ESSnet for SDMX FINAL REPORT

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Project acronym:

Project title: Essnet for SDMX, phase II, WP 2

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[1]   Usually the contact person of the coordinator.
[2]   The home page of the website should contain the generic European flag and the Eurostat logo which are available
     in electronic format at the Europa website (logo of the European flag:
     http://europa.eu/abc/symbols/emblem/index_en.htm). The area of activity of the project should also be mentioned.

PART A. TECHNICAL REPORT

Introduction/Summary

The Action is composed by five work packages one of which is represented by management. Below will be described the initial goals and the results of the four work packages, a separate paragraph will be dedicated to management.

WP2 (*SCB*)– *PC-Axis-SDMX ML integration Phase 2*

The WP2 is the continuation of the WP7 of the "ESSNet on SDMX phase I". In order to have a more clear vision about the objectives of the WP2 the results obtained during the first phase are described.

The PC-Axis environment is represented by a family of tools used for the dissemination of statistical data that are used by the following countries within or related to the ESS: Estonia, Denmark, Ireland, Finland Latvia, Lithuania, Luxembourg, Slovakia, Slovenia, Spain and Sweden. Candidate states: Croatia and The Former Yugoslav Republic of Macedonia. EFTA Countries: Iceland and Norway. In total 15 countries in the region. In addition the software is used in Africa, Asia and the Pacific and Latin America.

In order to disseminate data in SDMX format the architecture defined in the PC-Axis environment was integrated during the first ESSnet, with the SDMX-RI. The result reached can be briefly resumed in these points:
1. Starting from a PC-Axis files data can be disseminated in SDMX format using static files stored in a Web hotel (with rss notification) or using a web service in "hub" mode.
2. Starting from the Statistic database SSD, used in PC-Axis environment, data can be disseminated in SDMX format using static files stored in a Web hotel (with rss notification) or using a web service in "hub" mode.

The objectives to be achieved during the ESSNet on SDMX II are a follow up of the work done in the first ESSnet:
- the improvement of the architecture developed in phase I
- the test of the architecture defined in phase I will be done with more complex statistics
- the transfer of knowledge internally to SCB and to other organizations and Swedish authorities.
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Improvement of the architecture
The improvement of the architecture will include the implementation of attributes on ce1l level in the PC-Axis family Internet user interface PX-Web. This functionality will allow the PC-Axis community to check attributes added on cell level for the PC-Axis loaded in the SQL-database or in PC-Axis files.

Implementation of a component in the PX-Web software to produce a SDMX Generic data file. This functionality give the possibility to reuse visualization tools directly via PX-Web, that use the Generic SDMX data file as input.

Test of some tools
The test of tools that are part of the architecture should use more type of statistics and more complicated, the work done will allow including more use case in the User's Manual of the process.

Transfer of knowledge
The transfer of knowledge will be structured on presentation and information on the architecture developed in Phase I for other countries and Swedish authorities that will use it.

During the project some of the activities foreseen to reach the objectives were deleted due to two issues related to the definition of dsd for statistical in implementation or in production, this statistics are not under the responsibility of the Statistics of Sweden. In January 2012 was evident that the dsds will not been available before the end of the project. This had as consequence to restrict the test of the architecture to the statistics of census.
The other issue was linked to the security functionalities of the web service in the SDMX-RI that are not complete like those provided by the EVA portal.
The results achieved during the project, taking into account the issues below described are:
1) an upgrade of the pc-axis environment tools in particular the PX-Web tool in order to accept as input a PC-Axis file with attributes defined at cell level
2) the integration of the architecture with visualisation tools like for example "eXplorer" the software produce by the university of Linkoping and the company NComVA and "Data Express" software produced during the phase I by the Portugal
3) A test of the whole architecture with the census data
4) Capacity building action with internal seminary and a workshop held in Rome together with Istat at the end of June.

