Implementing SDMX for Energy Domain

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2016 InterEnerStat Workshop

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International Atomic Energy Agency

Goals

- Test possible introduction of SDMX to Energy Domain in simulated “real world” like environment
- Identify necessary tools, complexity associated with their use and limitations
- Find critical points that need to be agreed at international level before actual NSI implementation

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Goals

“If you are not sure where you are going you will finish someplace else”

Yogi Berra

“The going is the goal”

Horace Kallen

“A goal is a dream with a deadline”

Napoleon Hill

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Approach

- Participate into the work of SDMX Global Conference (included training/demonstration sessions, networking, direct communication with “main actors”)
- Find young and brave fellow with some IT knowledge and basic understanding of Energy Statistics to find “right” way by trying

  “It is common sense to take a method and try it. If it fails, admit it frankly and try another. But above all, try something”.

  Franklin D. Roosevelt

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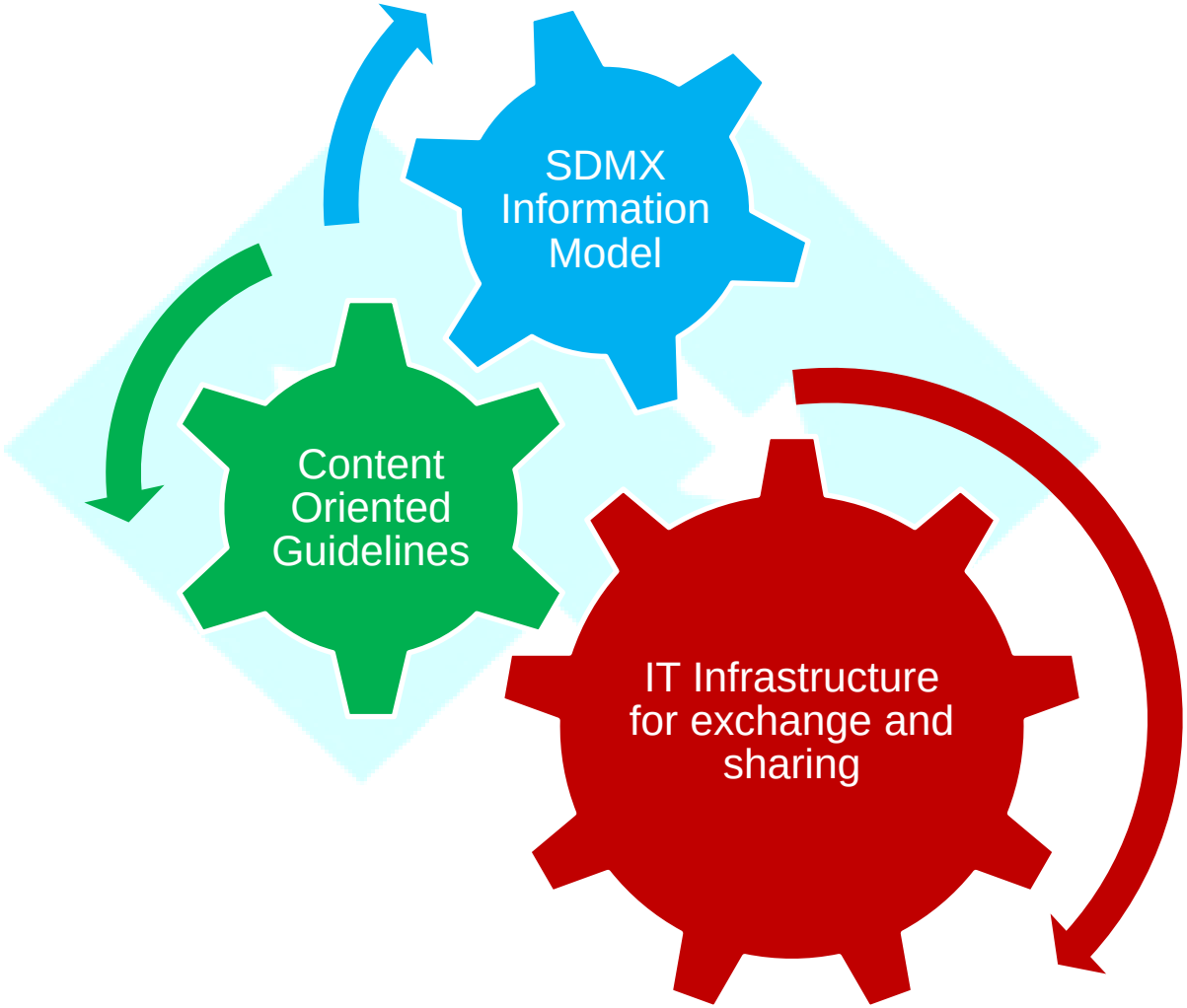
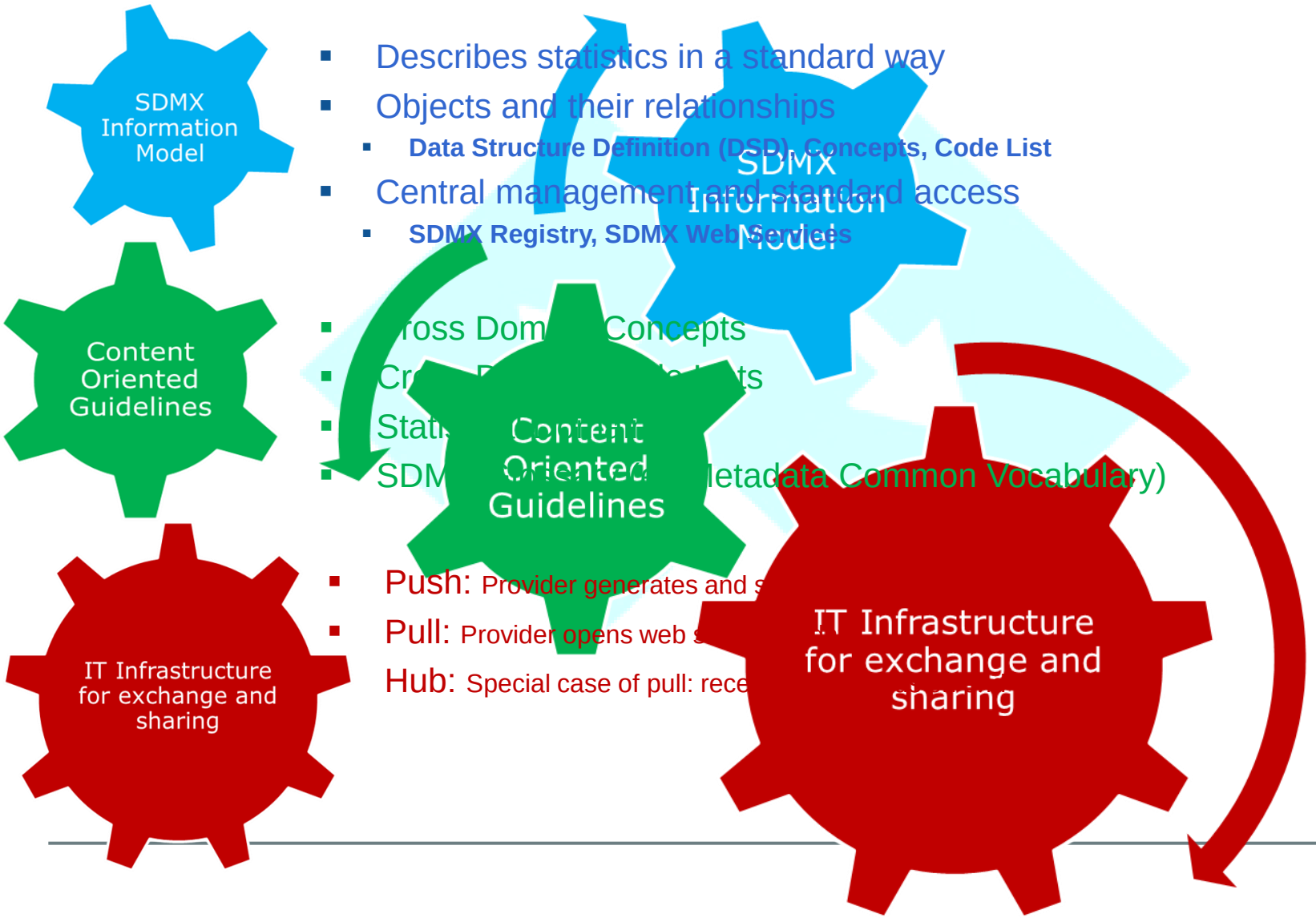
THE SDMX COMPONENTS



