Course: Software Technologies and Enterprise Architecture

WEEK 12: Technology Architecture

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WEEK 12: Technology Architecture

Contents

- Introduction to Technology Architecture
- Technology Architecture Approaches
- Common Technology Architecture Artefacts
- Technology architecture for cloud adoption

WEEK 12: Learning Objectives

By the end of this unit, the student will be able to

- Define Technology Architecture and explain its role in Enterprise Architecture.
- Identify the key components of technology infrastructure, including hardware, software, platforms, and services.
- Explain the importance and benefits of Technology Architecture in organizations.
- Describe the steps, approaches, and artefacts used in Technology Architecture development.
- Analyze common challenges and best practices in Technology Architecture.
- Understand the role of Technology Architecture in cloud adoption and digital transformation.

Introduction to Technology Architecture

Technology Architecture: Physical and Virtual Infrastructure

- Organizations maintain physical hardware running and storing data and applications: devices, servers, and hardware resources across locations.

Technology Architecture Defines:

- *Infrastructure Documentation* – Technology platforms supporting IT and computer systems, including physical, logical, and virtual infrastructure components.
- *Hardware Resources* – Servers, storage devices, networking equipment, and end-user devices enabling application operation and data processing.
- *Platform Services* – Operating systems, middleware technologies, databases, and infrastructure software providing foundation services.

[1]. What is Enterprise Architecture? Back to Basics," Avolution Software, Avolution Software .https://www.avolutionsoftware.com/our-resources/what-is-enterprise-architecture-back-to-basics/

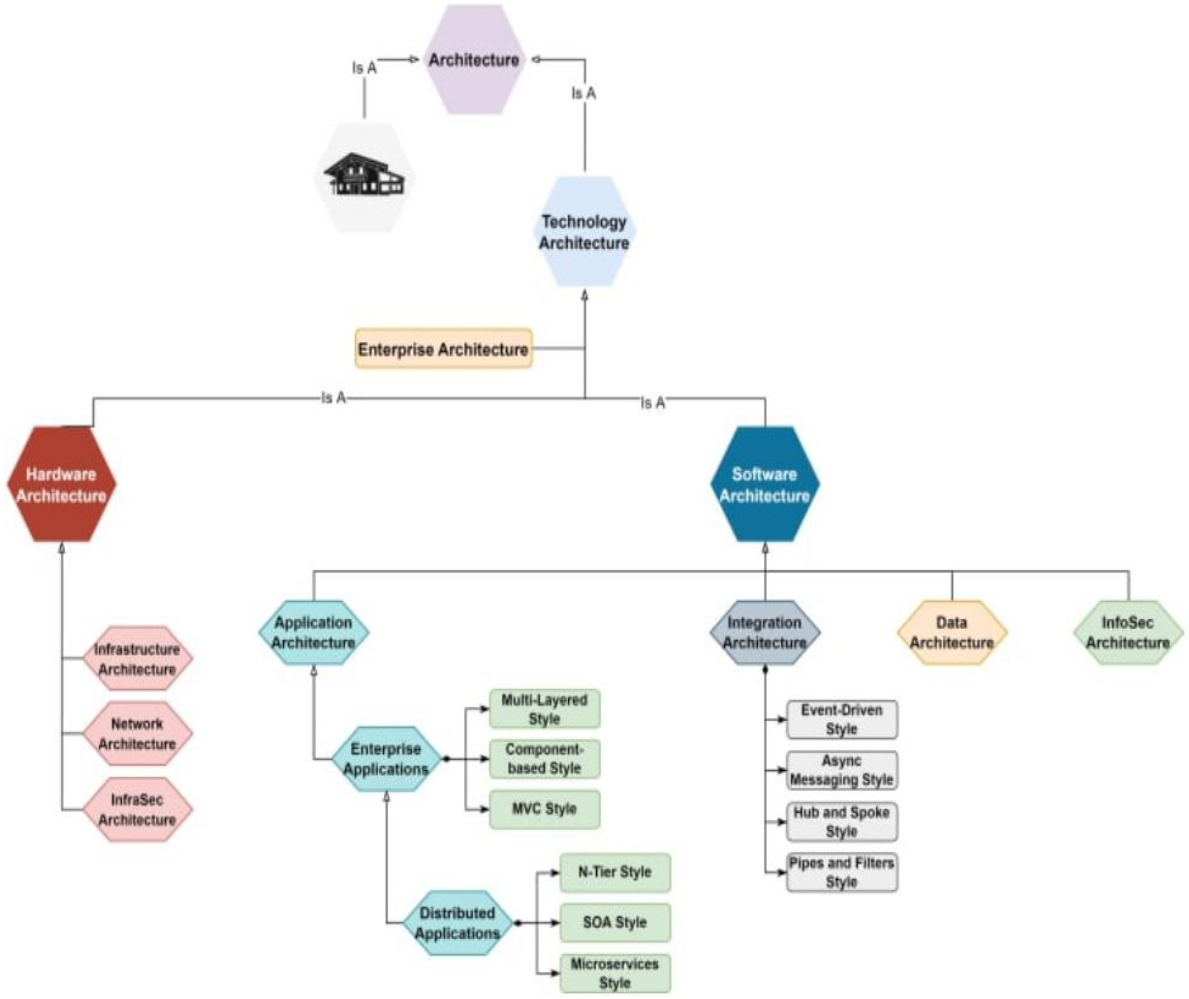
Cont. … Introduction to Technology Architecture

