

Architecture Vision

This Design Doc lists the Architecture Vision statements for SWISSGEO.

Status	APPROVED
Contributors	PP BGDI, SWISSGEO Core Team
Approvers	SGS Management, SGS Board (GKG and VS KKG)
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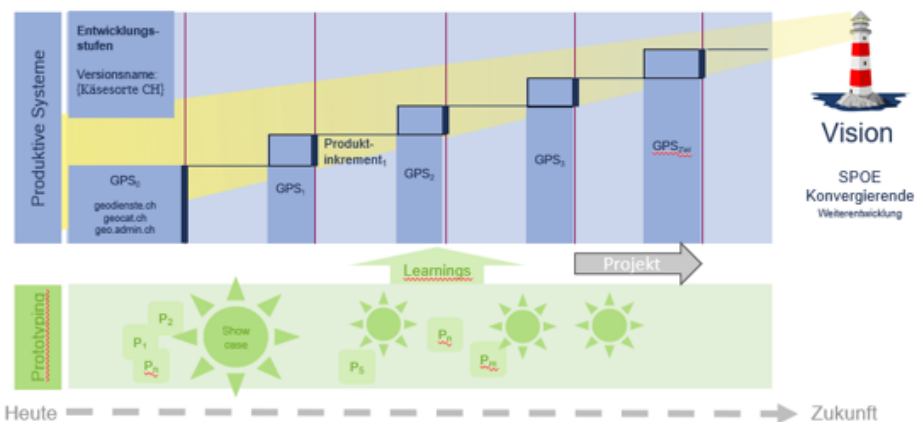
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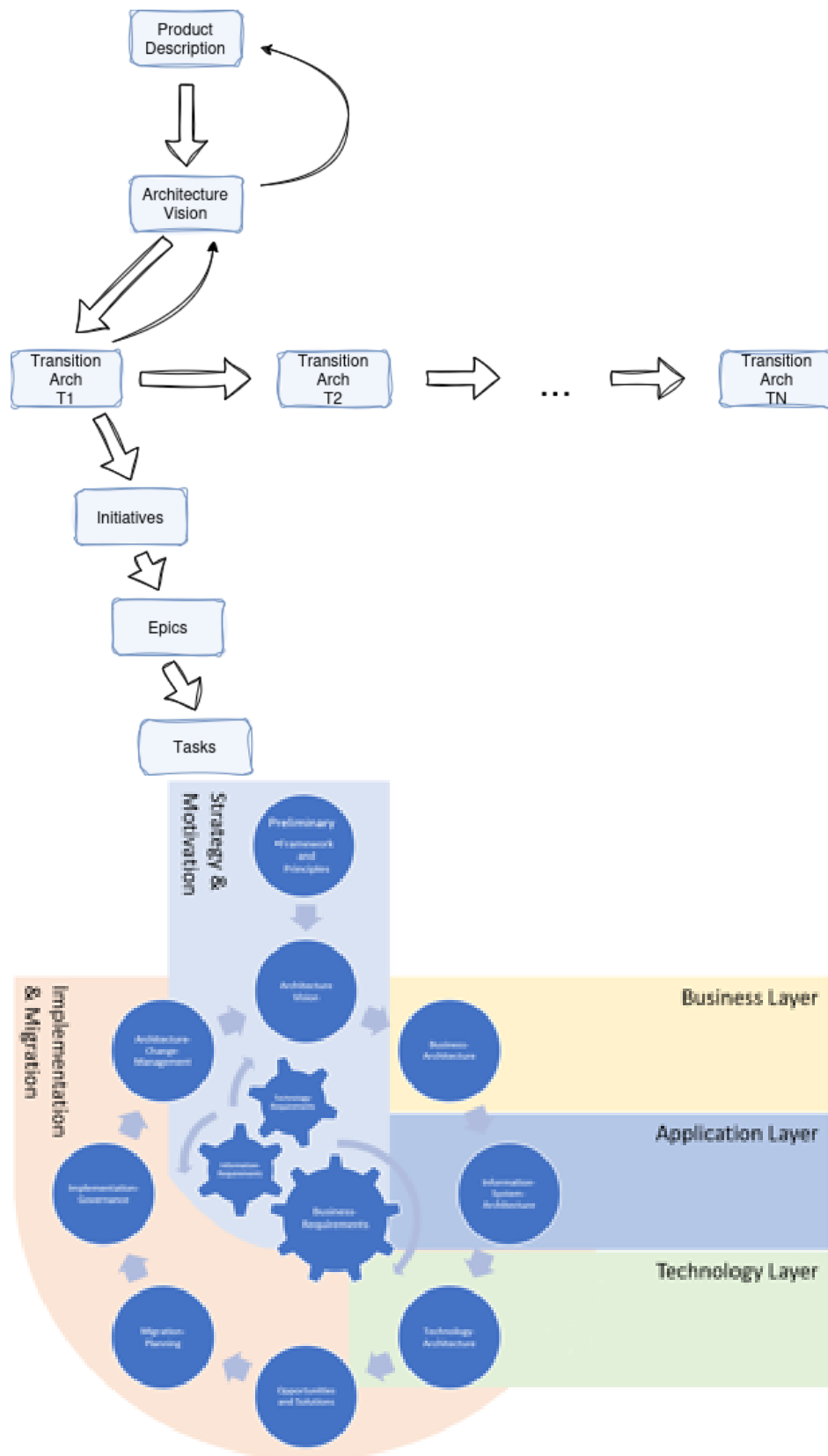
Context and Scope

