



User Guide | PUBLIC
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SAP Data & Analytics Advisory Methodology

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1 SAP Data & Analytics Advisory Methodology Overview

The SAP Data & Analytics Advisory Methodology provides a comprehensive framework for enterprise and data architects to evaluate data strategies, develop solution architectures, and foster a data-driven culture in a structured four-phase approach.

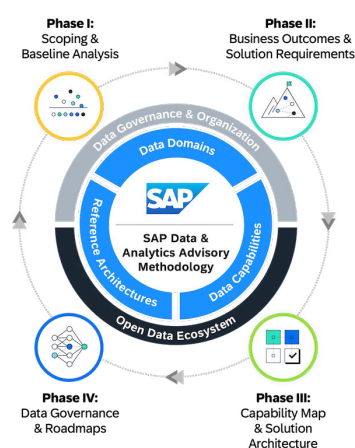
Introduction

Data is crucial for organizations because it serves as the foundation for informed decision-making and strategic planning. By collecting, analyzing, and leveraging data, organizations can gain valuable insights. Therefore, data and analytics play a central role in your organization when shaping your digital strategy and transformation.

The SAP Data and Analytics Advisory Methodology is a comprehensive guide designed to support enterprise architects, data architects, and professionals in executing data strategies, developing and validating solution architectures for data-driven business outcomes, and nurturing a data-driven culture.

This methodology represents an architecture development approach based on standard enterprise architecture frameworks, especially The Open Group Architecture Framework (TOGAF) and SAP Enterprise Architecture Framework (SAP EAF).

Structured into four phases, each with specific steps and deliverables, the methodology enables successful execution of data initiatives. It does so by applying well-known architecture development frameworks (SAP EAF/TOGAF), tailoring phases based on scope, and leveraging existing techniques and tools.



Phases of the Data & Analytics Methodology

The structured process is accompanied by the following:

- a **data domain reference model** to establish a common understanding of SAP data
- a **data & analytics capability model** to better support the architecture definition

- data-driven **use-case patterns** and related **reference architectures** to accelerate solution architecture development

The methodology also considers the organizational impact that new data & analytics capabilities and solutions might have, and how governance processes need to be adapted. Finally, it supports an open data ecosystem consisting of related third-party software products of hyperscalers or SAP partners.

Target Audience

- Enterprise architects
- Data architects
- SAP Customer & Partners

Related Information

[Download the Data & Analytics Advisory Methodology Overview](#) 

[Download the Data & Analytics Advisory Methodology Templates](#) 

[The Open Group Architecture Framework \(TOGAF\)](#) 

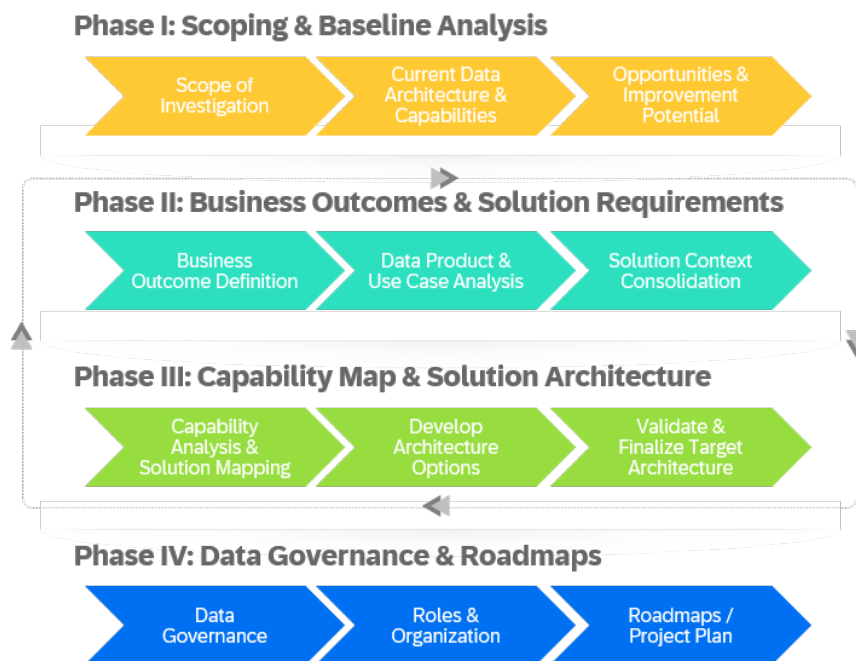
[SAP Enterprise Architecture Framework \(SAP EAF\)](#) 

2 The Phases of the SAP Data and Analytics Advisory Methodology

The methodology encompasses four phases, Phases I and IV provide essential context and adaptability to ensure comprehensive design and successful implementation, while Phases II and III focusing on analyzing business, data, and technical requirements to develop the target architecture .

The Data & Analytics Advisory Methodology is organized in four phases.

Overview



- [Phase I: Scoping & Baseline Analysis \[page 9\]](#)
- [Phase II: Business Outcomes & Solution Requirements \[page 16\]](#)
- [Phase III: Capability Map & Solution Architecture \[page 25\]](#)
- [Phase IV: Data Governance & Roadmaps \[page 34\]](#)

📌 Note

The core of the methodology lies in Phases II and III, where you analyze business, data, and technical requirements and develop the target architecture. However, there are additional critical factors to consider before and after the architecture development process. Phases I and IV serve as adaptable measures to

ensure all aspects of architecture design and its successful implementation are considered. Phases I and IV are typically executed once, based on the project scope, while Phases II and III may involve multiple iterations, depending on the number of business outcomes and use cases. You should tailor each phase to the scope and complexity of the investigation.

❖ Example

If the focus is on a specific and well-defined business outcome, step 3 of Phase I (analyzing opportunities and improvement potentials) may not be necessary. Similarly, if the target architecture does not affect governance or organizational aspects, steps 1 and 2 of Phase IV can be omitted.

Phase I

In Phase I, you define the scope of the investigation and review all relevant artifacts. This phase also offers tools and methods for an optional, more comprehensive analysis of the current situation. The goal is to identify any issues or opportunities that will serve as the foundation for subsequent phases.

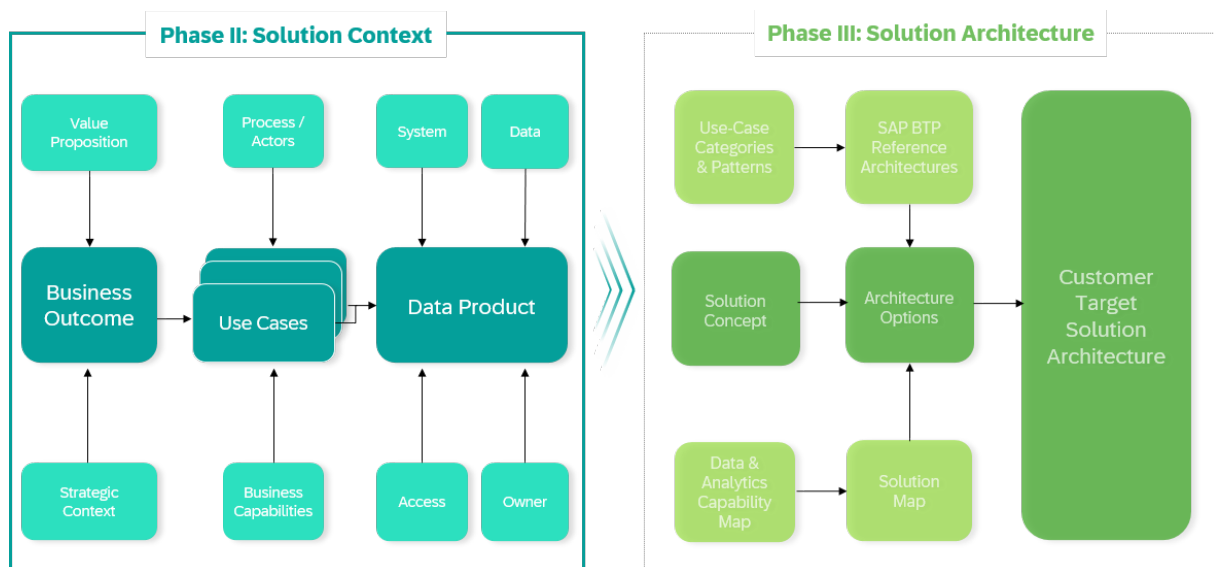
Phase II

To initiate Phase II, begin by thoroughly defining the business outcome. This refers to a business-centric, specific, and measurable action that must align with strategic objectives and be supported by both qualitative and quantitative benefits.

Following that, outline the business outcomes through a series of use cases that demonstrate how the outcomes and their benefits are realized. Each use case should describe the entire process of how data is transformed from its original source to generate the business value specified in the outcome. This includes detailing the necessary steps, the actors involved (such as business users, IT administrators, and data scientists), and the data and business requirements for each use case.

A crucial element of use-case analysis is identifying the data needed to define data products. A data product is a controlled dataset provided by a data domain, including data, metadata, and standard APIs for access. These data products must be clearly defined to support the creation of the target architecture. Additionally, document the complete data flow, from sources to target data products, along with transformation requirements, to enable IT solutions for data integration, transformation, or orchestration within the target architecture.

The following diagram outlines the artifacts and deliverables produced in Phase II, along with their sequence.



- [Context \[page 19\]](#)
- [Context \[page 17\]](#)
- [Step 2: Data Product & Use-Case Analysis \[page 19\]](#)

Phase III

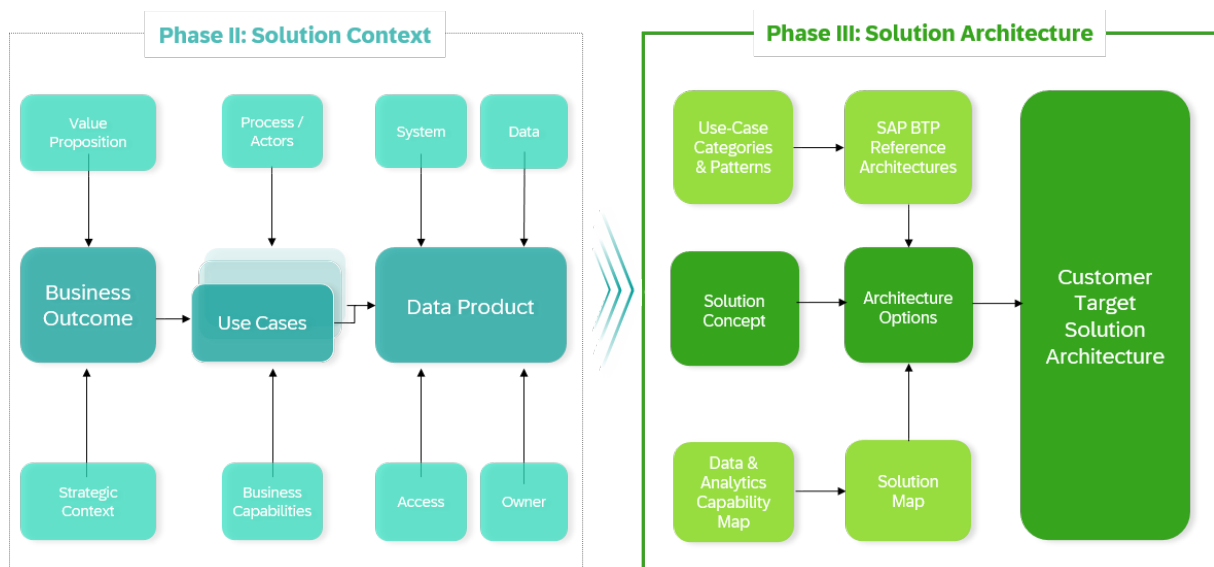
Phase III begins with a consolidated view of the architecture context. You then translate this architecture context into a solution concept that outlines the architecture building blocks and their interrelations. This solution concept provides a high-level representation of the intended solution, ensuring it meets the requirements of the architecture engagement.

To develop a target solution architecture based on the requirements gathered in Phase II, you have two options:

- **Traditional Approach:** Identify the required capabilities and map them to potential IT solutions. This approach is widely practiced by enterprise architects. Consolidate business and IT requirements by selecting the necessary capabilities from the Data & Analytics capability model, creating a tailored capability map. Then, map these capabilities to suitable IT solutions and solution features.
- **Accelerated Approach:** If the use cases align with predefined use-case categories and patterns, you can apply an accelerated path by reviewing related reference architectures. For instance, SAP BTP reference architectures are available in the SAP Discovery Center and can serve as a baseline for developing your target solution architecture.

In the final step, develop the target solution architecture by mapping the architecture building blocks of the solution concept to the identified IT solutions. Ensure that your architecture design adheres to specific policies, guidelines, and rules to maintain consistency.

The following diagram outlines the artifacts and deliverables produced in Phase III, along with their sequence.



- [Data & Analytics Use-Case Categories & Patterns \[page 61\]](#)
- [Context \[page 29\]](#)
- [Step 2: Develop Architecture Options \[page 29\]](#)
- [Context \[page 26\]](#)
- [Step 1: Capability Analysis & Solution Concept \[page 26\]](#)
- [Step 1: Capability Analysis & Solution Concept \[page 26\]](#)
- [Step 3: Validate & Finalize Target Architecture \[page 32\]](#)

Phase IV

Phase IV concludes the investigation by assessing potential impacts on data governance and organizational aspects. This phase results in a roadmap or high-level project plan outlining the steps needed to implement the architecture and enable your organization to generate the desired business value.

❁ Example

If the focus is on a specific and well-defined business outcome, step 3 of Phase I (analyzing opportunities and improvement potentials) may not be necessary. Similarly, if the target architecture does not affect governance or organizational aspects, steps 1 and 2 of Phase IV can be omitted.

Related Information

[Phase I: Scoping & Baseline Analysis \[page 9\]](#)

[Phase II: Business Outcomes & Solution Requirements \[page 16\]](#)

[Phase III: Capability Map & Solution Architecture \[page 25\]](#)

[Phase IV: Data Governance & Roadmaps \[page 34\]](#)

[Glossary \[page 45\]](#)

[Download the Data & Analytics Advisory Methodology Overview](#)

[Download the Data & Analytics Advisory Methodology Templates](#)

[SAP Discovery Center](#)

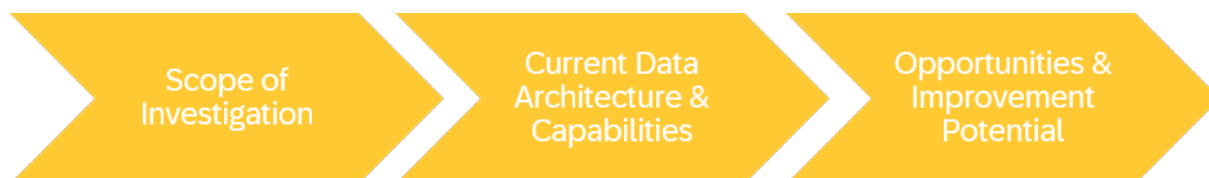
2.1 Phase I: Scoping & Baseline Analysis

This phase establishes a solid foundation for effective architecture development by thoroughly evaluating current architecture, identifying gaps, and aligning the initiative's scope with organizational needs and objectives.

This phase focuses on laying a strong foundation for developing an effective architecture by conducting a thorough evaluation. The aim is to gain a clear understanding of the drivers behind the initiative and establish a well-defined scope.

By carefully reviewing the current data architecture and assessing existing capabilities, you identify any gaps or limitations that need to be addressed. Additionally, this phase involves exploring deeper issues or opportunities within data management and analytics, especially when business objectives related to data outcomes are uncertain or require prioritization.

The goal is to ensure that the architecture development process is aligned with the organization's needs and that all critical factors are considered for success.



- [Step 1: Scope of Investigation \[page 10\]](#)
- [Step 2: Current Data Architecture & Capabilities \[page 12\]](#)
- [Step 3: Opportunities & Improvement Potential \[page 13\]](#)

This phase is crucial, because effective planning serves as the foundation for successful project execution. Without a clear understanding of the goals, functional and technical scope, resources, stakeholders, timeline, and other constraints, you will struggle to monitor progress and measure success against defined outcomes. Establishing the project context, gaining a thorough understanding of the current business and IT environment, and identifying existing issues or opportunities are essential for organizing and managing the subsequent architecture development process, which will be addressed in Phases II and III.

Related Information

[Step 1: Scope of Investigation \[page 10\]](#)

[Step 2: Current Data Architecture & Capabilities \[page 12\]](#)

[Step 3: Opportunities & Improvement Potential \[page 13\]](#)

[Download the templates for the Data & Analytics Advisory Methodology - Phase I](#) 

2.1.1 Step 1: Scope of Investigation

The goal is to establish a comprehensive overview of the investigation, detailing its purpose, scope, deliverables, timelines, and key stakeholders to ensure all teams have a clear understanding of the objectives and tasks involved.

