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Session 4: Topic I: The GSBPM and Process Quality Management

The GSBPM and ESS statistical business process metadata

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I. Introduction

1.   In its Commission Communication "Re-engineering the Production Systems of European Statistics: a Vision for the next decade"[1], Eurostat presented a vision for improving the production methods of European statistics and their efficiency within the European Statistical System (ESS). In May 2010, the European Statistical System Committee (ESSC) presented a joint ESS strategy[2] for the implementation of this Commission Communication, providing the strategic orientations for the work of the ESS and how it would be possible to modernise this system and equip it in the medium and long term to meet the challenges that statistical producers are faced with at national as well as at European level.

2.   As one response to this Vision, the availability of high quality reference metadata for European statistics is considered as an essential pre-condition for the further integration of business processes within the ESS. In accordance to the Generic Statistical Business Process Model (GSBPM), metadata are used as an over-arching bridge all across the statistical business process. Therefore, the harmonisation of metadata within the European Statistical System becomes crucial when it comes to the implementation of the abovementioned ESS vision. Metadata harmonisation will not only rationalise the statistical business processes used, but also enhance the quality of the data and metadata produced and disseminated within the ESS.

3.   Furthermore the ESS statistical business processes should be integrated from end-to-end i.e. from data collection until dissemination. In this context the use of a generic model is considered essential to facilitate the horizontal and vertical integrations within the ESS. In order to investigate the use of generic models within the ESS, Eurostat launched a monitoring exercise in 2010/2011. National Statistical Institutes (NSIs) were asked if they have adopted a model for their statistical business processes, if they are using it and to which extent this model is related to the

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[1] COM (2009) 404, 8 August 2009
[2] ESSC 2010/05/6/EN, 20 May 2010

Generic Statistical Business Process Model (GSBPM). It was also investigated if NSIs produce and manage corresponding process metadata for each phase of the respective model used.

4.   Based on the results of this investigation, a first structure for the definition of process metadata has been drafted by Eurostat: the Euro Process Metadata Structure (EPMS). This structure, accompanied by guidelines, is focusing essentially on phases 4 to 7 of the GSBPM and will help for a better documentation of the statistical business processes and their further integration.

II. The adoption and use of a generic business model within the ESS

II a. A heterogeneous situation within the ESS.

5. Eurostat asked the NSIs if they have adopted and if they use a business model for statistical business processes.

6. The result reveals that 19 out of 33 NSIs have adopted a model for describing the statistical business processes (see table 1).

7. Only 4 NSIs (12%) declared the GSBPM as the model chosen for their organisation. However, the GSBPM seems to be considered as a reference since 12 out of the 15 NSIs using a different model saw their national model related or derived from the GSBPM. These models could be considered as national implementations of the GSBPM.

Table 1. The adoption of a business process Model

Do you have a Model/Standard for describing the statistical business processes ?	NSIs
Yes, we have the Generic Statistical Business Process Model (GSBPM)	4
Yes, we have other than GSBPM	15
No, we do not have a specific Model/Standard	14
Total	33

Is this model related to the GSBPM ?	NSIs
Yes	12
No	2
NA	1
Total	15

II b. Towards an extended use of the chosen model…

8. It was also asked to the NSIs to what extent the respective business model is used. 5 out of the 19 NSIs declared that their national business model is used intensively and 8 use it to a lesser extent (see table 2).

9. Nevertheless, when designing new/future business processes, NSIs intend to use their national business model more intensively.

Table 2. Extent of use of the Model

Extent of use of the Model	Current processes	Future processes
Use of the Model to a large extent	5	13
Use of the Model to a smaller extent	8	3
We have adopted the Model but we are not actually using it for the moment	4	2
NA	2	1
Total	19	19

II c. … and the adoption of the GSBPM

10. As illustrated in table 1, 14 NSIs do not use any national business model. 10 of these countries, however, intend to adopt and implement a statistical business process model (see table 3). 4 of them intend to adopt the GSBPM whilst 2 intend to choose other business models.
Another 4 NSIs have the intention to adopt and implement a model but have not yet decided which one they will adopt.