1. Work Completion

*My intention is to release also the original documents if it is necessary to have details so your original document will be released.*The work foreseen in the grant were:

T2.1 Implementing of attributes on ce1l level in the Web application PX-Web belonging to PC-Axis family to visualize the attributes implemented in the PC-Axis file and in the SQL-database

T2.2 Implementation of the Generic SDMX data file in PX-Web to reuse it with some tools for visualization like for example "Explorer".

T2.3 Add more use cases to the User's Manual for the process. These use case are represented by statistics that are more complicated to be sure that the architecture can cover all the different statistics.

T2.4 Presentation and information for other coontries and Swedish authorities that wilI use the process developed in Phase I, taking actions solving problems that could arise when different countries start to use the process.

T2.5 Installation and test of new version Eurostat SDMX-RI

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T2.6 Study of how other governrnental bodies in Sweden wiIl do the reporting to Eurostat in SDMX format, if they intend to use the architecture developed in the first phase

T2.7 Plan the activities to put in place in case the Census is required with the SDMX 2.1 version.

T2.8 Planning, coordination meetings, report writing and administration.

Overview of the work in WP 2

The PC-Axis files are not used as the standard output of the database, from Statistics Sweden except for commissioned services and for the report of statistics to the international organizations, however the work done by Statistics Sweden in the WP2 can be used by the PC-Axis family members that base their statistics reporting on the PC-Axis files and by those using the SQL metadata model.

In January 2012 was evident that to realize a process using new statistical domains to test the architecture developed in the first phase was more complex then expected. In the picture below is shown the status of the process that will cover the period of the project.

The domains in production, Fisheries, Waste and Aviation were not under the responsibility of Statistics Sweden and also not available during the project therefore the only domain on which the architecture can be tested is the Census. Furthermore it was decided at Statistics Sweden not to use the dissemination data base used for the Statistics Sweden Website for the Census hypercube due to performance issue and set up a separate data base only for the Census reporting to Eurostat. This choice influenced the architecture on which the test had to be based.
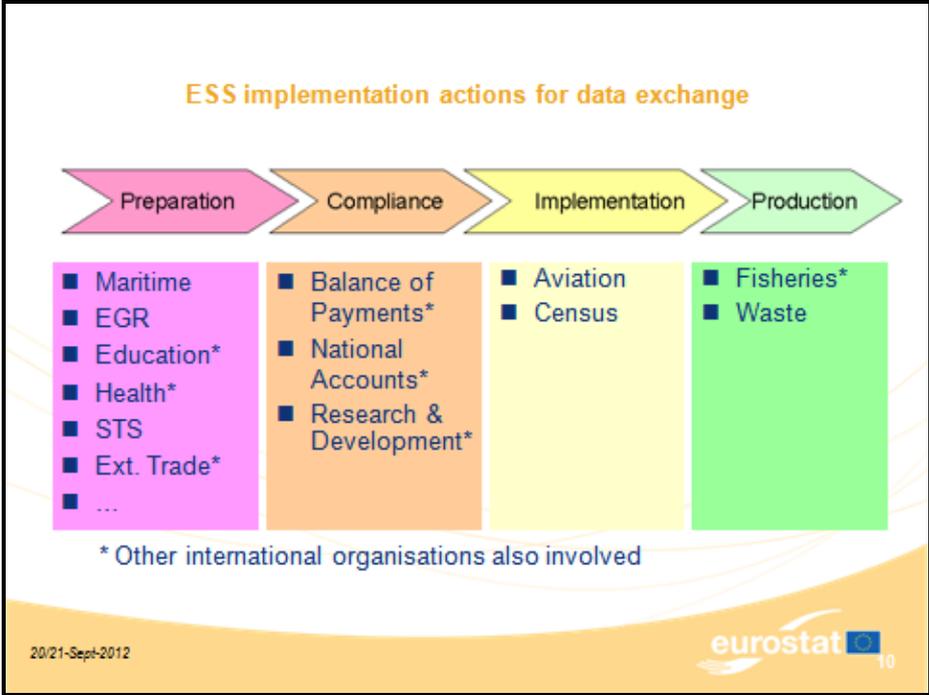
Another issues found during the project concerned the security functionalities provided by the SDMX-RI that did not cover the same functionalities of the eWA (edamis Web Application) portal.