Context

A Statement of Architecture Work outlines the entirety of the investigation to help teams quickly understand the goals, tasks, timelines, and stakeholders.

The statement of work includes the following aspects:

1. First, provide a description of the **mission or purpose** and the main drivers behind the investigation.
2. Next, detail the **scope of investigation** across several dimensions:
 - Organizational Scope: Define whether the focus is global, with an enterprise-wide investigation, or regional/local, involving specific business units, sites, or countries.
 - Business Process Scope: Specify the selected end-to-end processes or functional process areas.
 - Functional / Data Domain Scope: Identify the selected lines of business and related data domains, if they already exist.
 - Data Architecture Scope: Include business applications, data and analytics solutions, and related technology components.
 - Data scope: List key data entities, if they are already known.
3. The most important **deliverables** of the investigation are then listed. You determine which result artifacts need to be delivered. Examples related to data and analysis could be a report, an architecture model, a heat map of capabilities, or even a prototype.
4. The deliverables need to be scheduled and put into a plan that outlines the **key milestones** and due dates.
5. Finally, it is advisable to list the **key roles and resources** of the investigation. This starts with the sponsor, followed by the project lead, and finally key roles from business and IT contributing to the project.

Mission

Describe the essential purpose or mandate of the engagement

Scope

- Organizational Scope
- Business Process Scope
- Functional / Data Domain Scope
- Architecture Scope

Deliverables

Describe key deliverables of the initiative

Team

Project Role	Name
Sponsor	Steve Sponsor
Lead	Joe Lead
Core Team	Doe Spencer, ...
...	

Milestone

Key Milestones	Date
Phase 1: Scoping & baseline analysis	October 20, 2023
Phase 2: Requirements use cases 1-4	October 23, 2023
Phase 3: Architecture development	November 27, 2023
Phase 4: ...	...

Statement of work template

For a more extensive investigation, you develop a detailed **project plan** to effectively plan and track progress.

Conduct a **kick-off meeting** with key stakeholders to ensure that everyone understand the deliverables and their purpose.

Procedure

1. Define the scope of investigation by aligning business processes, data domains, and organizational aspects.
2. Tailor methodology tasks to specific project requirements while ensuring alignment with overarching objectives.
3. Engage stakeholders to establish a shared understanding of objectives, roles, responsibilities, and project timeline.

Deliverables

- Statement of Work
- Project Plan

Related Information

[Download the template](#)

2.1.2 Step 2: Current Data Architecture & Capabilities

This step involves gathering relevant artifacts to assess the current data and analytics landscape, conduct a capability evaluation, and identify gaps in expertise and governance while analyzing strategic guidelines, existing data sources, and data management practices.

Context

In this step, you collect all relevant artifacts that provide insight into the current situation within the defined scope. These artifacts may include data strategy documents, architecture diagrams, data flow models, process descriptions, responsibility matrices, organizational charts, and capability maps.

Conduct a **capability assessment** to evaluate the current data and analytics expertise. Use the data & analytics capability model provided by the methodology or any comparable model as a reference. You can also perform this assessment in Phase III, where you identify future capabilities based on use-case analysis results. Compare the as-is capabilities with the to-be capabilities to identify and address any gaps in the process.

Similarly, address **data governance** aspects in this phase. Review related issues now, but also revisit them in Phase IV, where data governance and organizational impacts will be analyzed in detail.

As one of the initial steps, analyze the as-is situation by addressing the following questions:

- What strategic guidelines must be considered during the investigation?
- What does the current data and analytics landscape look like?
- What are the source systems of data within the scope of the investigation?
- How is data created in transaction systems, integrated, and managed in data stores for analytics purposes?
- Which analytics tools are used for specific analytics purposes?
- How is data quality managed?
- Is clear ownership and responsibility established for data and analytics?

Procedure

1. Review strategic goals, industry demands, and regulatory guidelines to understand the contextual landscape.
2. Analyze the current system architecture for data and analytics, focusing on data sources, storage, and processing mechanisms as well as solutions to analyze data.
3. Optional: Evaluate the existing data and analytics capabilities to assess their alignment with strategic goals.

Deliverables

- Baseline Architecture capturing the current state
- Optional: Capability Heat Map highlighting strengths and gaps

2.1.3 Step 3: Opportunities & Improvement Potential

The final step of Phase I equips teams with tools and methods to identify and prioritize current issues in data management and analytics, focusing on pain points, improvement opportunities, and new data-driven business possibilities.

Context

The final step of Phase I provides tools and methods for analyzing current issues in data management and analytics.

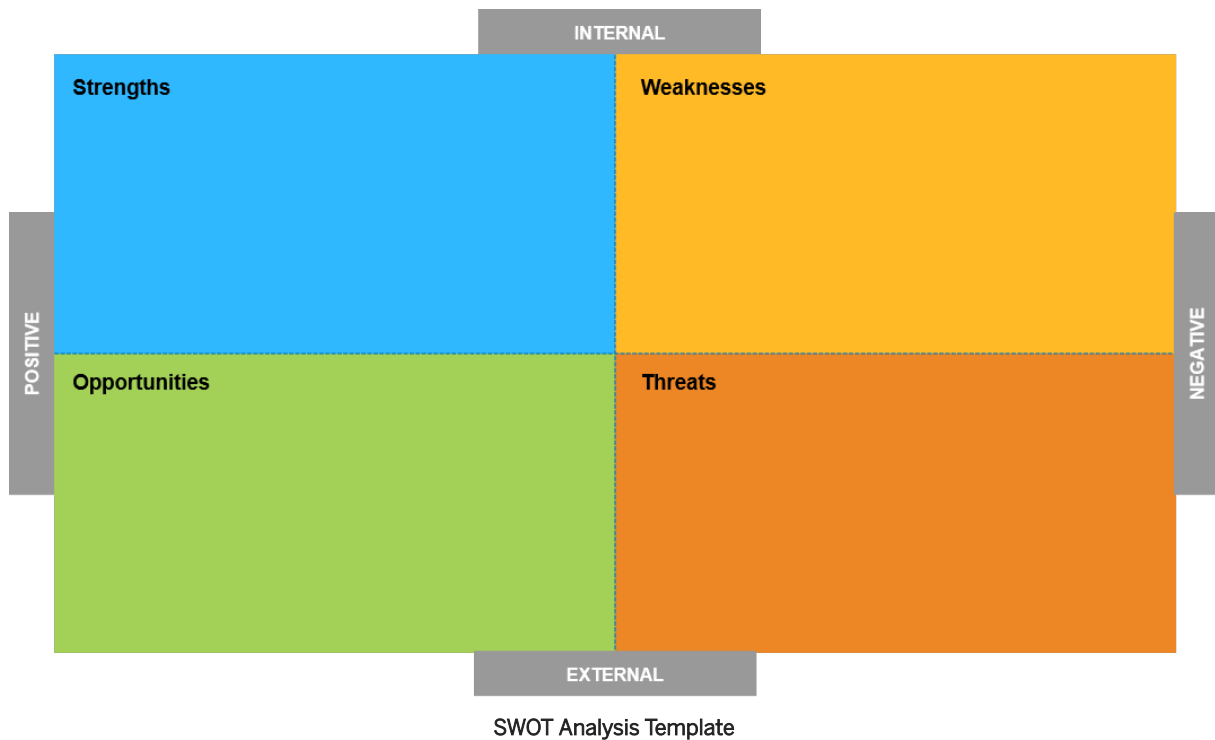
Issues may include:

- Pain points and associated improvement opportunities
- New data-driven business opportunities

To identify these issues, use the following instruments and tools:

- **SWOT Analysis**
- **Design Thinking**
- **Fishbone Diagram**
- **SAP Data & Analytics Strategy Assessment (SAP Service)**

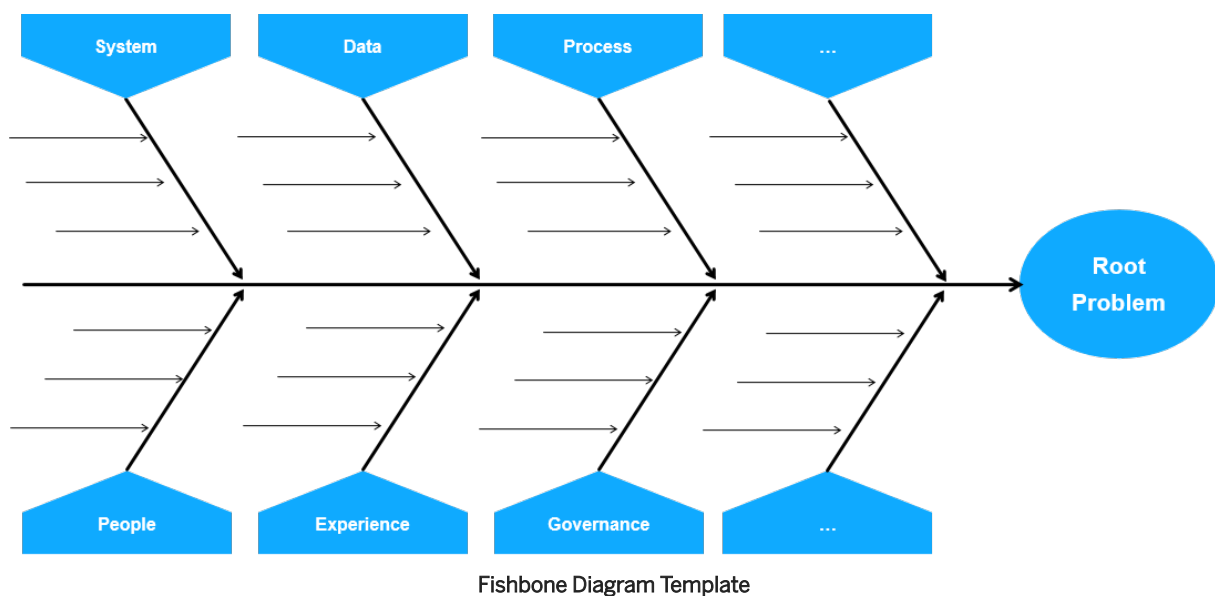
SWOT Analysis and Design Thinking are primarily suited for strategic excellence, focusing on introducing new processes, products, business capabilities, or business models.



Elements of a SWOT Analysis:

- **Strengths:** Internal attributes and resources that support a successful outcome.
- **Weaknesses:** Internal attributes and resources that work against a successful outcome.
- **Opportunities:** External factors that the entity can use to its advantage.
- **Threats:** External factors that could jeopardize the entity's success.

The Fishbone Diagram and SAP Data & Analytics Strategy Assessment are better suited for operational excellence, emphasizing pain point and improvement analysis.



Elements of a Fishbone Diagram:

- Identifying the **root problem or effect**, which is written at the right side of a horizontal line where the head of a fish would be.
- Next, identify the **causes of the problem** and write them at the end of lateral lines that extend from the main horizontal line.
- Finally, **more details, sub-headings**, and relevant information can be written as branches off of each cause for further clarification.

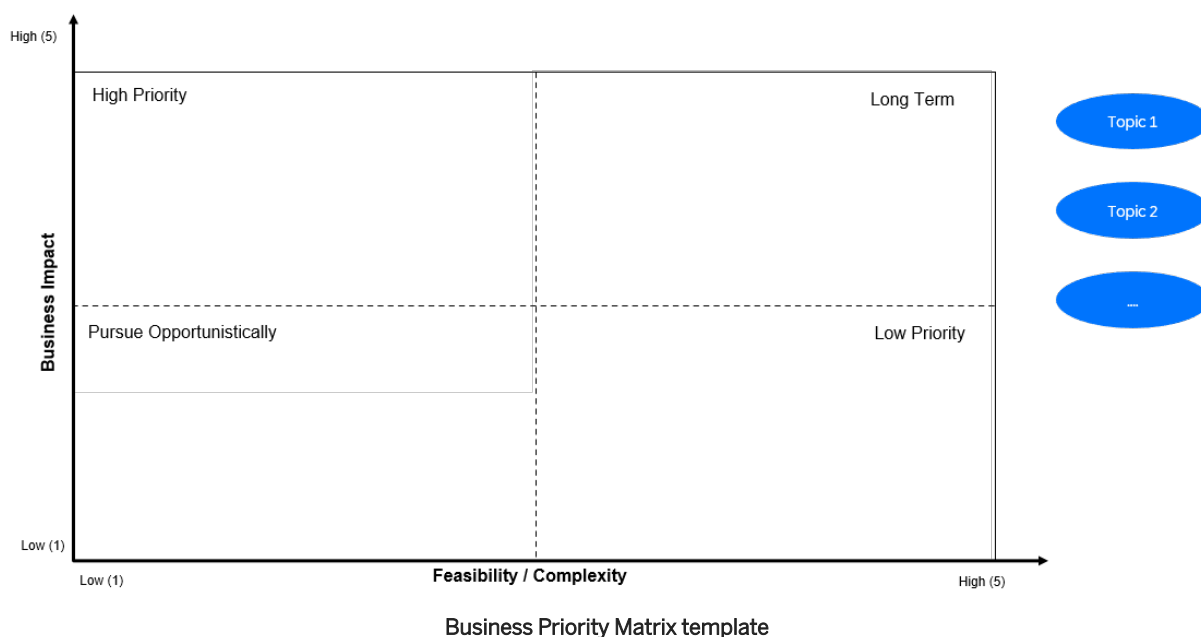
No matter which approach you take, start by compiling a list of issues and prioritize those with the greatest impact. To aid in this process, use a business priority matrix, which evaluates issues across the following dimensions:

- **Complexity:** The difficulty and extent of implementing the solution
- **Business Impact:** The potential benefit the solution brings to the business

Position each issue within the matrix to aid in prioritization. Functional areas, together with relevant company representatives, should handle this process.

→ Recommendation

When analyzing multiple Lines of Business (LoBs), consolidate the top two to three key issues from each LoB into a matrix. This approach helps prioritize and determine the overall order in which these issues are addressed.



Definition of quadrant:

- **High Priority:** Schedule implementation immediately.
- **Long Term:** Plan and organize realization carefully, potentially as a separate work package or project.
- **Pursue Opportunistically:** Implement during an appropriate improvement cycle of the affected IT solutions.
- **Low Priority:** Defer for future evaluation.

After prioritizing the issues, group them and translate them into business outcomes for further investigation in the subsequent phases of target architecture development.

Caution

Depending on the scope of investigation, such an analysis can become rather extensive. Especially, when covering multiple Lines of Business (LoBs), business units, or countries. Therefore, extensive investigations need to be thoroughly planned.

Procedure

- Collaborate with relevant IT and business stakeholders to identify and prioritize enhancement potential and opportunities for enhancing business data-driven decision-making and business results.
- Identify and define business outcomes based on results.
- Validate the scope, timeline, and stakeholder alignment as outlined in the Statement of Work.

Deliverables

- Business Priority Matrix with prioritized issues
- List of business outcomes as baseline for next phase

Related Information

[Download the templates](#) 

2.2 Phase II: Business Outcomes & Solution Requirements

Phase II aligns data-driven business outcomes with strategic objectives, exploring use cases to transform raw data into actionable insights while ensuring the architecture supports both business and technical needs.

Phase II focuses on aligning data-driven business outcomes with strategic objectives to ensure measurable and impactful results. It emphasizes a comprehensive approach to understanding how data can be leveraged to create value for the organization.

In this phase, use cases are explored to illustrate the journey of data from its source to the delivery of business value. These use cases highlight the necessary steps, key actors, and specific requirements involved in transforming raw data into actionable insights.

The phase culminates with a clear view of how the architecture will support these outcomes, ensuring the solution addresses both business and technical needs.



- [\[page 16\]](#)
- [\[page 19\]](#)
- [\[page 22\]](#)

Related Information

[Step 1: Business Outcome Definition \[page 17\]](#)

[Step 2: Data Product & Use-Case Analysis \[page 19\]](#)

[Step 3: Solution Context Consolidation \[page 22\]](#)

[Download the templates for the Data & Analytics Advisory Methodology - Phase II](#) 📄

2.2.1 Step 1: Business Outcome Definition

In this step, a data-driven business outcome is defined along with its value and strategic relevance, as well as related business use cases that illustrate how these results will be achieved.

