



EUROPEAN CENTRAL BANK

EUROSYSTEM

Managing the frequent updates of the European System of Central Banks SDMX structural definitions

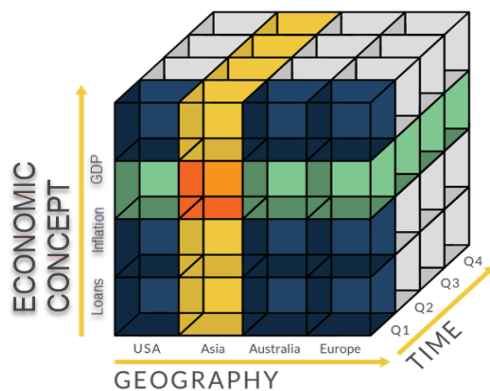
How to automate the update of Fusion Registry content using its API

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Data Structure Definitions (DSD) at ECB



Our Structural metadata are the DSD for the data cubes



dimensions + attributes and their code lists

Maintenance activities of our team:

1. Creating new DSDs for new datasets
2. Adding new codes to existing code lists
3. Harmonising DSDs between Test, Acceptance and Production Environments

DSD maintenance processed established more than 25 years and continuously evolving:

Many changes has taken place:

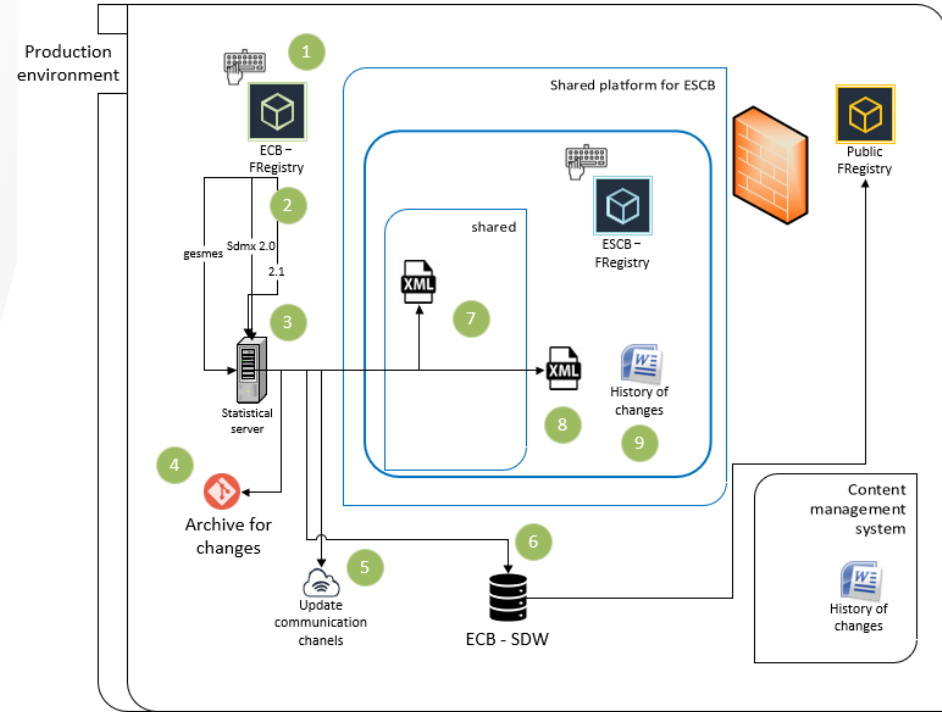
- in the IT architecture,
- among system components,
- internal parties and external organisations involved
- tools replaced: such as introduction of Fusion Registry

Simplified action graph of DSD updates

Each arrow among the components represents a separate step in the workflow.

A high variety of tools are used in different environments.

Extensive training is needed for colleagues involved.



Fusion Registry

- The golden copy of ESCB metadata for macro statistics
- The 'Structural metadata management' feature of the Fusion Registry is used to centrally manage all SMDs for the statistical department.
- The Registry offers different ways to maintain its structural metadata content:
 - Update manually on the graphical interface (*currently used*)
 - Upload prepared files of DSDs via the web interface (*currently used*)
 - Through its API (*not used yet*)

Manual editing of code lists in the Fusion Registry

Example of the manual steps needed for updating the content of a code list:

In case of bulk changes, the list of changes is prepared in MS Excel and uploaded to the registry

