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Topic (ii): Governance

DEVELOPING A GENERIC STATISTICAL BUSINESS PROCESS MODEL

Invited Paper

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I. INTRODUCTION

1. The Joint UNECE / Eurostat / OECD Work Sessions on Statistical Metadata (METIS) have, over the last few years, been preparing a Common Metadata Framework (CMF)¹. Part C of this framework, “Metadata and the Statistical Cycle”, refers to the phases of the statistical business process (also known as the statistical value chain or statistical cycle) and provides generic terms to describe them.

2. During the development of Part C, METIS participants agreed that the model currently used by Statistics New Zealand, with the addition of ‘Archive’ and ‘Evaluate’ phases, would provide a good basis for developing a “Generic Statistical Business Process Model” (GSBPM). Following several drafts and rounds of comments, including discussions at a workshop in Lisbon in March 2009², the current version of the model was approved by the METIS Steering Group for public release in April 2009. It is considered final at the time of release, however, it is also expected that future updates may be necessary in the coming years, either to reflect experiences from implementing the model in practice, or due to the evolution of the nature of statistical production. Current and previous versions are available at the website www.unece.org/stats/gsbpm.

II. THE MODEL

A. Purpose

3. The original intention was for the GSBPM to provide a basis for statistical organizations to agree on standard terminology to aid their discussions on developing statistical metadata systems and processes. The GSBPM should therefore be seen as a flexible tool to describe and define the set of business processes needed to produce official statistics. The use of this model can also be envisaged in other separate, but often related

¹ See: <http://www.unece.org/stats/cmfi/>

² See: <http://www.unece.org/stats/documents/2009.03.metis.htm>

contexts such as harmonizing statistical computing infrastructures, facilitating the sharing of software components, and providing a framework for process quality assessment and improvement. These other potential uses are explored further in Section III.

B. Applicability

4. The GSBPM is intended to apply to all activities undertaken by producers of official statistics, at both the national and international levels, which result in data outputs. It is designed to be independent of the data source, so it can be used for the description and quality assessment of processes based on surveys, censuses, administrative records, and other non-statistical or mixed sources.

5. Whilst the typical statistical business process includes the collection and processing of raw data to produce statistical outputs, the GSBPM also applies to cases where existing data are revised or time-series are re-calculated, either as a result of more or better source data, or a change in methodology. In these cases, the input data are the previously published statistics, which are then processed and analyzed to produce revised outputs. In such cases, it is likely that several sub-processes and possibly some phases (particularly the early ones) would be omitted.

6. As well as being applicable for processes which result in statistics, the GSBPM can also be applied to the development and maintenance of statistical registers, where the inputs are similar to those for statistical production (though typically with a greater focus on administrative data), and the outputs are typically frames or other data extractions, which are then used as inputs to other processes.

7. Some elements of the GSBPM may be more relevant for one type of process than another, which may be influenced by the types of data sources used or the outputs to be produced. Some elements will overlap with each other, sometimes forming iterative loops. The GSBPM should therefore be applied and interpreted flexibly. It is not intended to be a rigid framework in which all steps must be followed in a strict order, but rather a model that identifies the steps in the statistical business process, and the inter-dependencies between them. Although the presentation follows the logical sequence of steps in most statistical business processes, the elements of the model may occur in different orders in different circumstances. In this way the GSBPM aims to be sufficiently generic to be widely applicable, and to encourage a standard view of the statistical business process, without becoming either too restrictive or too abstract and theoretical.