Context

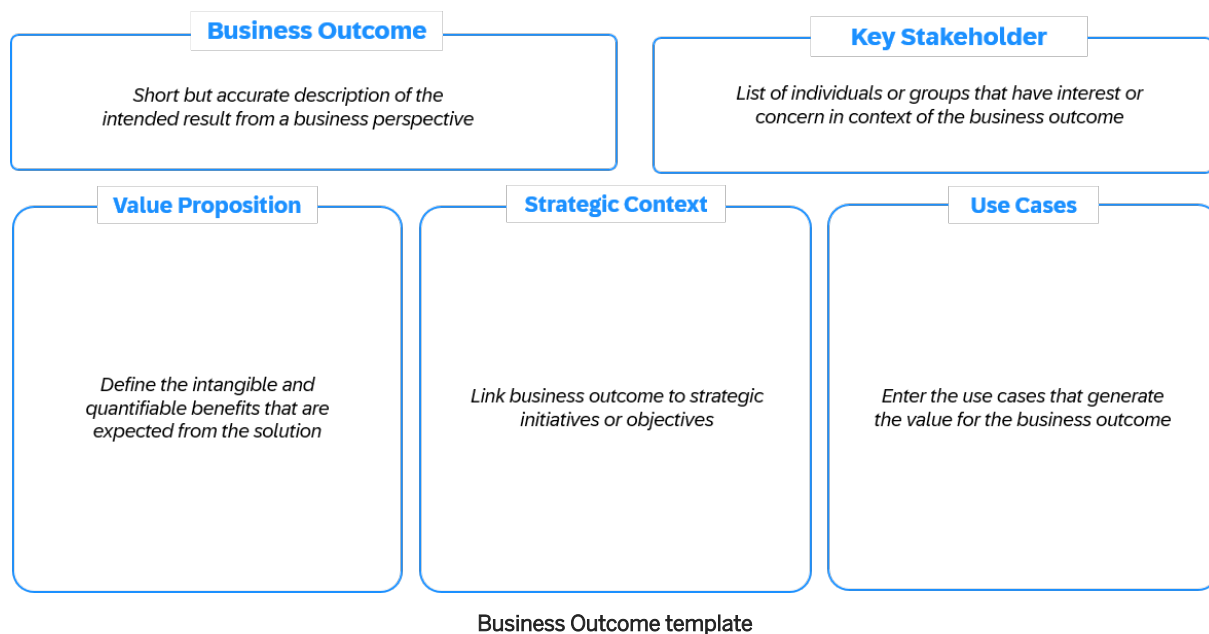
A **business outcome** is defined as a business-centric, specific, and measurable target action taken in response to a business direction or disruption. It represents an achieved end state that can be verified through measurable results. The guiding questions are: *what* needs to be achieved and *why*. The definition should be brief and concise, capturing the key aspects in one or two sentences.

In this context, adapt the term to data-driven business outcomes, where the measurable actions focus on processing and analyzing data.

A business outcome offers a **value proposition**—an intangible yet quantifiable benefit expected from the solution or result. It must also align with strategic initiatives or objectives (**strategic context**), derived from the business strategy or, ideally, from a data strategy that outlines key objectives and guidelines. It is essential to understand how a data-driven business outcome fits into the strategy and contributes to achieving the goals. Both the value proposition and strategic context clarify why the business outcome is necessary and important.

Additionally, identify the **key stakeholders** who will benefit from the business outcome and those must be involved in achieving it.

Finally, list the associated **business use cases** that detail how the results will be achieved. Use cases are crucial for deriving the business, data, and technical requirements necessary for architecture development.



→ Recommendation

If you identify multiple business outcomes, iterate each one through the architecture development cycle (phases II and III), analyzing the related use cases. In the first iteration, develop and validate an initial version of the solution architecture against other business outcomes and use cases. Remember, each business outcome or use case may involve different business and IT stakeholders.

A well-defined business outcome serves as the key reference for the subsequent analysis. Ensure that this artifact is aligned with and approved by both the business owner and the sponsor of the investigation.

Procedure

- Concretely define data-driven business outcomes by highlighting their intrinsic value and relevance.
- Establish clear connections between business outcomes and strategic objectives, emphasizing their contribution to overall success.
- Identify illustrative use cases that exemplify the creation of value through data-driven approaches.

Deliverables

- Detailed Business Outcome descriptions

Related Information

[Download the template](#)

2.2.2 Step 2: Data Product & Use-Case Analysis

Analyze each use case in detail to derive business and IT requirements, focusing on the end-to-end process, stakeholder involvement, systems and technology utilized, and stakeholder expectations.

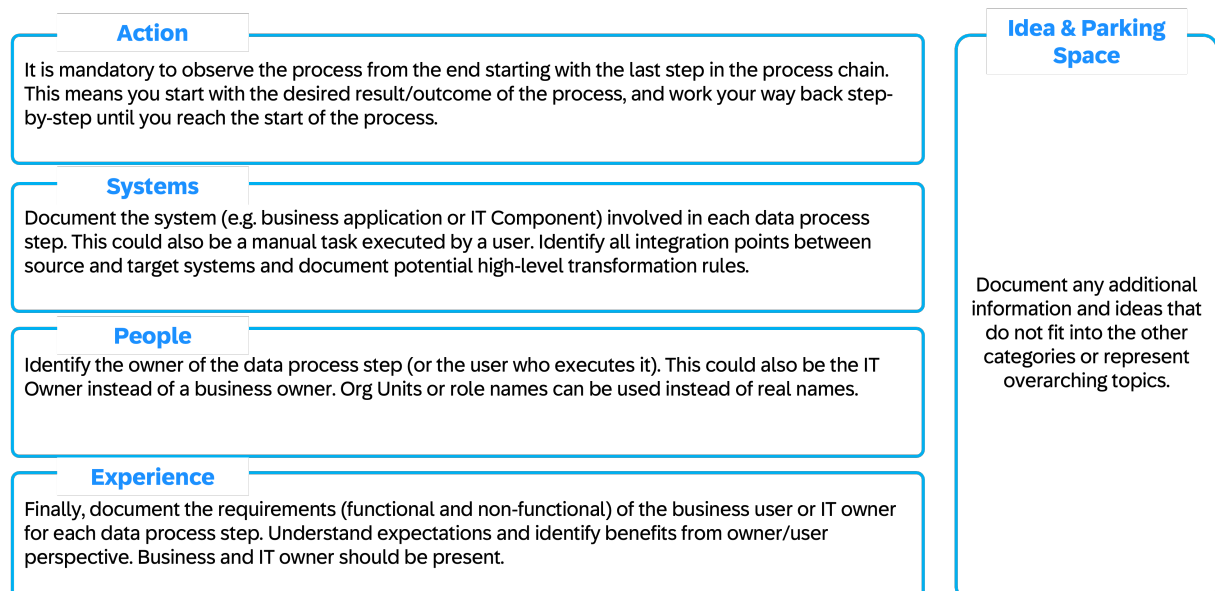
Context

This step provides an in-depth analysis of the business use cases defined for the specified business outcome.

For each use case, provide detailed information on the following aspects:

- **E2E Process (WHAT):** Describe the end-to-end process from source data to value creation.
- **Stakeholders (WHO):** Identify the IT and business stakeholders involved in the process.
- **Systems and Technology (HOW):** Outline the systems, technology, and data utilized.
- **Stakeholder Expectations (WHY):** Clarify the expectations of stakeholders regarding improved experiences.

To conduct this analysis effectively, use the **data journey map**. This tool, which includes four pillars (action, system, people, experience), allows you to document the use-case content in a workshop setting.



Data Journey Map template

Start the approach by analyzing the end-to-end process from the final step, where data consumers create the expected outcome. Next, define the preceding step and discuss the roles, systems, technology, and data required for that step. Repeat this process until you trace back to the data source.

❖ Example

When you deliver a sales dashboard, it is crucial to first understand how it will be used and the specific benefits it will provide to the sales organization. Clarifying these expectations ensures that everyone involved understands the dashboard's purpose, allowing you to clearly define the content needed for its delivery. Before this, discuss the organization of the dashboard and how key figures will be calculated. This process continues step-by-step, tracing back to the source of the required data, such as sales information from an ERP or CRM system.

In a side panel (idea & parking space), document any additional overarching requirements, constraints, or relevant aspects of the use case. For example, security requirements, performance constraints, or key characteristics necessary for architecture definition.

Another critical aspect of the use-case analysis is identifying the required data for defining **data products** in the final step of this phase. A data product is a controlled data set provided by a data domain, consisting of data, metadata, and standard APIs for access.

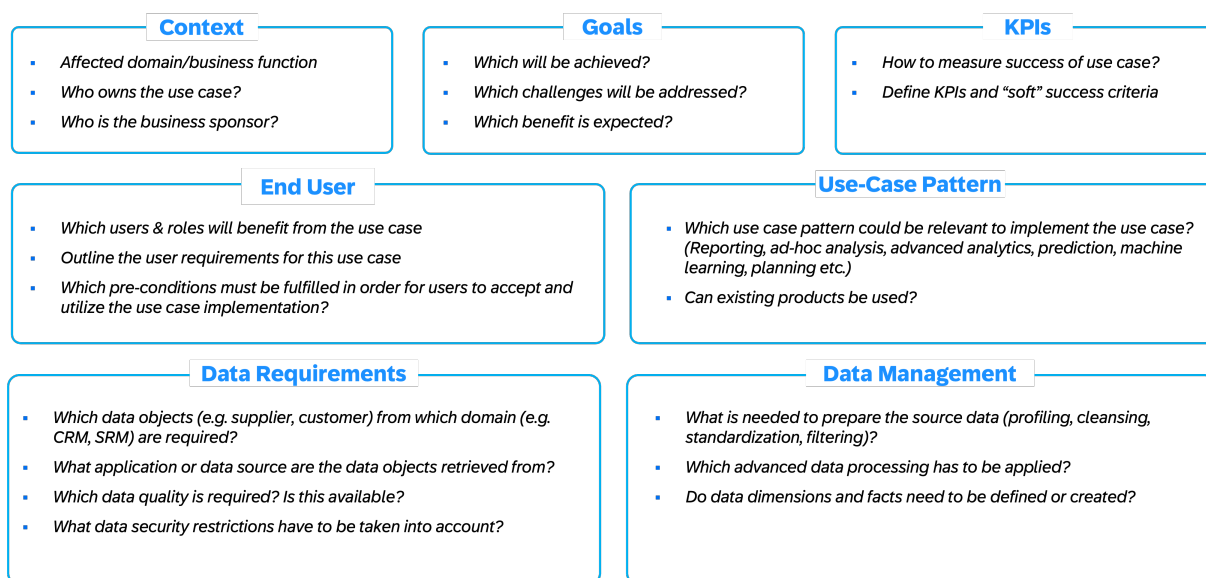
Define data products sufficiently to support the development of the target architecture. At this stage, document the **end-to-end data integration flow** from source to target, including important transformation requirements (inbound and outbound), to ensure that IT solutions for data integration, transformation, or orchestration are considered in the target architecture.

Typically, you develop the data journey map for the business use case in a workshop setting. This workshop involves business and IT representatives who have a stake in the use cases, and the discussions will reflect the desired future scenario for the use case.

→ Recommendation

Involve relevant stakeholders from business and IT when analyzing the use cases. It is important that everyone understands the business needs of the outcome and how to create the expected result. It also helps to align the required data entities that feed the data products from a business perspective and document this in the end-to-end data integration flow.

In the final step of the use-case analysis, consolidate the major aspects of the use case into a **use- case canvas**. This canvas organizes the results of the data journey map into distinct areas. At this stage, you can determine whether the use case aligns with a specific use-case category or pattern, as defined by SAP-centric reference architectures. Identifying these alignments can expedite the solution architecture definition process conducted in Phase III.



Use-Case Canvas template

Procedure

- Business stakeholder provides an introduction to the use case, illustrating their relevance and value in the context of real-world scenarios.
- Trace the entire life-cycle of value creation from the end result back to the underlying data sources, transforming abstract concepts into tangible processes.
- High-level definition of data product requirements and considerations to ensure they align with business needs.
- Optional: Detailed analysis of data products, their structure and data transformation requirements.

Deliverable

- Data Journey Map
- Use-Case Canvas
- Optional: Data Product Requirements Definition

Related Information

[Download the templates](#) 

2.2.3 Step 3: Solution Context Consolidation

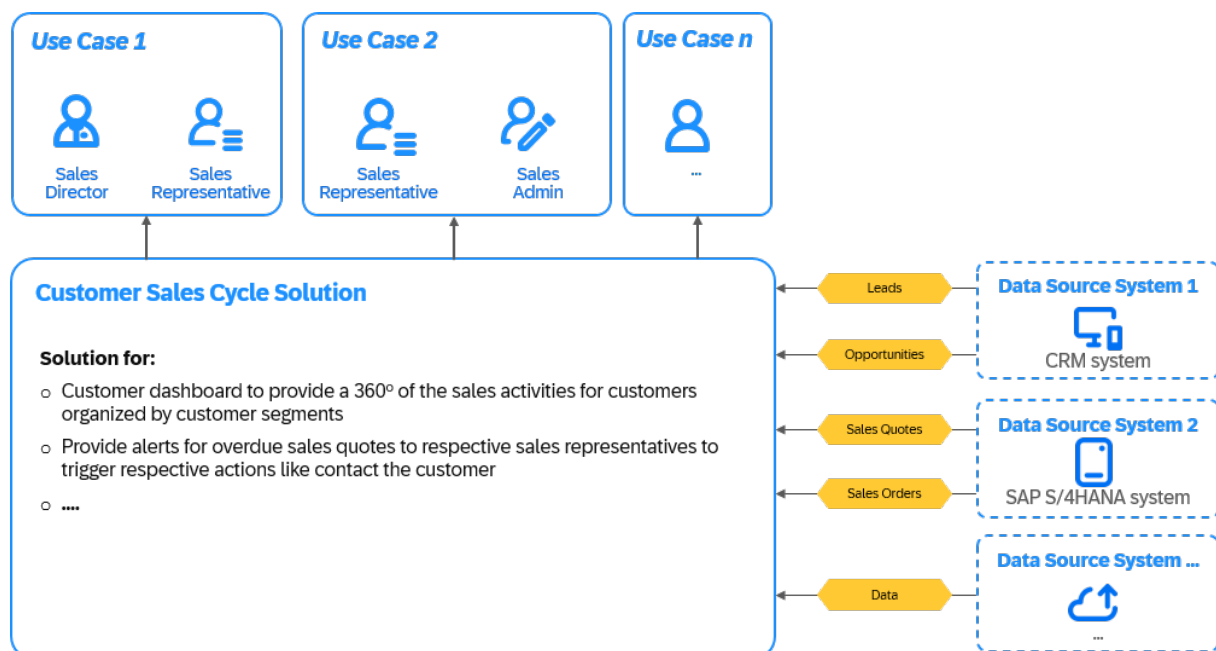
Consolidate the business and data requirements by creating solution context and end-to-end data integration flow diagrams to illustrate the solution's relationship with organizational units and the data movements from source to consumption.

Context

In the final step, consolidate the business and data requirements and place the solution within the organizational context. Use two types of diagrams for this purpose: the solution context diagram and the end-to-end data integration flow diagram.

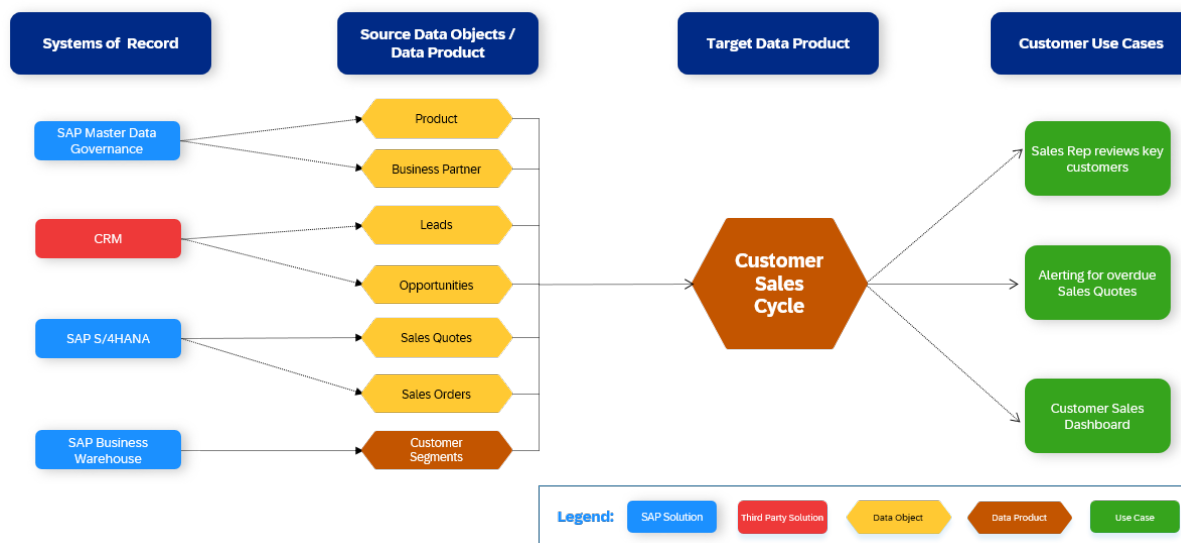
The **solution context diagram** illustrates the relationship between the intended solution and the organizational units, business roles, and business functions within the enterprise. Follow these three steps to create this diagram:

1. List the main solution requirements and capabilities identified in the previous steps in a central box, focusing on key aspects only.
2. Outline the data sources and the required data.
3. Reflect all business roles and related functions that will utilize the solution. This approach helps you understand how solution components align with organizational units performing business functions and identify additional requirements in areas such as usability, security, and support.