Technology architecture ensures:

- New applications have adequate infrastructure resources
- System reliability meets business requirements
- Infrastructure costs align with business value delivered
- Security controls protect technology assets
- Disaster recovery capabilities limit business interruption risks

[1]. What is Enterprise Architecture? Back to Basics," Avolution Software, Avolution Software https://www.avolutionsoftware.com/our-resources/what-is-enterprise-architecture-back-to-basics/

Cont. … Introduction to Technology Architecture



Most comment Architectural Styles for each Architectural Type

Types of Technology Architectures

- New specialized types of architecture have emerged into Hardware Architecture and Software Architecture, which have been specialized further into more fine-grained types, as shown in the diagram.

[2] Raik, Haitham. *Technology Architecture Types and Related Architectural Styles.* Vocal Media, 2021. https://vocal.media/01/technology-architecture-types-and-related-architectural-styles

Cont. … Introduction to Technology Architecture

Enterprise Architecture Best Practices: Aligning Business Strategy with Technology

- High-performing EA teams guide business decision-making by aligning business strategy, processes, and technology investments.

Data-Driven Decision Support

- Modern enterprise architecture integrates data supporting informed decisions across:
  - IT portfolio optimization and application rationalization
  - System design and solution architecture
  - Process improvement and business transformation
  - Risk assessment and security management
  - Performance optimization and cost reduction

[1]. What is Enterprise Architecture? Back to Basics," Avolution Software, Avolution Software .https://www.avolutionsoftware.com/our-resources/what-is-enterprise-architecture-back-to-basics/

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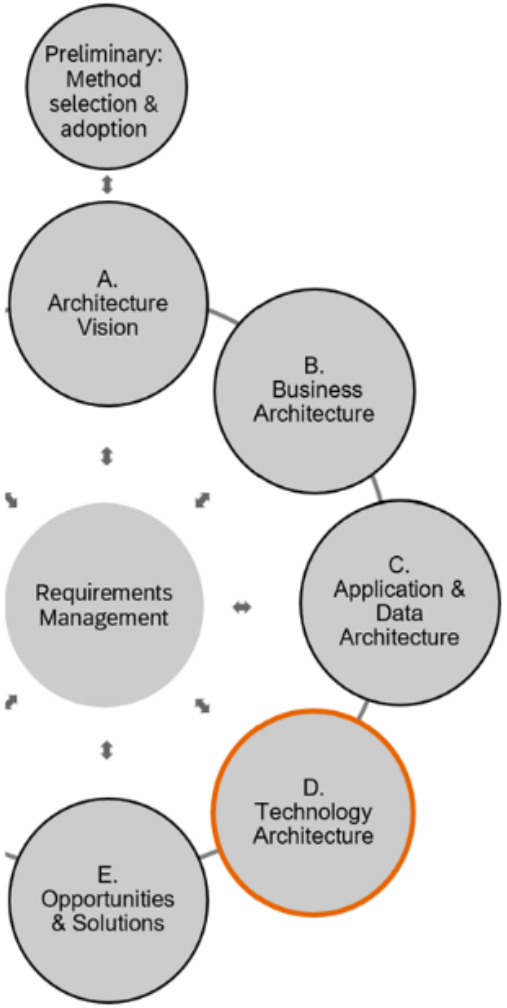
Technology Architecture



Purpose

- Describes and documents the deployment of your organization's IT systems including hardware, software, and communications in specific Data Center locations
- Develop Target Technology Architecture that enables the Target Business Architecture, Data, and Application Architecture building blocks to be delivered via technology components (for example, Operating Systems, virtualized environments, Hardware, Networks)

Key architectural work product is **Target Technology Architecture** with these artifacts:

- **Environments and Locations Diagram:** grouping technology components into deployment environments (Data Centers)
- Network and Communications Diagram: (for example, definition of communication lines / VPNs and etc.)
- Container / virtualization environments
- Hardware specifications

[3]. Defining Technology Architecture, SAP Learning Team (Editor), SAP Learning, 2026. https://learning.sap.com/courses/intelligent-enterprise-architecture-fundamentals/defining-technology-architecture

