

TWINNING CONTRACT

BA 12 IB ST 01

Support to the State and Entity Statistical Institutions, phase VI



MISSION REPORT

on

Activity 3.5 Development of Financial Accounts II

Mission carried out by
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07-09 March 2016

Version: Final



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List of Abbreviations

| | |
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| BHAS | Agency for Statistics of Bosnia and Herzegovina |
| BiH | Bosnia and Herzegovina |
| CBBH | Central Bank of Bosnia and Herzegovina |
| EC | European Commission |
| EU | European Union |
| FBiH | Federation of Bosnia and Herzegovina |
| FIS | Institute for Statistics of Federation of Bosnia and Herzegovina |
| MS | EU Member State |
| RSIS | Institute for Statistics of Republika Srpska |
| RTA | Resident Twinning Adviser |
| TOR | Terms of Reference |

1. General comments

The MS Expert would like to express his thanks to all officials and individuals met for the kind support and valuable information which he received during his stay in Bosnia-Herzegovina.

Dataformats for source data were discussed and the challenges concerning those, like suppliers changing the record structures etc. Methods to tackle this problem were discussed and the approach Statistics Denmark used were presented but given that it requires the user to have a good knowledge of SAS programming CBBH is not sure it was a possible road to take since their users do not have any knowledge of SAS. CBBH do not own a SAS license and since they are quite expensive other avenues would have to be investigated, like for example the open source R platform. Other methods were discussed in dealing with this problem, like creating a Graphical User Interface (GUI) so the user could generate rules that would be applied when loading data. It is the recommendation of the MS Expert to give the user the ability to describe how data should be loaded, otherwise it most likely will require too much IT support when something goes wrong.

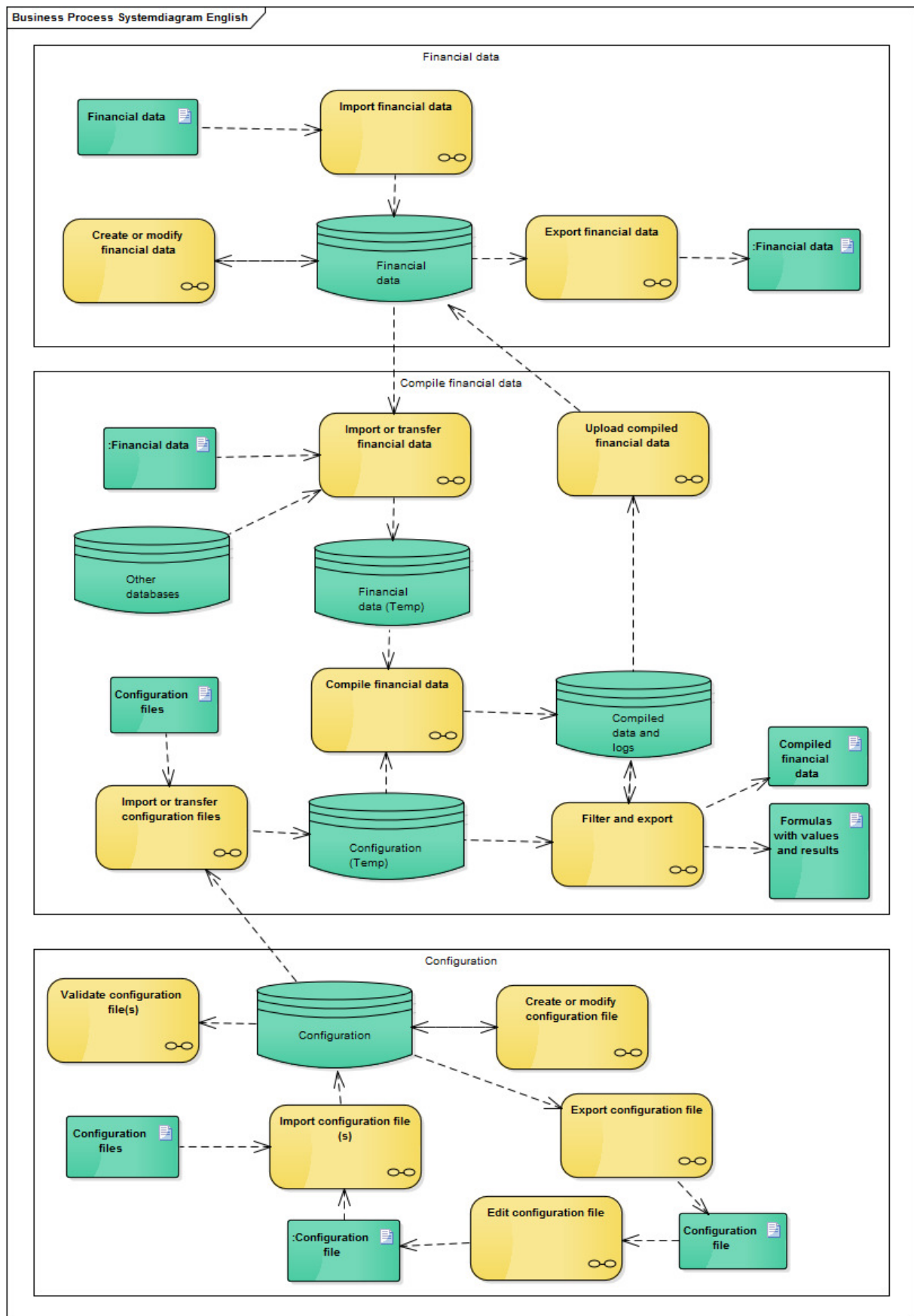
CBBH's internal systems run on a closed network for security reasons. They have external databases which are used in conjunction with their website. The challenges of getting data from their internal servers to the external ones were discussed. CBBH has an idea on how to do that, but no other solution was presented. The MS Expert will make enquiries in Statistics Denmark about ways to upload data to an external database from a closed network.

