





MZ:2012:09

# ICT situation after move to new site

# Report from a short-term work as consultant at the ITC-section of the National Statistical Institute of Mozambique, Maputo Mozambique

1 October – 31 December, 2012

within the frame work of the

AGREEMENT ON CONSULTING ON INSTITUTIONAL CAPACITY BUILDING, ECONOMIC STATISTICS AND RELATED AREAS

between

**INE and Scanstat** 

Adão Ernesto Saranga



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# 1 OCTOBER - EXECUTIVE SUMMARY / SUMÁRIO EXECUTIVO

#### English

Scope of the mission

The main focus of the mission is to coordinate the response on the diagnostic report from C2D, follow the installation of the new data center and make sure that all is properly documented and to produce 3 alternative scenarios on how ICT at INE could be organized.

The consultant has additionally been also involved in some other important activities namely the design of the terms of reference and systems specifications for a tender for the new data center setup, the update the 2013-2017 strategic plan and budget and the introduction of the foundations for the annual activity based planning and budgeting targeting the linkage with the monitoring and evaluation.

The written documents and presentations have been discussed within DICRE, namely the DISI and DPI departments, and also with technicians from DARH.

#### **Português**

Alcance da missão

O foco principal da missão é de coordenar a elaboração dos comentários ao diagnóstico efectuado pela consultoria da C2D, acompanhar a instalação do novo centro de dados do INE e garantir que estão todos os processos adequadamente documentados e ainda propor três cenários alternativos para o funcionamento e enquadramento institucional das TIC's no INE.

O consultor foi adicionalmente envolvido em outras actividades consideradas importantes, nomeadamente a elaboração dos termos de referência e o desenho das especificações técnicas para o concurso visando a configuração do novo data center do INE, a actualização do plano estratégico 2013-2017 e seu orçamento e ainda, o início da abordagem sobre a planificação anual por actividades e assente em rubricas de despesa, com vista ao estabelecimento duma ligação com a monitoria do plano em si.

Os documentos produzidos e as apresentações efectuadas foram discutidos ao nível da DICRE, nomeadamente pelos departamentos DISI e DPI, bem como junto dos técnicos da DARH.

#### 1.1 INTRODUCTION

The mission was carried out 1 - 30 October 2012.

C2D Consultancy Report -

This consultancy is to assess the SEN's current information technology situation, specifically how statistical information is stored in different formats, and how this can be harmonized to facilitate the analysis and dissemination of official statistical information. Additionally, appropriateness of the current IT organizational structure, staffing and training needs to be assessed to determine if it is still optimally organized to meet the SEN's maturing business objectives. The objectives of this consultancy can be summarized as (i) an improved understanding of the constraints and risks of an integrated database solution; (ii) a strategy and recommendations for the more effective use of integrated database technology in the storage and retrieval of statistical information; (iii) recommendations to improve data quality through the clarification of role definitions and assignment of responsibilities between subject matter areas and IT support. The primary goal of this business practice analysis is to support data quality with an emphasis on the proposed integrated database strategy and (iv) recommendations to improve IT organizational support through organizational change, staffing and training. The objectives will be addressed in parallel if significant progress is to be made in achieving the goals of the National Statistics System Strategic Plan 2013 -2017.

The report has been presented in six chapters namely (i) an introduction presenting the background and proceeding of the study, (ii) an analysis of the internal environment as it can affect the recommendations, (iii) an analysis of the external environment as it can affect the recommendations, (iv) an outline of best practices and guidelines that will be used as a reference for the assessment of the current situation and then, the recommendations, (v) the assessment of the current situation; (vi) the recommendations, targets and objectives that have to be achieved by INE and (vii) the detailed operational work plan orchestrating the various recommendations and targets.

Update of the 2013 - 2017 Strategic Plan and Budget The exercise aimed to update the strategic budget for the 2013-2017 period bearing in mind all the relevant issues that have to be in place for the population Mozambican census to be held in 2017.

The update included training programs for the IT technicians, new equipment for the central and provincial levels as well as all the data center enhancements to cover all the required data collection and processing.

New data center setup

A set of new equipment had been bought just after INE headquarters moved to the new building. The equipment include new servers for the already working local area network, data storage devices, backup tape devices and a wide list of operating systems and management software.

