworks, e.g. TOGAF, NAF, MoDAF, DoDAF, ITIL.
  - Taxonomies, e.g. Zachmann
  - Industry frameworks, e.g. BIAN, TM Forum Framework
  - Process management frameworks, e.g. PCF
- Know how software architecture and software development are represented in enterprise architecture frameworks.

### **1.3. References**

[AMBoK2013], [Bente2012b], [Burlton2022], [cobit], [Gharbi2012], [Greefhorst2011], [Grigoriu2011], [Hanschke2012], [Hanschke2022], [ITIL], [Keller2012], [Morris2013], [Op'tLand 2009], [Reussner2008], [Ross2006], [Schekkerman2004], [Schwarzer2009], [Tiemeyer2011], [Tiwary2019], [TOGAF], [Ulrich2011], [Vogel2005], [Ziemann2022]

## 2. EAM Approaches

Duration: 270 min	Practice time: 120 min
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### 2.1. Terms and Principles

Architecture principles, current, target, and transition architectures, application portfolio management, TOGAF Architecture Development Method (ADM), maturity analysis, gap analysis, impact analysis, architecture roadmap, risk analysis, business capability, capability analysis, business scenario, EAM visualisation types, agile frameworks, domain-driven design, reference model.

### 2.2. Learning Goals

#### LZ 2-1: General approaches for developing and enhancing an enterprise architecture.

- Know how the software architects are involved in deriving the IT enterprise architecture from the enterprise strategy.
- Know different tools and approaches to assess existing architectures, e.g. maturity analysis, gap analysis, impact analysis, risk analysis, scenario-based assessment.
- Know typical EAM visualisations, such as blueprints, portfolio graphic, information flow graphic, cluster graphic, or roadmap graphic.
- Understand that different architectural decisions could be made when viewed from the enterprise architect's perspective or from the software architect's perspective.
- Know the different approaches to develop or enhance enterprise architectures, e.g.:
  - Top-down, bottom-up
  - Process-oriented approach, e.g. TOGAF ADM
  - Capability-based planning
  - Application portfolio management
  - Pattern-oriented approach, e.g. SEBIS Technical University of Munich
  - Risk-driven further development
- Know the impact of the corporate culture on the approach.
- Know how software architecture is addressed in the different approaches.

#### LZ 2-2: Business capabilities as a link between business and software architecture.

- Explain the definition, benefits, and uses of business capabilities.
- Know the relationship between business capabilities and architecture domains.
- Know the relation of business capabilities to software architecture methodologies, e.g., domain-driven design.

#### LZ-2-3: Methods for specifying and analyzing the baseline architecture.

- Know the challenges in describing and modeling the baseline architecture.
- Understand the approaches to analyzing the baseline architecture, e.g., risk analysis, maturity

analysis, cost-benefit analysis, etc.

#### **LZ 2-4: Methods for developing and changing the target architecture.**

- Understand that the analysis of the business drivers, strategy, and requirements are a basis for the target architecture.
- Present and explain the evolution of a target architecture that impacts multiple applications.
- Understand the need to continuously update the target architecture.

#### **LZ 2-5: Methods for developing and changing the architecture roadmap.**

- Understand how to derive transition architectures from the baseline and target architectures.
- Know impact and gap analysis.
- Be able to explain the approach for architecture planning (roadmap).
- Understand the need to continuously update roadmap.

#### **LZ 2-6: Architecture Principles**

- Understand architecture principles as a part of enterprise architecture.
- Know how to categorize architecture principles.
- Know the TOGAF architecture principles catalog.

#### **LZ 2-7: Reference models or architectures.**

- Understand standards, reference models, best practices, architecture guidelines, and principles as drivers of quality.
- Know the definition and use of reference architectures.
- Know examples of reference architecture models, e.g.:
  - TOGAF reference models
  - Industry-specific reference models, e.g., TM Forum, BIAN, Frameworx, etc.
  - Architecture patterns that impact multiple systems, e.g. microservices, event- or message-driven, composable architecture, etc.
  - Integration patterns
- Know reference models as a means of knowledge management / transfer.
- Know the challenges (e.g., level of abstraction, constraints) in evolving reference models.
- Know the differences and relationships between reference models at the enterprise and software architecture levels.