The MS Expert presented part of the financial compiling system developed in Statistics Denmark, which rely on the user to describe in a pseudo language what the system should do when running batch calculations. It has been converted from SAS code to Oracle's programming language and a GUI has been developed to help the end user since it previously required a very detailed knowledge of the syntax to use. The syntax was developed in house in Statistics Denmark. A similar system would be very helpful to CBBH so it was decided the MS Expert will describe how the system in Statistics Denmark operates in different stages on a conceptual level.

CBBH experts told about their system especially concerning the challenges of importing data and preliminary design ideas for intentions and requirements to develop a new system for compiling financial accounts.

Description of the oracle based compilation system

The following diagram is an overview of the system. The descriptions following the diagram are directly linked to the individual elements in that diagram.



Each element is described from top to bottom as they appear in the diagram split up into the 3 sections in the diagram, Financial data, Compile financial data and Configuration.

Financial data section:

- Financial data : balance sheets, account and such.
- Import financial data : Loads data into temp table, user validates it and loads it into final table.
- Create and modify financial data : A Graphical User Interface where the user can view data in a matrix with time horizontal and accounts vertical. The values are then presented in that matrix. Here the user can modify data if needed. New versions can be created if the original values are to be kept before modifications are made. New time periods can be added if needed when manually adding data.
- Export financial data : Export financial data to excel spreadsheet, each record containing one value, the time period and the different codes associated with the account (sector, element, instrument and such).

Compile financial data:

- Import or transfer financial data : Data can come from the Financial data database or externally from flat files/another database. All three sources can be used in one run. It is described in a configuration file called Filelist, which describes the source of each set of data to be loaded.
- Upload compiled financial data : After a completed run the user can choose to upload the data back into the Financial data database and mark it as output data.
- Other databases : Source data which are to be used in a run.
- Financial data (Temp) : A table to store all the data which are to be used in a run.
- Configuration files : Only the file list needs to be used in a run. The other files are optional.
 - Filelist : Contains the various data sources to be used in a run.
 - Formulas : The formulas to be used in a run, written in a pseudo language.
 - Sourcekey : Describe which result data to export after a run. New columns can be added to the output described in this file. These columns are typically used in grouping of data. The new columns and values are matched to the source code listed in the file and the source code in output data.
 - Unit key : Used in substitution but can also contain new columns to be added to the output. Here the new columns and values are matched against the unit code in this file and the unit code in output data.
 - Element list : Used when retrieving data from Statistics Denmark's dataware house to be used in a run.
 - Indicator : Used in calculating projections and distribution of both source data and calculated results from this run.
 - Unit2 : Used in substitution where the data in this file, will be used to replace the substitution character when needed.
 - Elm1 : Used in substitution where the data in this file, will be used to replace the substitution character when needed.
 - Elm2 : Used in substitution where the data in this file, will be used to replace the substitution character when needed.
 - Dkcode : Used in substitution where the data in this file, will be used to replace the substitution character when needed.
- Compile financial data : 2 of the parameters describes the time period and what type of time period the run should compile data for, for instance yearly, quarterly etc. A run can consist of the following phases:

