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## Terms of Reference

Project No	139 628
Project Name	Improving the Production and Dissemination of Statistics
Beneficiary	State Statistical Office of Republic of North Macedonia
Contracting Authority	The EU Delegation to the Republic of North Macedonia
Component	4A Developing metadata-driven IT system for standardized integrated statistical data production
Position	Data Architect and Data Administrator
Type	Junior Non-Key Expert
Days Allocated	Up to 80 work days
Location	Skopje, Republic of North Macedonia
Start/End of Assignment	July 2020 – November 2021

### 1. Background

The purpose of the project is further support of the State Statistical Office (SSO) of Republic of North Macedonia in harmonization with acquis and upgrading its statistical and ICT infrastructure for increased efficiency of the statistical production and improved data quality in order to respond better to emerging challenges from the changing EU acquis.

Developing a statistical system compliant with the EU standards is a long-term task, requiring solid investments in establishing a political, institutional and financial framework to allow full harmonisation with the EU acquis and the implementation of the European Statistics Code of Practice. Official statistics play a dual role in the Stabilisation and Association Process and in the EU accession process. First, Chapter 18 of the acquis defines the harmonisation of statistics with EU standards and rules, and has to be implemented in the pre-accession period. Second, official statistics serve other policy areas and chapters by providing the data from which policies can be developed, changes monitored and impacts assessed.

The SSO is responsible of coordinating the statistical system, producing statistics and managing the international relations in statistical sector. The SSO produces more than 70% of the official statistics. The SSO is an independent professional organisation whose competences and scope of work are regulated by the Law on Organisation and Operation of the State Administration Bodies and the Law on State Statistics. In accordance with the Law on State Statistics, the SSO, on the basis of scientific methods, provides users (legal and natural persons) with data on the economy, demography, social life, environmental protection and other areas. Official statistical data, as well as the time and content of all forms of dissemination, are protected from any kind of influence, and all users are treated equally.

The SSO performs its role in cooperation with other authorised bodies that are also responsible for producing official statistics under the Programme of Statistical Surveys 2018-2022. The Programme is a by-law that determines the statistical surveys that are implemented within a certain period of time and specifies the authorised bodies that collect, process and disseminate statistics. The Programme of Statistical Surveys lists all statistical surveys that produce official statistics. The authorised bodies are: the National Bank; the Ministry of Finance; the Ministry of Interior; the Ministry of Justice; the Hydro-meteorological Service; the Institute of Public Health; the Pension and Disability Insurance Fund; the



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Employment Agency. In the Programme for 2018-2022, a total of 319 statistical surveys are included and 252 of them are implemented by SSO.

In its regular work the SSO cooperates with other stakeholders and has signed memoranda on cooperation with them: Central Register, National Bank, Agency for Electronic Communications, Ministry of Agriculture, Forestry and Water Management, Ministry of Finance, Institute for Public Health and Office for Civil Registration, Public Revenue Office, Employment Agency, Pension and Disability Insurance Fund, Customs Administration and Community of Local Self-government Units. These memoranda cover topics linked with: format of data delivery from administrative data sources to SSO, content of data and periodicity for data delivery. Inter-institutional collaboration and analysis of administrative data in terms of assessing the statistical concepts and definitions have been crucial in the procedure for obtaining data from administrative sources. Variables included in administrative databases are delivered to SSO on a regular basis and are subject of additional statistical processing.

The SSO of Republic of North Macedonia receives support to improve its statistical system mainly through the EU Instrument for Pre-accession Assistance (IPA). From February 2019, SSO is a Beneficiary to the IPA funded project "Improving the Production and Dissemination of Statistics" (IPDS). The activities of the current assignment are related to the Component 4 of the project: Further improvement of ICT infrastructure. This component aims to re-engineer the statistical IT system in line with EU and international standards, increasing the system efficiency and improving the processing of surveys.