Cont. … Introduction to Technology Architecture

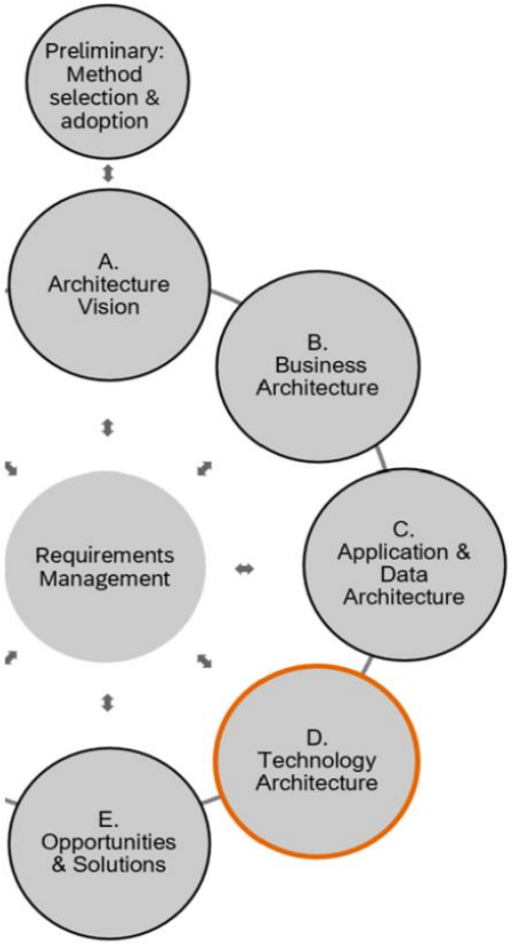
Technology Architecture - Steps

- **The objectives of this phase are as follows:**
  - Develop the Target Technology Architecture that enables the Architecture Vision, target business, data, and application building blocks to be delivered through technology components and technology services, in a way that addresses the Statement of Architecture Work and stakeholder concerns
  - Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Technology Architectures

[3]. Defining Technology Architecture, SAP Learning Team (Editor), SAP Learning, 2026. https://learning.sap.com/courses/intelligent-enterprise-architecture-fundamentals/defining-technology-architecture

Cont. … Introduction to Technology Architecture

Technology Architecture - Steps



With these steps, develop the Target Technology Architecture that enables the Target Business Architecture, Application, and Data Architecture:

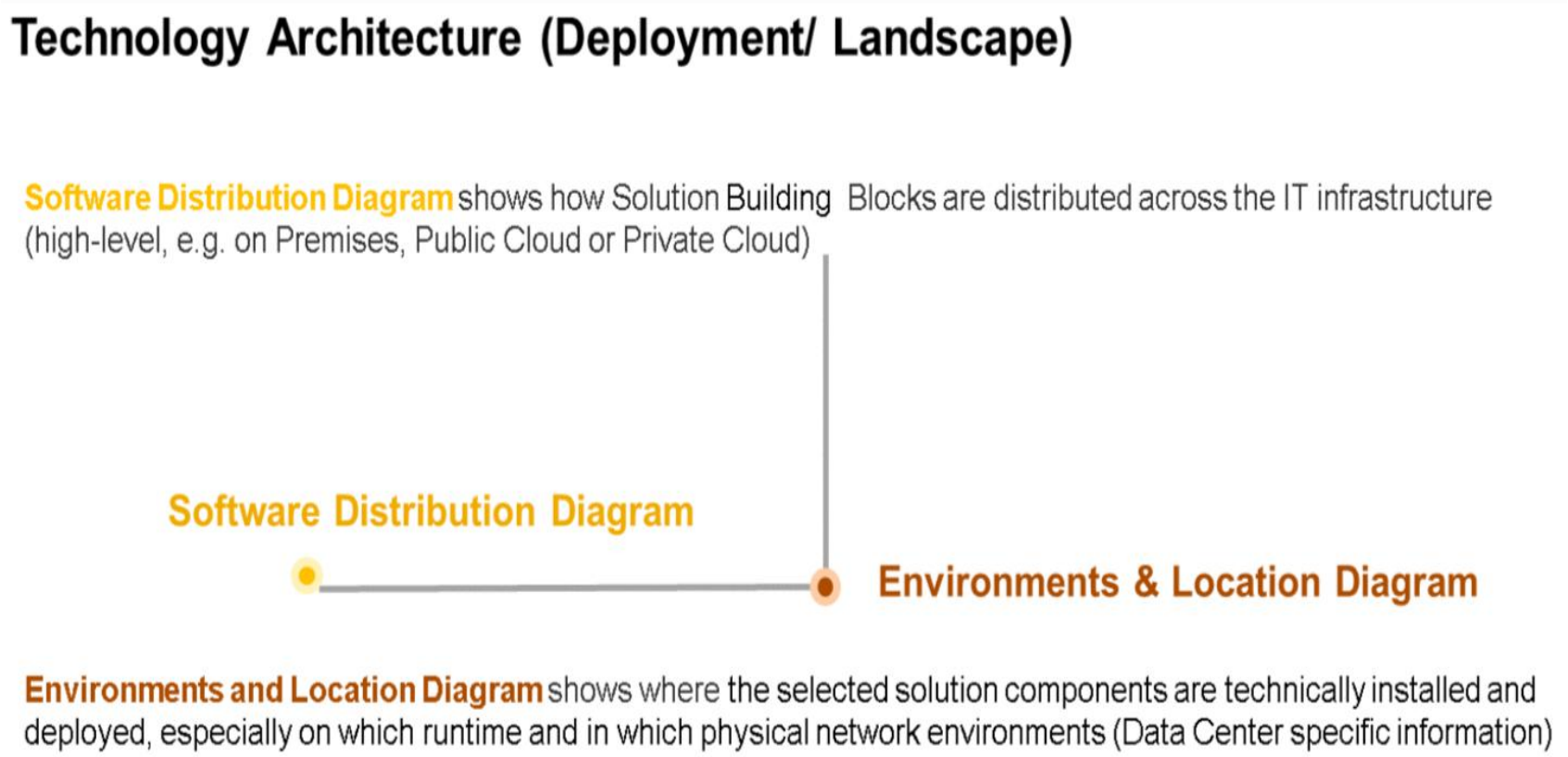
1. Develop Baseline Technology Architecture Description
2. Develop Target Technology Architecture Description
3. Perform Gap Analysis
4. Define Candidate Roadmap Components
5. Resolve Impacts Across the Architecture Landscape
6. Conduct Formal Stakeholder Review
7. Finalize the Technology Architecture
8. Create the Architecture Definition Document