The main objectives are to implement a server virtualization approach with the new generation of servers recently bought, a server redundancy within the site, raid and non unattended data backup procedures, database and applications servers and all related features demanded.

The set up will include a full migration from the Windows Server 2003 to 2008, within a System Center Configuration Manager (SMS) environment. It has been also decided that the mail system managed by Microsoft Exchange 2003 will be updated to the 2010 version.

Annual activity based planning and budgeting software

With the growing demand of a financial and physical monitoring of the approved annual activities and budget plans, INE has started efforts to have new and efficient tools for its monitoring and evaluation system.

As a starting point, two application software for the annual activity based planning and budgeting have been presented to the Planning and Integration Department as well as the Administration and Human Resources Directorate.

The objective is to have planning tailored software for INE to be used for the next planning process in 2013 and based on that system, start building a activity monitoring system that will be also linked to financial execution process.

#### 1.2 DETAILED INFORMATION

Description	Comments	Status
C2D Consultancy Report	A set of comments and remarks have been made by	Implemented
Draft	INE and submitted to the consultant.	
	After sometime the consultant have responded and clarified all the raised issues and sent back to INE.	
	A final statement from INE has been elaborated and delivered to the consultant and the next step is expected to the final version of the report from the C2D	
2013-2017 Strategic Plan Update	DISI have remarked all the relevant updates to the activities, good and services that are linked to the strategic plan.	Implemented
	Therefore minor changes of the budget have come	

	out but with a very low impact on the initial figures	
New data center setup	Systems specifications have been written in order to launch a public tender for the configuration process.	Under implementation
	Additionally, a proposal has been submitted to the INE top level decision makers, stating clearly the need and context of this activity.	
Annual activity based planning and budgeting software	The budgeting and planning software used in the Phase II of the Agricultural Sector National Development Program (PROAGRI) has been presented to DPI and DARH unities.	Not Implemented
	It also has been presented the software being used in the PPFD program within the Ministry of Plan and Development for the budgeting, planning and financial monitoring.	
	The two software's presented aimed to facilitate a comprehensive approach about what should be suitable for INE and efforts are on place so that next year a tool is already in place	
Update operation manual and prepare maintenance documentation for all systems.	Fill out information in the documentation template will give a good basis in a disaster recovery situation. The information should be updates regularly, printed and places in a safe place. This can be the same place as the backup tapes.	Waiting
	As the infrastructure gets more and more complex, the need of documentation increases. INE will be less depending on knowledge by individuals. There are existing plans on having a logbook where changes are documented.	

#### **ACTIVITIES NOT FULFILLED**

According to the terms of the reference, the main activities for the consultancy were:

- Coordinate the response on the diagnostic report from C2D;
- Follow the installation of the new server, both hardware and software (including the virtual servers) making sure that all is documented properly;
- Produce 3 alternative scenarios on how ICT at INE could be organized.

As stated before, the first activity was fully completed whereas the two other one were partially implemented. Apart from having the consultant being involved in other ad hoc activities, there were comprehensive reasons to have the last two activities not fulfilled.

As for the installation of the data center the main constraint has been the difficulty to get the Denmark consultants to with short notice come and run the full installation of the new equipment. Therefore, INE has launched a local tender to select a company that will carry out the installation and this process is still under all administrative required steps.

Regarding the three alternative scenarios it can also be stated that the activity is under implementation. There are already some inputs from the C2D diagnostic but the consultant has also interviewed separately all the technicians from the Database and Software Development Unit under DISI, including those who are currently not working at the DICRE.

There's a need to complete this exercise with the interview of the Network and Support staff, activity that will be certainly completed in November. It is understood that only after that assessment it can be possible to propose the alternative scenarios for ICT within INE.

# 2 NOVEMBER - EXECUTIVE SUMMARY / SUMÁRIO EXECUTIVO

#### English

Scope of the mission

The main focus of the mission is to coordinate the response on the diagnostic report from C2D, follow the installation of the new data center and make sure that all is properly documented and to produce 3 alternative scenarios on how ICT at INE could be organized.

The consultant has additionally been also involved in some other important activities namely the evaluation of the bid offers for the new data center setup, the summary of the constraints accessed during the interviews to all the INE software development and database administration unit staff and the design of the budget and activity planning methodology understood as the basic foundation for the INE monitoring and evaluation processes.