#### **LZ 2-8: EAM Maturity Level:**

- Know an example of an enterprise architecture maturity model, e.g.:
  - CMMI
  - GAO EAMMF
  - OMB EA Assessment Framework

- Gartner EA Maturity Assessment Framework
- Understand how EAM maturity levels relate to possible change activities.

### 2.3. References

[AMBoK2013], [Bente2012a], [Bente2012b], [Burlton2022], [Gharbi2012], [Greefhorst2011], [Grigoriu2011], [Hanschke2012], [Lankhorst2013], [Morris2013], [Op'tLand 2009], [Reussner2008], [Ross2006], [Tiemeyer2011], [Tiwary2019], [TOGAF], [Ulrich2011], [Weill2004], [Ziemann2022]

## 3. Repositories and Metamodels

Duration: 120 min	Practice time: 60 min
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### 3.1. Terms and Principles

Repository, metamodel, baseline architecture, transition architecture, target architecture, industry standards, reference library, reference architecture.

### 3.2. Learning Goals

#### LZ 3-1: EAM Repository

- Understand the function and benefits of EAM repositories, e.g., maintaining a history of changes, determining the delta (differences), and versioning.
- Know the challenges in maintaining and updating data in the repository.
- Know the different tools for elaborating and managing an enterprise architecture.
- Understand the challenges in describing different architectural domains (e.g., business, information, application, and technology domains) and architectural layers (e.g., transitions between enterprise architecture, solution architecture, and software architecture).

#### LZ 3-2: Metamodels

- Know the function and utility of metamodels.
- Know the relation between software architectures and EA metamodels (e.g., TOGAF).
- Be able to name the types of information in an EAM repository, e.g.:
  - Architecture metamodel, e.g. from the TOGAF Architecture Content Framework
  - Documentation of baseline, transition, and target architectures
  - Standards (industry standards, etc.)
  - Reference library (reference architectures, templates, patterns, etc.), e.g., TOGAF reference models

### 3.3. References

[[Hanschke2012](#)], [[Reussner2008](#)], [[Tiemeyer2011](#)], [[TOGAF](#)]

## 4. Architecture Governance

Duration: 150 min	Practice time: 60 min
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### 4.1. Terms and Principles

Governance, levels of governance (corporate, IT, architecture), architecture boards, architecture guidelines, metrics, compliance, COBIT.

### 4.2. Learning Goals

#### LZ 4-1: Governance Terms and Concepts

- Know the definition, objectives, and benefits of architecture governance
- Know how architecture governance relates to IT enterprise architecture.
- Know the distinction between architecture governance and corporate and IT governance.
- Know the relation between governance frameworks (e.g. COBIT, TOGAF Architecture Capability Framework) and EAM.
- Understand the tasks of architecture governance, e.g. risk management.
- Know the relationship and distinction between governance and compliance.

#### LZ 4-2: Governance organization, roles, and responsibilities.

- Explain the function, role, and composition of architecture boards.
- Understand the different architect roles (e.g. enterprise architect, solution architect and software architect) and responsibilities, as well as their delineation and interrelationships.
- Understand collaboration as a success factor across architecture and business domains, e.g. through architecture communities.
- Understand the Interaction between the enterprise architect and the software architect, e.g.:
  - Support in architecture decisions.
  - Experiences from projects
  - Discussions about new technologies

#### LZ 4-3: Compliance

- Understand that requirements and acceptance criteria are a basis for compliance.
- Understand methods for monitoring and assessing architecture compliance, e.g. according to TOGAF.
- Know the tasks and process of a compliance reviews, e.g. according to COBIT or TOGAF.

### 4.3. References

[cobit], [Hanschke2010], [Johannsen2010], [Op'tLand 2009], [TOGAF], [Weill2004], [Ziemann2022]

## 5. Interaction Between Software Architecture and Enterprise Architecture Management

Duration: 90 min	Practice time: 30 min
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### 5.1. Terms and Principles

Corporate strategy, architecture principle, architecture decision, architectural aspects that impact multiple applications (cross-cutting concerns / concepts).