[3]. Defining Technology Architecture, SAP Learning Team (Editor), SAP Learning, 2026. https://learning.sap.com/courses/intelligent-enterprise-architecture-fundamentals/defining-technology-architecture

Cont. … Introduction to Technology Architecture

The Deployment/Landscape of Technology Architecture

- The following image outlines the deployment/landscape of the Technology Architecture. It describes the functions of the Software Distribution Diagram and the Environments and Location Diagram.



Cont. … Introduction to Technology Architecture

Environments and Location Diagram

- The Environments & Location Diagram shows which Solution Building Blocks are deployed and operated in which data centre location, as well as the required physical connections between the Solution Building Blocks.
- The physical locations of the users and other external systems that need to interact with the Solution Components must also be considered.
- This also visualizes which data is exchanged over public lines and where VPN security capabilities need to be added.

[3]. Defining Technology Architecture, SAP Learning Team (Editor), SAP Learning, 2026. https://learning.sap.com/courses/intelligent-enterprise-architecture-fundamentals/defining-technology-architecture

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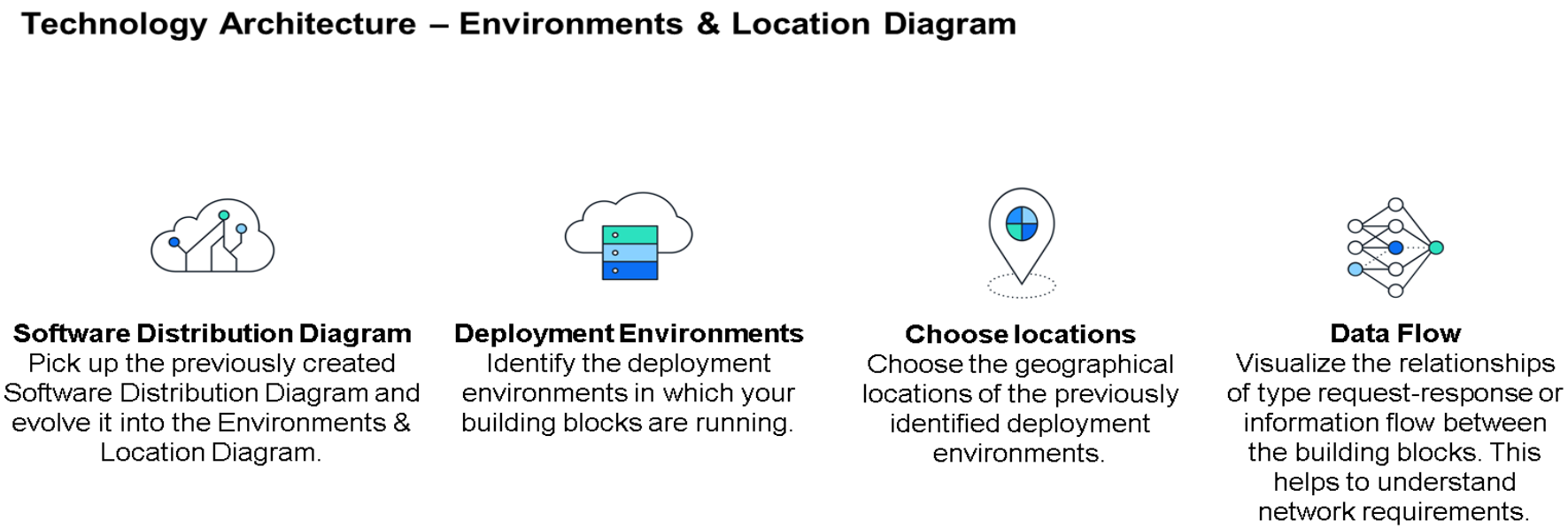
Environments and Location Diagram



- It illustrates which of our architecture building blocks and solution building blocks are deployed, at which locations. We can also outline different deployment environments such as development, test, and production.
  - **Software Distribution Diagram**: Pick up the previously created Software Distribution Diagram and evolve it into the Environments & Location Diagram.