These two facts have changed the plan of the initial activities and the deliverables of the project and a large part of the work was to restart and plan again the activities.

The statistic of Census was used to test the whole process that can be described in the following steps:
1) Data are produced via PX-Edit in PC-Axis files file format
2) The PC-Axis file is mapped using the Mapping Assistant
3) Data are retrieved by the Web service, for this purpose also the Test Client and the Web Client were tested.

Although Statistics Sweden will not use the PC-Axis files for the Census this test can be useful for the National Offices of Statistics that want to realize the international reporting using PC-Axis files.

In this context also the dissemination using the new architecture through the PX-Web had to be modified adding the attributes on cell level as was already done for PC-Axis and SQL database as well. The analysis on how to handle the Attributes on cell level took time creating a delay in the development work.

The task has the objective to find a solution that suits the whole chain including the preparation of the data with cell attributes using PX-Edit in a rational and safe way; the PC-Axis file adjusted for the attributes on cell level must fit into as well PX-Web as the Mapping Assistant. Some discrepancies on the use of attributes at cell level were found between the Census statistic and other statistics that can use them in same case as empty values.

During the project a big part of the work consisted also in the test the software in the Reference Architecture, especially the tools Mapping Assistant and in the definition of new functionalities to be implemented inside the SDMX-RI.

Concerning the capacity building subtask it was planned to share the experiences done during the ESSnet projects both to other domestic organizations responsible for official statistics as well as to other NSIs that use the PC-Axis environment. Due to the fact that the datasets sent from Statistics Sweden were not converted in SDMX to the security issue mentioned above the other organizations in Sweden were not be contacted however for the other NSIs was planned and performed (together with ISTAT, see WP5) a workshop that was held in Rome at the end of June 2012.

Process for CensusHub reporting from PC-Axis files

2012-05-26
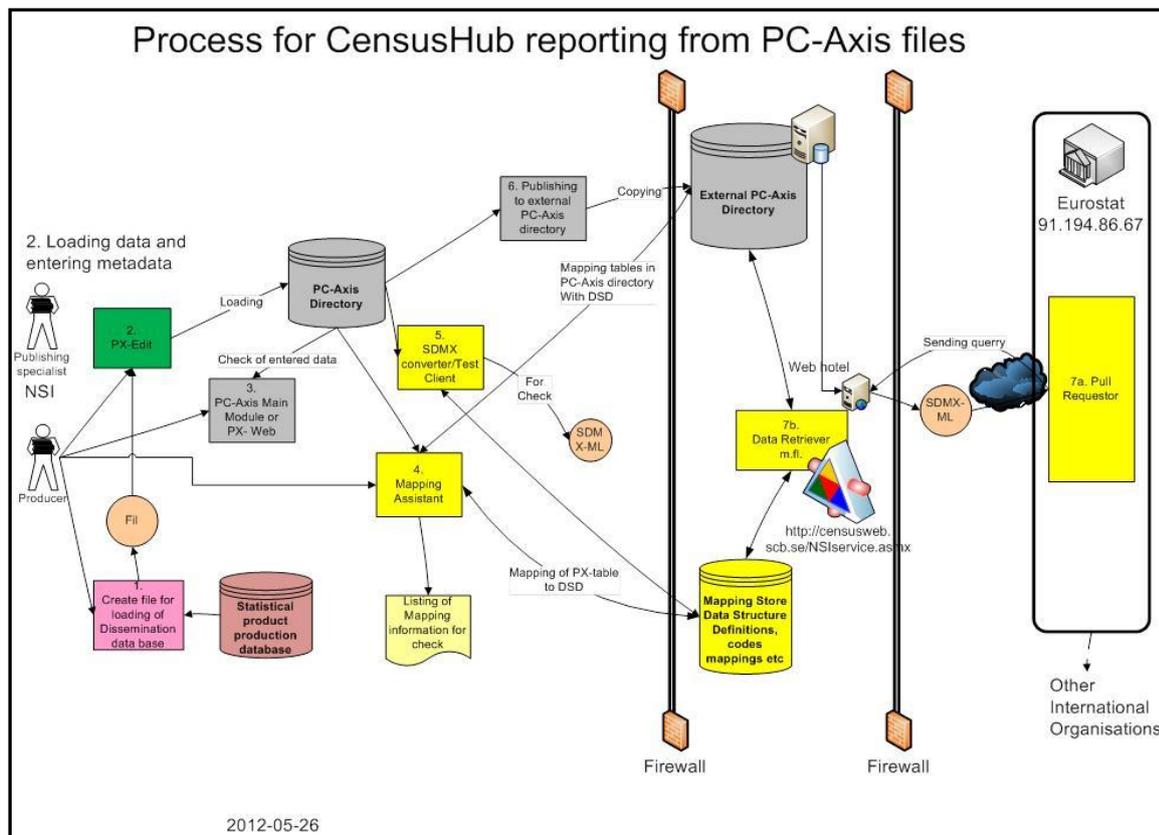
Census Hub SQL implementation for SDMX at Statistics Sweden