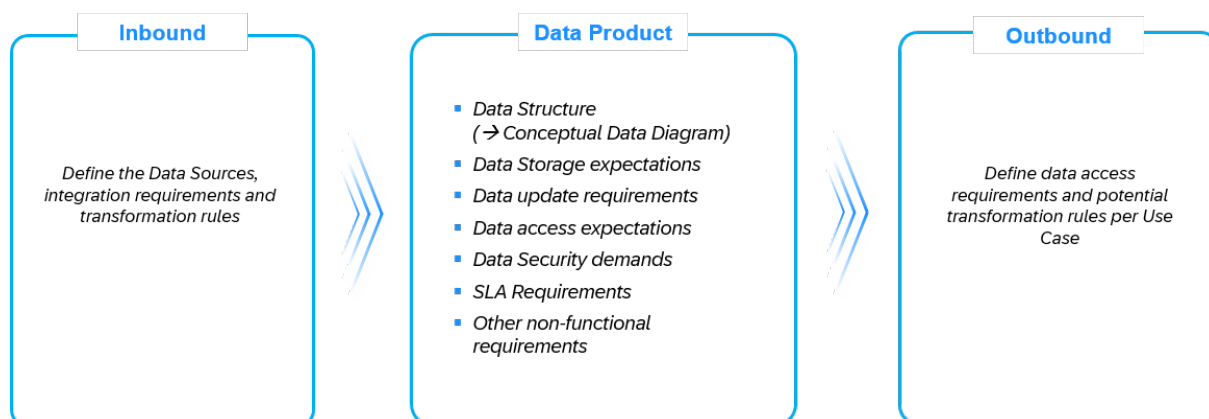
Solution Context Diagram template

Use an **end-to-end data integration flow diagram** to consolidate the data movements of the analyzed use cases from source to consumption. This diagram should reflect the source systems, data objects, and data products consumed by the use cases.



Data Integration Flow Diagram template

If necessary, analyze the data products in greater detail by creating inbound and outbound data product definitions or by applying data modeling techniques, such as the Entity Relationship Model.

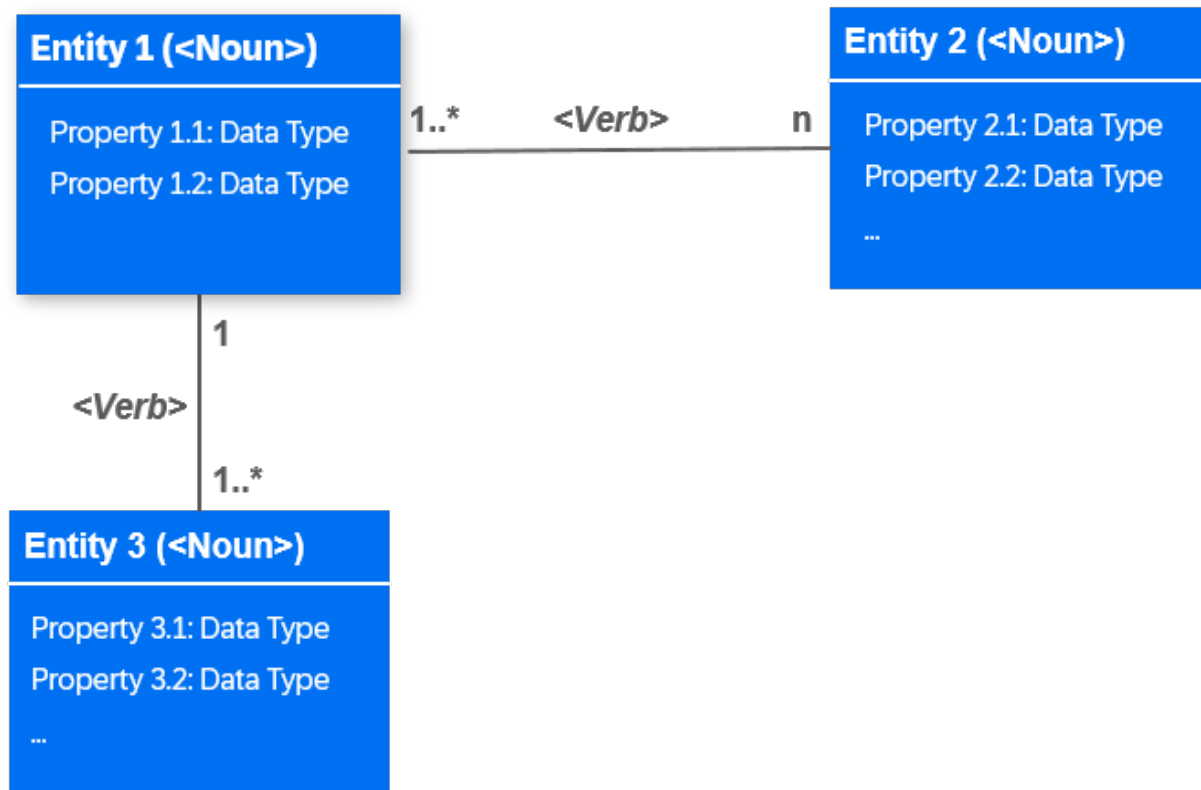


Inbound and outbound data product definitions template

One data modeling technique is to create a conceptual data diagram, which illustrates the relationships between data and business entities within the proposed solution. This diagram functions similarly to an Entity-Relationship diagram, depicting and describing the information processed by the solution.

To create a conceptual data diagram, follow these steps:

1. **Define Entities:** Identify the information objects (entities) processed by the Solution Building Blocks and understand the flow of information between these blocks.
2. **Define Attributes:** Add details to the identified entities by specifying attributes or properties, including their data types.
3. **Define Relationships:** Identify and illustrate the relationships between the various entities.



Entity Relationship Model template

However, this is usually not necessary for defining a solution architecture. Instead, such analysis is typically carried out during the detailed design phase, following the approval of the final solution architecture.

Procedure

- Integrate and align business requirements and capabilities within a unified solution context.
- Detail the specifics of data product development, including data models, data flows, and the requirements of data consumers.
- Develop clear visualizations, such as end-to-end data integration flows, data product models, and solution context diagrams, to illustrate the structure of the solution.

Deliverables

- Solution Context Diagrams
- Data Integration Flow diagram
- Optional: Conceptual Data Diagram of data product
- Optional: Data Product Models
- Optional: Data Product Definitions

Related Information

[Download the templates](#) 

2.3 Phase III: Capability Map & Solution Architecture

Phase III transforms business and technical requirements into actionable architecture designs aligned with data and analytics needs, utilizing capability mapping to develop a flexible, scalable solution validated through proof-of-concept efforts.

Phase III is centered on translating business and technical requirements into actionable architecture designs that align with the organization's data and analytics needs.

This phase uses business capability mapping to ensure that essential capabilities are selected and integrated into a comprehensive solution architecture. By exploring various architectural options and considering alternative solutions or integration scenarios, this phase aims to develop a flexible and scalable design.

The detailed architecture serves as a foundation for implementation, allowing for further validation through proof-of-concept efforts to confirm its alignment with business objectives and technical feasibility.



- [\[page 26\]](#)
- [\[page 29\]](#)
- [\[page 32\]](#)

Related Information

[Step 1: Capability Analysis & Solution Concept \[page 26\]](#)

[Step 2: Develop Architecture Options \[page 29\]](#)

[Step 3: Validate & Finalize Target Architecture \[page 32\]](#)

[Download the templates for the Data & Analytics Advisory Methodology - Phase III](#) 

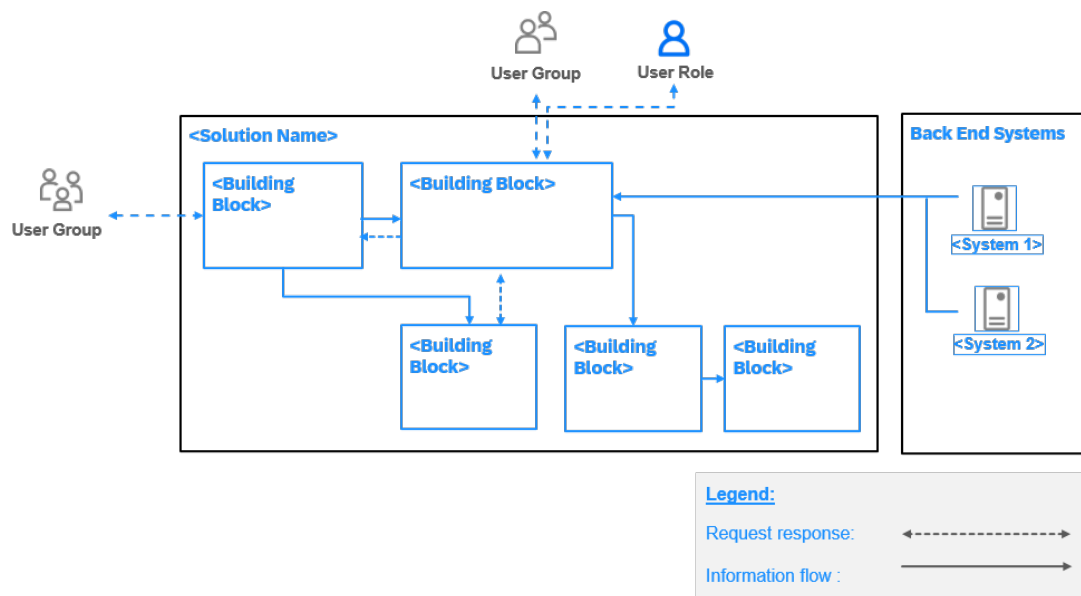
[Data & Analytics Capability Model \[page 45\]](#)

2.3.1 Step 1: Capability Analysis & Solution Concept

Develop a solution concept diagram to outline the key architecture building blocks and conduct a capability analysis to identify and map essential data and analytics capabilities to appropriate technology solutions.

Context

In this step, you develop a solution concept diagram to outline the key architecture building blocks to provide a clear, high-level view of the system's components and their interactions. These building blocks often include data sources, integration tools, storage solutions, analytics platforms, governance mechanisms, and business intelligence systems. This conceptual architecture is the baseline for the following activities where each architecture building block is replaced by IT solutions to build the final solution architecture.



Solution Concept Diagram Template

As part of the step, you conduct a **capability analysis** to identify the essential data and analytics capabilities relevant to your organization. Assess their maturity and availability to create a target solution map based on this analysis.

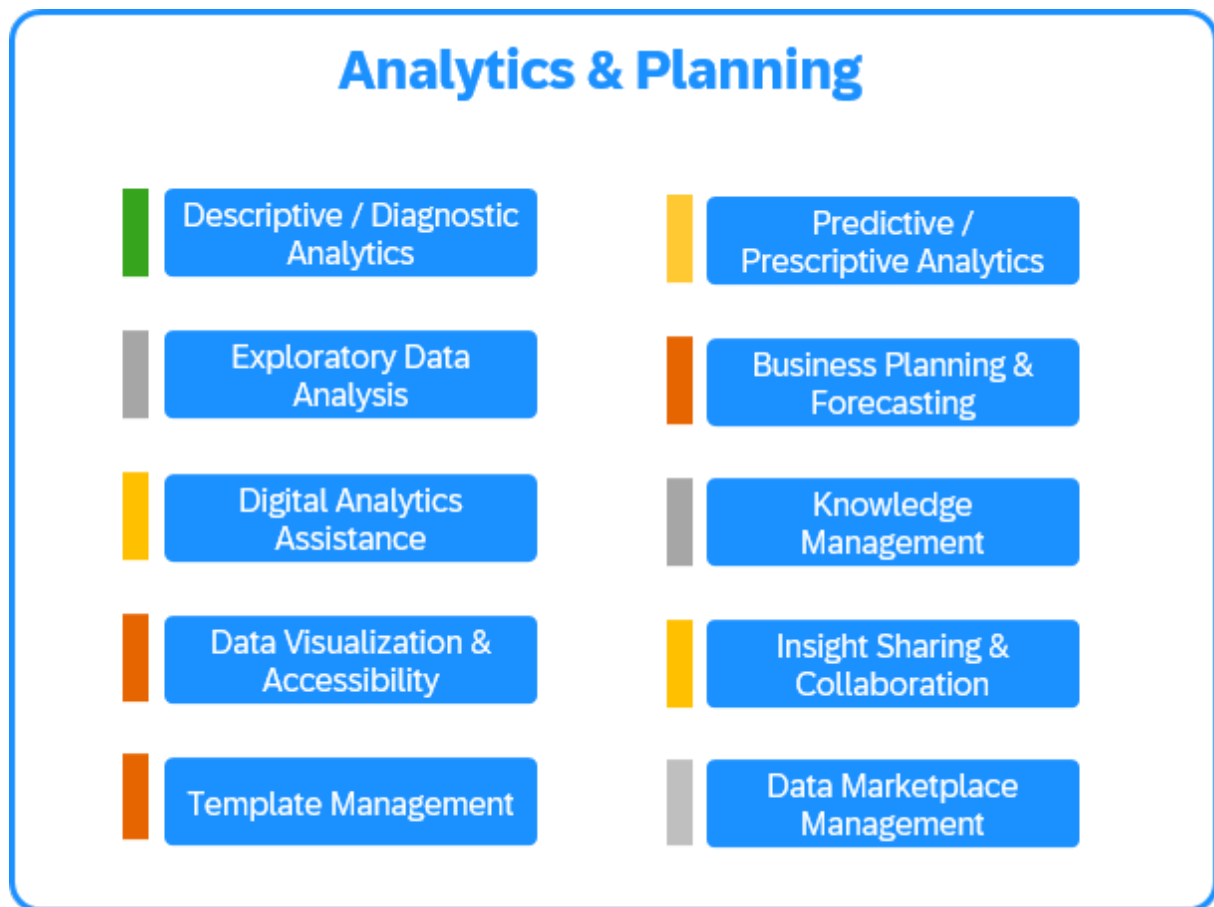
When selecting capabilities, you choose to either leverage the SAP Data & Analytics Capability Model or rely on your own framework. To perform the capability analysis, use one of the following approaches:

1. **Architect-Led Approach:** The (enterprise) architect identifies the relevant capabilities based on the requirements discussed in Phase II. This capability map is then validated with the relevant stakeholders.
2. **Stakeholder-Led Approach:** Gather relevant stakeholders to discuss and define the required capabilities. Use the Data & Analytics Capability Model domains as a reference to map these capabilities.

Once you have selected the capabilities, assess their availability and maturity, while ensuring they align with the business and technical requirements you gathered. Use the following rating system to evaluate them:

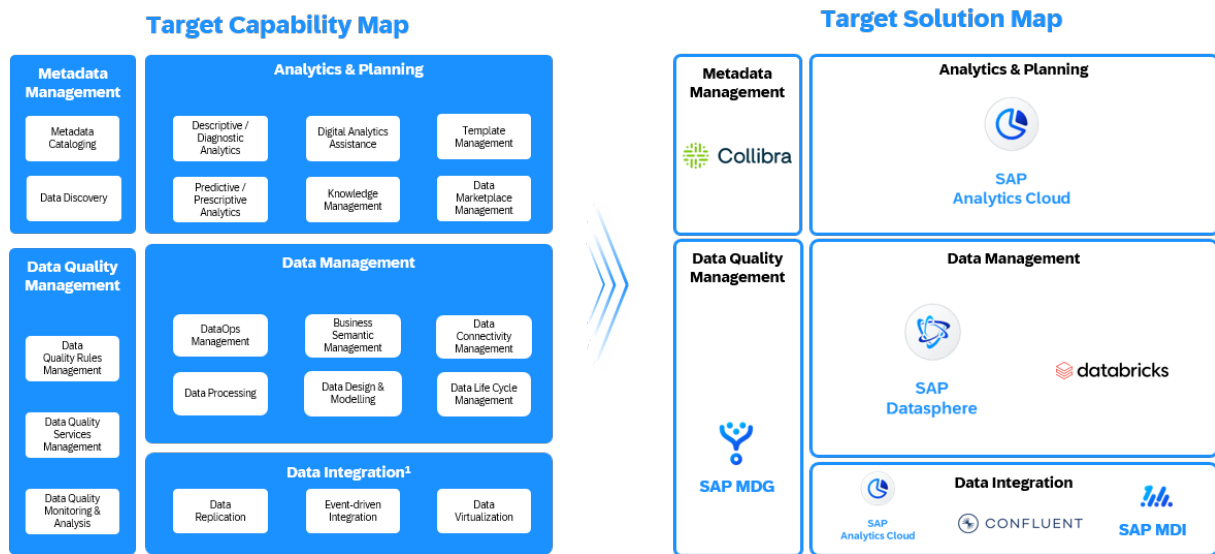
- Required but not available ("Yellow")
- Required and available ("Green")

- Required, available but pain point (“Red”)
- Out of scope (“Grey”)



Example of a Capability Analysis

Use the resulting capability map to identify suitable standard software solutions from SAP or other vendors. If no standard solution is available, consider developing a custom solution. This process results in a solution map, which serves as the foundation for developing the solution architecture in the subsequent steps.