Cont. … Introduction to Technology Architecture

Environments and Location Diagram

- **Deployment Environments and Locations**: Identify the deployment environments in which our Solution Building Blocks are running.

- Add more details to the "landing zones" of the Software Distribution Diagram by explicitly naming the data center providers, the data center location, and infrastructure-specific details per "landing zone".
- Map the identified solution building blocks to the deployment environments.
  - **Data Flow and required connectivity**: Visualize the relationships of type request-response or information flow between the Solution Building Blocks. This helps to understand network requirements.

[3]. Defining Technology Architecture, SAP Learning Team (Editor), SAP Learning, 2026. https://learning.sap.com/courses/intelligent-enterprise-architecture-fundamentals/defining-technology-architecture

Cont. …Introduction to Technology Architecture

Why Technology Architecture Matters?

- Because it provides the structural and strategic foundation organisations need to operate effectively in a fast-changing digital landscape.
- It ensures that technology decisions are made with clarity, consistency, and purpose, enabling the organisation to adapt to market demands, regulatory shifts, and evolving customer expectations.
- By defining clear standards and integration patterns, it reduces complexity and supports long-term scalability.

- Technology Architecture strengthens decision-making, enhances organisational resilience, and supports continuous improvement across the technology landscape.
- It ensures the organisation remains agile, well-integrated, and capable of delivering high-quality digital experiences.

Cont. …Introduction to Technology Architecture

Cont. … Why Technology Architecture Matters?

- It helps the organisation translate strategic objectives into executable technology roadmaps, ensuring investments deliver measurable value.
- It also addresses common challenges such as fragmented systems, rising technical debt, and inconsistent user experiences by creating alignment across platforms and teams.
- Executives, managers, and end users each benefit differently, as it guides portfolio decisions, simplifies operations, and enables seamless digital workflows.
  - **Strategic Alignment:** Ensures technology investments directly support business priorities.
  - **Operational Efficiency:** Reduces redundancy and improves system performance.
  - **Innovation Enablement:** Creates a stable foundation for adopting emerging technologies.

[4]. Technology Architecture, Harald Arnold, LEADing Practice, 2026.
https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/

Cont. …Introduction to Technology Architecture

- Technology Architecture provides a clear strategic justification by improving performance, lowering risk, and strengthening the organisation's ability to respond to change.
- It helps leaders priorities investments and supports consistent execution across technology initiatives.

Typical benefits of Technology Architecture include:

- **Reduced Complexity:** Streamlines the technology landscape and lowers integration effort.
- **Cost Optimisation:** Minimises duplication and supports more efficient resource utilisation.
- **Improved Agility:** Enables faster adaptation to market and technology changes.
- **Enhanced Reliability:** Strengthens system performance, stability, and resilience.
- **Greater Innovation Capacity:** Creates a scalable foundation for new services and digital capabilities.

Cont. …Introduction to Technology Architecture

- Technology Architecture is applied through a structured framework that guides organisations in designing, governing, and evolving their technology landscape.
- **The framework combines three core perspectives:**
  - *The process stages* outline how Technology Architecture is developed and implemented, from initial assessment to ongoing optimisation.
  - *The pitfalls and challenges section* highlights common missteps that can hinder progress, helping organisations avoid fragmentation and unnecessary complexity.
  - *The leading practices section* showcases methods used by high performers to achieve coherence, agility, and innovation.
- These perspectives provide a comprehensive guide for using Technology Architecture effectively and consistently across diverse organisational contexts.

Technology Architecture Approaches

- A structured Technology Architecture approach follows a clear sequence of phases that guide the organisation from initial understanding to long-term optimisation.

1. Current-State Assessment

- Evaluates existing systems, platforms, and infrastructure.

2. Capability & Requirements Analysis

- Identifies business needs and technology enablers.

3. Principles & Standards Definition

- Establishes guidelines for design and decision-making.

4. Target-State Architecture Design

- Defines the future technology landscape and structure.

Cont. …Technology Architecture Approaches

5. Architecture Modelling & Mapping

- Visualises components, integrations, and dependencies.

6. Gap Analysis

- Compares current and target states to determine priorities.

7. Technology Roadmap Development

- Outlines initiatives, timelines, and investment needs.

8. Governance & Approval

- Validates design choices and ensures alignment.

[3]. https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/ Technology Architecture, Harald Arnold, LEADing Practice, 2026, page N/A.

Cont. …Technology Architecture Approaches

9. Implementation Support

Guides execution and ensures adherence to architectural direction.