### 5.2. Learning Goals

#### LZ 5-1: Influences from the enterprise architecture on the software architecture.

- Identify and account for influences from enterprise strategy and requirements on the IT landscape and the corresponding software architectures, e.g.:
  - New strategies, business models, etc.
  - Legal changes, e.g. data protection
  - Economic situation of the company
  - Organizational restructuring
- Recognize and account for influences of trends on the IT landscape and corresponding software architectures, e.g.:
  - Market trends (competition, prices, customer preferences, etc.)
  - Methodology trends (e.g., the impact of agile approaches on the decision-making processes and authority)
  - Architecture and technology trends (e.g., blockchain, microservices, cloud, etc.)
  - Internationalization (including the subtle issues, such as cultural differences)
  - Demographic change
- Recognize and account for influences from the enterprise architecture specifications on the IT landscape and corresponding software architectures, e.g.:
  - Flexibility and adaptability at the IT-landscape level.
  - EA principles, e.g. Bezos API mandates
  - Changes in domains or capabilities

#### LZ 5-2: Influences of the Software Architecture on the Enterprise Architecture

- Know that software architecture decisions influence the enterprise architecture, especially regarding the different aspects in the architecture domains, including business domains, organizational structures, processes, data, infrastructure, etc.
  - e.g. the microservices approach can influence decision making, processes, standardization, organizational structure, integration, composition, bounded contexts, privacy and accountability, security, etc.
- Identify influences of software architecture principles on the IT landscape.



- Know that software architecture decisions influence the business and IT strategy.
- Know that application changes (not just new development) influence enterprise architecture.

**LZ 5-3: Architectural aspects that impact multiple applications (crosscutting concerns or concepts).**

- Know architectural aspects that affect multiple applications, e.g., interfaces, integration, internationalization, security, administration, monitoring, transaction management, user interaction, flow control, reliability, etc.
- Be able to decide on the division of responsibilities for aspects that impact multiple applications.
- Understand the interrelationship between enterprise architecture and software architecture regarding these aspects.

### **5.3. References**

[\[AMBoK2013\]](#), [\[Greefhorst2011\]](#), [\[Grigoriu2011\]](#), [\[Hohmann2003\]](#)

## 6. Enterprise architecture frameworks

Duration: 270 min	Practice time: 90 min
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### 6.1. Terms and Principles

Architecture frameworks (TOGAF, etc.), business sector frameworks (TM Forum Framework, etc.), audit frameworks (COBIT, etc.), operations frameworks (ITIL, etc.), architecture views (IEEE 1471-2000), metamodel, repository, governance, reference architecture, Zachman, TOGAF, ARIS, CIM, SID, DoDAF, MoDAF, tailoring

### 6.2. Learning Goals

#### LG 6-1: What should the participants be able to do?

- List and explain requirements on and benefits of enterprise architecture frameworks.
- Differentiate between and explain the types of architecture frameworks:
  - Operational frameworks (e.g., TOGAF)
  - Conceptual frameworks (e.g., Zachmann)
  - Business sector frameworks (e.g., TM Forum Framework).
- List and explain application areas, purposes and target groups of the different types of architecture frameworks.
- Explain the differences between the different types of architecture frameworks.
- Explain the significance of reference models and architectures in the different architecture frameworks.

#### LG 6-2: What should the participants understand?

- The essential elements of TOGAF
- The essential elements of the COBIT framework
- The essential elements of the Zachman framework
- The consideration of “classic” IT disciplines such as software architecture, business process modelling and software development in enterprise architecture frameworks
- Challenges in the use of an enterprise architecture framework
- Selection and tailoring of an enterprise architecture framework for a company.

#### LG 6-3: What should the participants know?

- The TOGAF Architecture Development Method (ADM)
- The TOGAF architecture content framework
- The TOGAF architecture capability framework
- TOGAF architecture governance
- Examples for the customisation effort when using a framework for a specific company

- The Zachman framework
- The ARIS approach
- The Common Information Model (CIM)
- The TM Forum Framework
- The Department of Defense Architecture Framework (DoDAF)
- The Ministry of Defence Architectural Framework (MoDAF)

### **6.3. References**

[\[DoDAF\]](#), [\[Hanschke2012\]](#), [\[MODAF\]](#), [\[Tiemeyer2011\]](#), [\[TOGAF\]](#)

## 7. Examples

Duration: - min	Practice time: - min
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This section is not examinable.

### 7.1. Terms and Principles

In every licensed training session, at least one example for EAM must be presented.

Type and structure of the examples presented may depend on the training and participants' interests. They are not prescribed by iSAQB.

### 7.2. Learning Goals

Discussion of the development of a real enterprise architecture, and its advantages and disadvantages.

## References

This section contains references that are cited in the curriculum.

Structure of an anchor: - [] ATTENTION: labels have to be non-numeric.

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