Example of Target Capability Map and Target Solution Map

Procedure

- Develop a solution concept diagram for a clear and high-level view of the system components and their interaction.
- Evaluate the Data and Analytics Capability Model to identify the technical capabilities critical to translating use-cases into tangible results.
- Map identified capabilities to suitable technology solutions, constructing a comprehensive solution map.

Deliverables

- Solution Concept Diagram
- Target Capability Map
- Elaborated Solution Map showcasing the alignment of capabilities with technology solutions

Related Information

[Download the templates](#)

[Data & Analytics Capability Model \[page 45\]](#)

2.3.2 Step 2: Develop Architecture Options

In this step, you develop architecture options by mapping identified solutions to relevant building blocks using the Solution Map and Concept, or by leveraging existing Data and Analytics Use-Case Patterns and SAP BTP Reference Architectures, followed by a thorough evaluation based on established criteria.

Context

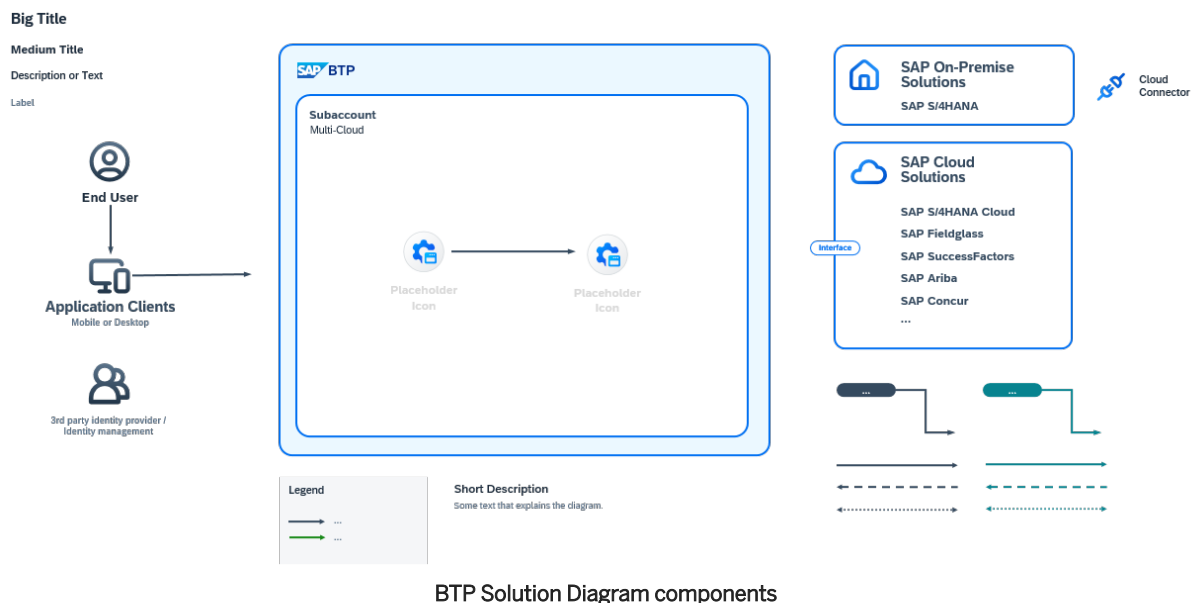
In this step, you develop architecture options based on your expectations and previously gained insights. For this process, you have two possible approaches:

Develop architecture options based on the Solution Map and Concept:

You use the Solution Concept and Target Solution Map to map the identified solutions to the relevant building blocks.

The first approach expands on the Solution Concept and Target Solution Map, aligning the identified solutions with the relevant building blocks to develop your architecture options.

SAP offers a standard solution architecture notation within the BTP Solution Diagram Repository. This notation is used to convey and represent solution architectures in platforms like the SAP Discovery Center or SAP LeanIX. The repository contains all the essential resources for creating a standardized BTP Solution Diagram, including diagram components, guidelines, and more.

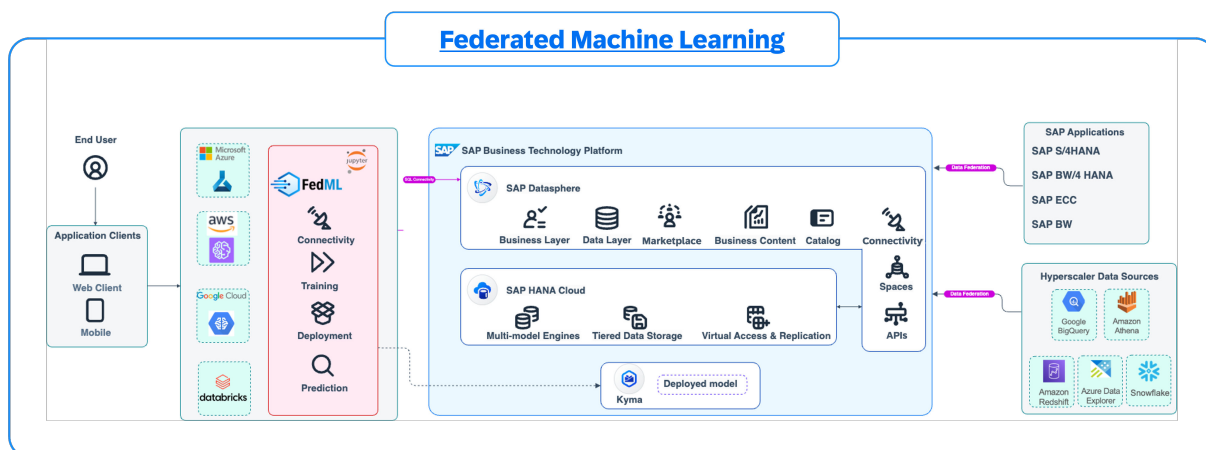


This repository provides you a foundation for developing architecture options, but you are not restricted to using this notation. You can apply any other architecture notation to create your architecture options. What's essential is that all aspects of the solution concept and product map are represented in the solution architecture.

Using Existing Data and Analytics Use-Case Patterns

In the second approach, you review the Data and Analytics Use-Case Patterns provided by the methodology, along with the related SAP BTP Reference Architectures, available in the SAP Discovery Center. When you

encounter matching or similar use cases, you can use these Reference Architectures as a foundation, adjusting them to meet your identified needs. This expedites the architecture development process and ensures alignment with the BTP Solution Diagram notation.



Example of an architecture option

SAP BTP Reference Architectures are also represented as SAP BTP Solution Diagrams. You can download and customize SAP BTP reference architecture solution diagrams using tools such as draw.io.

Once you have developed several architecture options, you evaluate them.

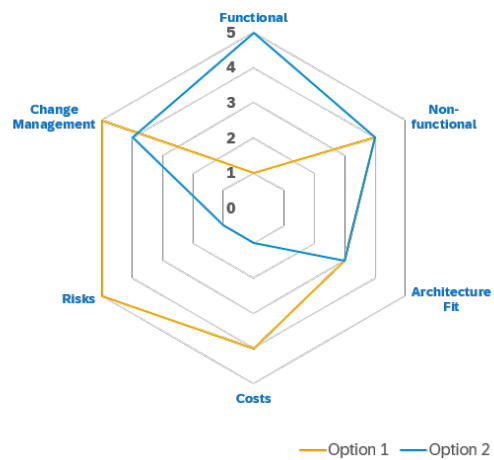
The methodology includes a quantitative approach to assess and evaluate the identified architecture options, helping you make an informed recommendation for decision-making.

Establish relevant assessment criteria and apply a scoring metric from 1 to 5, with 5 representing the best fit. You can enrich this approach by incorporating qualitative factors for a more thorough evaluation.

Based on your objectives, consider the following common drivers when assessing architecture options:

- **Best of Breed vs. Best of Suite:** Choose between solutions from various providers or a single provider offering an integrated suite.
- **Different Solution Options:** Evaluate various options for a capability or architecture building block.
- **Data Integration Methods:** Assess options such as data virtualization or data replication, considering performance requirements.
- **Implementation Approaches:** Decide between a big bang implementation or a phased approach to the target architecture.
- **Architecture Complexity:** Consider the complexity of the architecture.
- **Assumptions:** Evaluate factors related to resources, timelines, and other assumptions.
- **Costs and Risks:** Analyze cost implications and risk factors.
- **Change Impact:** Evaluate the impact on change management, data governance, and literacy competencies.
- **Build vs. Buy:** Decide whether to build a custom solution or buy a ready-made product.

Criteria	Option 1 Score	Option 2 Score
Functional coverage	1	5
Non-Functional Coverage (Performance, Availability)	3	4
Architecture Fit	3	3
Cost	4	2
Risks	5	1
Change Mgmt.	4	4
Overall rating	3,66	3,00



Example of architecture option assessment

Procedure

- Assess applicability of reference architectures for their compatibility with the identified use cases.
- Develop multiple architecture options, based on relevant business and technical drivers.
- Evaluate the different architecture options, detailing the trade-offs, strengths, and limitations of each.

Deliverables

- Architecture Options
- Assessment of architecture options

Related Information

[Download the templates](#) 

[Data & Analytics Use-Case Categories & Patterns \[page 61\]](#)

[SAP Discovery Center](#) 

[BTP Solution Diagram Repository](#) 

[Draw.io](#) 

2.3.3 Step 3: Validate & Finalize Target Architecture

Validate the preferred architecture option through a proof-of-concept (PoC), a basic prototype that demonstrates its feasibility by testing relevant BTP services.

Context

It is advisable to validate the preferred architecture option by conducting a proof-of-concept (PoC). A PoC is a basic prototype of the target architecture developed to demonstrate its feasibility.

For SAP BTP-centric architectures, you can efficiently test the most relevant BTP services by subscribing to them (many of them are available for free or at a reduced cost). Refer to the Mission Catalog in the SAP Discovery Center for guidance. Missions represent use-cases that you can implement on the SAP Business Technology Platform. They offer step-by-step instructions and support from subject matter experts and the SAP community.

The methodology includes the following steps for the PoC process:

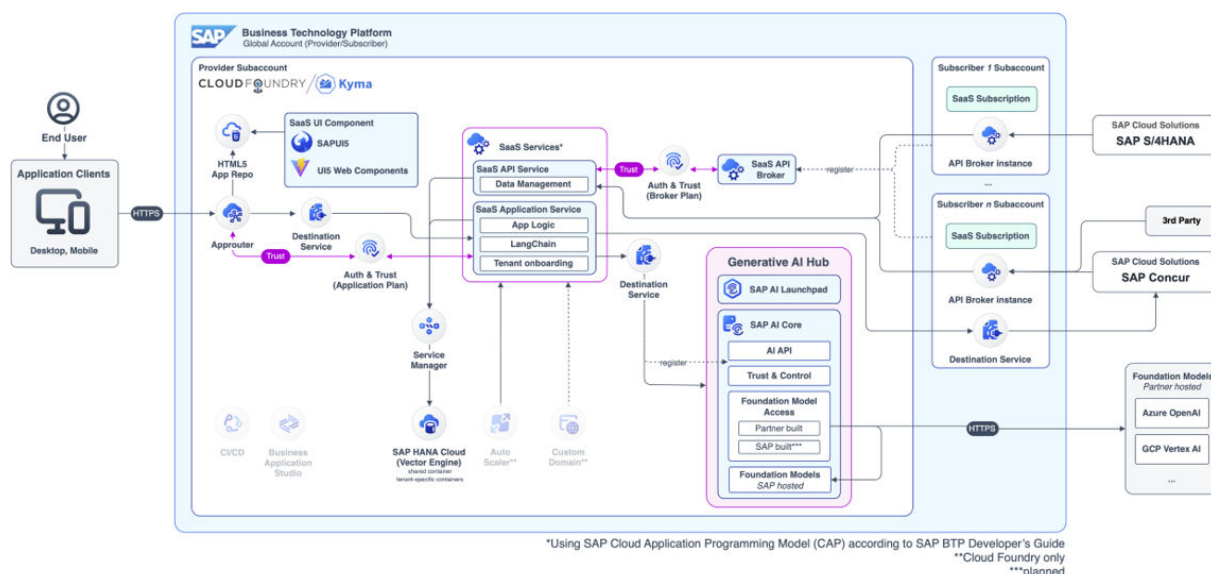
1. **Set Targets and Define Questions:** Clearly outline the objectives and questions the PoC aims to address.
2. **Plan the Proof of Concept:** Develop a detailed plan for the PoC, including timelines and resource requirements.
3. **Build and Test the PoC Solution:** Create and test the PoC to validate its feasibility.
4. **Review and Document Results:** Analyze the results and document findings for evaluation.
5. **Decide on Next Steps:** Make a go/no-go decision based on the PoC's results.

Depending on your validation, you need to further detail the architecture to reflect all components necessary for implementation planning. Use either the SAP BTP Solution Diagram notation or the standard architecture drawing approach utilized within your organization.

A solution architecture diagram outlines your target architecture by breaking it into applications and functional components based on solution building blocks (SBB). The purpose of this diagram is to introduce solution components and add technical details that serve as a baseline for the implementation phase.

- **Create Solution Building Blocks:** Map vendor-specific solution building blocks to architecture building blocks.
- **Technical Integration:** Identify dependencies between solution building blocks and include technical integration aspects.
- **Add Users & Application Clients:** Incorporate users, roles, and their application clients, such as desktop and mobile.

The following diagram illustrates an example of an SAP solution architecture diagram:



Example of an SAP solution architecture diagram

In the diagram, the blue area represents the SAP BTP-related solution components and services. These are organized into account structures (global/local accounts) and runtime environments (Kyma, Cloud Foundry, or ABAP Cloud) as structural elements.

Outside the BTP area, you will find end users and application clients accessing the BTP services. On the other side, you have the required source systems, such as SaaS and on-premise applications or data stores. Technical integration details can also be documented.

The level of technical detail should align with stakeholder needs and future implementation plans.

Procedure

- Integrate the insights obtained from architecture assessments, capability mappings, and technology alignments to create a cohesive target customer solution architecture.
- Confirm the viability and alignment of the proposed architecture with business goals by conducting a proof-of-concept or pilot projects.

Deliverables

- Pilot project or Proof-of-Concept
- Target Solution Architecture

Related information

[SAP Discovery Center](#) 

[BTP Solution Diagram Repository](#) 

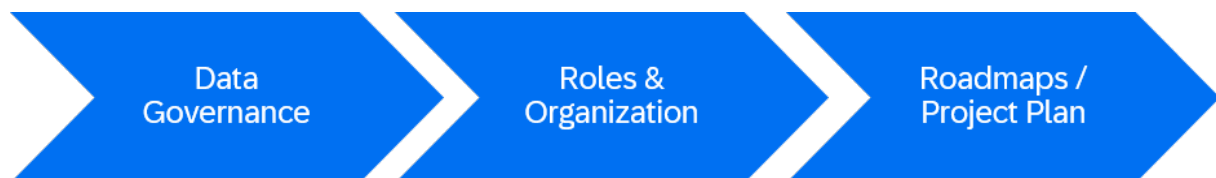
[BTP Solution Diagram](#) 

2.4 Phase IV: Data Governance & Roadmaps

You conduct a high-level maturity assessment to evaluate data governance needs and develop a strategic roadmap for implementing necessary organizational changes to support the target solution architecture.

In Phase IV, you perform a high-level Data and Analytics Maturity Assessment to evaluate the need for action regarding data governance, roles, and organizational structure. Effective data and analytics practices require established data governance processes, policies, key roles, and competencies within the organization. This phase includes a review of data governance topics to identify gaps that may limit the architecture's ability to deliver value.

To implement the target solution architecture and manage related organizational changes, you develop a list of necessary activities and initiatives, along with roadmaps or high-level project plans. Strategically planning these activities ensures responsible data management and supports the implementation of the architecture in an environment that achieves the desired business outcomes.



- [\[page 35\]](#)
- [\[page 39\]](#)
- [\[page 43\]](#)

Related Information

[Step 1: Data Governance \[page 35\]](#)

[Step 2: Roles & Organization \[page 39\]](#)

[Step 3: Roadmaps / Project Plan \[page 43\]](#)

[Download the templates for the Data & Analytics Advisory Methodology - Phase IV](#) 

[Data & Analytics Maturity Assessment \[page 57\]](#)

2.4.1 Step 1: Data Governance

Conduct a comprehensive Data Governance Maturity Assessment to evaluate the effectiveness of data management practices, identify gaps, and develop an action plan to enhance governance processes, roles, and accountability within the organization.

Context

Data governance is a framework designed to manage data effectively by establishing rules, processes, and accountabilities. It treats data as a product, ensuring that it meets specific standards and delivers value to both internal and external stakeholders. When managed as such, it is referred to as a "data product."

