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**ORGANISATION FOR ECONOMIC  
COOPERATION AND DEVELOPMENT (OECD)  
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Topic (i): IT governance in statistical offices

## **A FRAMEWORK FOR THE MANAGEMENT OF STATISTICAL OPERATIONS AT THE ECB**

### **Supporting Paper**

Submitted by the European Central Bank<sup>1</sup>

#### **I. INTRODUCTION**

1. This paper considers the problem of improving the efficiency of statistical operations and processes, and of facilitating the assessment and improvement of the quality of statistics. It describes a framework for the management of statistical operations that is being introduced at the Directorate General Statistics (DG-S) of the European Central Bank (ECB). This framework is based on a complete and interactive documentation of all processes used in the development, preparation, maintenance and production of statistics.

2. The paper also describes the organization of the documentation exercise, and concludes with some considerations as to the expected benefits that the systematic documentation of statistical processes can bring.

#### **II. DESCRIPTION OF STATISTICAL OPERATIONS**

##### **A. Processes**

3. This section describes the technical framework that is used for a common description of statistical operations within DG-S. The following definitions apply:

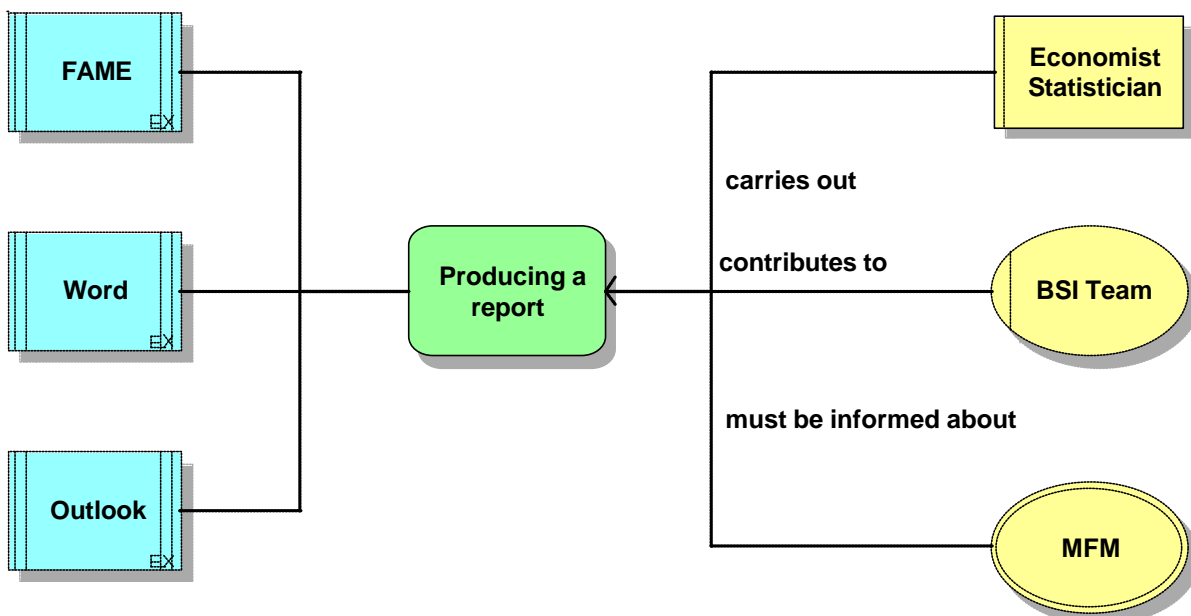
- **Process** – a succession of steps, the chain of inputs-outputs that produces a result (product or service)
- **Function** – a set of tasks with clearly defined inputs and outputs

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- **Human Resource** – Position type or group of position types assigned to a function in the form of: is technically responsible, carries out (under instruction), contributes to, is informed about, has a consulting role.
- **Technical resource** – Means that are essential in contributing to the process: Communications (e.g. Telephone, Outlook, Internet), Application (e.g. Word, Excel, Access, ORACLE), Information (e.g. documents, databases, workbooks).
- **Model** – Description of a process with the related resources. Models are created with the help of a software package (ARIS).
- **Modeller** – Individual producing the actual models using the ARIS software package,
- **Documenter** – Individual who provides the information to the modeller and is responsible for updating, collating and providing the “Handbooks” for inclusion in models
- **Statistical Operations** - Operation of processes that produce statistics as output.