The IT system should be a comprehensive metadata-driven system for ensuring rationalized, standardized and integrated statistical data production processes by using advanced IT tools. In the new survey processing system, data entry, data integration, data editing and imputation, data validation and data processing will make use of metadata, thus ensuring a maximally end-user friendly working environment where there will be no need to re-program the processes in cases of changes.

Furthermore, the system should be able to provide output data in a form suitable for loading into MAKSTAT, Dissemination Data Base and/or for fulfilling SSO obligations towards Eurostat and other international organizations using the available SDMX-RI. The production environment of the system should provide effective tools for manageability and traceability of data and processes, as well as the management of the users, roles and their rights. The solution should be based on Microsoft platform (Windows, MS SQL Server and .Net).

The key activities under this Component 4A include:

- Analysing and mapping the statistical processes;
- Logical modelling of the statistical information (data + metadata);
- Description of the metadata necessary for data entry, validation, editing, imputation, estimation of quality indicators and processing of statistical data;
- Development of metadata-driven Statistical Information System for Statistical Data Processing in the State Statistical Office of the Republic of North Macedonia.

In the framework of another related project EuropeAid/138214/IH/SER/MK "Tailor-made software development and data warehouse for economic statistics" a NAIMS (National Accounts Information Management System) has been developed. It applies the best EU practices Macroeconomic statistics" and will cover statistical data processing and warehousing of the data for all surveys as well as the processing of significant part of them. Period of Implementation was January 2018 - November 2019.



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## 2. Objectives and Description of the Assignment

### 2.1. Objectives

The activities of the assignment are part of the “Improving the Production and Dissemination of Statistics” IPDS project Component 4: Further improvement of ICT infrastructure. This component aims to re-engineer the statistical IT system in line with EU and international standards, increasing the system efficiency and sustainability, speeding up survey processing and data production, improving the accuracy and improve the timeliness of data.

The objective of the assignment is to design the physical data models of all System databases according to the requirements of the actualized logical data model in Chapter 6 of System Requirements Analysis Document (SRAD - this document will be made available to the expert before the start of the assignment). The maintenance of DB environments (migration of the data between environments and from SSO sources) and management of the databases’ users is also part of objectives of the assignment.

The other tasks of the assignment are related to the maintenance and update (when required) the system classifications and code lists as well as provided by SSO staff national and international classifications. All metadata and all survey properties from Five Years Statistical Programme (FYSP) and Annual Plan for Statistical Surveys (APSS) have to be prepared and loaded in the Central database. In the Central Database have to be loaded general graphic and textual elements when they are available.

### 2.2. Scope of work

The activities of the expert are applied over all databases in all environments (development, test and production). The primary loading of the metadata could be performed with the functionalities of the MS SQL Management Studio and later with the functionalities of the Classifications & Messages Module and Process Control Module (when they are developed in the first stage of the development).

For the initial creation of the databases have to be created relevant scripts. Later the databases could be created with restore from backup of a source database. Additionally, some final updates could be done with the functionalities of the MS SQL Management Studio. The designed data model has to be created in the development environment and later has to be copied in the test environment when needed. When the testing of all System’s modules is completed, the production database has to be deployed in the production environment.

The system code lists used in the IT System have to be defined and documented. The properties of the surveys have to be prepared and supplied by the SSO staff, but the needed conversion of the data and loading in the Central Database have to be done by the expert.

The management of the database users and roles will be carried out with MS SQL Management Studio. It has to be used also for loading in the final registers the prepared accordingly test surveys data. The loading of test survey metadata is out of scope of the assignment.

The activities to be carried out under this TOR include:

- Creation of physical data models of all System’s databases on the base of the actualized logical data model, described in the Annex 6 of SRAD. Install MS SQL Server on the VM dedicated as database server.
- Creation all databases in the development environment. Create users and roles in the databases located in the development environment. Apply all required changes during the development process.