- Summary of source data, for instance in a run where the period type is yearly and the source data contain monthly data, they will automatically be summed up to yearly level.
- Indicator, if used, will calculate projections or distribution or a combination of both for the specified key on source data and results. A key will also be in the following format : unit code + dk code + source code + element code. Step is optional.
- Substitution, here formulas and the source key file can be transformed using substitution. The user creates a template for a formula and instead of using actual keys uses substitution characters instead of sector code, source code, dk code and element code. If no substitution is used, this step is not performed.
- Pre-calculation, creates a sorted formula list, based on dependencies between them. It performs a check to see if 2 or more formulas are connected in a circular reference which is illegal. Step is optional.
- Calculation, here all the formulas are calculated. Step is optional.
- Indicator, substitution, pre-calculation and calculation are run 2 times.
- Saves all the data and logs to the database.
- Performs seasonal data calculation, a form of curve smoothing. Step is optional.
- Create the output from the run.
- Transfer the filtered output data to the financial data storage area. Step is optional.
- Compiled data and log : All the generated output from a run are stored in tables, like formulas and their values used in the computation and their results. Various logs which can be used to track what the system did in a run.
- Import or transfer configuration files : The files can either be loaded from an external location, like a network drive or from this systems own configuration tables.
- Configuration (Temp) : A storage area for the configuration files which were transferred or loaded to be used in a run.
- Filter and export : Based on one of the configuration files (source key file) data are filtered so only the records matching the criteria in this file will be used for export or upload to this systems database. The **source key file** and the **unit key file** are both used to add extra variables (columns) to the data. It's a way to for instance group data together by adding extra information to it. The filtered data are exported and the formulas are exported as well. Each formula is exported once for all the time periods used in a run containing all the values for each part of the formula and the result as well.
- Compiled financial data : The filtered financial data from a run.
- Formulas with values and results : All the values used to calculate a formula for the specified time period are exported to excel spreadsheets linked to the keys for each part of the formula. The result is also saved. The file can be used to examine each formula in detail for each time period.

Configuration:

- Validate configuration file(s) : Each file are checked for syntax errors but all the files are validated in relation to each other as they contain data which can be used in conjunction with other files to save time (substitution).
- Configuration : Storage space for the configuration files.
- Create or modify configuration file : A GUI where the use can easily create or modify the different configuration files.

- Import configuration file(s) : Either used to import existing files from a set of txt files on a network drive or just to import one which previously were exported for editing in a text editor.
- Export configuration file : Export a file for editing in a txt editor if the user finds this more convenient.
- Edit configuration file : A text editor of choice where the user manually edits the file.

2. Assessment and results

The purpose of this mission was to sit down and discuss ways for CBBH to compile financial accounts and to talk about the system implemented in Statistics Denmark, as inspiration.

When the summary mission report where written a short description of the Danish system was added but it was decided a more detailed description were needed. This detailed report contains such a description.

3. Conclusions and recommendations

It is the recommendation of the MS Expert to give the user the ability to describe how data should be loaded, otherwise it most likely will require too much IT support when something goes wrong.

Annex 1. Terms of Reference

EU Twinning Project BA-12-IB-ST-01 **Terms of Reference**

Component 3: Financial Accounts **7 – 09 March 2016** **CBBH, Sarajevo, Mehmeda Spahic 5, 5th floor**

Activity

- 3.5 Development of Financial Accounts II

Benchmarks

- Annual pilot data collected by 5th project quarter
- Methodology for compilation of Financial Account for BiH based on ESA 2010 prepared by 8th project quarter
- Financial Accounts for BiH prepared by 8th project quarter

Purpose of activity

The expected activities are:

Presentation of Danish IT system for compilation of financial accounts including:

- Presentation of flexible approach adopted in Danish IT system
- Ways how to handle several sectors and counterparts
- How to produce time series in flexible manner

Expected output

- Ideas for a new system for compilation of financial accounts

List of Participants

MS Expert

Mike Elkjær Barbré (DK)

Central Bank of Bosnia and Herzegovina (CBBH)

Amir Hadziomeragic

Bojan Savic

Kenan Begic

Adnan Dzelihodzic

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| Agenda |
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Location: Sarajevo, CBBH, Mehmeda Spahe, 5th floor

| Time | Day | Place | Event | Purpose / Detail of event |
|-------------------|-------------------|-------|--------------------------------------|--|
| 8:30-8:45 | Monday | CBBH | MS experts meeting with RTA and RTAA | Introducing MS expert on the work done and expected activities |
| 9:30-16:00 | | | Workshop with BC Experts | Welcome and Introduction Presentation of flexible approach adopted in Danish IT system |
| 9:00-16:00 | Tuesday | CBBH | Workshop with BC Experts | Ways how to handle several sectors and counterparts How to produce time series in flexible manner |
| 9:00-11:30 | Wednesday morning | CBBH | Workshop with BC Experts | Presentation of the summary mission reports by MS expert |

Annex 2. Persons met

Central Bank of Bosnia and Herzegovina (CBBH)

Amir Hadziomeragic

Bojan Savic

Kenan Begic

Adnan Dzelihodzic

RTA Team:

Søren Leth-Sørensen, RTA

Djemka Sahinpasic, RTAA