4. The following chart represents an individual process as modelled within our framework. The example is that of the production of a statistical report. Several technical resources are used for this process. The human resources are associated with roles as indicated on the chart.



## B. Product matrix

5. A product is considered as the production of a dataset following a defined timetable and set of processes from the development phase to actual production and publication. An example of a product is the production of Balance of Payments data for the Euro area. To date, 66 products have been identified and they define the columns of the so-called “Product Matrix”. Products also include the processing of 3<sup>rd</sup> party databases that are obtained from other institutions.

6. Processes have been categorized as Development, Maintenance, Support, Production and Housekeeping activities. An example of a process is the plausibility checks on incoming data. Sixty distinct processes have been identified and these define the rows of the product matrix. As a result the

current maximum potential number of models to be described is 3,960. Not all processes will be applicable to all products, and some will be applicable to more than one product. There is even the potential for identical models for processes for all products. A conservative estimate of the number of models to be described in the product matrix is 2,500. The chart below presents a simplified product matrix.

## Simplified Product Matrix

	Product 1	Product 2	Product 3	Product 4	Product 5	Product 6
Process c1	Model c1-A12		?	Model c1-B		
Process c2	Model c2-A1	Model c2-A2	N/A	Model c2-B1	Model c2-B2	Model c2-B3
Process c3	Model c3-A1	N/A	?	N/A	Model c3-B2	Model c3-B3
Process c4	?	Model c4-A2	N/A	Model c4-B12		Model c4-B3
Process c5	?	N/A	?	Model c5-B1	N/A	?
Process c6	?	?	?	?	N/A	?

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7. In the framework, no product is considered as being the responsibility of a particular Division, but of DG-S as a whole. With this approach, we are able to effectively obtain the contributions of all Divisions for all products. Management and administration functions will be modelled outside the framework of the products.

### III. Organization of the documentation exercise

#### A. Core Team

8. A team of 6 persons was established to co-ordinate and assist the project, with responsibility for checking the coherence and consistency of the models. This team includes the project manager and 4 colleagues from DG-S, as well as an expert in process modelling from a central planning area. The latter ensures that the conventions of the ECB are followed so that the work being carried out is consistent with that of other business areas doing process modelling.

#### B. Divisional support

9. Each DG-S Division provides 2-3 contact persons whose contribution is to provide both the details of the models as well as all supporting documentation. Although not obligatory, these contacts may undertake some of the modelling themselves.

### **C. Software package (ARIS)**

10. An "off the shelf" software package called ARIS has been chosen as the standard software to support this activity within the ECB. In addition to documenting the processes, it is also a database, which helps in identifying where particular technical and human resources are employed. The immediate advantages are in the assignment of re-usable objects such as resources, e.g. person types, IT applications, so that when the attributes of an object are modified, the changes are immediately reflected wherever this object is used.

11. The intention is that the different production units document processes in the same way, i.e. using the same "language". Conversely, by consulting a resource object in the system, the user can identify all the processes in which a resource is employed. This would apply not only to staff but also to applications. Should there be any changes in resources, line management will be able to see where there would be impacts, e.g. Software upgrades, staff mobility.

12. A Web-publication feature producing dynamic HTML pages is available for providing on-line information on processes. This makes it possible to visualise details and to navigate the Product Matrix. Reports can be created for the various possible users of the system, statisticians and managers, via the web publishing tool included in the application. They include links to navigate between different reports and descriptions of the objects within the documents. The reports can also include links to documents stored outside the software package. In the future, there will be the possibility to carry out simulation exercises using built in functionality of ARIS.

13. Since the potential of ARIS is much greater than our demands warrant, both within the ECB and the DG-S, a "Conventions" guide has been provided and the administrators of the software have restricted the type and number of modelling objects available. This is immediately of value as it is easier to select the correct icons and also encourage new modellers. This conventions guide can be updated if there is an identified need to add another object or model type.

## **IV. DOCUMENTATION EXERCISE**

### **A. Procedure**

14. To start with, for each of the Sections of each Division a stable product is selected. This product may have or have not been modelled in the early investigation work of 2003 but is always considered as not. By involving the core team in the modelling of all these products consistency in properties of the models is ensured. The Division contacts meet with the members of the core team to describe the details of the process. Where documentation is considered lacking, out of date or inadequate for the purposes of the exercise, the contact persons report to their respective areas in order for these "gaps" to be filled in a timely fashion.