An architecture vision defines the high-level intent and direction of an architecture initiative. Its purpose is to establish a shared understanding of the desired future state, articulate the business value the architecture will deliver, and align stakeholders around key goals, principles, and constraints. The architecture vision is the basis to set up the roadmap and transition architectures to reach the target state. It serves as a guiding reference for decision-making throughout the lifecycle, ensuring that detailed designs and implementations remain consistent with strategic objectives.

In governance terms, the Vision should dovetail with the approved Architecture Design and Decision Process (consent-based reviews, alignment to principles, explicit approval steps), so that “vision → principles → design docs → decisions” form a clear chain of accountability and traceability.



Transition Architectures will be established based on the Architecture Vision and will again serve as basis to define Product Increments on Initiative and Epic level.



These architecture vision statements concretize the SWISSGEO [Produktbeschreibung](#) . The following related aspects of are covered elsewhere:

- “Professional Services” → covered by Product Vision
- community → covered by Product Vision
- high data quality → covered by Product vision
- customer management → covered by product vision (customer success)

Governing regulations

SWISSGEO and its technical parts are subject to a number of governing regulations that authorise and frame the Architecture Vision. Important ones are

- GeoIG/GeoIV ([Fedlex GeoIG](#) , [Fedlex GeoIV](#))
- All directives from DTI Federal Chancellery (<https://www.bk.admin.ch/bk/de/home/digitale-transformation-ikt-lenkung/vorgaben.html>)
- EMBAG/DigiV ([Fedlex EMBAG](#), [Fedlex DigiV](#))
- API Architektur & Guidelines Bund (<https://www.bk.admin.ch/bk/de/home/digitale-transformation-ikt-lenkung/bundesarchitektur/api-architektur-bund.html> , [GitHub - swiss/api-guidelines](#))
- eCH «[Architekturvision 2050](#)»
- Strategie Geoinformation Schweiz (SGS) (<https://www.geoinformation.ch/de/strategie-geoinformation-schweiz-sgs>)

Architectural aspects that are bindingly prescribed or regulated by a regulatory authority are not repeated here (for example data security which is governed by Schuban regulations).

Definitions

“Data” is comprehensive

When speaking of “Data” this encompasses always

- Geodata
- Metadata
- Models
- Symbolisation
- Legal references
- Configuration of services for data publication / configuration metadata
- Content / Distributions

unless stated differently.

Aggregation & Harmonisation

When speaking of “Data Aggregation” we mean the combination of data from multiple sources to produce a new dataset that provides a summary view. Aggregation can occur at different levels, e.g. by time period, geographic region, or category. This typically requires an upstream harmonisation step that aligns the formats and models across the different contributors.

“**Data Harmonisation**” means the alignment of the content of the data itself across the different contributors (e.g. avoid discontinuities at data boundaries, use categories and labels consistently etc.).

Self-service

'Self-service' refers to the capability that allows data providers or authorised users to independently manage, prepare, and publish their data without requiring direct intervention or manual support from platform administrators. This typically includes features such as user-friendly interfaces for uploading data, managing metadata, configuring access permissions, validating data quality, and initiating publication workflows—enabling faster, more efficient, and scalable data sharing.

Catalog

A catalog is an organised and structured (curated) collection of metadata that describes basically any kind of resources (e.g. datasets, resources, services). It enables users to discover, search, and access information about the contents, such as dataset titles, descriptions, formats, sources, and access conditions. A catalog typically serves as a central directory or inventory, making it easier for users to find and understand what data or resources are available within the platform.

Vision statements

Fundamentals

F1: SWISSGEO is the national platform that provides high quality geospatial knowledge in a harmonised way

SWISSGEO is a citizen- and user-centric geospatial platform that provides all the capabilities that are necessary to manage, discover and use official geospatial data published on SWISSGEO or another publication platform in a standardised and harmonised way.

