

# Enterprise Architecture in the Hungarian Central Statistical Office

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## Abstract

In the Hungarian Central Statistical Office (HCSO) standardisation and integrity of a statistical system has always been taken into consideration at elaborating and improving its statistical system and also when improvement actions are formulated and followed up concerning the activity of the HCSO. As a result the elements of an Enterprise Architecture are elaborated adequately, but there is no uniform structure yet.

Therefore the HCSO decided to elaborate a structure for the Enterprise Architecture based on the international standards in this field. The HCSO uses the relevant standards in order to ensure comparability and better understanding at international level.

Currently the HCSO is at the conceptual level at elaborating the Enterprise Architecture model. The aim of this action – beside the above mentioned uniform structure – is to give a base for the future work of reviewing the processes and the products of the statistical activity of the HCSO in order to modernise those where needed thus it forms the basis for further methodological standardisation. Quality of the whole statistical activity is ensured when the operational environment and roles are clearly and fully defined.

**Keywords:** enterprise architecture, standardisation

## 1. Introduction

The Hungarian Central Statistical Office (HCSO) has a strategic goal for the improvement of its Business Architecture and for introducing Enterprise Architecture in line with the relevant international standards. These international standards are as follows: Common Statistical Production Architecture (CSPA), Generic Activity Model for Statistical Organisations (GAMSO), Generic Statistical Business Process Model (GSBPM) elaborated by the UNECE and the European Statistical System Enterprise Architecture Reference Framework (ESS EARF) elaborated by the Task Force on Enterprise Architecture. The driving force behind using solutions compliant with international standards concerning statistical systems is twofold: a) to support the efficient cooperation between NSIs thus increase awareness and transparency and b) to overview the processes and objects used for operating the whole HCSO in a systematic way, identify common elements with other NSIs, potentially use available tools and solutions implemented at these organisations (facilitate interoperability), and to modernise them where necessary.

The Enterprise Architecture (EA) model to be introduced at the HCSO will be used for methodological standardisation purposes in order to further increase quality of the products and processes and to raise the level of efficiency, transparency, understandability of the operation of the HCSO.

At the HCSO the Business, Information, Application Architecture layers of an Enterprise Architecture have a long history due to the metainformation system of the HCSO which supports the statistical and supporting activities with metadata-driven IT applications. The history of the metainformation system of the HCSO goes back to late 1970s. Since there were not any international standards at this time such as Statistical Data and Metadata Exchange (SDMX), Generic Statistical Business Process Model (GSBPM), Generic Statistical Information Model (GSIM), therefore the HCSO established its own Business Information, Application Architecture models supported by its metainformation system. The philosophy of these models is cross-cutting, which means that the elements of these Architectures cover all the subject-matter domains and their data and metadata flows in an integrated way.

## **2. Current situation at the HCSO**

### *2.1. The concept of the new EA Model at the HCSO.*

The concept of the new EA at the HCSO has been elaborated, discussed and adopted in the following way:

*Elaboration of the concept of the EA has been carried out by the Methodology Department*

During the elaboration of the concept the aim of the EA was determined by stating that the main purpose of the EA is to give a structure to the operation of the HCSO in order to ensure further methodological standardisation of its processes and products. The basic structure of the EA has been elaborated by using international standards e.g. Common Statistical Production Architecture (CSPA), Generic Activity Model for Statistical Organisations (GAMSO), ESS Enterprise Architecture Reference Framework (ESS EARF), Business Architecture Activity Model used by the ESSnet on Standardisation project. The further (detailed) elaboration of the new EA will be conducted in the framework of an internal HCSO project. As a first milestone, this project aims to elaborate the theoretical model and to determine the connections between the architectures determined in the concept of the EA.