15. Once supporting documentation is submitted and considered appropriate, it is added to the centralized depository from where it can be directly accessed by hyperlinks from the models.

16. For the non-production divisions, such as the Development and Co-ordination Division and the Statistical Information Management and user Services Division modelling concentrates on their respective core activities which will later "slot" into the product matrix where these are deemed as applicable. On a weekly basis, the Core Team meets to discuss the models developed and to address any issues arising from the work, e.g. modelling additional processes. Further meetings between members of the core team and the expert from the central Planning & Controlling area take place to "clean up" the models at an early stage.

17. A colour coded key system is used to indicate the progress of the work for each process in the Product Matrix, from No Model through to Final Model and complete documentation. This Product Matrix is updated on a weekly basis and refreshed for the benefit of the entire DG-S.

18. On a monthly basis, there is a progress meeting between the Core team and Business areas. Models will be discussed in detail and upon acceptance by both parties, they will be considered finalised. A brief progress report to management is submitted at the end of each month.

## **B. Level of detail and other considerations**

19. An important question from the beginning is that of the limit of the level of detail. For this exercise, we agreed that the level should be understandable by all colleagues. To go to the point where each and every "button" pushed, etc. was considered too much detailed for this exercise. Naturally the level of "Product Matrix" itself was not detailed enough. It was decided to limit the detail to one level down into the product matrix.

20. Each function is identified by the unique combination of Human and Technical resources and/or decision. An example model is shown in annex. Certain assumptions can be made when modelling, e.g. MS Outlook and email are synonymous and unless there is a specially formatted email, then this need not be assigned to a function. It is also important to distinguish functions that create/modify a document or database, against those that obtain information contained within these information carriers.

21. A visual benefit is obtained by distinguishing the "Position type(s)" responsible for the execution of a function from those who contribute or are simply informed about it. It is important to ensure the cross referencing of connections between models (Process Interface) so that relationships and navigation in the product matrix is optimized.

## **V. Time Frame**

22. Modelling started in all Divisions in early 2005. It is expected that 10-15 products will be modelled per month. Completion of the models is expected by October 2005, with final acceptance of the last models one month later, i.e. November 2005. Finalisation of the Framework is expected in January 2006.

23. Hand over to business areas will start in February 2006. Each area will become responsible for the maintenance of the models related to their work. Where a model reflects the contribution of more than one area, then the Core Team will establish which area is the major contributor and will assign the responsibility to them. Completion of Handover is expected by May 2006.

24. The focus of the Core Team will change from Development and Population to Support and Reference. When models need updating, the respective business area will either copy the existing model to or create a new one in their "Work" area of the database. Here they will have full access to the changes they wish to make. Once completed, these "new"/"modified" models will be assessed by the Core Team before they can be entered in the "Reference" area of the database.

## **VI. ISSUES**

### **A. Resources**

25. The issue of resource allocation is of concern to the operational managers who have to balance the requirements of supporting this exercise with their regular activities. To get the project started, it was decided that the Core team would carry out the modelling whilst sitting with the contributors from the business areas, allowing for the possibility of contributors to take on the modelling tasks as and when they wanted and as they recognised the benefits of doing so.

26. It is also fairly common that the more junior and less experienced colleagues are nominated by Sections for this additional task. However, once subjecting the models to approval it is realised that a better quality would have been obtained immediately by involving the more senior staff directly.

27. Another lesson learnt is that it is not realistic to think that modellers could work directly from existing handbooks. In practice, although a model can be produced from the written documentation, rarely is the information relating to non-success, the technical resources and the knowledge required to complete the model itself.

## **B. Understanding the definitions surrounding the Product Matrix and the models**

28. Modelling business processes is a new concept to many colleagues in DG-Statistics and, as such, getting the definitions across is a prime consideration. As early as possible, definitions and concepts are put forward to all affected colleagues as soon as possible.

29. The term “Product” itself raises questions with some colleagues. It has been necessary to define the term in relation to the “Product Matrix” as opposed to publications to which our “Products” contribute. For example, a concept such as “Checking data” introduces some surprises to colleagues, since they understand what functions follow the success of checks but have never experienced a failure and as such need to leave a model half finished whilst they consult with their colleagues as to what procedures are followed. A similar issue arises when modelling a management approval. They are surprised when they need to consider what actions are to be taken when approval is denied.

