Mission Report

From a short-term mission on

Improving the Compilation System of National Accounts

7- 18 June **2004**

TA for the Scandinavian Support Program to Strengthen the Institutional Capacity of the National Statistics, Mozambique

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Executive summary

This mission was a follow up on the mission carried out in March-April this year by Jan Redeby and the consultant, Søren Netterstrøm. The main task of the mission was to further analyse the needs for an application allowing the use of a database as a base for the Systems of National Accounts in Mozambique while still using Excel spreadsheets as the basic tool and user interface for system.

The tasks of the mission were to analyse the present compilation system for national accounts; to outline ways of improving the IT-system including the organisation and structure of Excel files; and to lay the foundation for an SNA database.

During the mission a revised version of the application was presented for the staff of the National Account division and discussions about the scope of the application in relation to the SNA was carried out.

At the end of the mission it is the impression of the consultant that key persons within the National Account has a good understanding of the application and the possibilities it offers to help building a more robust implementation of the SNA.

The consultant stressed, that the application in case is just an extension to Excel and in no way interferes with the way the national account is compiled. However, it should be stressed that in order to implement the application a complete overhaul of the structures in present system of Excel sheets should be undertaken as a revised implementation is developed. This is by no mean a trivial task and must be carried out by INE staff with assistance from the advisers available.

The role of the IT-section of INE in relation to the new application was discussed. It was stressed that implementation of the revised implementation has to be carried out by the specialist in National Account, but IT-staff could play an advisory role on the use of Excel and perform minor specialist tasks as setting up the database, establishing backup etc. At a later state INE may want to take over further development of the application. Since the application is distributed as source code, INE at any point of time has full access to the code.

A last mission is anticipated towards the end of the year. In the time up to then INE should start using the application. In the meantime relevant staff at INE and the consultant will communicate by e-mail. Request for added functionality will be handed along the way and new versions of the application can be sent by e-mail.

1   Introduction

A mission from Denmark Statistics visited the Instituto Nacional Estatistica (INE) from 7 – 18 June 2004 with the task to look at the implementation of a database system for the national accounts. The consultant was Mr. Søren Netterstrøm, IT-expert from Denmark Statistics. The terms of reference is attached as Appendix 1.

Meeting was held with staff members of the Department for National Account, including Mr. Said Dada, Director of national Accounts and Global Indicators. Meetings were also held with staff at the IT-department at INE.

During the meetings the role of the proposed database in the process of compiling the National Account was discussed. The issue of division of labour between the IT-department and the Department for National Account was also raised.

2.   The processing system for National Accounts

The processing system for the National Accounts, not to be confused with the System of National Accounts, has two major phases.

In the first phase information for a large number of independent sources outside the SNA are gathered and harmonised to fit the demands of the SNA. The output from this phase is data sheets for products, industries and Institutional sectors.

The second phase is the balancing and reconciliation within the core tables of the 1993 SNA, Supply and Use Table (SUT), Cross-Classification of Industries and Sectors (CCIS) and Integrated Economic Accounts (IEA)

Further analysis shows, that the first phase in fact consists of a number of rather independent subsystems, the actual number is likely to be between 10 and 20. They share the same output format, but the input available and the process are unique for each subsystem, even some similarities may be found. These subsystems are also vulnerable to changes in the systems delivering the input. Often decisions must be taken and new rules created on the flight.

The second phase in contrast is a single homogenous system. This is the actual implementation of the SNA, reflecting the systematic approach of SNA. The second step is not likely to change over time (unless changes are introduced to SNA 1993) and most (if not all) rules for calculations and flow of processing can be predefined.

The differences between the two phases of the process of compiling the SNA indicate that the approach that can be used when building IT-systems to support those processes may as well be quite different. During the mission it was demonstrated, that the proposed solution for a database makes sense for the second phase, but it seems unlikely that it could bring any improvement to the first phase in general.

It is the recommendation of the consultant that the database approach is used in conjunction with a renovation of the IT-system behind the second phase and that the creation of an improved IT-system for the SNA starts with this project. At a later stage, each subsystem in the first phase should be examined and renovated as feasible. As a part of these projects, use of the database can be considered based on the

experience gathered during the construction of the improved system for the second phase.

3. SNA as a set of time-series.

A prerequisite for the proposed solution for a database is that all the figures in the SNA can be seen as a set of interrelated time-series. Each of the time-series is identified through a set of classification values. For instance a product series may be identified by Product number, Transaction Type (P1 (Production), P11 (Commercial production) ...), concept (current_prices, constant_prices). To this one could add information about Preliminary or final figures (or revision number). Each value could then be identified by the same set of identifiers and time.

All series that are identified by values from the same set of classifications are considered a key-family. There will be one key-family for time series related to products and another key-family related to industries. All in all there may be 10 to 20 key-families. Each key family is represented by a table in the database.

It should be mentioned, that the concept of key-families are used within the European Statistical System and the Central Banks of Europe, when data regarding National Account as well as other economic statistics are exchanged between the partners.