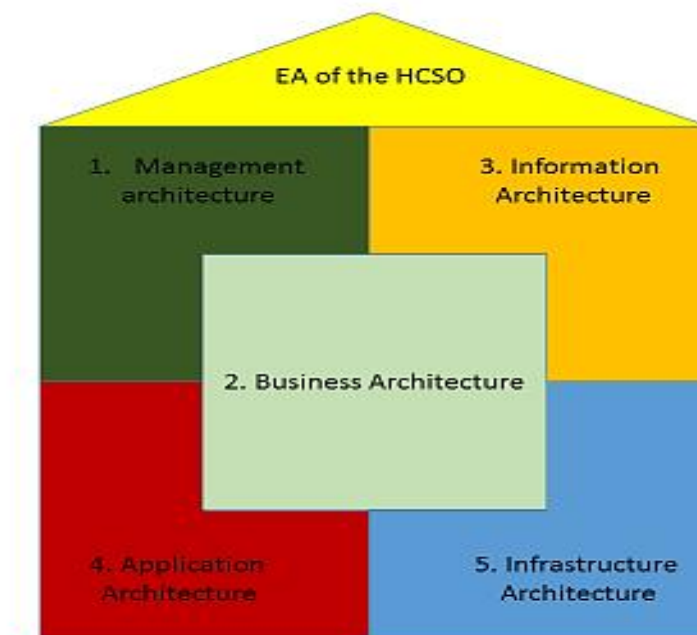
*Discussion and adoption of the concept of the EA and the establishment of the internal HCSO project have been carried out by giving presentations at the following internal boards*

- Methodology and IT Board, which is the highest professional (expert) forum for discussing and supporting various methodological and IT topics within the HCSO. This Board has permanent members from different areas who can vote, but the meeting of the Board is open for all of the staff of the HCSO.
- Director's Board, which task was to discuss the concept of the EA from a managerial point of view. The members of the Board are Directors of Departments.
- Director General's Board, where the concept of the EA and its method of elaboration has been adopted as the members of the Board are the Director General

and the Deputy Director Generals and directors of horizontal department of the HCSO.

As a result the following figure visualises the overall framework for the future EA of the HCSO (see figure 1).

**Figure 1: Overall framework of the New Enterprise Architecture Model of the HCSO**



*Setup of the internal HCSO project for the establishment of the new HCSO Enterprise Architecture*

The start and finish dates of the project are March 2016 and December 2016 respectively, as currently foreseen. The project aims to elaborate the theoretical model of the EA which will be used for implementation (action planned from 2017). Currently 27 members are in this project from various organizational units of the HCSO (methodology, IT, subject-matter domains, administration) in order to ensure that experience and knowledge already available at the HCSO are used as input for the elaboration. In order to organize the work more efficiently the project is divided into 7 sub-projects. There are 5 of them aiming the elaboration of the

five architectures (see: Figure 1., content described in chapter 2.2) and there are two further sub-projects for communication and for project management/administration. The sub-projects have 5-6 members. The other members of the whole project are the ones who give feedback on the results.

In the framework of this project the IT tool that will be used for visualization of the architectures will be determined by gathering the available solutions (e.g. ArchiMate, other software already used by the HCSO).

Consultation with external EA experts outside the HCSO is also part of the planned activity of the group (EA experts in Hungary and experts from the National Institute Institutes of the ESS) in order to use the advantages from cooperation and knowledge sharing.

Concerning the communication, reporting to the Boards previously mentioned are planned at significant stages of the project and organizing events where the staff of the HCSO can get familiar with the EA is also a key activity of communication in order to facilitate discussion and involvement.

## *2.2. Description of the new Enterprise Architecture*

### *Management Architecture (MA)*

The MA *‘describes and defines the activities that take place within a typical statistical organization. It extends and complements the Generic Statistical Business Process Model (GSBPM) by adding additional activities needed to support statistical production’* (UNECE, GAMS0 ver. 1.0. description). Currently the MA exists only in the format of internal regulation which stipulates the processes in this area. As there has to be a structure for these processes in order to ease further analysis and standardisation, the HCSO decided to use GAMS0 for this purpose (UNECE, GAMS0, see figure 2) as GAMS0 includes all relevant processes in this area:

**Figure 2: The structure of the GAMSO model**



As the ‘Production’ level covers the GSBPM, therefore the HCSO decided to handle this level at its Business Architecture. As a consequence the MA will only cover the first three levels, which are: ‘Strategy & leadership’, ‘Capability management’ and ‘Corporate support’. From the HCSO’s point of view these levels include processes and products with different characteristics then processes in the ‘Production’ level therefore these have to be separated from each other having in mind that these processes are interconnected.