## **VII. EXPECTED BENEFITS**

### **A. Direct**

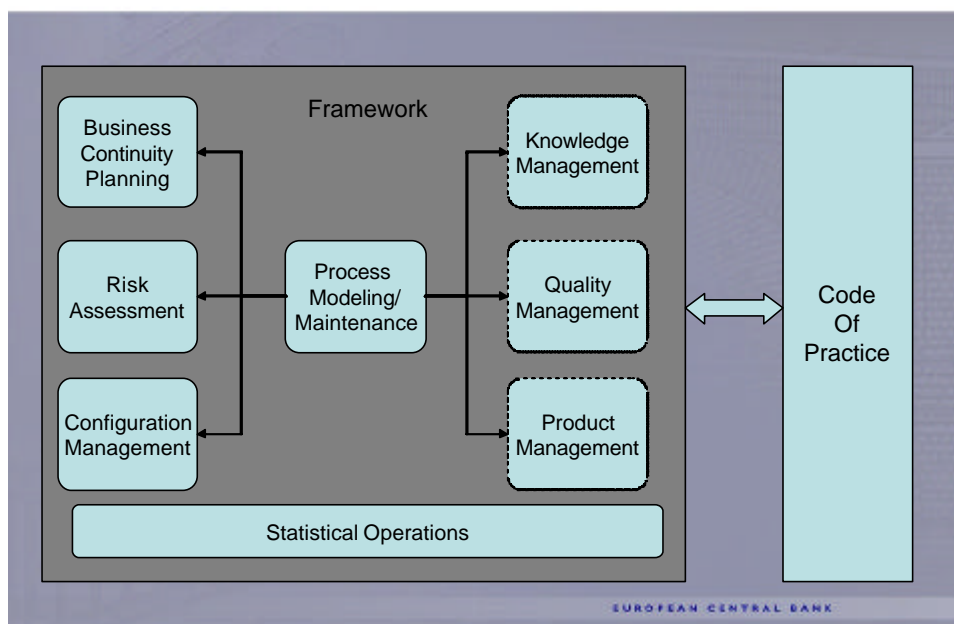
30. The following direct benefits are expected from this exercise:

- Availability of documentation for all statistical processes used within DG-S in a consistent manner.
- Further improvement of the overall efficiency of statistical processes and operations within DG-S, through the identification of synergies between related processes.
- The modelling exercise makes contributors view their statistical tasks from a different angle. In many cases, contributors are describing processes that were handed down to them by their predecessors on the job, and have rarely questioned the reasons why a process follows the route they describe. They know and understand the succession of processes until they are faced with a question like “What happens in case of failure to meet the criteria for success?”. By having to describe the alternative route(s), they increase their own understanding of the processes and thus immediately incorporate this into supporting documentation.
- Easier communication between subject matter areas. Currently products have been developed independently and the “language” is not fully consistent across business areas. This methodology is expected to avoid the risk of developing “Silos”.
- Convergence towards common best working practices across DG-S where appropriate.
- Contribution to an overall ECB process management exercise.

### **B. Supporting the framework for monitoring and controlling statistical activities**

31. As illustrated in the chart below, the modelling of statistical processes is the basis for many activities aimed at monitoring, controlling and planning statistical activities.