F2: SWISSGEO has one End-User Web Application

This application allows to

- Explore Data

- Access Data
- Visualise Data
- Download Data
- Display Information about various aspect related to SWISSGEO (standards, organisational and legal aspects, support)

and should satisfy the requirements from the broad public, geo experts, subject matter experts and data publishers.

F3: SWISSGEO has one Self Service Management Portal

This portal allows to

- Manage Data
- Manage Users and permissions
- Retrieve Business Metrics (how often is the data used, etc.)

and enables data publication without manual intervention from SWISSGEO side.

The business portal is using the published APIs mentioned below.

F4: SWISSGEO has a comprehensive and complete Entity Relation Model

SWISSGEO has a comprehensive and complete Entity Relation Model that includes all relevant data entities and their possible relations in context of SWISSGEO platform.

The entity model links business requirements and their technical implementation in a binding manner.

F5: SWISSGEO has a Catalogue of all official geodata of Switzerland

SWISSGEO provides Catalogue functionality based on a comprehensive and consistent Entity Relation Model encompassing all information that is required to

- collect (legal foundations)
- discover (descriptions)
- understand (explanations, contact information)
- use (models, service information, standards, content)

data

of type

- Geo-Base Data with Access level A + B
(<https://www.fedlex.admin.ch/eli/cc/2008/389/de>)

- further geographically referenced data sets produced from or on behalf of authorities on all federal levels

which is made available on SWISSGEO itself or elsewhere.

F6: Security is a foundational principle of SWISSGEO architecture

The platform is architected with security as a foundational principle, ensuring the confidentiality, integrity, and availability of all geoinformation assets and services. Security is embedded by design and by default—across infrastructure, applications, data, and processes—through proactive risk management, robust access controls, and continuous monitoring. SWISSGEO therefore operates a central authentication service which is connected to eIAM and makes existing Identity Pools (FedLogin, AGOV, potentially others) available via federation. SWISSGEO also operates an authorisation service that allows to authorise platform users to manipulate protected resources in a central place. Monitoring is covered by the comprehensive observability platform.

F7: API First

All resources managed in SWISSGEO can only be created, edited, used and deleted via centralised, harmonised and well documented technical interfaces (APIs) implementing official or open and established standards.

F8: Responsible, transparent and trustworthy integration of data analysis technologies like AI

The platform ensures that all AI and other data analysis capabilities are designed, deployed, and governed in a manner that is responsible, transparent, and trustworthy. This means:

- AI systems are developed and operated in compliance with applicable laws, ethical standards, and organisational values.
- Data used for AI is managed to prevent bias, protect privacy, and ensure security throughout its lifecycle.
- Stakeholders—including users, data subjects, and regulators—are informed about AI usage and have accessible channels for feedback or redress.
- The platform regularly assesses and documents AI risks and implements mitigation controls.

Data

D1: Open Geo-base-Data and other Data is offered centrally and uniformly for anonymous fair use in SWISSGEO.

SWISSGEO is a publication platform where open Geo-base-data and other data can be used anonymously within fair use limits. SWISSGEO therefore operates services to

- explore data (what kind of data is available)
- access data (obtain specific parts of datasets by filtering or searching)
- visualise data
- download data

D2: Geo-base-Data and other Data with access restrictions is offered centrally and uniformly in SWISSGEO and requires authentication and authorisation for use.

SWISSGEO is also a publication platform for Geo-base-data and other data with usage restrictions. Usage of restricted data is only possible authenticated users that have obtained the required authorisation.

D3: Automated and standardised data management

Geodata provisioning in SWISSGEO is governed by harmonised and standardised, automated processes that ensure consistent data quality — enabling data providers to contribute spatial data in a simple, efficient, and repeatable way.

D4: SWISSGEO preserves data semantically in publication pipelines

SWISSGEO will accept data in different formats that may or may not directly be used as source for data publication. SWISSGEO will therefore have to manipulate / transform data in order to

- optimise performance and visualisation for web publication
- build derivatives (e.g. vector tile sets)
- generate different data formats automatically

SWISSGEO will not change data semantically.

D5: SWISSGEO data sources

SWISSGEO will be the source of truth or data master for a number of entities that are created on the platform, for example

- publication configuration
- user drawings (data annotations)
- static editorial content
- catalogue metadata (certain parts may originate elsewhere)
- aggregation and derivations of datasets based on data from other datasets
- observability data and usage metrics

SWISSGEO will manage data that originates elsewhere and is duplicated and cached in SWISSGEO. If necessary to meet functional and performance requirements, SWISSGEO will allow the data provider to optimize its data to meet the requirements

- geodata
- models

D6: SWISSGEO allows to build aggregates and derivatives of data from different contributors

SWISSGEO enables data providers to aggregate geodata from different contributors using the same standardised geodata model. Potential further downstream validation (such as harmonisation) and approval steps of the individual contributions can be enabled and remain in the responsibility of the dataset owner in terms of content.