10. Monitoring & Continuous Improvement

Tracks performance and adjusts the architecture as needed.

[4]. Technology Architecture, Harald Arnold, LEADing Practice, 2026.
https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/

Cont. …Technology Architecture Approaches

Identifying Pitfalls and Challenges: Antipatterns and Worst Practices

- Organisations often struggle with Technology Architecture when decisions are made in isolation, executed without governance, or driven by short-term pressures.
- Addressing these issues early protects the integrity and long-term value of the architecture.

5 Antipattern Examples:

- **1. Siloed Design:** Solutions built without cross-domain alignment, causing duplication.
- **2. Tool-First Thinking:** Choosing technologies before defining business needs.

5 Worst Practice Examples:

- **1. Ignoring Standards:** Allowing inconsistent tools, platforms, and integrations.
- **2. Lack of Documentation:** Creating architectures that cannot be maintained.

Cont. …Technology Architecture Approaches

- Avoiding these pitfalls strengthens coherence, reduces risk, and ensures Technology Architecture supports sustainable growth.
- A proactive approach helps maintain alignment, improve quality, and secure the long-term effectiveness of the technology landscape.

3. Over-Engineering: Adding unnecessary complexity that slows delivery.	**3. Skipping Analysis:** Making decisions without assessing impacts or dependencies.
4. Shadow Architecture: Teams bypassing governance and creating uncontrolled solutions.	**4. Unmanaged Legacy Systems:** Allowing outdated technologies to remain unchecked.
5. Reactive Decision-Making: Architecture shaped by urgent issues rather than strategy.	**5. No Governance Model:** Leaving architecture decisions to chance or convenience.

[4]. Technology Architecture, Harald Arnold, LEADing Practice, 2026. https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/

Cont. …Technology Architecture Approaches

Best Practices and Leading Practices

- Successful organisations apply Technology Architecture with discipline, clarity, and a long-term perspective.
- Their approaches demonstrate how structured methods, consistent standards, and cross-functional collaboration create strong, future-ready technology landscapes.

5 Best Practice Examples:

- **1. Clear Architectural Principles:** Consistent rules guide design and decision-making.
- **2. Integrated Planning:** Architecture is embedded in portfolio, investment, and delivery processes.

5 Leading Practice Examples:

- **1. Capability-Driven Design:** Architectures are built around business capabilities, not systems.
- **2. Modular Architecture:** Highly composable components enable faster change and reuse.

Cont. …Technology Architecture Approaches

- These practices demonstrate how disciplined execution and forward-looking strategies help organisations stay agile, resilient, and innovative.
- Applying them ensures Technology Architecture delivers sustained value and supports long-term business ambitions

3. Cross-Functional Collaboration: Business and IT jointly shape architectural priorities.	**3. Proactive Technology Scouting:** Emerging technologies are assessed continuously.
4. Lifecycle Governance: Standards and decisions are managed from design to retirement.	**4. Data-Informed Decision-Making:** Metrics guide architecture evolution and investment choices.
5. Structured Documentation: Models and guidelines are maintained for transparency and reuse.	**5. Continuous Transformation Mindset:** Architecture evolves iteratively rather than in periodic cycles.

[4]. Technology Architecture, Harald Arnold, LEADing Practice, 2026. https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/

Cont. …Technology Architecture Approaches

- Technology Architecture is applied across a wide range of organisational domains to ensure that technology systems, platforms, and processes operate cohesively and support strategic goals.
- Its influence spans both business and IT functions, enabling consistent standards, efficient operations, and effective digital transformation.

Typical domains include:

- **Information Technology**: Structures infrastructure, applications, and integrations for stability and scalability.
- **Operations:** Supports automation, workflow optimisation, and resilient service delivery.
- **Finance:** Enables secure, compliant, and high-performing financial systems and analytics.
- **Customer Service**: Enhances omnichannel tools, case management systems, and customer experience platforms.
- **Human Resources**: Supports digital HR solutions, workforce analytics, and employee engagement platforms.

Cont. …Technology Architecture Approaches

When Should We Embrace Technology Architecture?

- Determining the right moment to adopt Technology Architecture is essential for ensuring effective implementation and long-term value.
- Organisations benefit most when timing aligns with strategic priorities, operational needs, and technology shifts.
- Recognizing these triggers and prerequisites allows organisations to adopt Technology Architecture at the right time, ensuring strong foundations for transformation

[4]. Technology Architecture, Harald Arnold, LEADing Practice, 2026. https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/

Cont. …Technology Architecture Approaches

- Before embarking on Technology Architecture, organisations should ensure stakeholder alignment, dedicated resources, clear governance structures, and a baseline maturity in project delivery and technology management.