In the forthcoming transmissions from Census Hub in Sweden the SQL-environment will be used.

Actually the dissemination database used, called Statistical Databases of Sweden (SSD), generates data and metadata from Nordic Model SQL databases. Since the begin it was decided to use the whole process for the Census transmissions to Eurostat and also to handle the Census data in a database different from the statistical one, on a server aimed for the international transmissions only. The main reason to keep the two kind of data (dissemination and Census data) in two different database and also in two different servers was due to take into account the performance in the national dissemination on one hand and the dissemination to Eurostat on the other. Since we moved the Census from the statistical database to a separate one a simpler schema model was adopted containing the data tables with all the attributes needed for the transmissions.

The picture below shows the whole process having a starting point in the production system in which aggregates and disclosure risks are handled. The reporting activities start with loading the data into an internal output database for attributes preparations and checks. The mappings are created using the Mapping Assistant (MA) to the internal SQL database. Then data and attributes are checked using the tools Test Client and Web. In some cases also PX Web can be used. Finally, when data are checked and ready to be reported to Eurostat the DDB-connection defined in the MA is changed to point to an external SQL server and make data available via the SDMX-RI Web Service.

Each hypercube represents one dataflow and is stored in one data table, adopting storage schema defined in the mapping assistant, scheme type A in which the table include as columns all the dimensions and attributes defined for the hypercube concerned except from the concept "HC_NOTE". Aggregates are included for each dimension and disclosure for the

data will not be possible. In the local data tables of Sweden database in which the Census data are stored, the codes are the same that those of the code lists used in the DSDs defined by Eurostat, for that reason it is not necessary any transcoding and the dimension names consist of a national short name together with the Census B6 names in code form.

The test of the hypercube HC02 and HC06 are completed with data flows, datasets, Mapping sets and Header info. HC02 is a large cube (6 million rows) which was loaded with almost authentic data. The tests of the whole process from our external output database, via the mappings, used the Census Hub Pilot interface.

During the test activities, the needs of some added functionalities to the MAs was reported and some of them were implemented by Eurostat.
Examples on these activities are the union select of tables in the dataset, to make changes in Datasets custom queries connected to a mapping set, handle HC_NOTE as a constant value in the mapping set among others.