4. Work to be done

During the coming month the staff at INE should start the planning and implementation of the improved system for SNA.

The first step, as with all development of IT-systems, should be a rather detailed planning. This includes an analysis of the data flows within the system as well as rules for calculations.

It is envisaged, that the system can be build by creating a set of templates. Each template contains information about the relation to the database as well as all fixed calculations, but the templates carry no data.

As an example, a template will be build for a product sheet. The sheet for all products will by the end have the same structure for all 100+ products, so this structure is reflected in the template. Each actual product sheet is then created by making a copy of the template and inserting code and name of the product (and other constants as necessary). The sheet is then ready to receive data. A similar approach can be taken to sheets for industries, sectors etc.

Once this technique is used, it should be underlined that the structure of a sheet must only be altered by authorized persons and with proper documentation. If this rule is not followed the system may very quickly deteriorate.

Each sheet may hold areas that can be used for special calculations (product or industry related etc.), but such areas should be clearly marked. For such area, the individual user may be given more freedom to use and change as fitted to the tasks to carry out.

5. Good Excel conduct

During the mission, a 1 day seminar was conducted relating to good Excel conduct. The power-point presentation used is added as an appendix.

It was stressed, that the purpose of good conduct is to enable cooperation and make sure that other persons (and the author herself) is able to understand the information contained in a particular Excel file.

The consultant would like to recommend, that the ideas from this seminar is discussed within the National Accounts Division, especially in the group involved with the development of the new system. As a result, a set of commonly agreed rules for good Excel conduct should be established and pursued.

It should be noted, that even if some of the rules at the end may seem very simple, so you may wonder if they should be formulated, practice shows that if they are not formulated, they will not always be followed.

The importance of good Excel conduct should be understood by all members of the staff. It should be noted, that establishing good Excel conduct is an on-going process that may need to have special attention from time to time or it may slowly erode.

Appendix 1: Terms of Reference

TERMS OF REFERENCE
Within the Scandinavian Support Program
For a short-term mission from 07/06 to 18/06/04
On
National Accounts-System Database

1. Objectives of the Mission

The short term mission[1] on "Improving the Compilation System of National Accounts", from 22/03 – 01/04/04 on its Report indicated some guidelines for good Excel conduct, which will have to be made more specific as the revised system is set up and started the development o a Database that could maintain the all exchange of data within the system and avoid links between the various Excels. Although further programming of the database and the user interface could partly be done by the IT-expert at home, the mission recommended that this should be followed by a short-term mission during the second quarter, 2004.

Therefore, the objectives of this mission are to refine and improve the proposal of the "Excel Access Links using Templates" connecting the Excel spread sheets of National Accounts compilation system with an Access Database, made during the previous mission; and make it familiar to the staff at INE, especially the National Accounts Department and DISI with concepts and what is proper use of it. More specifically, the objective of the mission will be:

1. Beneficiaries of the Mission

The mission will primarily benefit the staff at INE and especially the National Accounts Department by providing knowledge and improved software for National Accounts compilation through a new National Accounts-System Database. The beneficiaries in the long run will be the users of NA through improved quality of the National Accounts.

2. Expected Results

§ Improved Guidelines for 'Good Excel Conduct'

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[1] J. Redeby and S. Netterstøm, March/2004, on "Improving the Compilation System of National Accounts

- § Refined Excel Access Links using Templates through an User Interface for easy access to files of the system that would give an overview of its components and point to the various files included
- § Staff at INE familiarized with concepts and proper use of the SNA Database, especially the National Accounts Department and DISI.
- § Technical Report containing guidelines and procedures for better use of the SNA Database and how certain tasks can also be automated by using the programming language of Excel.

3. Work to be carried out by the Consultants

- § Meet with the NA Director, Head of department, consultants including the IT-consultant, and other key-persons related to NA;
- § Refine the Model in cooperation with INE´s staff (National Accounts and IT)
- § Make the INE staff familiar to the Model specially on concepts and proper use of it through a one day workshop;

As this mission is a continuation of the previous mission, emphasis should be on taking the Report of the 22/03-01/04/04 mission on "Improving the Compilation System of National Accounts" as a starting point.

4. Agenda for the Mission

To be prepared, but should include the following:
- § Interviews and meetings to gather information
- § Review the pc-network and the working files in the present system.
- § Assessment, evaluation and elaboration of suggestions in cooperation with NA Director, Head of department, Head of IT Department and the consultants
- § Discussions of suggestions with the NA director, the Head of Department, the IT Head of Department and the consultants related to NA.

5. Tasks to be done by INE to facilitate the Mission

- § Elaborate the Terms of Reference for the mission
- § Prepare and supply the consultant with necessary documents and information
- § Arrange meetings with key persons
- § Supply good working conditions for the consultant

6. Consultants and Counterpart

Consultants: Søren Netterstøm
Counterpart: Monica Magaua and Calado P. Fijamo

7. Timing of the mission

The mission will take place 07/06 to 18/06/04

8. Report

The consultants will prepare a draft Technical Report to be discussed with INE before leaving Maputo. They will submit a final draft to INE for final comments within one week of the end of the mission.

