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

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

Our Structural metadata are the DSD for the data cubes

dimensions + attributes and their code lists
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.
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

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

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.

2. **Validate rule on selected source**
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

1. All DSD download
2. Extract
   - sdmxPanda module fetches all DSDs
3. DSD to be changed
   - Add changes
4. DSD with changes

API documentation:
https://wiki.sdmxcloud.org/Category:WebService

Page of Structural Metadata Import:
Thank you for your attention
Q&A