Table 3. Plans for adoption of a Model

Existence of plans for the future adoption and implementation of a statistical business process model	NSIs
Yes, we plan to adopt GSBPM. The implementation did not start yet	4
Yes , a project for the adoption of a Model/Standard other than GSBPM is in progress	2
Yes, but we do not know yet which model/standard we will adopt	4
No, we do not have any plans	2
Other	1
NA	1
Total	14

II d. The GSBPM contributes to national business process integration

11. NSIs consider that the GSBPM contributes to the "standardisation of statistical processes". Indeed, 23/32 NSIs recognised its contribution as "very important" (see table 4). The GSBPM - on the other hand - was considered less important for the organisational structure and the measurement of operational costs.

12. Moreover, the majority of the NSIs considered that the GSBPM has a "very important" or "important" impact on:
- "Development of statistical metadata systems" (10 and 17 respondents respectively),
- "Quality assessment of statistical business processes", (exactly the same scores),
- "Description of statistical business processes" (18 and 12),
- "Increase of understanding of statistical business processes" (also 18 and 12).

Table 4. Contribution of the GSBPM to the main issues

Issue to which GSBPM contributes	Importance of GSBPM's contribution				
	Very important	Important	Not all that important	Not important at all	Don't know
Development of statistical metadata systems	10	17	5	0	0
Standardisation of statistical business processes	23	8	1	0	0
Quality assessment of statistical business processes	10	17	3	2	0
Description of statistical business processes	18	12	1	1	0
Impact on the organisational structure	5	9	13	5	0
Increase of understanding of statistical business processes	18	12	0	2	0
Provision of an input to high-level corporate work planning	6	13	8	3	2
Measurement of operational costs	1	14	10	5	2

<u>II e. A general lack of resources when no business model is used</u>

13. For countries having not adopted a business model yet, the lack of resources (both human and/or financial) appear as the main reason hampering the adoption and further implementation of a business process model (see table 5).

14. A second cause evoked by 2 NSIs is an absence of strategy for improving the degree of harmonisation and standardisation of statistical business processes.

Table 5. Reasons for not having a Model

Reasons for not having a Model/Standard	NSIs
Absence of strategy for improving the degree of harmonisation and standardisation of business processes	2
Limited human and/or financial resources	10
Other	3

III. ESS process metadata: what is produced and what is made available?

<u>III a. Process metadata are not broadly available in the ESS</u>

15. In addition to the adoption and use of a model, it was asked to NSIs if they compile metadata describing the statistical business process steps in accordance to the GSBPM (in its steps and sub steps).

16. National process related metadata are available for each phase of GSBPM, but the extent to which these process metadata are compiled differs among the 9 GSBPM phases (see figure 1).
The GSBPM phase "7.Disseminate" is the one for which process related metadata are often fully available (20/32 NSIs). Moreover, these metadata are also partially available in 10 NSIs.

17. Process related metadata for the GSBPM phases "4.Collect" and "5.Process" are fully or partially available in 30 NSIs. This means that NSIs mainly aim at better documenting these three steps.

18. Among all other GSBPM steps, process related metadata are compiled to a lesser extent. For the GSBPM phases "8.Archive "and "9.Evaluate" NSIs do not make very high efforts for compiling these process related metadata.