The written documents and presentations have been discussed within DICRE, namely the DISI and DPI departments.

#### Português

Alcance da missão

O foco principal da missão é de coordenar a elaboração dos comentários ao diagnóstico efectuado pela consultoria da C2D, acompanhar a instalação do novo centro de dados do INE e garantir que estão todos os processos adequadamente documentados e ainda propor três cenários alternativos para o funcionamento e enquadramento institucional das TIC's no INE.

O consultor foi adicionalmente envolvido em outras actividades consideradas importantes, nomeadamente a avaliação das propostas para o fornecimento do serviço de configuração do novo data center do INE, a sistematização dos principais constrangimentos levantados nas entrevistas aos técnicos da Repartição de Desenvolvimento de Software e Administração de Bases de Dados e a conclusão do desenho da metodologia de planificação e orçamentação anual, entendida como base os processos de monitoria e avaliação.

Os documentos produzidos e as apresentações efectuadas foram discutidos ao nível da DICRE, nomeadamente pelos departamentos DISI e DPI.

#### 2.1 INTRODUCTION

The mission was carried out 1 - 30 October 2012.

C2D Consultancy Report -

This consultancy is to assess the SEN's current information technology situation, specifically how statistical information is stored in different formats, and how this can be harmonized to facilitate the analysis and dissemination of official statistical information. Additionally, the appropriateness of the current IT organizational structure, staffing and training needs to be assessed to determine if it is still optimally organized to meet the SEN's maturing business objectives. The objectives of this consultancy can be summarized as (i) an improved understanding of the constraints and risks of an integrated database solution; (ii) a strategy and recommendations for the more effective use of integrated database technology in the storage and retrieval of statistical information; (iii) recommendations to improve data quality through the clarification of role definitions and assignment of responsibilities between subject matter areas and IT support. The primary goal of this business practice analysis is to support data quality with an emphasis on the proposed integrated database strategy and (iv) recommendations to improve IT organizational support through organizational change, staffing and training. The objectives will be addressed in parallel if significant progress is to be made in achieving the goals of the National Statistics System Strategic Plan 2013 -2017.

The report has been presented in six chapters namely (i) an introduction presenting the background and proceeding of the study, (ii) an analysis of the internal environment as it can affect the recommendations, (iii) an analysis of the external environment as it can affect the recommendations, (iv) an outline of best practices and guidelines that will be used as a reference for the assessment of the current situation and then, the recommendations, (v) the assessment of the current situation; (vi) the recommendations, targets and objectives that have to be achieved by INE and (vii) the detailed operational work plan orchestrating the various recommendations and targets.

New data center setup

A set of new equipment had been bought just after INE headquarters moved to the new building. The equipment include new servers for the already working local area network, data storage devices, backup tape devices and a wide list of operating systems and management software.

The main objectives are to implement a server virtualization approach with the new generation of servers recently bought, a server redundancy within the site, raid and non-unattended data backup procedures, database and applications servers and all related features demanded. The set up will include a full migration from the Windows Server 2003 to 2008, within a System Center Configuration Manager (SMS) environment. It has been also decided that the mail system managed by Microsoft Exchange 2003 will be updated to the 2010 version.

Assessment from Software Development and Database Administration Unit

The assessment has been understood as a complementary effort for all the ongoing strategic and operational actions aiming the ICT's in general within INE. At a more specific perspective it has been taken to in other to accomplish the terms of reference of the current contract which include a formulation of alternative scenarios on how ICT at INE could be organized.

Apart from the already known findings from the C2D consultancy that include a massive use of non-robust databases (ms access, ms excel), lack of expertise in key positions of the ICT Department, some other constraints assessed during the interviews include aspects like the non-use of systems analysis and design tools, lack of common structure for the systems documentation, no project management for the cycle that aims a software implementation, etc.

Annual activity based planning and budgeting software

With the growing demand of a financial and physical monitoring of the approved annual activities and budget plans, INE has started efforts to have new and efficient tools for its monitoring and evaluation system.

As a starting point, two application software for the annual activity based planning and budgeting have been presented to the Planning and Integration Department as well as the Administration and Human Resources Directorate.

The objective is to have planning tailored software for INE to be used for the next planning process in 2013 and based on that system, start building a activity monitoring system that will be also linked to financial execution process.