#### Business Architecture (BA)

The definition of the Business Architecture is as follows:

*‘Business Architecture covers all the activities undertaken by a statistical organization, including those undertaken to conceptualize, design, build and maintain information and application assets used in the production of statistical outputs. Business Architecture drives the Information, Application and Technology architectures for a statistical organization.’*

(UNECE, CSPA ver. 1.1. description)

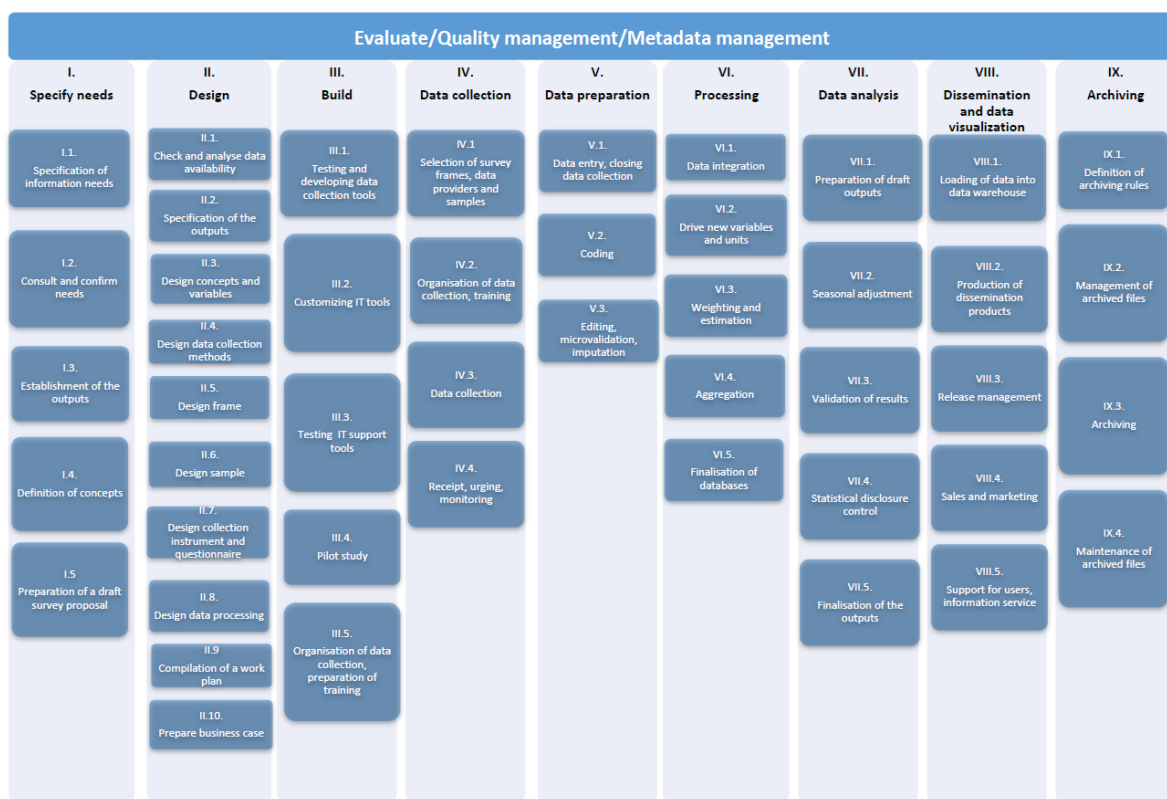
#### *Statistical business process model*

The main model for the BA is the statistical business process model, handled as a cross-cutting issue at the HCSO. The current statistical business process is described by an internal handbook.

The HCSO has recently reviewed its statistical business process and introduced the national version of the Generic Statistical Business Process Model. This model is called the Hungarian Statistical Business Process Model (ESTFM) (see Figure 3). Further improvement of the

model is currently ongoing in order to make it easier adaptable in practice and to prepare an updated base for the planned refinement of the HCSO Quality Guidelines.

**Figure 3. The Hungarian Statistical Business Process Model (ESTFM)**



*Information Architecture (IA)*

The definition of the IA is as follows:

*‘Information Architecture (IA) classifies the information and knowledge assets gathered, produced and used within the Business Architecture. It also describes the information standards and frameworks that underpin the statistical information. IA facilitates discoverability and accessibility, leading to greater reuse and sharing.’ (UNECE, CSPA ver. 1.1. description)*

As most of the IT applications are metadata-driven therefore most of the information objects are described in our metadatabase. The HCSO decided to use the GSIM ver. 1.1. as an input for compiling a full list of the information objects – irrespective of whether those are stored in database or not – that are used by different processes in the various architectures.