C. Structure

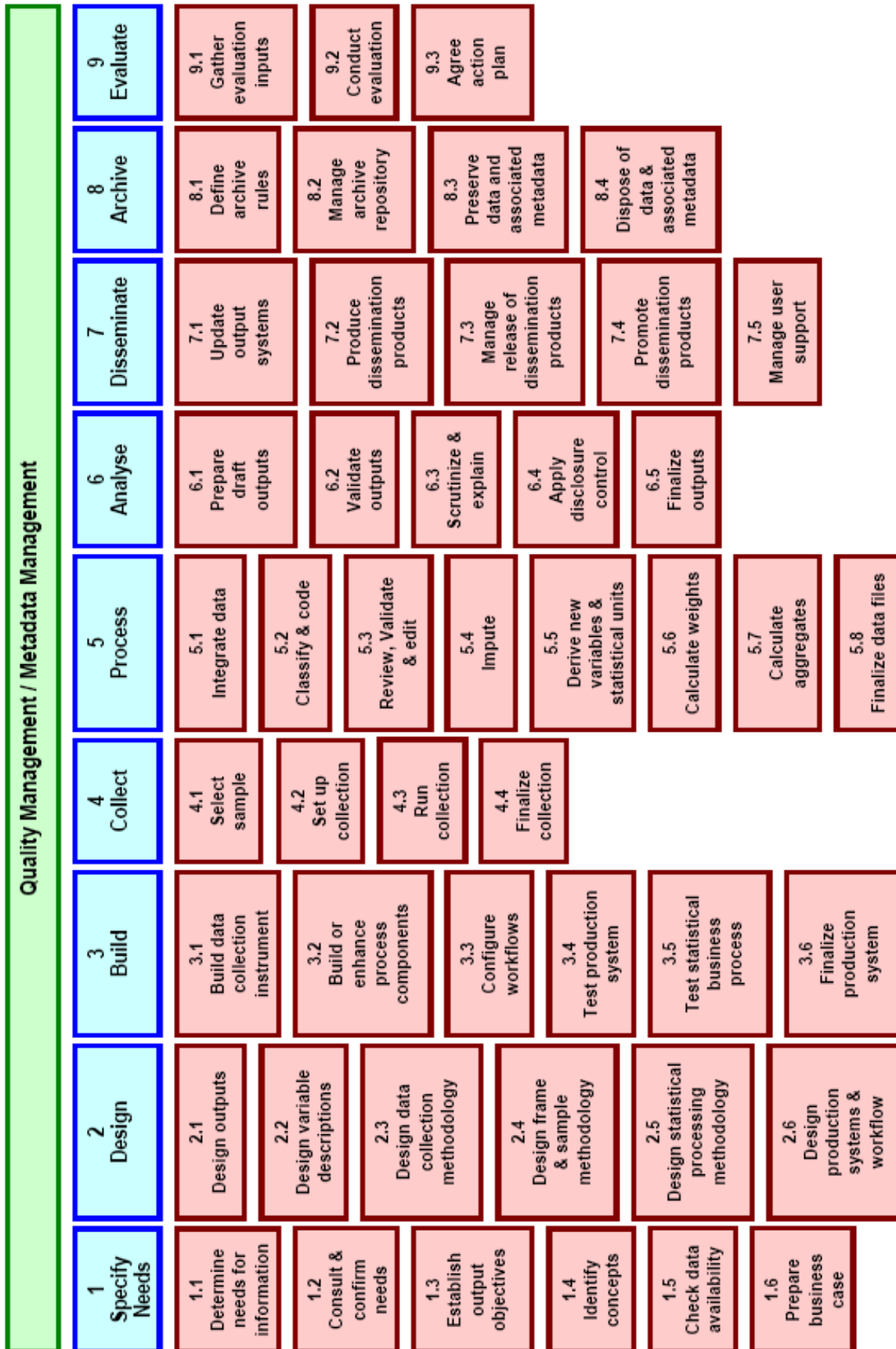
8. The GSBPM comprises four levels:

- Level 0, the statistical business process;
- Level 1, the nine phases of the statistical business process;
- Level 2, the sub-processes within each phase;
- Level 3, a description of those sub-processes.

9. Further levels of detail may be appropriate for certain statistical business processes or in certain organizations, but these are unlikely to be sufficiently generic to be included in this model. The diagram below shows levels 1 and 2 of the model, whereas level 3 can be found in the model documentation³.

³ www.unece.org/stats/gsbpm

Levels 1 and 2 of the Generic Statistical Business Process Model



10. The GSBPM also recognizes several over-arching processes that apply throughout the nine phases, and across statistical business processes. These can be grouped into two categories, those that have a statistical component, and those that are more general, and could apply to any sort of organization. The first group, and particularly the processes of quality and metadata management are considered to be more important in the context of this model, and are described in detail in the model documentation, however the second group should also be recognized as they have (often indirect) impacts on several parts of the model.

D. Relationship to other models

11. As part of the development of the GSBPM, it has been mapped to other international models, including those proposed in the 1999 UNECE publication “Information Systems Architecture for National and International Statistical Organizations⁴”, and in the Data Documentation Initiative (DDI) Combined Life Cycle Model⁵ (Version 3.0). The relationship with the SDMX (Statistical Data and Metadata eXchange) Content-oriented Guidelines has also been discussed; SDMX aims, through the Content-oriented Guidelines to harmonize data and metadata terminology and quality, as well as providing transmission standards. The GSBPM, in offering standard terminology for the different phases and sub-processes of the statistical business process, would seem to complement, and fit logically within the SDMX Content-oriented Guidelines.