The screenshot displays the ECB Registry interface. On the left is a navigation menu with the following items: Home, Organisations, Data, Items (selected), Category Schemes, Concept Schemes, Codelists (marked with a green circle '1'), ValueLists, Hierarchical Codelists, Metadata, Structure Maps, Web Service, Bulk Actions, Structure References, Activity, and Search. The main content area shows a table of code lists. The 'Codelists' dropdown menu is open, showing options: 'Create New Codelist' (marked with a green circle '3'), 'Edit selected Codelist' (marked with a green circle '4' and a mouse cursor), 'Delete selected Codelist', and 'Manage Annotations'. The table below has columns for 'All', 'BIS', and a list of code list names. The row for 'CL_AGENCY' is highlighted in blue and marked with a green circle '2'. The table contains the following entries:

All	BIS	
	BIS	CL_ADJUST
	BIS	CL_AGENCY
	BIS	CL_AREA
	BIS	CL_AVAILABILITY
	BIS	CL_BIS_BLOCK
	BIS	CL_BIS_GL_REF_AREA
	BIS	CL_BIS_IF_REF_AREA
	BIS	CL_BIS_INST_CODE
	BIS	CL_BIS_SUFFIX
	BIS	CL_BIS_TOPIC
	BIS	CL_BIS_UNIT

Showing 1 to 12 of 702 entries

Solution: Redesign of the maintenance process

Reviewing:

- Each step in the process:
what could be optimised? Abandoned?
- The code and tools involved:
standardise, simplify, find new way of archiving
- Communication channels to all parties involved, and the information exchanged:
standardise and simplify, use Fusion Registries notification features
- *Quality control has an even higher priority*

New Tool: to fasten and automate manual steps

Single entry point approach:

One centralised control panel for the governance of SMD maintenance

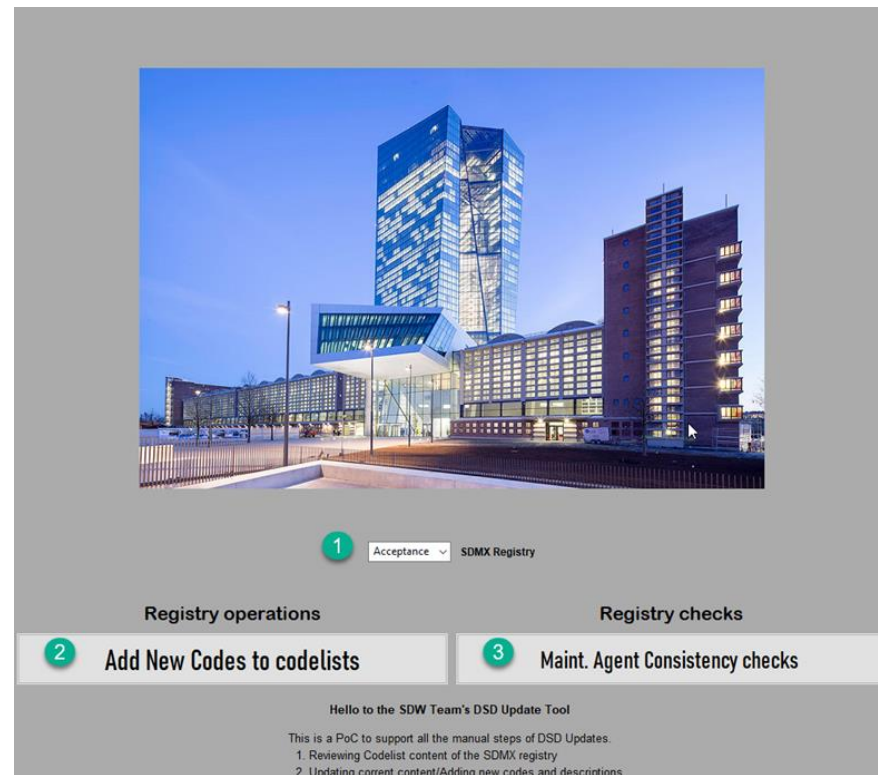
Simplify, fasten and make more secure the work + reduce learning curve

Features cover all the current processes:

- Downloads and uploads Structural Metadata from the Fusion Registry
- Loads changes to the Statistical Data Warehouse of the ECB
- Updates other systems relying on the Structural Metadata
- Archives changes in a dedicated repository
- Documents changes in human readable format

The main screen of the tool

- Switch between Fusion Registry Acceptance and Production instances
- Select the task you want to work on:
 1. Maintaining Code lists
 2. Run Quality Checks



2. Code list maintenance 8-step Wizzard

Step #1: adding new codes to code lists

Add Codes to Codelists Wizard

Update Codelist content in Acceptance

Step #1: Review/update the codelist content

1. Select codelist

Maintenance Agency: [ECB] European Central Bank

Codelists [336] Search

ALV - Attachment level code list (4)

Automatic Preview is displayed for codelists with less than 4000 codes.