#### *Application Architecture (AA)*

The definition of the AA is as follows:

*‘Application Architecture (AA) classifies and hosts the individual applications describing their deployment, interactions, and relationships with the business processes of the organization (e.g. estimation, editing and seasonal adjustment tools, etc.). AA facilitates discoverability and accessibility, leading to greater reuse and sharing.’* (UNECE, CSPA ver. 1.1. description)

The IT applications used by the HCSO are parts of an integrated system, which means that the IT applications are used irrespective of the subject-matter domains, and are metadata-driven, which metadata can be found in one database. The functions of the IT applications are determined according to the needs of a certain process phases and not according to the need of each subject-matter domain. The IT applications that support both the whole statistical business process and the applied methodologies are established according to the needs of subject-matter statisticians, IT experts and methodologists. The task of the project is to determine which process uses which certain IT application. The main IT applications that support the Business Architecture are shown in Figure 3.



**Figure 3. Classification of main IT applications by function**

Function \ Topic	A, B, C, D, E... Statistical product				
Meta system	META	GÉSA-meta	ADÉL-meta	Data warehouse-meta	
Registers	GSZR	Kerreg	Address Register		
Preparation of collection	GÉSA	LAKOS	KARÁT		
Data collection	ELEKTRA	TÉBA	Mobile device based		
Data editing	ADÉL	BLUMEN	ADAMES		
Process	EAR				
Data storage	Data warehouse				
Dissemination	STADAT	Dissemination database	Methodological documentation	Safe centre	Contact center, ADKI, KARÁT

### *Infrastructure Architecture*

The Infrastructure Architecture ‘describes the infrastructure technology underlying (supporting) the other architecture perspectives’ (UNECE, CSPA ver. 1.1. description). As there are no international standards for describing this architecture, therefore this architecture will be described according to the present practices of the HCSO.

### **3. Summary**

The new EA of the HCSO will serve the needs of further methodological standardisation of the statistical products and processes and the supporting activities of the HCSO. As this

improvement requires sound knowledge from various areas of statistics and beyond therefore an internal HCSO project has been set up with participants from several subject-matter and horizontal departments of the HCSO. The most important issue – as first step – is to implement relevant international standards in this field into HCSO’s environment and create the theoretical model of the new envisaged EA of the HCSO. With the help of the relevant international standards (with modifications according to the HCSO’s needs) the theoretic model of the EA (which is a ‘to-be-state’ architectural model for the HCSO) will be implemented in practice. This model can be used as a base for further analysis of the current situation discovering white spots and areas where modifications have to be conducted.

#### 4. References

CSPA (Common Statistical Production Architecture) ver. 1.1.,  
<http://www1.unece.org/stat/platform/display/CSPA/CSPA+v1.1>

GAMSO (Generic Activity Modell for Statistical Organisations) ver. 1.0.,  
<http://www1.unece.org/stat/platform/display/GAMSO/GAMSO+v1.0>

GSIM (Generic Statistical Information Model) ver. 1.1.,  
<http://www1.unece.org/stat/platform/display/gsim/Generic+Statistical+Information+Model>

ESS Enterprise Architecture Reference Framework ver. 1.0. (2015), Eurostat, Task Force on Enterprise Architecture,

ESSnet on Standardisation, SGA-2, Guidelines for the interpretation of the Business Architecture Model from a standardisation point of view, [http://www.cros-portal.eu/sites/default/files/ESSnet\\_on\\_Standardisation\\_%20SGA2\\_WP4\\_Del2.pdf](http://www.cros-portal.eu/sites/default/files/ESSnet_on_Standardisation_%20SGA2_WP4_Del2.pdf)

Hungarian Central Statistical Office (2015), Hungarian Statistical Business Process Model (ESTFM – part of the Quality Guidelines of the HCSO), [http://www.ksh.hu/docs/bemutakozas/eng/minosegi\\_iranyelvek\\_eng.pdf](http://www.ksh.hu/docs/bemutakozas/eng/minosegi_iranyelvek_eng.pdf)