Key Components of Data Governance:

- **Rules:** Establish standards, policies, and guidelines foundational to data management.
- **Processes:** Facilitate data management and decision-making on relevant topics.
- **Roles & Accountability:** Define responsibilities and decision rights for data management.

Managing data as a product involves ensuring its availability, usability, security, and integrity to maximize business value.

Data governance can be organized around various subject areas and goals.

Typical **goals** for data initiatives include:

- Securing data
- Ensuring compliance with regulations and data privacy laws
- Improving data quality
- Eliminating inconsistent data silos
- Enhancing trust in data
- Supporting better decision-making
- Building standard, repeatable processes
- Reducing costs and increasing effectiveness through coordinated efforts

Examples of Data Governance Focus Areas:

- Data Strategy
- Policies and Standards
- Data Quality
- Privacy, Compliance, and Security
- Architecture and Integration
- Architecture Archetypes such as Data Warehouse, Data Mesh/Fabric, Lakehouse, and so on
- Master Data Management
- Metadata Management
- Management Support

Ultimately, data governance aims to ensure that the right data reaches the right person at the right time, maintaining the expected quality to support informed decision-making and drive business outcomes.

In the first part of the maturity assessment, you analyze several focus areas to ensure a comprehensive evaluation:

1. **Data Strategy:** Establish data and analytics as core competencies.
2. **Assess KPIs:** Track the execution of the data strategy and evaluate data quality.
3. **Examine Data Architecture:** Ensure a common understanding of data.
4. **Review Processes:** Guarantee data quality and the delivery of tailored reporting, analytics, and business AI solutions.

Data & Analytics dimensions - Part 1

Dimensions	Description	Focus topics
Data Strategy	A data strategy provides direction on the journey to becoming more data-driven and outlines why and how data can contribute to reach strategic objectives. The business change for becoming data-driven requires an increase in data literacy, which means that people understand the value of data better and act accordingly.	• Data Strategy Management • Data Literacy For more information, see Glossary. [page 59]
Data & KPIs	Efficient digital business processes and fact-based decision-making require good quality of data, especially for master data. Relevant KPI's help to measure the progress towards data that is fit-for-purpose. Data quality KPI's should be integrated in an overall data governance KPI model that ensures that the organization clearly sets out measurable goals to fulfill its data strategy.	• Data Quality • KPI Management For more information, see Glossary. [page 59]
Data Architecture	Data architecture refers to the design and organization of data assets within an organization, including their structure, storage, integration, and management. One key aspect of data architecture is the structure and organization of metadata, which provides information about the data assets from a business and from a technical perspective.	• Data Dictionary & Logical Data Model • Data Model & Technical Metadata For more information, see Glossary. [page 60]

Dimensions	Description	Focus topics
Processes	Clean data requires two different processes: get clean, where incorrect data is made correct, and stay clean, where (master) data in specific is created and changed correctly. Solid processes should also be in place to ensure that data is used efficiently for quality KPI reporting, analytics and AI use cases that create business outcomes.	• Get clean process • Stay clean process • Analytics process • Business AI process For more information, see Glossary. [page 60]

Legend: A Current maturity B Required maturity	Initial Reactive Active Pro-Active Autonomous
Focus topic 1	
Focus topic 2	
Focus topic 3	
Focus topic 4	
Focus topic 5	
Focus topic 6	

Data & Analytics Assessment Template

Finally, consolidate the assessment results into a structured format, such as a table, documenting the following:

- **Focus Topics:** The specific areas that were assessed
- **As-Is Maturity:** The current level of maturity for each focus topic
- **To-Be Maturity:** The desired future level of maturity for each focus topic
- **Gap Closure Activities:** A description of potential actions needed to bridge the gap between the current and required maturity levels

Governance focus topic	Relevance	Maturity level (as-is)	Maturity level (to-be)	Actions to be taken	Owner	Timeline
Data strategy	Yes	Initial	Active	Develop initial data strategy	CDO	H2/2024
Data literacy	Yes	Reactive	Active	Define training plan	CDO	H1/2025
Data quality	...	...	...	...	...	...
KPI management						
Data dictionary & logical data model	Yes					
Data model & technical metadata						
Get clean process						
Stay clean process						
Analytical process						
Business AI process						
Roles						
Ownership						
Skills						
Security & Compliance						
Target Organizational Model						

Action Plan for Data & Analytics Governance Template

Procedure

- Select relevant focus topics and discuss current and required maturity levels.
- Document current and required maturity levels and analyze potential gaps.
- Agree on required actions and document them in activity plan.

Deliverables

- Data Governance Maturity Self-Assessment
- Action plan for Data & Analytics Governance

Related Information

[Download the templates](#) 

[Data & Analytics Maturity Assessment \[page 57\]](#)

2.4.2 Step 2: Roles & Organization

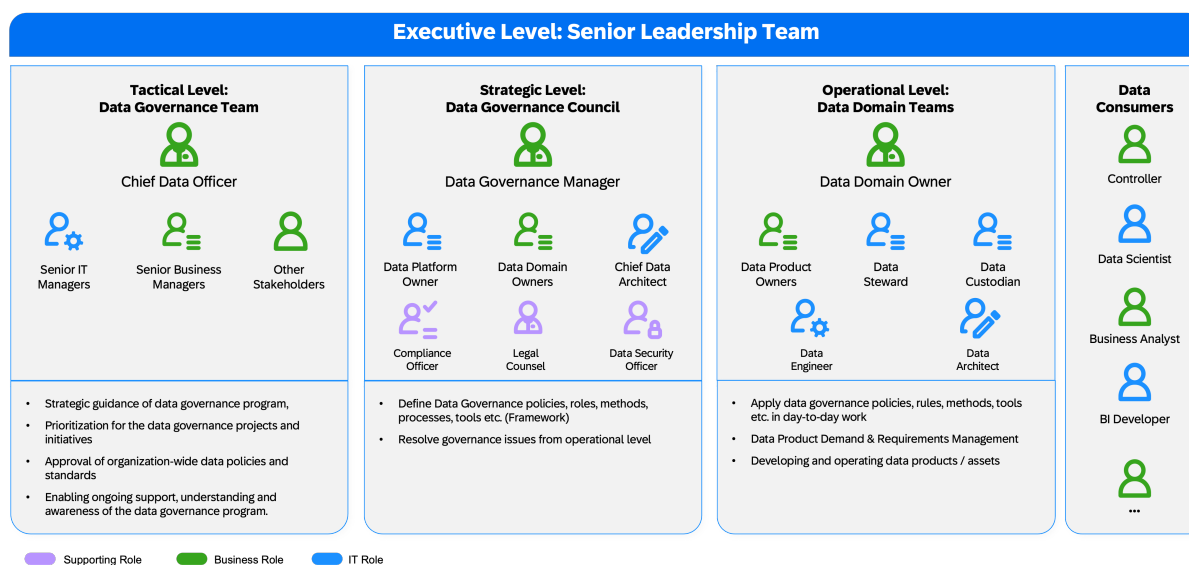
Part two of the Data and Analytics Maturity Assessment evaluates your organization's readiness in terms of roles and teams involved in data governance, identifying areas for improvement to enhance data management and governance practices.

Context

Part two of the Data and Analytics Maturity Assessment focuses on the “organization” dimension, evaluating your organization's readiness concerning roles and teams involved in data governance, and identifying areas for improvement.

In a mature, data-driven organization, data governance and management teams include various roles, each with specific responsibilities and skills.

The following illustration depicts a reference organization for data governance and management, outlining typical roles, teams, and decision boards:



Reference organization for data governance and management

The most important data governance roles are:

Data Governance responsibilities

Role	Responsibilities
Chief Data Officer	- Oversee an organization's data assets to maximize their business impact - Manage data governance, strategy, and management - Maintain data quality, security, and compliance, as well as promoting innovation and data-driven decision-making within the organization

Role	Responsibilities
Data Governance Manager	• Oversee the development and implementation of data governance policies and procedures in an organization • Manage data consistently and compliantly to meet quality and security standards • Work with stakeholders to set data governance goals, create frameworks, and oversee activities
Data Steward	• Manage and maintain data quality, integrity, and security of data assets • Create and enforce data governance policies and procedures, and ensure compliance with data regulations • Collaborate with data stakeholders to establish data management best practices
Data Domain Owner	• Manage a specific area or domain of data within an organization to ensure accuracy, integrity, security, and availability • Implement data governance and management policies, collaborate with stakeholders to set data standards, and oversee data projects • Align data management with business goals and serve as a liaison between data management and other departments
Data Platform Owner	• Oversee the development and maintenance of the organization's data platform • Define platform strategy, ensuring data quality and security, managing data governance, and ensuring platform meets business needs • Implement best practices and enable data analytics and reporting capabilities
Chief Data Architect	• Establish and lead the data architecture strategy for an organization • Create and maintain a data architecture roadmap that aligns with the organization's business goals and objectives • Work closely with business stakeholders and IT teams to ensure that data architecture supports the organization's analytical and reporting needs

These roles are integral to data governance, which is recognized as a critical responsibility within the organization. To establish and enforce data governance rules and policies effectively, it is essential to define the structure of governance boards and teams.

This involves:

- **Data Governance Council:** Provides strategic direction for the data governance program, prioritizes projects and initiatives, and approves organization-wide data policies and standards.
- **Data Governance Teams:** Develops data governance policies, roles, methods, processes, and tools (Framework), enforces data standards, and collaborates with operational teams to address governance issues.
- **Data Domain Teams:** Implements data governance policies, rules, and methods on a daily basis, manages data product demands and requirements, and ensures data quality and security.

The "organization" dimension of the maturity assessment evaluates how well these roles and teams are established within the company. The following five focus topics are assessed:

Data governance dimension - Part 2

Dimension	Description	Focus Topics
Organization	Different parts of the organization have different requirements around (the same) data. The organizational component ensures that all these viewpoints are taken into account when governing the data.	• Roles • Ownership • Skills • Security & compliance • Target organization model For more information, see Glossary [page 60].

Legend:

(A) Current maturity

(B) Required maturity

	Initial	Reactive	Active	Pro-Active	Autonomous
Focus topic 1					
Focus topic 2					
Focus topic 3					
Focus topic 4					
Focus topic 5					

Data & Analytics Assessment Template: Organization

Finally, consolidate the assessment results to the structured format created in step 1 of Phase IV, documenting the following:

- **Focus Topics:** The specific areas that were assessed
- **As-Is Maturity:** The current level of maturity for each focus topic
- **To-Be Maturity:** The desired future level of maturity for each focus topic
- **Gap Closure Activities:** A description of potential actions needed to bridge the gap between the current and required maturity levels

Governance focus topic	Relevance	Maturity level (as-is)	Maturity level (to-be)	Actions to be taken	Owner	Timeline
Data strategy	Yes	Initial	Active	Develop initial data strategy	CDO	H2/2024
Data literacy	Yes	Reactive	Active	Define training plan	CDO	H1/2025
Data quality	...	...	...	...	...	...
KPI management						
Data dictionary & logical data model	Yes					
Data model & technical metadata						
Get clean process						
Stay clean process						
Analytical process						
Business AI process						
Roles						
Ownership						
Skills						
Security & Compliance						
Target Organizational Model						

Action Plan for Data & Analytics Governance Template

Procedure

- Discuss roles, teams and decision boards from the reference organization in context of your current situation.
- Select relevant organizational focus topics and discuss current and required maturity level.
- Document current and required maturity levels and analyze potential gaps.
- Agree on required actions and document them in activity plan.

Deliverables

- Roles & Organization Maturity Self-Assessment
- Action list for Data & Analytics Governance

Related Information

[Download the templates](#) 

[Data & Analytics Maturity Assessment \[page 57\]](#)

2.4.3 Step 3: Roadmaps / Project Plan

Develop an architecture roadmap that strategically aligns short-term and long-term goals with IT solutions by organizing activities into functional clusters, ensuring effective planning and execution to achieve the target architecture.

Context

A roadmap is a strategic planning tool designed to align short-term and long-term goals with specific IT solutions. It presents these plans in formats, such as a sunray diagram or a planning chart.

An architecture roadmap organizes activities based on business needs and priorities to achieve the target architecture within a defined time frame. Group these activities into functional clusters to streamline planning and execution.

Begin by compiling an activity catalog that includes a description, timeline, owner, and functional cluster for each activity.

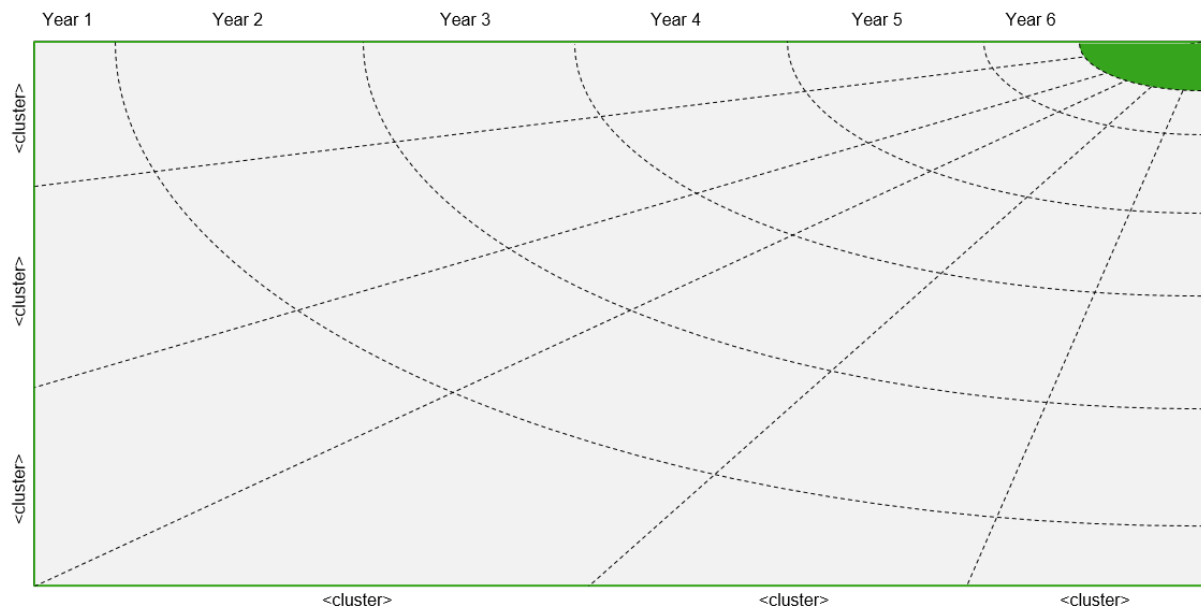
You can define clusters based on the steps needed to implement the architecture. Additionally, clusters can emerge from insights gained during the Data & Analytics Maturity Assessment.

Examples of such clusters include:

- Architecture Validation (PoC)
- Implementation
- Operations
- Security
- Know-How Transfer
- Organization and Governance

No	Activity	Description	Cluster	Comment	Dependency	Timeline	Owner
#	Name of the activity	Description of the initiative	Roadmap Cluster	Additional information	Dependency to other activity	Quarter, half year, year	Responsible for activity
1	Conduct PoC	Proof-of-concept for selected use cases	Architecture realization	PoC result is baseline for go/no-go decision	Further implementation steps require go-decision	Q1/2025	Lead consultant
2	Business case	Prepare business case for solution scope	Budget	Business case will be reviewed in Governance		Q1/2025	Functional expert
3	Cloud request	Define and submit cloud approval request	Data Security	Cloud approval required for critical financial data		Q4/2024	Head of XY

Activity Catalog for Roadmap Template as example



Roadmap Template

Procedure

- Derive the activities necessary to realize the architecture by comparing the actual and target architecture, while considering the business objectives.
- Consider additional activities besides the architecture realization activities, such as actions from the Data & Analytics Governance Assessment, which must be considered during implementation.
- Define roadmap clusters and assign activities.
- Create the roadmap diagram reflecting activities in context of time horizon and clusters.

Deliverables

- Activity Catalog
- Architecture Roadmap or Project Plan

Related Information

[Download the templates](#) 

2.5 Glossary

In this glossary, you find detailed information about the Data & Analytics Strategy Frameworks.

This encompasses the processes, tools, and patterns needed to assess, develop, and optimize an organization's data and analytics capabilities for driving business outcomes.