Key scenarios that signal readiness include:

- ***Rapid Growth*:** Scaling operations requires structured technology decisions and standardisation.
- ***Digital Transformation*:** New business models demand a cohesive and future-ready architecture.
- ***Legacy Modernisation*:** Ageing systems create risk and inefficiency, prompting architectural redesign.
- ***Market or Regulatory Change*:** External pressures require adaptable and compliant technology landscapes.
- ***Merger or Restructuring*:** Consolidation efforts need alignment across systems, platforms, and processes.

Common Technology Architecture Artefacts

- Technology Architecture relies on a set of core artefacts that provide structure, clarity, and consistency throughout the architectural lifecycle.
- These tools help organisations document decisions, visualise complex environments, and guide implementation.
- Using well-defined artefacts ensures that teams work with a shared understanding of the technology landscape.

[4]. Technology Architecture, Harald Arnold, LEADing Practice, 2026. https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/

Cont. …Common Technology Architecture Artefacts

Typical Technology Architecture artefacts include:

- **Architecture Principles:** Define the rules and guidelines that shape technology decisions.
- **Current-State Architecture Model:** Maps existing systems, integrations, and infrastructure components.
- **Target-State Architecture Model:** Describes the future design, structure, and desired capabilities.
- **Technology Standards Catalogue:** Documents approved platforms, tools, and integration patterns.
- **Technology Roadmap:** Outlines the sequence of initiatives to transition from current to target state.

[4]. Technology Architecture, Harald Arnold, LEADing Practice, 2026. https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/

Cont. ..Common Technology Architecture Artefacts

The Artefacts Table

- The following table summarises the core Technology Architecture artefacts and tools, providing a clear view of what they are and how they are used.

Artefact	Description	Practical use
Architecture Principles	A concise set of rules and guidelines that steer technology design and decision-making.	Used to evaluate options, resolve design conflicts, and ensure consistent choices across projects and domains.
Current-State Architecture Model	A structured view of existing systems, integrations, data flows, and infrastructure components.	Applied during assessments to identify gaps, overlaps, risks, and opportunities for consolidation or improvement.

[4]. Technology Architecture, Harald Arnold, LEADing Practice, 2026. https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/

Cont. ..Common Technology Architecture Artefacts

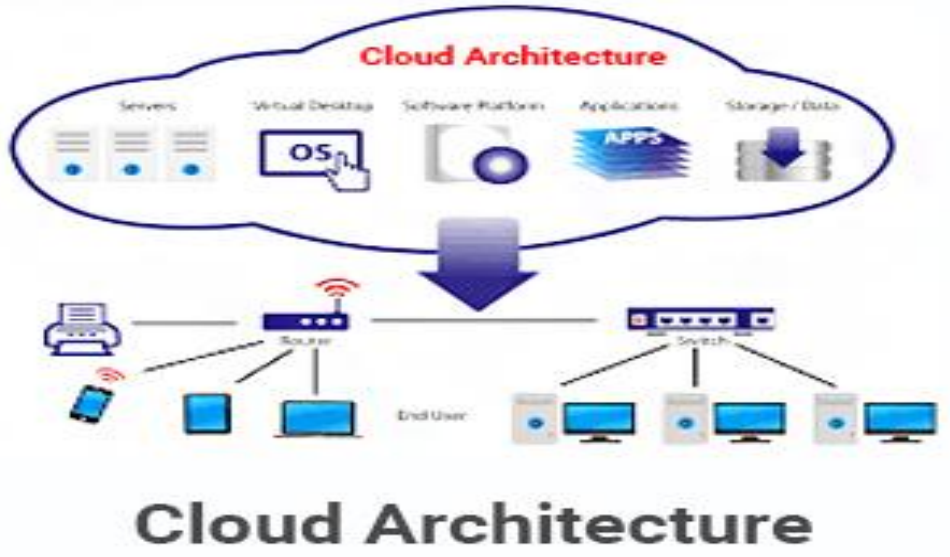
Cont. …The Artefacts Table

Artefact	Description	Practical use
Target-State Architecture Model	A blueprint describing the desired future technology landscape and capabilities.	Used to align stakeholders on the future direction and to guide solution designs and investment decisions.
Technology Standards Catalogue	A documented list of approved technologies, platforms, patterns, and integration approaches.	Applied by architects and delivery teams to select compliant solutions and reduce variability and technical debt.
Technology Roadmap	A time-phased plan of initiatives required to move from the current state to the target state.	Used to sequence projects, coordinate dependencies, and communicate priorities and milestones to stakeholders.

[4]. Technology Architecture, Harald Arnold, LEADing Practice, 2026. https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/

Technology architecture for cloud adoption

- Technology architecture for cloud adoption refers to the design and structure of the IT infrastructure, systems, applications, and services that leverage cloud computing resources.
- It encompasses the selection, integration, and management of various technologies to support our goals within a cloud environment.



https://share.google/9zkdtaYwjvocUEmLW

[5] .Technology Architecture, Oracle, Oracle Corporation, 2024, page N/A. https://docs.oracle.com/en-us/iaas/Content/cloud-adoption-framework/ea-technology-architecture

Cont. ..Technology architecture for cloud adoption

- The following information describes the functions and design considerations when implementing technology architecture for cloud adoption.
- Develop a clear strategy outlining our goals, objectives, and reasons for adopting cloud technology.