THE SDMX COMPONENTS



- Describes statistics in a standard way
- Objects and their relationships
  - **Data Structure Definition (DSD), Concepts, Code List**
- Central management and standard access
  - **SDMX Registry, SDMX Web Services**

- Cross Dom Concepts
- Cr ts
- Stati
- SDM letadata Common Vocabulary)

- Push: Provider generates and s
- Pull: Provider opens web s
- Hub: Special case of pull: rece

SDMX IMPLEMENTATION STEPS

1. Acquire basic understanding of key SDMX concepts / artefacts	Links to existing material / resources
2. Consider range of issues beforehand	Cover: institutional; IT; statistical; skills / resource-related issues
3. Identify skill development needs	• Cover: SDMX information model; how to access / use tools; • How to acquire required skills
4. Identify which SDMX implementation tools to use	• Not necessary to reinvent wheel • Consider range of tools available
5. Link into SDMX regional / global networks	• SDMX.org • With implementation countries • Expert meetings / Global conferences

Tools Tested and Used

Most of the tools we used are openly available on the Eurostat SDMX site but also from Metadata Technology

- Data Structure Wizard (DSW)
- NSI/SDMX-RI Web Service
- NSI/SDMX-RI Web Application
- Mapping Assistant
- Metadata Technology Fusion Registry and Fusion Transformation

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Data Structure Wizard

- Used for SDMX schemas creation for versions 2.0 and 2.1 of the protocol.
- Code Lists, Concept Schemes, Data Structure Definitions (DSD), Agency Scheme, Dataflow Scheme, Metadata Structure Definition (MSD)
- Can be used to create data messages with the available DSDs

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DSW: What was used

- Code list for frequency was taken from SDMX Global Registry
- Code list for countries was created based on UN codes and definitions
- Code list for energy flows, energy units, unit multipliers are based on the UN questionnaire for energy data
- Code list for energy products based on Standard International Energy Classification (SIEC) was taken from IRES.

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NSI/SDMX-RI Web Service

- Backend infrastructure that retrieves data requested by the user from a database
- Returns the data in SDMX 2.0 & 2.1 and can use SOAP and RESTful protocols
- Can be deployed on both Windows and Linux
- Connects with Mapping tool to transcode the information stored in the database

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NSI/SDMX-RI Web Application

- Front end to Web Service
- Takes the information returned by the web service and presents it in a human-readable format to the end-user
- Creates tables, simple charts
- Can export to PDF, SDMX-ML and Excel

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Mapping Tool

- Sits in between the Web service application and the database
- Uses DSDs as input to transcode information
- Converts the codes in the database to the definitions in the DSD

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SDMX-JSON

- New SDMX specification for data transmission/exchange
- Technology itself not new at all
- Contains both the datasets and the structure used to describe the dataset information
- More human readable and more efficient to retrieve and submit large amount of data