Related Information

[Data & Analytics Capability Model \[page 45\]](#)

[Data & Analytics Maturity Assessment \[page 57\]](#)

[Data & Analytics Use-Case Categories & Patterns \[page 61\]](#)

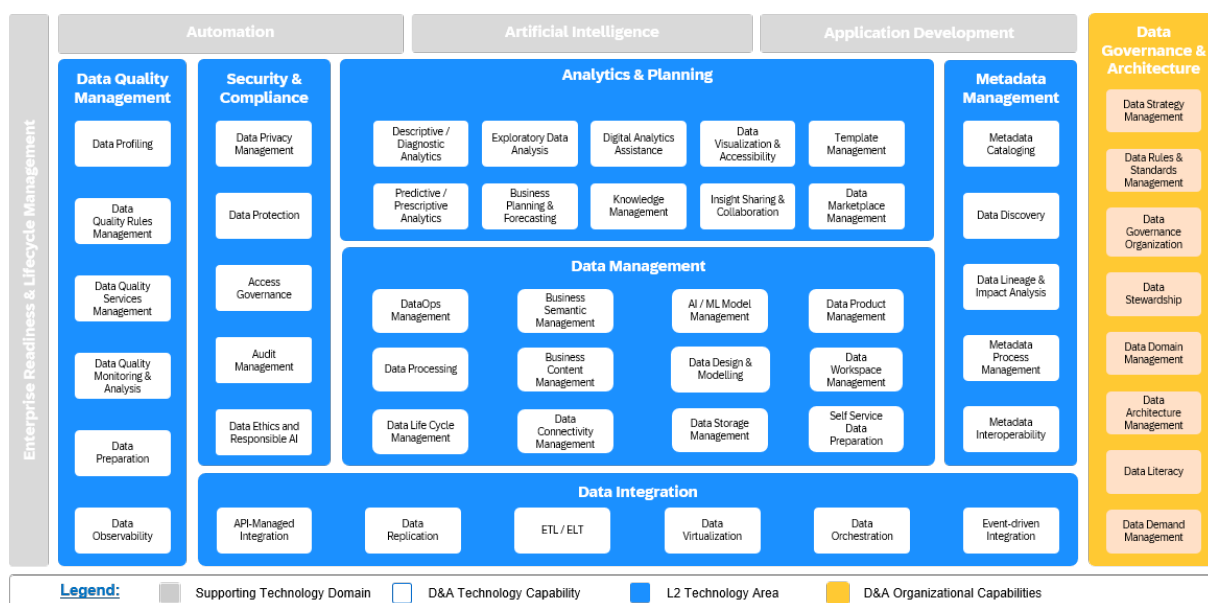
2.5.1 Data & Analytics Capability Model

The SAP Data & Analytics Capability Map is utilized to evaluate and improve your data and analytics capabilities.

A business capability defines the functions that a company performs to achieve its desired outcomes. It articulates the activities necessary for the enterprise to fulfill its objectives and provides a common language for business units to express needs and for IT to devise solutions.

A capability model organizes these functions into various levels and domains, facilitating visualization and analysis based on criteria such as strategic importance, availability, maturity, and the extent of IT support.

The SAP Business Capability Model identifies business applications that support specific business capabilities, while the SAP Data & Analytics Capability Model helps pinpoint technology solutions for data and analytic-related capabilities.



Data & Analytics Capability Map

The data and analytics technology capabilities are organized into technology areas, marked in blue in the diagram above, and can be mapped to software solutions. Additional capabilities from other technology domains, which are not central to the data and analytics domain, are indicated in gray boxes.

The model also includes organizational capabilities, grouped under "Data Governance & Architecture" and marked in orange. These capabilities are typically not mapped to software solutions, but can be used to reflect data governance and organizational aspects.

Definition of each Level 2 capability

Analytics & Planning Capabilities

Capability	Description
Descriptive / Diagnostic Analytics	The ability to transform historical data into actionable insights that inform an organization's operational business decision. The focus is on descriptive and diagnostic analytics to determine the result of these decisions.
Predictive / Prescriptive Analytics	The ability to discover deeper insights, generate recommendations to help business organizations to make strategic and tactical decisions. The focus is on predictive, prescriptive and cognitive analytics to determine the result of these decisions.
Business Planning & Forecasting	The ability of an organization to design, manage, and adjust its strategic, tactical, and operational business plans. It involves analyzing historical data, market trends, and other relevant factors to develop a realistic plan for the future, and allows the business to plan and align to different planning versions in a collaborative way. It also covers the use of forecasting algorithms that help to reduce uncertainty.

Capability	Description
Exploratory Data Analysis	The ability to examine and understand source data to gain insights, identify patterns, detect anomalies, and identify relationships between variables. EDA helps formulate hypotheses, select appropriate statistical techniques, and prepare the data for further analysis.
Data Visualization & Accessibility	The ability to communicate complex data relationships and data-driven insights in a way that is easy to understand and access. This can be achieved through use of common visual tools like spreadsheets, graphics, charts, plots, info graphics, and even analytical apps. This also considers the correct rendering when the content is accessed with different devices (for example, mobile, desktop, and so on).
Template Management	The ability to organize and manage templates used for analytics and planning purposes. These templates are typically used to standardize, accelerate, and streamline the creation of reports, dashboards, planning layouts, and other analytical and planning outputs.
Insight Sharing & Collaboration	The ability of data & analytics teams to collaborate, share insights, make collective decisions, report metrics, create strategies, and ensure cross-organizational transparency. This capability typically involves the use of collaboration tools, such as shared folders, chat services, or project management applications, that allow stakeholders to securely access and edit data, reports, dashboards, and other assets. It also covers bursting, for example distribution of reports based on its data.
Data Marketplace Management	The ability of organizations to curate, manage, and provide access to data products from internal and external sources. This includes structured and unstructured data, which can be bought, sold, or exchanged. It involves the ability to ensure the data's quality, security, privacy, and compliance with relevant regulations. This includes the ability to organize, label, and make data easy to find and use for potential buyers or users. The Data Marketplace capability also includes the ability to facilitate the transaction process, such as pricing, licensing, and distribution of data.
Knowledge Management	The ability to organize, connect, discover, and use knowledge in a more interconnected and context-aware manner. This enables the business to connect and analyze complex, disparate data from multiple sources and improves information accessibility and data quality. This leads to more informed decision-making, accurate business predictions, advanced AI capabilities, and more personalized user experiences.

Capability	Description
Digital Analytics Assistance	The ability to harness advanced technologies and artificial intelligence to facilitate and optimize analytics processes for all users. This entails employing tools, such as virtual assistants or chatbots, that can interpret and address user inquiries and needs. It helps users turn data into insights, simplify analysis, and make informed decisions.
Data Management Capabilities	
Capability	Description
Business Content Management	The ability to deliver and reuse pre-built industry-specific, LOB-specific or solution specific data models and analytics content, like reports and dashboards. This content reflects business context, use cases, or business scenarios based on technical best practices.
Data Product Management	The ability to oversee the development, launch, and continuous improvement of data-driven products. These products use data and analytics to deliver value, and solve problems for business stakeholders or external parties.
Data Workspace Management	The ability to manage, govern, and operate data within specific business domains as decentralized, autonomous units. Each domain team is responsible for the full lifecycle of the data they produce. You need to be able to manage data models and connections in one secured and governed place, and collaborate between peers through clearly defined access authorizations. This also includes resource allocation like disc space and memory or workload configuration.
AI / ML Model Management	The ability to organize, track, and maintain machine learning models throughout their lifecycle. It involves various tasks, such as version control, training, deployment, monitoring, and retraining.

Capability	Description
Data Design & Modeling	The ability to design, construct, and implement data models from an abstract level (conceptual and logical data models) to a detailed data schema at the physical level of a data storage management system (physical data models). The former involves structuring, organizing data elements, defining entities and their relationships that are often visualized through diagrams, such as entity-relationship diagrams (ERDs). The latter is used for optimizing performance and ensuring data integrity and security, while considering factors like hardware constraints, storage capacity, memory, and processing power. The goal of data modeling is to facilitate communication between stakeholders (like developers, designers, and business users) and to provide a high-level understanding of the data landscape.
Business Semantics Management	The ability to manage a semantic layer that systematically defines, links, and manages business terms and semantics across data sources and data models within an organization. It involves creating a unified, consistent, and business-oriented view of data. By establishing common definitions and relationships among data elements, business stakeholders will be able to understand and use data more efficiently.
Data Processing	The ability to handle and manage data that comes from multiple sources and in different formats (structured, semi-structured, and unstructured data) to prepare it for further use. This capability involves techniques for extracting, manipulating, and integrating information from these diverse data types. The main goal of data processing is to optimize the data for usability and consistency, and to facilitate streamlined and effective data analysis.
Data Storage Management	The ability to manage data storage technologies / systems to efficiently store, back up, archive, and manage diverse data types (structured, semi- and unstructured data) for an organization. This discipline encompasses a range of tasks such as data tiering, data protection, disaster recovery, scaling of storage resources, or storage monitoring. It involves the use of storage technologies and tools, to ensure data accessibility, integrity, security, and privacy.
Data Connectivity Management	The ability to use connectivity techniques to enable controlled external outbound and inbound access to data.

Capability	Description
Self Service Data Preparation	The ability for business users to independently access, manipulate, and transform raw data into a format suitable for analysis or reporting purposes. It enables users to perform data cleansing, integration, and enrichment tasks without relying on IT or data specialists.
Data Life-Cycle Management	The ability to manage the entire life cycle of data, from creation or collection to disposal or archival. The stages of the data life cycle include following: • creation • processing • storage • usage • archiving • deletion. It involves determining the economic and business value of data at each stage of the life cycle, and using this information to make decisions about how the data should be handled. This includes policies on data retention, data protection, data privacy, and data archiving.
DataOps Management	The ability to combine principles, practices, and tools to streamline and automate the processes involved in managing and delivering data within an organization. It aims to improve the efficiency, quality, and reliability of data operations by applying agile and DevOps methodologies to data management. DataOps focuses on integrating data engineering, data integration, data governance, and data quality processes into a cohesive and collaborative framework. It emphasizes close collaboration between data engineers, data scientists, data analysts, and other stakeholders involved in the data lifecycle.

Capability	Description
Metadata Cataloging	The ability to systematically organize and manage business and technical information about core data entities and data products. This ability makes this data more accessible and understandable. The catalog is the central place to discover, enrich, classify, and publish analytic assets and data entities from across your enterprise. Metadata information covers business information like: • business glossary • business rules • ownership • data classification • access controls Technical information includes data source, data type definition, and logical and physical data models
Data Discovery	The ability to find, understand and locate data entities in the data landscape required to fulfill the needs of data consumers. This covers the following: • searching for data entities • understanding their business context (business glossary and taxonomies) • structure and content • identifying ownership It also involves the identification of potential data sources like business applications, databases, or files.
Data Lineage & Impact Analysis	The ability for organizations to track and understand the flow of data within their systems. It provides a clear and comprehensive view of how data is transformed and used throughout its lifecycle. It also enables organizations to assess the potential impact of changes or issues on their data, by helping them make informed decisions and ensure data quality and integrity.
Metadata Process Management	The ability to define and apply systematic procedures and workflows to collect, store, organize, and maintain metadata. It contains features like auditing, collaboration, rating, and tagging.

Capability	Description
Metadata Interoperability	The ability of different systems or platforms to exchange and understand metadata. This describes the connection and automated extraction of metadata from various sources using a prebuilt metadata API. It also covers the export of this metadata for reporting or sharing with third-party tools, particularly in distributed data catalog environments.

Data Quality Management Capabilities

Capability	Description
Data Quality Services Management	The ability to identify and eliminate erroneous data and maximize the value of data. This involves services that support the execution of data quality processes, such as data cleansing and data enrichment. It also includes running layered processes to ensure data integrity, such as data collection, data reformatting, data matching, and data transformation techniques.
Data Quality Rules Management	The ability to define, create, implement, and maintain data quality rules for an organization. These rules combine data quality services to create data that is fit for use by data consumers, for example, accurate, complete, consistent, and of an acceptable standard.
Data Preparation	The ability to execute the conversion of processed data into format for defined analytical use cases. The primary objective of data preparation is to ensure the quality, accuracy, and reliability of the data, which is crucial for laying the foundation for effective data analysis and decision-making.
Data Profiling	The ability to analyze and examine source data to gain insights into its structure, quality, and content. It helps you understand the characteristics of data, such as its range, distribution, completeness, and uniqueness. By performing data profiling, organizations can identify data issues, anomalies, and patterns. This enables them to define data quality improvement opportunities.
Data Quality Monitoring & Analysis	The ability to measure, assess, and validate the quality dimensions of data used in business operations and decision-making processes. If data doesn't meet defined or expected quality dimensions and KPIs, you must initiate follow-up activities to resolve the issue.

Capability	Description
Data Observability	The ability to holistically understand the state and health of an organization's data, data pipelines, data landscapes, data infrastructures, and financial governance of the data. This is accomplished by continuously monitoring, tracking, alerting, analyzing, and troubleshooting problems to reduce and prevent data errors or downtime. (Gartner)

Data Security & Compliance Capabilities

Capability	Description
Data Privacy Management	The ability to manage privacy requirements across multiple privacy regulations, to manage the business and stakeholder response to data privacy regulation changes, and to demonstrate the degree of privacy regulation compliance. It requires the implementation of measures, such as data masking and anonymization, encryption, access controls, and consent management. It ensures compliance with data protection and data privacy laws.
Data Protection	The ability to limit access to sensitive data, manage data access across locations, monitor user access, and handle key management. It involves implementing a set of policies, procedures, and technologies to safeguard data and ensure its • integrity (correctness (immutability) of data) • confidentiality (prohibit unauthorized access to data using classification of data / Information) • availability (data is accessible at the right time and requested location).
Audit Management	The ability to manage the comprehensive audit process by: • Building audit plans • Preparing for audits • Analyzing relevant information • Documenting results • Forming an audit opinion • Communicating results • Monitoring progress This includes the monitoring and tracking of data usage and access, conducting data compliance audits, and maintaining records to demonstrate compliance with regulatory requirements or internal compliance rules.

Capability	Description
Access Governance	The ability to: • find and remediate segregation-of-duties (SoD) and critical-access violations • maintain roles • perform risk-based provisioning • perform root-cause analysis and remediation • manage user access It involves defining and enforcing policies and procedures to ensure that only authorized individuals or systems can access, modify, or delete data. This includes verifying the identity of users or systems before granting access to data (authentication) and determining what level of access each user or system has to specific data (authorization) and role-based access control, that is assigning specific roles to users or groups and granting them access privileges based on their roles.

Data Ethics and Responsible AI	The ability to promote ethical data practices and responsible AI usage, by considering the following factors: • Fairness • Transparency • Accountability • Bias mitigation
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Data & Analytics Integration Capabilities

Capability	Description
Data Replication	The ability to create an accurate and up-to-date copy of single- or multiple-source data within a target data store. Replication implies that there are two or more copies of the data. Full loads and delta loads let you keep your replicated data up-to-date. You can update replicated databases with either a batch-oriented (pull) or real-time (push) configuration.
Data Virtualization	The ability to provide a near real-time, unified view of data, potentially from various sources with different data models. You can view this data in one location. Data virtualization retrieves and interprets data, but doesn't require uniform formatting or a single point of access.

Capability	Description
Data Orchestration	The ability to extend data integration by: - Combining data discovery - Preparation - Integration - Processing - The connection of data across multiple and complex landscapes Data orchestration follows a pipeline-driven data integration approach for disparate kinds of data supporting also distributed processing.
Data Streaming	The ability to manage, integrate, store, and analyze continuously acquired data streams. A streaming data source typically consists of a stream of logs that record events in real time. Common examples of streaming data include: - IoT sensor - Server and security log - Real-time advertising - Click-stream data from apps and websites. Streaming analytics allows process streams of incoming event data in real time, and collect and act immediately on incoming information.
API-Managed Integration	The ability to provide omni-channel and secure access to business applications that can also hide the complexity of underlying heterogeneous landscapes. With the help of API-managed integration you can provide security features such as access control, enforce usage policies for APIs like rate limiting, and meter, as well as charge usage.
Event-driven Integration	The ability of software applications to interact and share data in real-time through event notifications. A significant action in one application triggers an event, which leads to specific responses in other applications.
ETL / ELT	The ability to extract data from different sources, transforming it into a structured format for analysis, and loading it into a data warehouse or a similar system. ETL (extract, transform, load) typically transforms the data before loading, ensuring that it aligns with the target system's schema and business rules. ELT (extract, load, transform) performs the transformation after the data is loaded into the target system.