Process for reporting SQL from SCB the CensusHub without RSS

2012-06-20
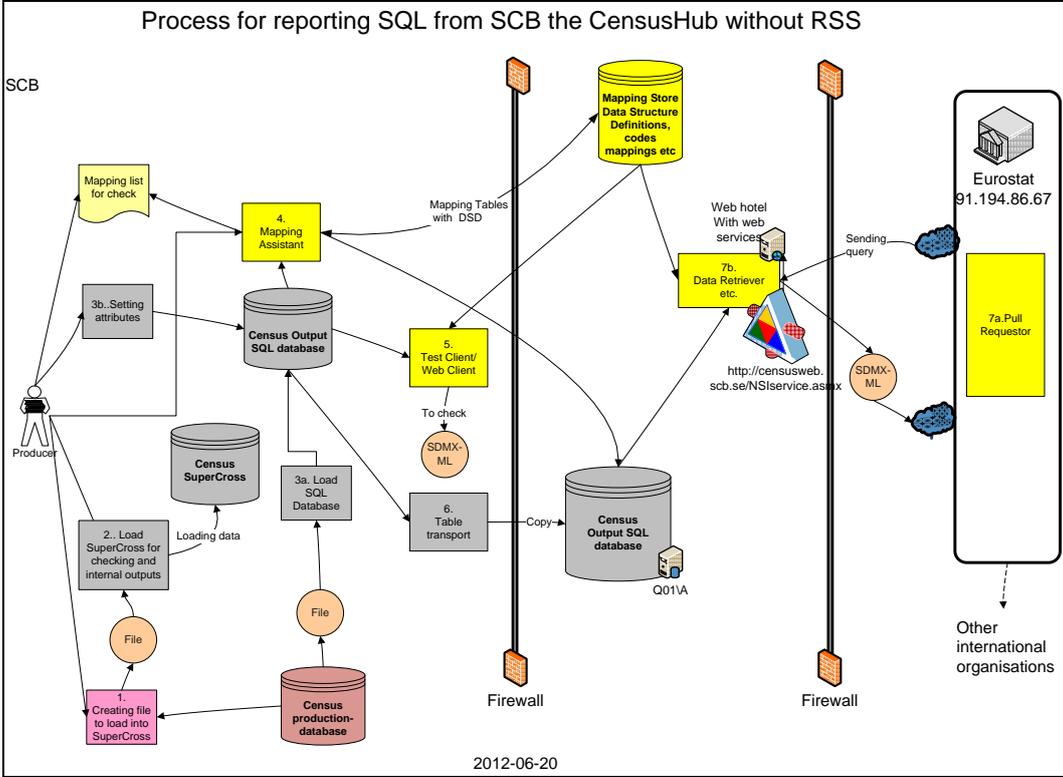
The picture above show the architecture that will be used for the CensusHub: the link to the Eurostat Hub will be direct directly to the Census server and will not involve the official database on the Statistics Sweden.

## PX-Web development
The PX-Web has been upgraded to handle attributes on cell level. The PX-Web is based on a technical platform named Paxiom that has been updated for the attributes that are provided to PX-Web.

Possible re use of PX-Web development in the Eurostat RI
There is a study still on going on the possibility to use, in the SDMX-RI, Paxiom as a part of the input of PC-Axis files.

Below will be described the results achieved for every subtask.