Fig. 1. Availability of process metadata
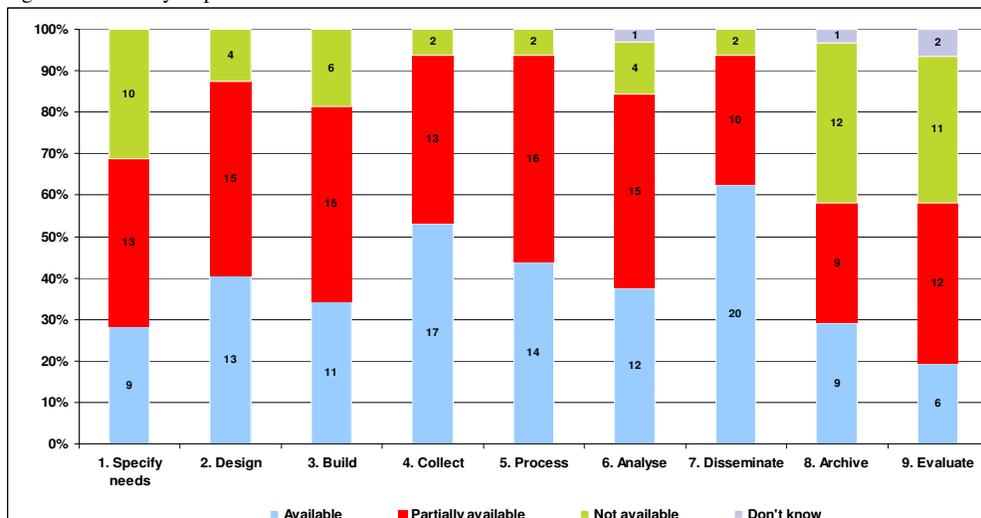
III b. Feasibility to compile process related metadata

19. NSIs think that process related metadata can be compiled for the GSBPM phases "1.Specify needs", "8.Archive" and "9.Evaluate" (see fable 6). NSIs could also partially collect some information related to the GSBPM phase "3.Build".

20. In opposite, it appears difficult for NSIs which don't collect any process metadata on phase "2.Design" to get such type of information.

Table 6. Feasibility to collect non available metadata

	Feasibility to collect currently non available process metadata				
Phases of GSBPM	Feasible	Partially feasible	Not feasible	Don't know	Total
1. Specify needs	3	2	3	2	10
2. Design	0	1	3	0	4
3. Build	0	4	1	0	5
4. Collect	0	1	1	0	2
5. Process	0	1	1	0	2
6. Analyse	0	1	1	2	4
7. Disseminate	0	1	1	0	2
8. Archive	3	2	2	0	7
9. Evaluate	3	4	2	1	10

III c. Different types of process related metadata available within the ESS

21. Also the content of process related metadata that are currently collected by the NSIs was investigated. Therefore, NSIs were asked to indicate to which categories the process related metadata that they currently compile belong to.

22. The proposed categories of process related metadata were:

1) **Methodological process metadata:** describing the methodological tools and standards along particular statistical production process
2) **Technical process metadata:** describing the workflow, IT tools and staff activities at each steps of the production cycle.
3) **Process quality metadata:** describing the quality of the statistical output and the underlying statistical production process.

23. "Methodological process metadata" is the most common category of process metadata that are currently compiled in the ESS (see table 7). This category of metadata is particularly collected for the GSBPM phases "2.Build", "5.Process" and "6.Analyse" where these metadata are often compiled together with process quality metadata.

24. Process quality metadata are also compiled for the GSBPM phases "4.Collect" and "7. Disseminate" but can merely be found in phase "9.Evaluate".

25. In phases "4.Collect" and "8.Archive", the three enquired categories of metadata are generally available to the same extent.

Table 7. The types of metadata available

Phases of GSBPM	Total Number of NSIs by type of process metadata for each phase of GSBPM								
	Methodological + Technical + Process quality	Methodological + Process quality	Methodological	Process quality	Methodological + Technical	Technical + Process quality	Technical	Other types *	Total
1. Specify needs	1	1	10	2	0	0	0	7	21
2. Design	2	6	7	2	2	0	1	6	26
3. Build	2	3	2	0	2	0	5	10	24
4. Collect	3	4	4	3	3	0	2	8	27
5. Process	2	6	4	2	4	1	0	9	28
6. Analyse	2	6	4	2	2	0	0	7	23
7. Disseminate	2	3	4	4	1	1	1	10	26
8. Archive	1	2	2	1	1	0	5	5	17
9. Evaluate	1	2	4	5	0	0	0	0	12

(*) 'Other' refers to very analytical descriptions of process metadata that cannot directly be classified into one or more of the main types (Methodological, Technical, and Process Quality)

III d. A clear need for better documentation of statistical business processes

26. One of the last aspects of the survey concerned the identification of the phases of the statistical business processes for which better documentation is considered as necessary by NSIs.