Capability	Description
Data Strategy Management	The ability to define, decide, enact, and regularly review the data strategy of an enterprise. A data strategy emphasizes the commercial relevance of data, defines the goals of data management and defines strategic guidelines for how to handle data within the company (Data Governance).
Data Rules & Standards Mgmt.	The ability to establish common rules, standards, processes, accountability and controls to manage data as a product. It incorporates the formulation and enforcement of policies, procedures, and standards to ensure the data's accuracy, consistency, transparency, and reliability across the organization.
Data Domain Management	The ability to organize data and analytics ownership into data domains and to ensure that all domains are managed in a consistent way. This includes running data governance processes, consistent decision making and close collaboration to ensure data is shared.
Data Governance Organization	The ability to systematically manage data governance processes through the establishment of decision-making entities within an organization. The roles and responsibilities regulate who is accountable for defining, determining, and facilitating the implementation of policies, procedures, and controls. This ensures the administration of data assets.
Data Architecture Management	The ability to design, create, deploy, and manage an organization's data architecture. This includes the rules, policies, standards, models, and structures used to organize and store data. It involves planning and implementation roadmaps to ensure that the data is accurate, accessible, consistent, and secure.
Data Literacy	The ability to read, write, and communicate data in context, including: • an understanding of data sources and constructs • analytical methods and techniques applied • the ability to describe the use case, application and resulting value

Capability	Description
Data Stewardship	The ability to establish, implement, and maintain data governance practices, policies, and processes. This ensures quality, availability, integrity, and security of an organization's data assets. It encompasses the operational aspects of data governance, including the day-to-day activities and tasks required to ensure the effective management and control of data asset.
Data Demand Management	The ability to capture, analyze, and organize business demand for data and analytics requests that are used to create value from data. This involves consistently managing requests, validating them with relevant data domain experts, and following a guided approval process to initiate subsequent steps, which includes analyzing requirements from both business and technical perspectives.

Related Information

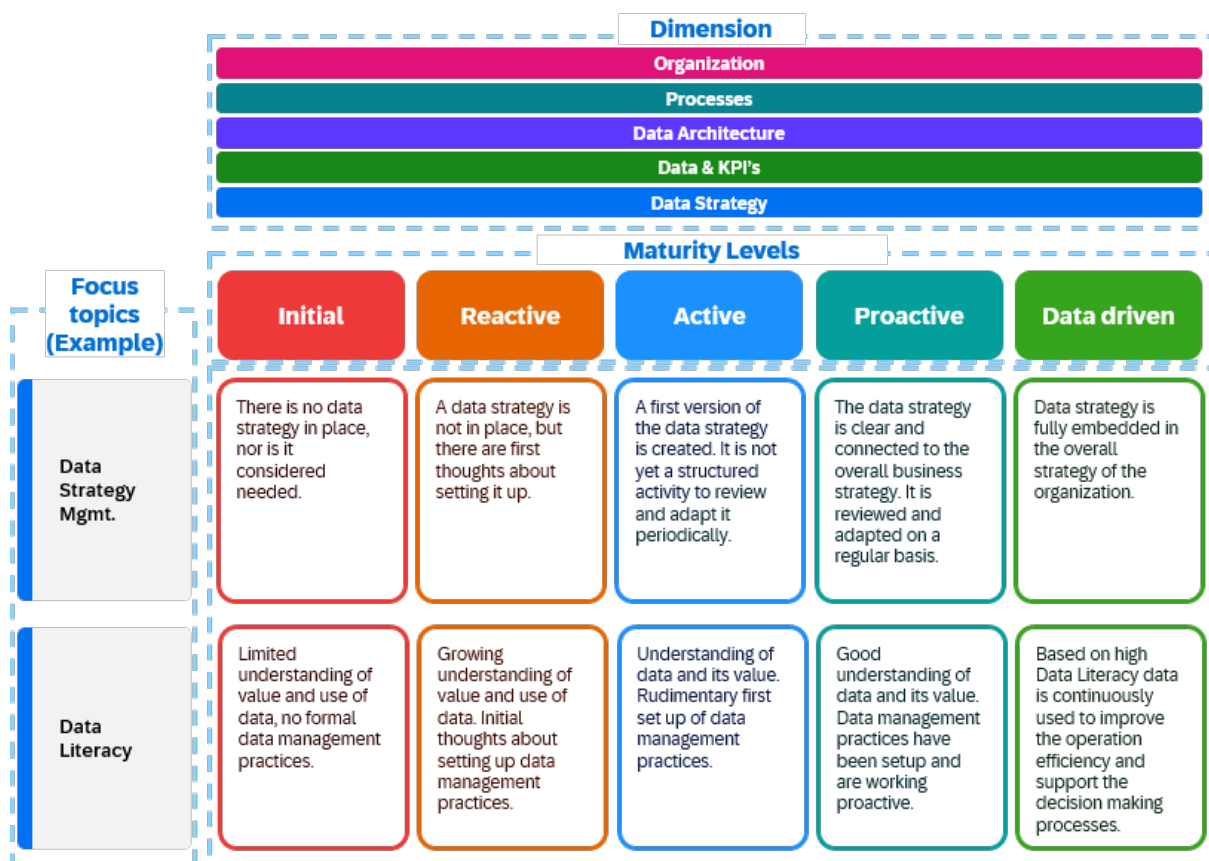
[Download the Data & Analytics Capability Model details](#) 
[Step 1: Capability Analysis & Solution Concept \[page 26\]](#)

2.5.2 Data & Analytics Maturity Assessment

The Data & Analytics Maturity Assessment conducts a high-level evaluation of an organization's data governance practices to identify critical gaps for successful target architecture implementation by comparing current and required maturity levels across key focus areas

The Data & Analytics Maturity Assessment involves a high-level examination of your organization's current and required data governance practices. Its primary goal is to identify gaps crucial for the successful implementation of the target architecture.

This assessment evaluates data governance and organizational focus areas. It compares the current state with the desired state by applying maturity levels.



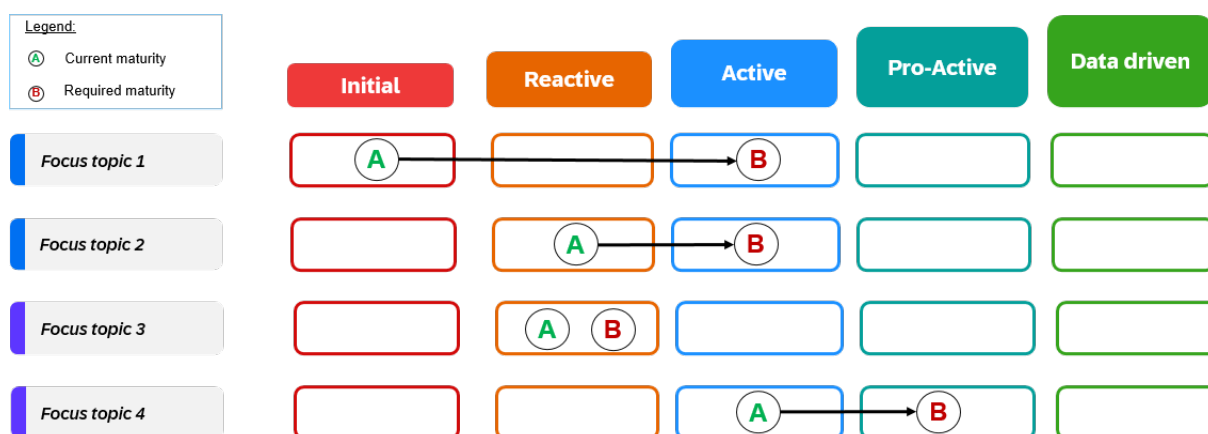
Overview of the Data & Analytics Maturity Assessment

The assessment is divided in two parts:

1. Examine data strategy, data quality, Key Performance Indicators (KPIs), data architecture, and processes.
2. Focus on data governance and management roles, their responsibilities, and their interactions within the organization.

To conduct the maturity assessment, follow these steps:

1. **Select Focus Topics:** Choose relevant data and analytics governance topics from the five dimensions based on the scope of the assessment and the target architecture.
2. **Assess Current Maturity:** Evaluate the current maturity level of the selected topics.
3. **Assess Future Maturity:** Determine if the current maturity level is sufficient or needs to be improved.
4. **Identify Necessary Actions:** Perform necessary actions to eliminate disparities between the current and the required maturity level.



Data & Analytics Assessment Template as example

If the assessment indicates a need for a more detailed investigation of data governance, refer to related frameworks from SAP, such as the SAP Data Management Framework, or consult SAP partners for further guidance.

For more information on the maturity level descriptions, download the Data & Analytics Maturity Assessment.

Definition of the focus topics of each dimension

Dimension Data Strategy

Focus topic	Description
Data Strategy Management	Data Strategy describes a long-term plan how data generates business value to support overall business objectives. It clarifies the commercial relevance of data, determines the goals for data management, and defines conditions for the handling of data in the enterprise.
Data Literacy	Data Literacy refers to the ability to understand, analyze, interpret, and communicate data effectively. It involves the skills and knowledge required to work with data, including data collection, data analysis, data visualization, and data-driven decision-making.

Dimension Data & KPIs

Focus topic	Description
Data Quality	Data Quality, which is determined by aspects such as completeness, timeliness, relevance and accuracy, refers to data that is suitable for use by data consumers and serves as the basis for accurate data analysis and insights.
KPI Management	Definition of key performance indicators (KPIs) that allow measurement of data strategy execution and benchmarking against other internal or external organizations.

Dimension Data Architecture

Focus topic	Description
Data dictionary & logical data model	The data dictionary describes logical terms from a business context. What do we mean with profit, what is a customer, when is a shipment on-time, etc. The logical model depicts how these logical terms connect and interact with each other.
Data model & technical metadata	The data model shows how data is stored in systems, tables and fields. By linking this to the logical model the connect can be made between business speak and IT storage. The technical metadata model describes details of the data itself (the maximum length of a field, numeric, allowed format, etc.)

Dimension Processes

Focus topic	Description
Get clean process	Steps and techniques required to ensure that data is fit for the intended purpose, i.e. that data is accurate, consistent, free from errors or inconsistencies. This process involves identifying and correcting any issues or problems in the data to improve its overall quality.
Stay clean process	Ongoing efforts and procedures implemented to ensure that (master) data remains accurate, consistent, and reliable over time. It involves various activities aimed at preventing data degradation, errors, and inconsistencies, thereby maintaining the overall quality of the data.
Analytical process	Systematic and structured approach used to analyze data in order to gain insights and make informed decisions. It involves a series of steps that are followed to transform raw data into meaningful information, which can then be used to support decision-making processes.
Business AI process	Systematic approach and set of activities involved in leveraging artificial intelligence (AI) technologies to drive business outcomes. Business AI process focuses on ensuring that AI initiatives adhere to established data governance principles and practices.

Dimension Organization

Focus topic	Description
Roles	Responsibilities and functions assigned to individuals within an organization to ensure effective management and control of data assets. These roles typically include data stewards, data owners, data custodians, and data governance officers, who collaborate to establish and enforce data policies, standards, and processes.
Ownership	Data Ownership organizes accountability and management of key data assets by defining Data Domains representing functional areas, with the responsibility to provide and manage data products while ensuring compliance with quality and security standards.

Focus topic	Description
Skills	Proficient data, analytics skills and training are needed for various roles and activities to effectively maintain data and its architecture to drive business value.
Security & compliance	Handle data in a secure and legal manner to avert a damage from the company and also its customers, partners and employees. It involves implementing robust security controls, encryption, access controls, monitoring, and audits, as well as establishing policies and procedures to meet legal and regulatory requirements related to data privacy, protection, and retention.
Target organization model	Framework that outlines the structure and responsibilities of an organization in relation to data governance and management. It defines the roles, processes, and decision-making mechanisms and boards necessary to ensure effective management, protection, and utilization of data within the organization.

Related Information

[Download the Data & Analytics Maturity Assessment details](#) 

[Phase IV: Data Governance & Roadmaps \[page 34\]](#)

[Step 1: Data Governance \[page 35\]](#)

[Step 2: Roles & Organization \[page 39\]](#)

2.5.3 Data & Analytics Use-Case Categories & Patterns

Requirements for data-driven business outcomes are defined through specific use cases evaluated against standardized patterns, leveraging SAP BTP Reference Architectures to streamline solution development and address common challenges.

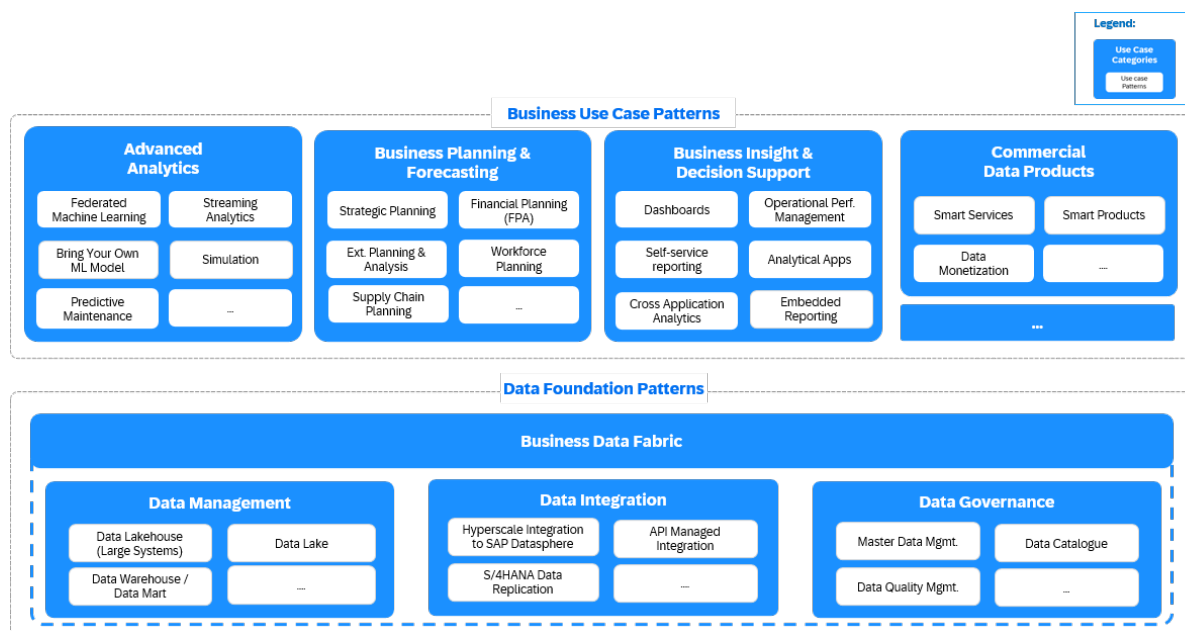
In Phase II of this methodology, you outline requirements for data-driven business outcomes through specific use cases. These use cases are evaluated against use-case patterns, which are standardized templates that address common business or technical challenges by reusing proven architecture or solution designs. Use-case patterns share common architecture patterns or technical capabilities. They are organized into functional use-case categories for easier reference.

For each use-case pattern, SAP provides SAP BTP Reference Architectures. These reference architectures help streamline solution development by aligning your use cases with proven best practices. They are available for download in the SAP Discovery Center.

The methodology distinguishes between two types of use-case patterns:

1. **Data Foundation Patterns** – These focus on advanced data provisioning concepts, such as simplifying data management or improving data governance.

2. **Business Use-Case Patterns** – These focus on delivering value to business functions and customers, for example, by optimizing business operations, enabling better decision-making, or introducing new products and services to customers.



Use-Case categories & patterns for Data & Analytics

Description of Data Foundation Categories

Data Foundation Categories	Description
Business Data Fabric	Dynamic and integrated data management architecture that enables real-time data connectivity across systems and applications to establish a unified view of your organization's data by keeping business data and its valuable context intact.
Data Management	Ensures availability, usability, consistency, integrity, and security of data across an enterprise. Data management provides effective data management throughout your enterprise, such as accountability for the adverse effects of poor data quality and ensuring that the enterprise data can be used by the entire organization.
Data Integration	Various approaches used to combine and consolidate data from multiple sources. Data integration patterns typically involve the following techniques: - data extraction - transformation - loading - data replication - data virtualization - application programming interfaces (APIs)

Data Foundation Categories	Description
Data Governance	A set of best practices and guidelines to provide enterprise-wide central transparency on all data topics to manage enterprise data, including the following: • data usage • data quality • security • business definitions • business requirements
Description of Business Use-Case Categories	
Business Use-Case Categories	Description
Advanced Analytics	Includes predictive, data science, and machine learning capabilities that focus on the following: • enabling new data insights • uncovering hidden relationships • predicting outcomes • generating forecasts • developing propensity models It covers reference use cases like predictive maintenance, predictive quality, and federated machine learning.
Business Planning & Forecasting	Focuses on preparing and planning budgets and forecasts and providing the required planning models to optimize and run the business. This pattern helps you align business units with departments. It covers the following reference use cases: • strategic planning • financial planning • enterprise planning • supply chain planning
Business Insight & Decision Support	Focuses on developing the necessary instrumentation and measures to oversee, guide, and steer the business. This pattern provides essential dashboards and visualizations that provide near-to-real-time information about the business. This pattern complements operational and performance management, and forecasting and planning.
Commercial Data Products	Represents innovative customer services and commercial models based on data generated by products or analytical data products provided on a data marketplace. For example, smart IoT-enabled products allow for flexible commercial models like consumption-based billing, and customer services like providing predictive maintenance. Analytical data products provide insights that you can commercialize.

You can use these patterns to accelerate solution development, to minimize risks, and to ensure consistency in achieving data-driven business outcomes.

Related Information

[Step 2: Develop Architecture Options \[page 29\]](#)

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Bias-Free Language

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