Results from Essnet for SDMX II WP2 PC- Axis SDMX Integration 2012-09-24
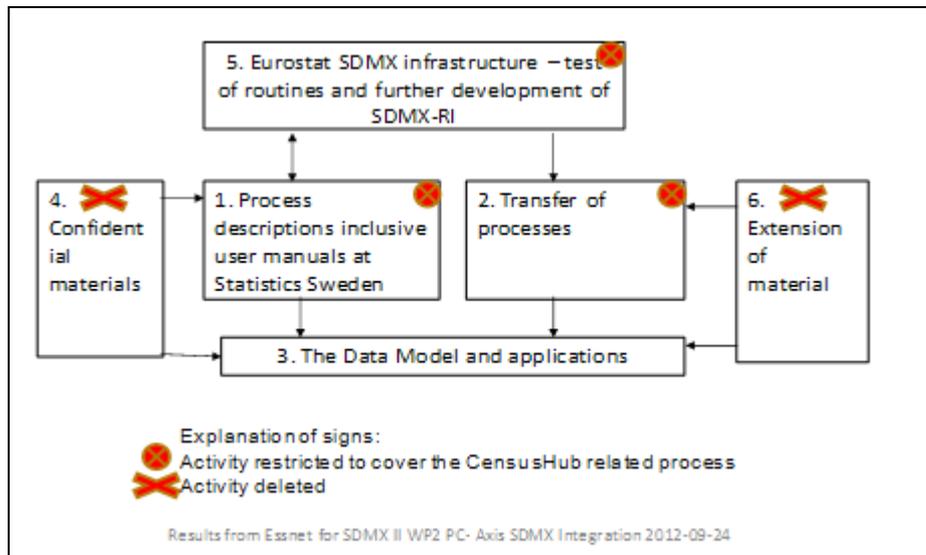
In the picture above are shown the areas on which the activities planned were grouped, the sign ⬤ defines the activities restricted to the CensusHub process while the sign ✖ defines the activities deleted. For every activity is indicated the corresponding deliverable referring to the deliverables foreseen in the grant.

1. Process descriptions inclusive user manuals at Statistics Sweden

1a) To design a proposal for the different central organizational units and subject matter divisions of a workflow for a first delivery and a workflow for continuous deliveries to Eurostat. The expected result was the input for an upgrade of the Process Support System (see also the point 1e) and it was conducted only for the CensusHub. The deliverable was shown to the workshop in Rome. The other activities, that had to be delivered in the deliverable D2.1:

> **1b)** Proposal for the distribution of responsibility between different Objects of Maintenance when it comes to applications in the Infrastructure.
> **1c)** Upgrade of the User Manual for statistics producers and others**.**
> **1d)** Process Support System
> **1e)** Adjustments in the User Manuals and the Process Support System from Feed Back from the users that has entered new materials etc**.** were deleted from the project.

2. Transfer of Processes

Internally at Statistics Sweden

Internally at Statistics Sweden the activities were deleted due to the no availability of the DSDs, the deliverables were included in the deliver D2.1 of the grant.
2a) Preparations of tests of the new way of working for selected statistics using the architecture implemented in phase I**.** The result expected was a proposal for statistics to be selected and a suggestion of a time table for the process.

2b) Seminars, information, time table and tests to do together with the producers.

Externally to other countries

2c) Preparation of a User Manuals for the PC-Axis family members adjusted for the PC-Axis environment and translated into English.
2d) Presentation and information for other countries and Swedish authorities that will use the process developed in Phase I.
The results expected are part of the deliverables D2.1 and D2.2 of the grant and consisted in a User Manual of the process, in English and the workshop realized in Rome at the end of June.

For other organizations in Sweden responsible for official Statistics – low priority

2e) Study of how other governmental bodies in Sweden will do the reporting to Eurostat in the SDMX era and information concerning the changes.
Statistics Sweden is local coordinator for Sweden, not only for Statistics Sweden but for other Swedish organizations. The results expected consisted in an investigation and preparation of corresponding document on how other organizations make the reporting to international organisations. This activity was deleted due to the lack of DSDs and to the security issues.