Codelist content (current + newly added) [0]

Id	Code	Description
1	1	Data set
2	4	Time series
3	5	Observation
4	9	Sibling group

New <code, description> pairs

New Code	Description
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3. Check new codes in codelist

5a. Add New Code

5b. Paste Codes from Clipboard

Delete Selected Item(s)

4. Add Code Changes to Your Change Preview

Requested Code Changes:

Codelist	New Code	Description of code
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The requested changes are complete, and double checked.

< Back Next > Cancel

1. Select Agency
2. Select code list
3. Code list content is displayed
4. Add new codes
5. Manual inserts
6. Pasting from Clipboard
7. Deleting codes
8. Add configuration to job
9. Confirm job

2. Code list maintenance

Step #2: run the job configured in Step #1

Update Codelist content

Step #2: Upload new codelist to the SDMX registry

1. Select the target registry for the upload

Target


ECB Internal Registry 1

ESCB Registry

Upload method: 2

Merge

3

 2. Upload Changes to Selected the Registries

Results:

1. Select target environment for the Registry
2. Select Update mode: Full/Merge
3. Run the job

3. Essential Quality Checks for the Synchronisation between environments

Rule: All codes, code lists, dimensions of a DSD have the same Maintenance Agency.

1. Select source of DSDs:

Acceptance + Production Registry, and SDMX files.

The screenshot shows a software interface with the following elements:

- ECB Registry:** A dropdown menu with 'Acceptance' selected and open, showing options: 'Acceptance', 'Production', and 'Local DSD file [SDMX format]'.
- Agency:** A dropdown menu with '[ECB] Production' selected.
- Maintenance agency of the DSD, and that of its concepts and codelists must be the same agency.** A text label.
- Check Maintenance Agencies of DSD components for the selected Agency** A button with a green checkmark icon.
- Table:** A table with columns: DSD Name, Artifact Type, Artifact Name, DSD Agency, Artifact Agency, Comment.

2. Validate rule on selected source

The screenshot shows a dropdown menu for 'Agency' with the following list of options:

- [ECB.DISS] ECB Dissemination
- All Agencies
- [SDMX] SDMX
- [ECB] European Central Bank
- [BIS] Bank for International Settlements
- [IMF] International Monetary Fund
- [ESTAT] Eurostat
- [EUROSTAT] Eurostat
- [OECD] Organisation for Economic Co-operation and Development
- [ILO] International Labour Organization

Technical implementation of the tool

- Python has been chosen, as one of the popular general purpose programming languages used in our organisation.
- wxPython module is used for the GUI prototype
- pandaSDMX module fetches content of registry with its API, and parses the received files.
- *Other modules* support work on Linux, with APIs to content management system, updating MS Word documents, etc.
- Custom built Python module:
 - for the upload of DSD artifacts to the Fusion Registry
 - to consume irregular metadata structures for the agency hierarchy

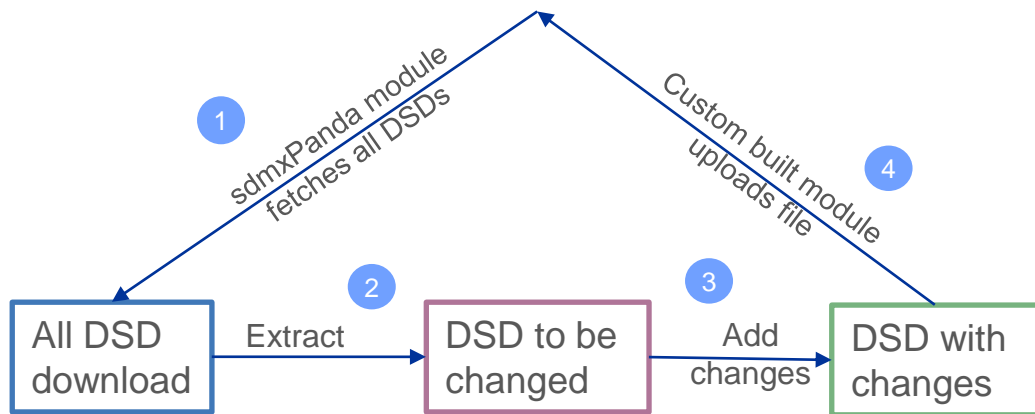
The process of updating the registry



Fusion Metadata Registry
API

API documentation:

<https://wiki.sdmxcloud.org/Category:WebService>



Page of Structural Metadata Import :

https://wiki.sdmxcloud.org/Structural_Metadata_Import_Web_Service

Thank you for your attention Q&A