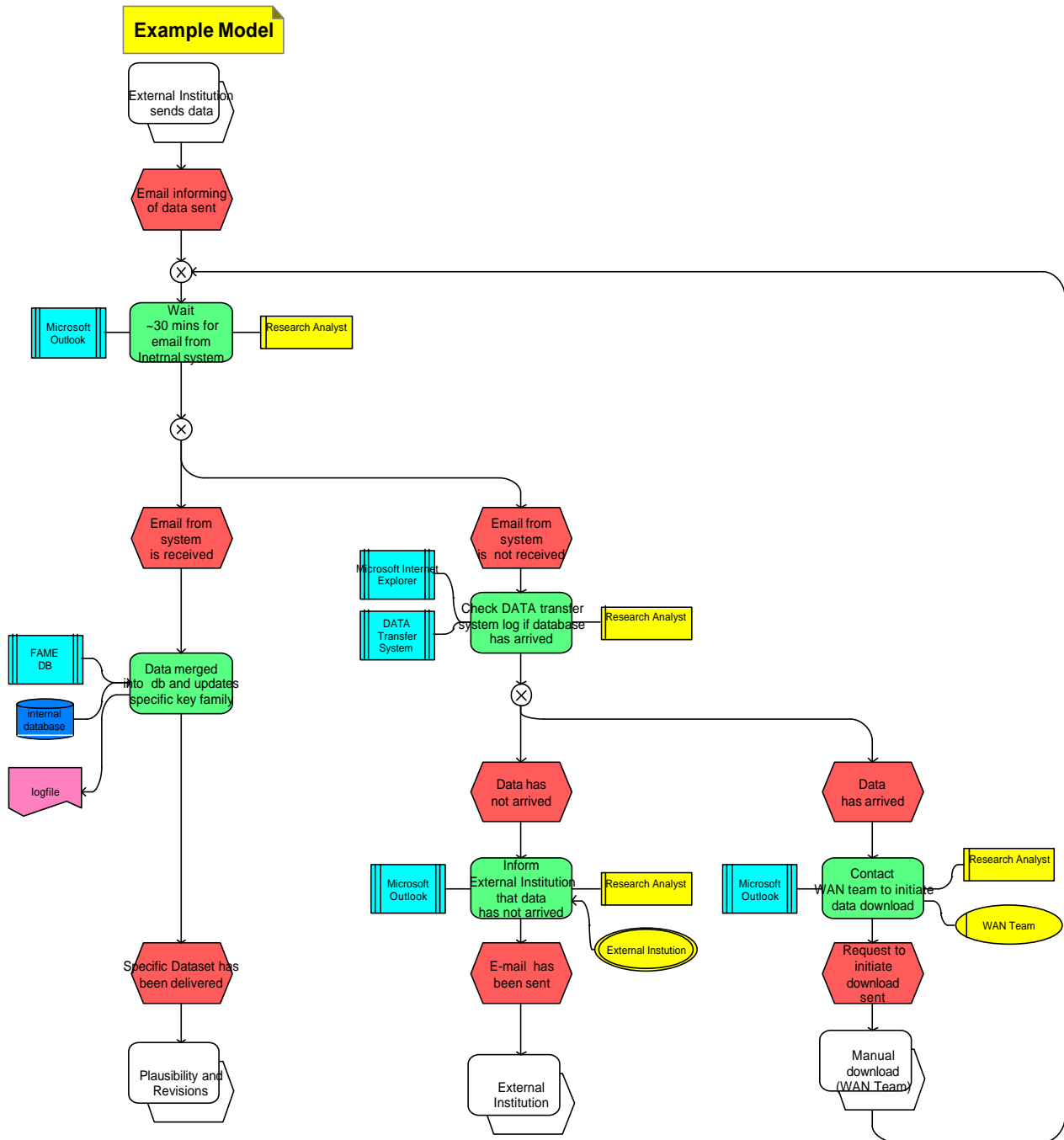
**Proposed framework will encompass several related activities**



32. This work is considered to provide the basis for the following activities:

- The establishment and support of a quality management programme for statistics.
- A systematic and structured management of risk in the statistical processes (“Risk Assessment”). The framework will also provide support for the improvement of change management procedures. Currently, as documentation is “de-centralised” it is difficult to assess the impact of any changes to the environment. The current practice is to announce the change(s) to interested parties and expect that all precautions are taken by the time a change has taken place. When the system is complete, the practice will be pro-active in that no announcement will be necessary and action is directed towards those procedures that have been identified and documented centrally.
- The consolidation of technical developments across Divisions (e.g. “Product Management” and “Configuration Management”). One of the standards to be introduced in the supporting documents is to identify each technical procedure executed, from this and the models, it will be possible to ensure that any impact of technical changes to the environment are completed prepared/tested for.
- Facilitate the internal mobility of staff and back-up of resources where needed (“Knowledge Management”). A feature of the modelling tool used is the ability to identify to which functions a person contributes and to which level, e.g. responsible, executor, contributor, informed etc.
- Support for a DG-S wide business continuity plan. From a DG-S viewpoint, this system will actually form the basis for the business continuity plan. An investigation will assess the possibility to directly link the two.

Annex : Example of a model



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