SDMX Maturity Model for SDMX adoption

Produced by “Task force for Implementing SDMX at the enterprise level”

Task force for Implementing SDMX at the enterprise level

- Problem statement
  - SDMX adopters need to get the best V4M, interoperability and integration when adopting SDMX for certain use cases
  - However, there is little reference material endorsed by the SDMX community

- Main goal is to create this reference material
  - List of common use cases for adopting SDMX
  - Maturity model to describe what is required to implement the use cases
  - “Cook book” to describe how to implement SDMX for the use cases
  - Top-down strategical approach

Goals of the Maturity Model

- Ascertain **agency's readiness** to implement use cases
- Know **where to focus resources and effort** to implement use cases
- Know **what to do** to implement use cases in the most efficient way
- **Measure an agencies maturity** in SDMX implementation

What are the main use cases for adopting SDMX?

Use case title	Description	Goal	Complexity
Basic dataset publication using existing structures	Convert a single dataset to SDMX and publish it as a file, using an existing DSD. For example, the National Accounts questionnaire transformation.	Offer a dataset in SDMX format(s) with a very low investment	Very Low
Local data viewer and validator	Use local tools to validate or view SDMX files	Ensure file structure and display capability	Very Low
Use a standard to structure data (with new structures)	Create a DSD to structure one dataset with dimensions and code lists	Introduce metadata and semantic structure using modelling best practices	Low
Publish data via SDMX API	Set up an SDMX-compliant RESTful web API	Enable programmatic data access	Low–Med
Import and reuse external SDMX data	Collect data from other agencies, e.g. sub-national offices, global organizations (e.g., Eurostat, IMF), other countries, or data aggregators	External data acquisition for internal use	Low–Med

What are the main use cases for adopting SDMX (continued)?

Use case title	Description	Goal	Complexity
Improve management of structural metadata	Store concepts, code lists, and other structural metadata in a consistent and accessible way	Enable consistent use of metadata and its governance and reusability	Medium
Publish harmonised datasets	Publish several datasets that reuse structural metadata between them	Achieve consistency and interoperability across datasets. Configure and populate a datawarehouse and/or data-lake	Medium
Integrate statistical production	Use SDMX for production stages of the data lifecycle	Streamline and consolidate internal workflows	High
Register data in a public registry	Register datasets and structures with an SDMX registry	Enable dynamic discovery and automated data exchange	High
Integrate AI tools with data	Implementation of AI tools that used SDMX data and enable further AI tools to be integrated with the data	Enable use of artificial intelligence tools to support quality and accessibility	Very high

Maturity model dimensions

Name	Description
Business and institutional setting	*This section encompasses executive support and planning, resource management, communication and capacity building, and staff-oriented governance workflows.*
Executive support, planning and coordination	Covers the support from management for implementation, management of human resources, strategic planning, external agreements with stakeholders, funding from management level.
IT resources	The provision of IT infrastructure and ability to implement required systems. Covers scalability, performance and contingency planning, and evolution of IT resources.
Communication and capacity building	Covers communication planning to stakeholders, peer reviews, stakeholder review and approval workflows, knowledge sharing, training
Structural metadata governance	Covers the business workflows of decision-making and maintenance of structural metadata content, who is consulted and the timeframes. Also, the access control and authentication for the structures.

Maturity model dimensions (continued)

Name	Description
Data architecture	*This section encompasses structural modelling using SDMX, internal harmonization of metadata, applications and IT tools knowledge, and integration of processes and designing workflows to enable consistent, efficient, and interoperable data management.*
Structural modelling	The ability to structurally model data and other information using SDMX. Knowledge of the SDMX information model.
Structural harmonization	Covers the internal harmonization of structural metadata at the enterprise level. The level at which domains and structures are consolidated, shared and reused.
IT tools knowledge	Ability of stakeholders to use the tools for the required use cases. Knowledge of users to use the full features of the tool. If there are tooling gaps, the capacity to develop tools. The openness and shareability of developed tools.
Processes and workflow	Repeatable processing, pipelines, scheduled, connected systems, across domains

Maturity levels: What is the capability of an agency to use SDMX?

Level Name	Level Description
Initial awareness	• A few individuals are becoming interested in the potential value of SDMX for certain use case(s) but the organisation as a whole is unaware of SDMX. • There may be some proof-of-concept projects but there is nothing in production yet. • Management may not necessarily be aware of the SDMX business case.
Pre-implementation	• Parts of the organisation and management are becoming interested in the potential value of SDMX. Use of SDMX is basic and limited to a few individuals. • Analysis has started on the value of implementing SDMX for the use cases. • There may be some projects and use cases in pilot, but reusability is not planned or prioritised. • Management are aware of the SDMX business case and the need to plan the implementation.
Early implementation	• Use of SDMX is spreading beyond pilots to other domains and units. It may used in an inconsistent manner across the organisation. Reusability may be planned but is not prioritised yet. • An implementation strategy is being prepared for endorsement by management.
Corporate implementation	• SDMX used as cornerstone standard across business processes. A corporate-wide programme/strategy for use of SDMX is in place. Reusability is prioritised. • There is a widespread awareness of SDMX and it is used in a consistent manner across the organisation.
Mature implementation	• SDMX is perceived as an important part of business operations/management, delivering value across the organisation. It is fully embedded into operations, and it drives value across the organisation. • SDMX is well understood, integrated into business processes and practices and used in a consistent manner.