3. The Data model and applications

3a) Test of PX-Edit concerning Attributes on Cell level and capacity test of PX-Edit, PC-Axis and PX-Web using large census files. The results expected was the availability of a version of PX-Edit as a part of the international reporting based on the new PC-Axis files that has also attribute on cell level. PX-Edit will be modified by Statistics Finland when a decision on how to implement the new functionalities will be taken. The result, related to the deliverable **D2.3** is financed outside the project.
3b) Implementation of the new functionality to manage the attributes on cell level in PX-Web application (.Net version). The software is finished and adjustments related to the final outcome will be done by PC-Axis project at Statistics Sweden.
3c) Test and adjustment of the Generic Default SDMX-format from PC-Axis. The result expected was that the Generic Data message produced starting from the PC-Axis file can be used as inlut with different tools like "Data eXpress" produced by Portugal during the first Essnet on SDMX and eXplore the software developed byt the University of Linkoping and the company NComVA. The result was achieved and released as the deliverable **D 2.3**
3d) Implementation of the Generic Default SDMX-component in PX-Web dot net. This work was done together with the development of the Web GUI used by Statistics Sweden Website. The result expected is a new version of PX-Web that has the functionality to save data in SDMX Generic data file. The function was partially implemented and will be released in November 2012 as Beta version together with the new documentation.
3e) Documentation of data model. This work had as deliverable the release of upgraded documentation on the data model. This documentation is actually pending on the decision on attributes on cell level.
3f) Adjustment of publishing software for the CensusHub data. This is a new activity that should take place in the Census project but due to the fact that the Census Hub will access a separate Census Server at Statistics Sweden the activity was deleted.

4. Confidential Statistic (activities deleted)

These activities concerned all the security functionality in the dissemination of data using the SDMX-RI but due to the fact that that the security level of SDMX-RI is not the same that in eDAMIS, these activities were deleted.
4a) Authorizing/permission issues
4b) Security issues for confidential statistics
4c) Further deliveries to other International Organisations and Confidential Statistics, safety issues

5. Test of routines and further development of the SDMX-RI

5a) these activities consisted in complete the tests of the Standard routine and the Census routine for both the SQL and PC-Axis files in collaboration with Eurostat to get the whole chain can be shown working, and was done only for the Census. It was done for one hypercube from the Census for the Workshop in Rome.
5b) Installation and test of new versions of the SDMX-RI, the NSIWebService_.NET_v2.4.3_2012.04.25 version was installed.
5c) Participation in the meeting on RI development in Luxembourg 27-28 February 2012. *Status Feb 2012.*

6. More statistics – low priority: Final Status: Deleted Grant

These activities which concerned the test of architecture with more statistics were deleted.

6a) Test of different types of statistics for delivery to Eurostat.
6b) Possible further development caused by results of test for different statistics
6c) More use cases shall be added to the User's Manual for the Process- up date, Swedish user's Manual and the Process Support System

Specific results
1. Workshop in Rome
2. Step by step tutorial for the PC-Axis SDMX integration distributed at the workshop
3. PX-Web with attributes on cell level and with Save as Generic SDMX structure and data files
4. Verifying the SDMX-RI system in the PC-Axis environment

The deliverables made during this grant agreement have been annexed to this report.

2. Dissemination action towards the ESS

Conclusion

WP 2 PC-Axis SDMX Integration

The general conclusion is that it will be possible to use what has been achieved in the WP 2 project and Eurostat RI project by the NSIs using the PC-Axis family of software for the international reporting.

PC-Axis and SDMX RI has been developed to a harmonized way of handling international reporting from NSIs using PC-Axis file format as well as the SQL databases structured according to the Nordic Meta data model. Concerning the development work in PC-Axis it is mainly the capacity to handle attributes on cell level that has been implemented. Concerning the SDMX RI a lot of adjustments has been done by Eurostat consultants to get the capacity to use PC-Axis files as a base for the international reporting of statistics. Mainly the adjustments in Mapping Assistant have been a subject to verifying by Statistics Sweden. Even if only the Census has been able to be tested, much of what has been developed will be of use for the reporting to international organizations in other domains. Adjustments may be needed for other domains that can concern security aspects like permissions, encryptions, violating privacy etc.