III. WIDER USES OF THE GSBPM

12. As stated above, the original aim of the work to develop this model was that it should provide a basis for statistical organizations to agree on standard terminology to aid their discussions on developing statistical metadata systems and processes. However, as the model has developed, it has become increasingly apparent that it can be used for other purposes. This has been confirmed by Statistics New Zealand, who have either applied, or plan to apply their national version of the model in several different areas. The list below aims to highlight potential rather than recommended uses, and to inspire further ideas on how the GSBPM can be used in practice.

- Harmonizing statistical computing architectures – The GSBPM can be seen as a model for an operational view of statistical computing architecture. It identifies the key components of the statistical business process, promotes standard terminology and standard ways of working across statistical business processes. The potential of the GSBPM as a model for statistical computing architectures will be evaluated further in the proposed European Union “ESSNet” project on a Common Reference Architecture⁶ during 2009.
- Facilitating the sharing of statistical software – Linked to the point above, the GSBPM defines the components of statistical processes in a way that not only encourages the sharing of software tools between statistical business processes, but also facilitates sharing between different statistical organizations that apply the model. It therefore provides an input to the “Sharing Advisory Board”, being created under the auspice of the UNECE / Eurostat / OECD Work Sessions on the Management of Statistical Information Systems⁷.
- Providing a basis for explaining the use of SDMX in a statistical organization in the Statistical Data and Metadata eXchange (SDMX) User Guide⁸. Chapter A2 of this user guide explores how SDMX applies to statistical work in the context of a business process model.

⁴ http://www.unece.org/stats/documents/information_systems_architecture/1.e.pdf

⁵ Data Documentation Initiative (DDI) Technical Specification, Part I: Overview, Version 3.0, April 2008, <http://www.ddialliance.org>

⁶ http://circa.europa.eu/Public/irc/dsis/itsteer/library?l=/directors_13-14/proposal_essnetdoc/ EN_1.0 &a=d

⁷ As proposed in the report of the MSIS Task Force on Software Sharing:

<http://www.unece.org/stats/documents/ece/ces/ge.50/2008/crp.2.e.doc>

⁸ See: http://sdmx.org/index.php?page_id=38, 2009 version

- Providing a framework for process quality assessment and improvement – If a benchmarking approach to process quality assessment is to be successful, it is necessary to standardize processes as much as possible. The GSBPM provides a mechanism to facilitate this.
- Better integrating work on statistical metadata and quality – Linked to the previous point, the common framework provided by the GSBPM can help to integrate international work on statistical metadata with that on data quality by providing a common framework and common terminology to describe the statistical business process.
- Providing the underlying model for methodological standards frameworks - Methodological standards can be linked to the phase(s) or sub-process(es) they relate to and can then be classified and stored in a structure based on the GSBPM.
- Providing a structure for storage of documents – As well as a framework for methodological standards, the GSBPM can also provide a structure for organizing and storing other documents within an organization, in conjunction with document management software tools. It can provide a basic document storage classification that allows clear links between documents and the parts of the statistical business process they relate to.
- Providing a framework for building organizational capability – The GSBPM can be used to develop a framework assess the knowledge and capability that already exists within an organization, and to identify the gaps that need to be filled to improve operational efficiency.
- Providing an input to high-level corporate work planning – The national business process model developed by Statistics New Zealand has been used as an input when preparing a high-level survey programme.
- Developing a business process model repository – Statistics New Zealand has developed a database to store process modelling outputs and allow them to be linked to their statistical business process model. They also plan to develop a Business Process Modelling Community of Practice – i.e. a regular forum to build knowledge of process modelling, to promote the their business process model and increase understanding of it, and to discuss process modelling and models as enablers for process improvement.
- Measuring operational costs – The GSBPM could conceivably be used as a basis for measuring the costs of different parts of the statistical business process. This, in turn, could help target development work to improve the efficiency of the parts of the process that are most costly.
- Measuring system performance – Related to the point above on costs, the GSBPM can also be used to identify components that are not performing efficiently, that are duplicating each other unnecessarily, or that require replacing. Similarly it can identify gaps for which new components should be developed.

IV. CONCLUSIONS

13. The adoption of a Generic Statistical Business Process Model provides a central framework against which processes in national and international statistical organizations can be mapped. This, in turn, provides a mechanism for mapping and benchmarking processes, and the applications behind them, between organizations. This will inevitably increase the possibilities for sharing systems and applications. The current model also reflects the moves towards process-oriented architectures and organizational structures by many producers of official statistics, and as early implementations are starting to show, it can offer a wide range of benefits across a statistical organization.