Which maturity level is needed for each use case?

Dimensions → / Use cases ↓	Business and institutional setting	Structural metadata governance	Structural modelling	Structural harmonisation	Tools expertise	IT infrastructure	Community and capacity building	Processes and workflow
Basic dataset publication (existing structure)	Initial	Initial	Initial	Initial	Pre impl	Initial	Initial	Initial
Local data viewer and validator	Initial	Initial	Initial	Initial	Pre impl	Initial	Initial	Initial
Use a standard to create a data structure	Pre impl	Pre impl	Pre impl	Pre impl	Pre impl	Initial	Initial	Initial
Publish data via SDMX API	Early	Pre impl	Pre impl	Pre impl	Early	Early	Pre impl	Pre impl
Import and reuse external SDMX data	Early	Early	Pre impl	Pre impl	Early	Early	Early	Pre impl
Improve management of structural metadata	Early	Early	Corporate	Early	Corporate	Early	Early	Pre impl
Publish harmonised datasets	Corporate	Mature	Mature	Corporate	Corporate	Corporate	Early	Pre impl
Integrate statistical production	Mature	Mature	Mature	Mature	Corporate	Mature	Corporate	Corporate
Register data in a public registry	Mature	Mature	Mature	Mature	Corporate	Mature	Mature	Mature
Integrate AI tools with data	Mature	Mature	Mature	Mature	Mature	Mature	Mature	Mature

Maturity level details for: Use a standard to structure data (with new structures)

Dimensions	Initial	Pre-implementation
Exec support, planning and coordination		Some senior managers are aware of SDMX benefits and agree pilots Estimation of resources, feasibility study started for limited implementation
Structural metadata governance		Awareness of COG material Proposals on the organisation's future governance framework Proposal on artefact ownership and access control Research into the review and agreement workflows SDMX advisory team is planned to provide expertise.
Structural modelling		SDMX modelling pilot projects start Management become aware of SDMX modelling business case Research has started into how modelling can be linked to data strategy vision. Growing knowledge of SDMX modelling, information model and COG among SDMX experts.
Structural harmonisation		Separation of structural metadata from presentation, etc started Repository(s) for storing structural metadata has been investigated and tested A way to migrate current structural metadata to SDMX is designed
Tools expertise		SDMX tools are used for pilot use cases Development has started on the gaps between the use cases and existing tools A testing coordinator is decided for releases of the tools
IT resources	IT resource analysis is started for SDMX systems and processing that match the use cases	
Community and capacity building	Initial discussion with management that SDMX is being analysed for use cases Circulation of the SDMX business case to stakeholders to support the PoCs and pilots Involved staff are made aware of SDMX.org material, e-learning courses	
Processes and workflow	The use cases for processes and workflow have been identified.	

Maturity level details for: Publish harmonised datasets

Dimensions	Pre-implementation	Early	Corporate	Mature
Exec support, planning and coordination			Senior management have agreed to finance/plan SDMX corporate solution. Staff objectives for corporate impl.	
Structural metadata governance				Structural metadata governance and maintenance well-defined
Structural modelling				SDMX modelling is part of a long-term plan Data managers can model in SDMX with best practices SDMX modelling part of processes and practices of the organisation SDMX experts and data modellers can use SDMX 3.0 features
Structural harmonisation			The harmonisation method applied to most of the data and metadata. Most structural metadata in SDMX repository Further migration planning Mapping/transformation solution used for all	
Tools expertise			SDMX tools are reused for most use cases Developed tools are made available Data managers know how to use the tools The testing team test every change	
IT resources			The SDMX IT resources successfully scale Minimal expected outage is reported The infrastructure is resilient and secure	
Community and capacity building		Information exchange with management about the pilot project status Management support SDMX pilot project(s) If success, build case to management to fund further SDMX implementation Planning of comm. and capacity building on SDMX tools and processes.		

Questions

- Q: How do I implement the details? e.g. **Exec support, pre-implementation: Some senior managers are aware of SDMX benefits and agree pilots**
- A: The forthcoming “cook book” will contain these details

- Q: When can I use the Maturity Model?
- A: The task force aims to publish the first material at end of 2025

- Q: How does my agency score on the Maturity Model?
- A: Interesting question! Though the main aim is to see how best to implement the use cases.

Thank you!

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Chair of SDMX Statistical Working Group (SWG)