27. NSIs recognised that more documentation on process metadata is actually needed for each phase of the statistical business processes (see table 8).

Table 8. Share of NSIs requiring better documentation

Phases of statistical business processes	NSIs
1. Specify needs	68
2. Design	80
3. Build	68
4. Collect	60
5. Process	72
6. Analyse	76
7. Disseminate	52
8. Archive	64
9. Evaluate	80

28. So, overall NSIs have started to compile process related metadata. They privileged certain process steps of the GSBPM for better documentation.

29. Most of the NSIs however think that their process metadata currently compiled is insufficient. More efforts and work are needed in this respect for progressing better towards horizontal and vertical business process integration.

IV. Harmonised ESS process metadata: the Euro Process Metadata Structure

30. The "ESS vision" as described in the introduction emphasises horizontal integration (i.e. between broader statistical domains) and vertical integration (between Eurostat and National Statistical Administrations).

31. The further integration of statistical business processes in the ESS needs better documentation of the statistical business processes, i.e. better and probably also harmonised process related metadata.

32. As a first attempt for standardising process related metadata, Eurostat recently drafted a metadata structure definition (MSD) which can be used for the compilation of ESS process related metadata.
This draft structure is called Eurostat Process Metadata Structure (EPMS).

IV a. Focus on steps 4 to 7 of the GSBPM
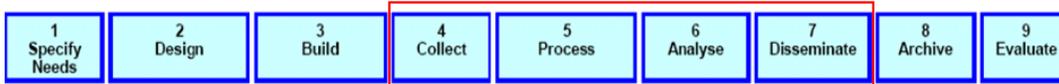
33. This MSD focuses on the documentation of the GSBPM steps 4 to 7, mainly due also to the fact that the EPMS will be tested within Eurostat first.

34. This additional MSD will reuse all metadata concepts used in related MSDs such as the Euro-SDMX Metadata Structure (ESMS) and the Eurostat Standard for Quality Reports Structure (ESQRS). This requires that the new EPMS is - as other MSDs - linked to a specific statistical process (e.g. Government Finance Statistics).

35. Figure 2 details further the structure of the EPMS and its correspondence with the GSBPM. The concepts in blue colour are those already implemented and used in the ESMS. The EPMS mainly asks for more details on the statistical processing. Currently, Eurostat is compiling some test files in a limited number of statistical domains which will then be evaluated and improved.

Fig. 2. The EPMS structure

EPMS	EPMS concepts	GSBPM
1	**Statistical processing**	5
1.1	Data collection	4
1.2	Source data	
1.2.1	Source data - integration	5.1
1.2.2	Source data - coding	5.2
1.3	Data validation	
1.3.1	Data validation - detection	5.3
1.3.2	Data vaildation - correction	5.4
1.4	Data compilation	
1.4.1	Data compilation - variables	5.5
1.4.2	Data compilation - weights	5.6
1.4.3	Data compilation - aggregates	5.7
1.4.4	Data compilation - finalisation	5.8
1.4.5	Data compilation - draftoutput	6.1
1.5	Data validation - final	
1.5.1	Data validation final - output	6.2
1.5.2	Data validation final - explanation	6.3
2	**Confidentiality**	
2.1	Confidentiality - data treatment	6.4
3	**Release policy**	
3.1	User access	4
4	**Dissemination format**	
4.1	Publications	4
4.2	On-line database	4
4.3	Micro-data access	4
4.4	Other	4
5	**Workflow**	3.3

V. Conclusions

36. NSIs use quite heterogeneous statistical business models for describing their business processes although they frequently orient themselves towards the GSBPM. The latter is considered as very important for progressing towards the standardisation of statistical business processes.

37. ESS process related metadata exist to a certain extent; they are compiled and disseminated for a number of NSIs and some main GSBPM process steps. However, many NSIs feel that more should be done for increasing the compilation of process related metadata and process documentation in the ESS.

38. As additional activity in this context, Eurostat has drafted the Eurostat Process Metadata Structure (EPMS). A standard process metadata structure could be essential when progressing towards the further integration of the statistical business processes within the ESS.