These Terms of Reference were prepared by:

Day   19 /02/04   Saide Dade – Director of National Accounts and Global Indicators

Approved by/in the name of the President of INE

Day   /   /   ....

Appendix 2. Good Excell Conduct, presentation

Good Excel Conduct

How to behave when sharing
spreadsheets

Why we need it

- You are not alone!
- We need to share information, not puzzles
- By following a set of common conventions
  we share more information at a glance

What is a spreadsheet

- A set of figures organised in 2-dimensional
  grids
- Graphs
- Formulas (partly hidden)
- Macroes
- Comments
- …

Program / data

- A spreadsheet is a mix of instructions (the
  program) given by formulas and macros
  and data in the form of numbers.
- If we are not careful we end of with a black
  box
- Input data -> black box -> output data
- How do we now what happened?

Different cell types

- Cells (containing numbers) may be divided
  into
  - Raw data (input)
  - Intermediate results (calculated)
  - External data (from other sheets or a
    Database)
  - Output (calculated or copied)
- Can we spot the difference?

Input/calculation/output

- A traditional accountants approach
  - One sheet to hold input data (regardless of whether it is actually typed in or loaded from a database or ?
  - One sheet containing all calculations
  - One sheet containing output (results)
- Gives structure, but ?

Color/format coding

- Use different colors (background or number) or formats (italic, bold) to indicate the nature of a number
- Input figures with ligth yellow background
- Intermediate calculations with ligth blue background
- Final result with white background
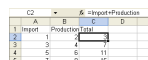- Bold figures to highlight most important results
- etc

Labels

- Use labels to give meaning to data
  - No figure should stand on its own
- Heading (what is this sheet about
- Column labels (just below heading)
- Row labels (the first rows)
- Freeze panes
- Don't mix several tables on one sheet

Top down, left to right

- We read upper left corner to lower right

  Important information should be at the top and to the left, not hidden in the lower right corner (that may not even be visible when we open the sheet).

  Scrolling up and down is more natural than scrolling sideways. Avoid many columns if possible or put most important columns at the beginning of the row

Formulas

- Consider
  - =E21+E25   and
  - =Import+Production

- Use named areas to improve readability of formulas

Garbage collection

- You may during your work with a spreadsheet use part of the sheet as a notepad
- Clean up (your mother is not here)
- Areas may be named but no longer needed at the end
- Clean up

Notepad (Garbage collection)

- A spreadsheet may be used as a temporary notepad to do some calculations, produce a graph to insert in a document etc.
- In such cases we may skip good conduct
- But be sure to get rid of the sheet when used, because it will have no value
- We can fill our folders with garbage

Application

- An application is a computer program used for a specific purpose
- Excel and Word are applications
- Notepad is also an application
- Some applications are used to build applications
- Excell can be used to build applications
- An Excel workbook can be an application

Building applications with Excel

- User Interface
  - Logical structure
  - Hide information not needed (hidden sheets)
  - User controls (Push-buttons …)
  - Use labels to guide the user
- Documentation
  - User documentation explaining the purpose and usage of the application

Building applications with Excel

- Macros
  - Used to automate tasks
  - Activated by menu items or pushbuttons
  - Easy to create and implement (record macro etc)
- VB Code
  - Used to implement more complex operations
  - Requires programming skills
- Documentation
  - Make sure that macroes and VB code are properly commented. Purpose, use of special functions etc.
  - Use meaningfull names
  - Documentation template
- Clean Up
  - Unused macroes and code should be removed

Building applications with Excel

- Hidden sheets
  - Intermediate calculations etc can be placed on hidden sheets
- Locking sheets and cells
  - Prevent the user from changing the application by mistake
- Password
  - Completely hide the program logic from the user

Naming conventions

- All areas named for same purpose should have same prefix.
- For instance a range of input areas could be named
  - INP_A…
  - INP_B…
- I area is a complete row
  - ROW_P23

Common rules

- Within INE or CN create a common use of color encoding and formatting
- Use a standard style for all sheets to improve readability

Formula or number

- A formula represents a rule
  - Do not delete formulas from a prepared or template sheet
- Do not use a formula if you don't intend to stress a rule.
  - Just because, by accident, cell B1 has the same value as cell A1 do not put
    =A1
    This will confuse future readers (including yourself two weeks from now)

Handling errors

- When we use a prepared sheet we may have

- But we should have

- It does not take long to do it correctly

Using an add-in

- Making new functions available for Excell
- Example
- ZDIV(A,B) will produce
  - A/B if A and B are numeric and B <> 0)
  - "…" if A and B are numeric and B = 0
  - "" if A is Empty or empty string
  - "N/A" in other cases