Cloud Strategy

- A cloud strategy in technology architecture for cloud adoption refers to using multiple cloud providers or services to meet business needs, and enabling communication and integration between these different cloud environments.

[5] .Technology Architecture, Oracle, Oracle Corporation, 2024, page N/A. https://docs.oracle.com/en-us/iaas/Content/cloud-adoption-framework/ea-technology-architecture

Cont. ..Technology architecture for cloud adoption

- A fine-grained control is available when choosing private cloud and more reliability is achieved using multi-cloud or hybrid cloud.

  a) Define the requirements: Define the business requirements for cloud strategy. This can involve identifying the need for redundancy, disaster recovery, or workload optimization, and determining how multiple clouds can provide these benefits.

  b) Select compatible cloud providers: Choose cloud providers that offer compatible services and application programming interfaces (APIs) to enable communication and integration between different cloud environments.

  - This can involve evaluating the compatibility of different cloud services, such as compute, storage, and networking, and selecting cloud providers that offer compatible services.

Cont. ..Technology architecture for cloud adoption

c) Standardize cloud services: Standardize the use of cloud services to minimize compatibility issues and ensure consistent management across multiple cloud environments.

- This can involve defining standard configurations for compute, storage, and networking resources, and enforcing these standards across multiple cloud providers.

d) Implement hybrid cloud solutions: Implement hybrid cloud solutions that allow for seamless integration between public and private clouds.

- This can involve using virtual private networks (VPNs) or direct interconnects to connect private cloud environments with public cloud providers.

[5].Technology Architecture, Oracle, Oracle Corporation, 2024, page N/A.
https://docs.oracle.com/en-us/iaas/Content/cloud-adoption-framework/ea-technology-architecture

Cont. ..Technology architecture for cloud adoption

e) Leverage cloud management tools: Leverage cloud management tools that provide a single pane of glass to manage multiple cloud environments.

- This can involve using tools that provide visibility into cloud resource usage, automate resource provisioning, and enforce security and compliance policies across multiple cloud environments.

f) Monitor and optimize performance: Monitor the performance of multi-cloud, hybrid cloud, and inter-cloud environments to ensure optimal resource utilization and minimize costs.

- This can involve using monitoring tools that provide insights into cloud resource usage, identify performance bottlenecks, and enable proactive capacity planning.

[5] .Technology Architecture, Oracle, Oracle Corporation, 2024, page N/A. https://docs.oracle.com/en-us/iaas/Content/cloud-adoption-framework/ea-technology-architecture

Summary

- Technology Architecture defines the physical and virtual infrastructure that supports business applications and services. It includes hardware resources, platform services, networking, security controls, and infrastructure documentation.
- Technology Architecture ensures reliable, secure, and cost-effective technology operations. It aligns technology investments with business goals while supporting scalability, resilience, and innovation.
- The architecture process involves assessing the current environment, defining the target architecture, identifying gaps, creating roadmaps, and governing implementation. This structured approach helps organizations evolve their technology landscape effectively.
- Technology Architecture defines where systems and services are deployed, including development, testing, and production environments. It also maps data flows, connectivity requirements, and security measures across locations.

Summary

- Key benefits include reduced complexity, cost optimization, improved agility, enhanced reliability, and greater innovation capacity. These advantages help organizations respond effectively to business and technology changes.
- Organizations may face challenges such as poor governance, fragmented systems, and isolated decision-making. Successful implementation requires clear standards, collaboration, governance, and a long-term strategic perspective.
- Technology Architecture supports multiple domains, including IT, operations, finance, customer service, and human resources. It ensures systems and processes work together to achieve organizational goals.
- Important artefacts include architecture principles, current-state and target-state models, technology standards catalogues, and technology roadmaps. These artefacts guide planning, communication, and implementation.
- Technology Architecture for cloud adoption focuses on designing cloud-based infrastructure and services. It includes cloud strategy, multi-cloud and hybrid-cloud integration, standardization, performance monitoring, and cloud governance.

References

1. What is Enterprise Architecture? Back to Basics," Avolution Software, Avolution Software. https://www.avolutionsoftware.com/our-resources/what-is-enterprise-architecture-back-to-basics/
2. Raik, Haitham. *Technology Architecture Types and Related Architectural Styles.* Vocal Media, 2021. https://vocal.media/01/technology-architecture-types-and-related-architectural-styles.
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4. Technology Architecture, Harald Arnold, LEADing Practice, 2026. https://www.leadingpractice.com/enterprise-standards/enterprise-architecture/technology-architecture/.
5. Technology Architecture, Oracle, Oracle Corporation, 2024, page N/A. https://docs.oracle.com/en-us/iaas/Content/cloud-adoption-framework/ea-technology-architecture.


Thank you!