SWISSGEO also allows to derive new geodata products using data from one or more data providers.

D7: Collaborative content creation

SWISSGEO provides an open and participatory environment where data providers, domain experts, and end users can jointly create, enrich, and maintain geospatial content — within a clear governance framework that ensures data quality, accountability, and trust. Openness and control are treated as complementary: contribution is actively encouraged and made accessible, while defined roles, validation rules, and audit trails ensure that the integrity of the platform's shared data assets is never compromised.

D8: SWISSGEO can tailor search results based on the users context.

SWISSGEO has detailed knowledge about relations of different datasets and the roles that organisations have with respect to datasets. Based on this knowledge, the platform can tailor what content is presented to the user based on the context (i.e. search filters) to decrease the refinement steps required to find the desired dataset.

D9: SWISSGEO allows to publish historicised Data

SWISSGEO has the functionality to publish several temporal versions of a dataset.

The assessment of requirements and implementation options for sustainable availability (“Nachhaltige Verfügbarkeit”) is currently underway. SWISSGEO is open to taking on tasks in this area for data providers.

Processes and Non-Functional

NF1: Architecture-driven design and development of SWISSGEO platform

The platform's architecture is guided by a **clear**, **adaptive**, and **collaborative** architectural practice that ensures long-term value, coherence, and agility. Architecture is treated as a strategic asset—providing a shared framework for decision-making, enabling alignment across

stakeholders, and supporting sustainable evolution in response to changing needs. All architectural work is transparent, principles-driven, and continuously improved through feedback, measurable outcomes, and active stakeholder engagement. The architecture function fosters innovation while safeguarding interoperability, security, and compliance, ensuring that every solution advances the platform's mission and resilience.

NF2: User-centric design and development of SWISSGEO platform

Architectural design decisions should place the **needs**, **workflows** and **outcomes** of its **users at the centre**, enabling people to discover, understand, and act on location-based insight with clarity, confidence, and minimal friction, regardless of their technical background or organisational role.

NF3: SWISSGEO is designed for high availability.

The platform is architected to ensure uninterrupted delivery of critical geoinformation services, even in the face of disruptive events. Business continuity management is embedded by design, encompassing:

- Proactive identification (observability) and mitigation of operational risks, including cyber threats, infrastructure failures, and natural disasters.
- Clearly defined recovery objectives (RTO/RPO) and tested procedures for rapid restoration of services and data integrity.
- Transparent communication protocols to keep users and partners informed during incidents.
- Continuous improvement through post-incident reviews, training, and integration of lessons learned into architecture and operations.

NF4: Digital Sovereignty

SWISSGEO is planned, built and operated in accordance with the Confederation's directives and ongoing action plans on digital sovereignty^[1], in particular the Digitalisierungsverordnung (DigiV), EMBAG, the **DTI Weisungen** (e.g. *W012 Weisungen für die digitale Souveränität in der Bundesverwaltung*^[2], *W010 Architekturprinzipien*, *AR010 Cloud-Prinzipien der Bundesverwaltung*^[3]) and the **Cloud-Strategie der Bundesverwaltung (SB020)**. The platform ensures that the Confederation retains effective control over its data, identities and critical capabilities, even when using public cloud services. The platform is operated in the public cloud of AWS as long as the requirements from the Federal Chancellery's DTI directives, information security (ISG/ISV) and business continuity management (BCM) are fulfilled and regularly reassessed in line with the Confederation's digital-sovereignty roadmap. Where feasible and economical over the lifecycle, SWISSGEO prefers open-source components and open ecosystems that strengthen transparency, verifiability and community collaboration, in line with the Confederation's digital-sovereignty and sustainability objectives.

[1]: <https://digital.swiss/en/strategy/focus-topics/digital-sovereignty>

[2]: <https://www.bk.admin.ch/bk/de/home/digitale-transformation-ikt-lenkung/vorgaben/w012->

[weisungen_digitale-souveraenitaet-der-bundesverwaltung.html](https://www.bk.admin.ch/bk/de/home/digitale-transformation-ikt-lenkung/vorgaben/ar010-cloudprinzipien.html)

[3]: <https://www.bk.admin.ch/bk/de/home/digitale-transformation-ikt-lenkung/vorgaben/ar010-cloudprinzipien.html>

NF5: SWISSGEO solution architecture optimises development and operational costs over the whole lifecycle

The solution architecture of SWISSGEO aims at minimising the overall costs for

- development
- maintenance
- operations
- infrastructure
- modifications

over the whole lifecycle of a component without affecting the required stability, security and performance.