Furthermore the function to make Generic SDMX structure and data files has been developed and implemented into the PX-Web system. Such saved files works as input to the Portuguese Data Express chart program as well as the "Story Telling" software eXplorer.

The PX-Web has been upgraded to handle attributes on cell level. The PX-Web is based on a technical platform named Paxiom that has been updated for the attributes that are provided to PX-Web.

In the Eurostat RI project there is an interest to use the Paxiom as a part of the input of PC-Axis files in the RI software.

Recommendations
- Security issues solutions in RI to keep up with the status in the present international reporting via eDAMIS.

Annexes

LIST OF DELIVERABLES FOR WP 2

As has been commented in the Overview of the work in WP above and showed in detail in the chapter Work completion above the project has been reduced to concern the Census data. Nevertheless the outcome of the project gives a positive believe in the usefulness of the development in WP2 for the use of PC-Axis environment and the SDMX-RI for the reporting of statistics from NSIs to international organisations.

The list below of deliveries has indications on which delivery concerned from the Grant document.

Within the PC-Axis community
- PX-Web with attributes, release in PX-Web Beta version in November 2012. The maintenance of the software is transferred to Statistics Sweden PC-Axis project. *Grant D2.3*
- PX-Web with save as Generic SDMX Structure file and Data file, release in PX-Web Beta version in November 2012. *Grant D2.3*
- PX-Web software and documentation on PC-Axis Website http://www.scb.se/Pages/StandardNoLeftMeny____314045.aspx *Grant D2.3*
- PX-Edit software and documentation from Statistics Finland on http://tilastokeskus.fi/tup/pcaxis/lataus_tyokalut_en.html Related to *Grant D2.3 but not financed of the Grant*
- Original PC-Axis file format on http://www.scb.se/Pages/List____314011.aspx
- Additional document for the attributes on cell level in the PC-Axis file format: Attributes in the PX file format ESSnet template.doc *Grant D2.1*
- Original SQL Metadata model on http://www.scb.se/Pages/List____314010.aspx
- Additional document for the attributes on cell level in the SQL data model: Attribute in the Nordic sql-datamodel-version-1.docx.doc *Grant D2.1*

Outside the PC-Axis community
- Documentation Tutorial Step by Step tutorial PX-File_to_SDMX1_Draft2.doc presented at the Workshop in Rome June 2012. *Grant D2.1 and Grant D2.2*
- Presentation of Generic SDMX from PX-Web: Presentation_Essnet_for_SDMX_WP2_GenericSDMX_Workshop_June_2012_draft2.ppt *Grant D2.3 and Grant D2.2*
- Presentation of the work in WP2 at the Workshop in Rome: Presentation_Essnet_for_SDMX_WP2_Workshop_June_2012_draft2.ppt *Grant D2.2*
- *These three documents above are available at the ESSnet Portal on URL:*
- *http://www.essnet-portal.eu/sites/default/files/157/Workshop_25_27.zip*
- Presentation of Final results in the project: Presentation_Essnet_for_SDMX_WP2_Final_Coordination_meeting_Sept_2012_draft1.ppt available on http://www.essnet-portal.eu/sdmx-ii/meetings
- Test Census routine with Swedish data in SQL to Census Hub Pilot Client in the document Test Plan SCB RI.doc

Part B. REPORT ON THE MANAGEMENT OF THE ESSnet

1. Project management

2. Final Deliverables

Table 1: Deliverables List

Del. no.	Deliverable name	Workpackage no.	Date due	Actual delivery date	Comments

3. Status of the final use of the resources

TABLE 2. RESOURCES (IN PERSON-DAYS/PERSON-MONTHS)							
Work package **Co-ordinator /**	**WP1**	**WP2**	**WP3**	**WP…**	**WP…**	**WP…**	**TOTAL per Beneficiary**

Co-partner							
1.							
2.							15
3.							
4.							
5.							
6.							
TOTAL							