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- Deployment all databases in the test environment when a functional testing or training will be carried out
- Preparation of needed graphic and textual elements used by the System. Load them together with the elements provided by the SSO staff into the Central Database in the development environment.
- Loading the templates for notifications, reminders and messages prepared by SSO. Update the loaded templates when required.
- Preparation of all provided by SSO information about the current Five Years Statistical Programme (FYSP) for loading. Prepare the provided by SSO Annual Plan for Statistical Surveys (APSS) in 2019 for direct loading into the tables of Central DB.
- Preparation of all system code lists for loading as they are described in Annex 2 of SRAD. Load the system code lists into the Central Database in the development environment.
- Preparation for loading the provided by SSO files containing the versions of national and international classifications in the last ten years. The SSO staff has to provide also the variants of the base classifications when such are used. Load the classification into the Central Database in the development environment.
- Make necessary changes in the loaded classifications and add new ones when required during the development process in the development and test environment.
- Load the current FYSP in Central Database. Add the data related to the APSS 2019.
- Maintenance of the databases in the test and development environments. This includes managing the users and roles in all databases, full backup of all databases (regular and by request) and migration of selected databases.
- Preparation of Administration Manual.
- Loading of classifications and code lists for the test surveys.
- Migration of the test surveys' data from the SSO sources for a previous period into the final registers and data warehouse databases in the test environment.
- Deployment of System's databases in the production environment
- Training of SSO Administrators

### 3. Deliverables

#### 3.1. Scripts for creation of the databases and tables inside

The scripts for creation of DB will be supplied as separate T-SQL file for each database.

The files for loading all classification and code lists will be supplied as separate Excel files for each classification version, variant and code list.

Script(s) for loading the FYSP and APSS into the development database.

Export of the final state of the Classification tables (CL\_xxxxxxx).

#### 3.2. Administration Manual

The JNKE shall deliver the sections of the Administration Manual which has provide good understanding and guidelines on how the databases have to be installed and maintained.



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### 3.3. Backups of all databases

The JNKE shall deliver full backups for all databases in all environments at the end of each development stage.

### 3.4. All templates, graphical and text elements

The JNKE shall deliver all templates, graphical and text elements used in the System core as export of the relevant tables from Central Database.

## 4. Indicative work schedule

The assignment is expected to be performed in Skopje in the period July 2020 – November 2021 according to the updated Development Plan in Chapter 12 of SRAD.

## 5. Required profile of the expert

### *General Professional Experience*

University Degree in Informatics, Computer Science, Information Technologies or another relevant subject

At least 3 years of general work experience and experience in building IT solutions

Good knowledge of English

Good communication skills

Professional IT Certificates (e.g. MCSE, MVP, etc.) will be considered as an advantage

### *Specific Professional Experience*

Experience with MS SQL, .Net, MVC, WebAPI 2

Experience in the development and implementation of IT solution for supporting statistical production will be considered as an advantage

Experience in projects with National and/or International Statistical Institutions and understanding of statistical data collection and statistical data processing will be considered an advantage

Knowledge of a local language in the country will be considered an advantage

## 6. Logistics

### 6.1. Reporting

The Junior NKE shall work under the guidance and follow the instructions of the Key Expert 3. All deliverables should be submitted to Key Expert 3 and the Project Director.

The NKE shall collaborate with the project team, other experts involved and representatives of the beneficiary institution, as relevant.

Each of the missions, its timing and duration shall be agreed with the Project Director and Key Expert 3 prior to each mission.

### 6.2. Working language

The working language of the assignment and the deliverables must be English.



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### 6.3. Starting date

It is expected that the work will be performed starting from July 2020 onwards. However, exact starting date will be agreed at a later stage.

### 6.4. Location/Place of assignment

The NKE have to deliver the assignment in Skopje.

### 6.5. Applications

Applications (EUROPEAID format CV in English) need to be submitted by e-mail to the Project Coordinator: Ms. Raya Litova at: [r.litova@bim-bg.com](mailto:r.litova@bim-bg.com) no later than 25 June 2020.

References must be available on request. Only short-listed candidates will be contacted.

The Project is an equal opportunity employer.

All applications will be considered strictly confidential.

Advertised post is not available to civil servants or other officials of the public administration in the beneficiary country, Republic of North Macedonia.