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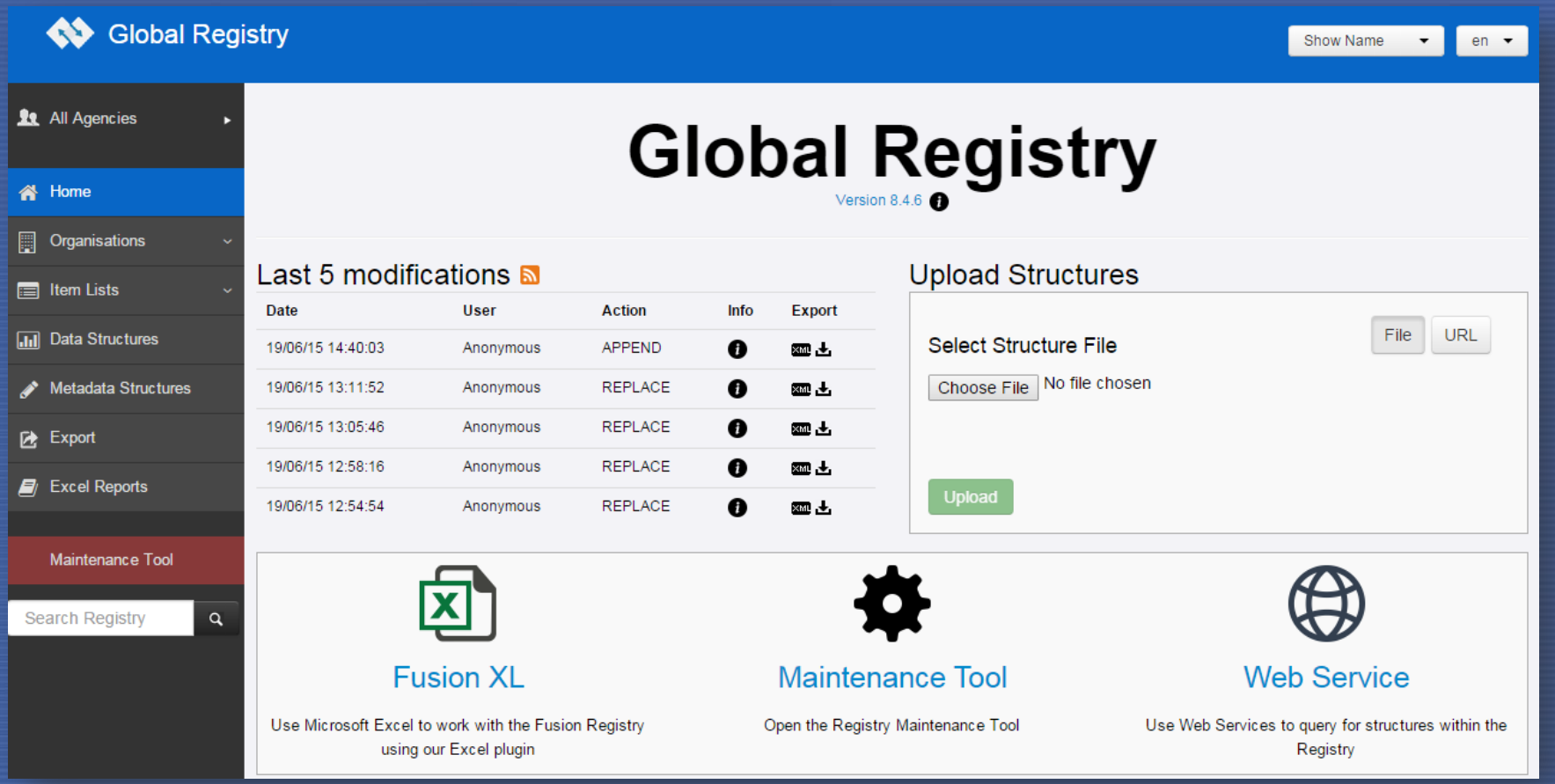
Global Registry
Show Name
en
All Agencies
Home
Organisations
Item Lists
Data Structures
Metadata Structures
Export
Excel Reports
Maintenance Tool
Search Registry
Global Registry
Version 8.4.6
Last 5 modifications
Date
User
Action
Info
Export
19/06/15 14:40:03
Anonymous
APPEND
19/06/15 13:11:52
Anonymous
REPLACE
19/06/15 13:05:46
Anonymous
REPLACE
19/06/15 12:58:16
Anonymous
REPLACE
19/06/15 12:54:54
Anonymous
REPLACE
Upload Structures
File
URL
Select Structure File
Choose File
No file chosen
Upload
Fusion XL
Use Microsoft Excel to work with the Fusion Registry using our Excel plugin
Maintenance Tool
Open the Registry Maintenance Tool
Web Service
Use Web Services to query for structures within the Registry

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Other tools available

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Lessons Learned

- Energy Domain has specific features not yet well addressed in other SDMX domains
- Portability of existing tools and solutions is less then ideal
- Discrepancy between different Web service tools
- SDMX-JSON ≠ SDMX-ML

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Points to address

- DSD Definitions
- Energy Flows standardization
- Different levels of details
- Cross-domain issues (energy prices, indicators, and so on)
- Ownership of Global DSDs and strategy for extending them with local registry maintained by NSI
- Energy and other units and calorific values
- Validation and transformation

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Future Plans

- Test and illustrate power of SDMX by using combination of readily available HTML5 visualization tools and data dynamically extracted in SDMX standard
- Work and test VTL (Validation and Transformation Language) that has great potentials

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Thank you

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