It has been agreed that specific software for the planning and budgeting has to be written for INE and this is expected to be done prior to next February. The software debugging process will be using the already approved 2013 budget, an exercise that will require a disaggregation of the budget to the activity level. Currently the budget figures have been approved at a high level namely the investment projects.

#### 2.2 DETAILED INFORMATION

Description	Comments	Status
C2D Consultancy Report	A final statement from INE has been elaborated and	Implemented
Draft and Final Version	delivered to the consultant and the next step is	

	<u> </u>	
	expected to the final version of the report from the C2D	
	Alignment of the recommend actions in the Plan of Action section to the operation plan of DISI for 2013.	Started
Assessment from the	Assessed all the main bottlenecks the impact	Implemented
Software Development	negatively on the activities of the unit	_
and Database		
Administration Unit	Prepared a proposal to overcome the main	
	constraints taking into consideration the recent	Under
	release C2D final report	Implementation
New data center setup	Evaluation criteria method formulated.	Implemented
	Bid offers technical evaluation.	Implemented
Annual activity based	Revised the structured of the 2013 approved plan	Implemented
planning and budgeting	and budget.	
software		
	Final version of the methodology prepared and	
	combined with all the existing data of the 2013	_
	approved plan and budget	Implemented

#### **ACTIVITIES NOT FULFILLED**

According to the terms of the reference, the main activities for the consultancy were:

- Coordinate the response on the diagnostic report from C2D;
- Follow the installation of the new server, both hardware and software (including the virtual servers) making sure that all is documented properly;
- Produce 3 alternative scenarios on how ICT at INE could be organized.

As stated before, the first activity was fully completed whereas the two other one were partially implemented. Apart from having the consultant being involved in other ad hoc activities, there were comprehensive reasons to have the last two activities not fulfilled.

As for the installation of the data center the main constraint has been the difficulty to get the Denmark consultants to with short notice come and run the full installation of the new equipment. Therefore, INE has launched a local tender to select a company that will carry out the installation and this process is still under all administrative required steps.

Regarding the three alternative scenarios it can also be stated that the activity is under implementation. There are already some inputs from the C2D diagnostic but the consultant has also interviewed separately all the technicians from the Database and Software Development Unit under DISI, including those who are currently not working at the DICRE.

There's a need to complete this exercise with the interview of the Network and Support staff, activity that will be certainly completed in December. It is understood that only after that assessment it can be possible to propose the alternative scenarios for ICT within INE.

# 3 DECEMBER - EXECUTIVE SUMMARY / SUMÁRIO EXECUTIVO

#### **English**

Scope of the mission

The main focus of the mission is to coordinate the response on the diagnostic report from C2D, follow the installation of the new data center and make sure that all is properly documented and to produce 3 alternative scenarios on how ICT at INE could be organized.

The consultant has additionally been also involved in some other important activities namely the evaluation of the bid offers for the new data center setup, the efforts to finalize the establishment of a demand-driven INE Data Portal and the design of the budget and activity planning methodology understood as the basic foundation for the INE monitoring and evaluation processes.

The written documents and presentations have been discussed within DICRE, namely the DISI and DPI departments.

#### Português

Alcance da missão

O foco principal da missão é de coordenar a elaboração dos comentários ao diagnóstico efectuado pela consultoria da C2D, acompanhar a instalação do novo centro de dados do INE e garantir que estão todos os processos adequadamente documentados e ainda propor três cenários alternativos para o funcionamento e enquadramento institucional das TIC's no INE.

O consultor foi adicionalmente envolvido em outras actividades consideradas importantes, nomeadamente a avaliação das propostas para o fornecimento do serviço de configuração do novo data center do INE, os esforços para a finalização do estabelecimento do portal de dados do INE orientado a procura e ainda, a conclusão do desenho da metodologia de planificação e orçamentação anual, entendida como base os processos de monitoria e avaliação.

Os documentos produzidos e as apresentações efectuadas foram discutidos ao nível da DICRE, nomeadamente pelos departamentos DISI e DPI.

#### 3.1 INTRODUCTION

The mission was carried out 1 - 31 December 2012.

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The report has been presented in six chapters namely (i) an introduction presenting the background and proceeding of the study, (ii) an analysis of the internal environment as it can affect the recommendations, (iii) an analysis of the external environment as it can affect the recommendations, (iv) an outline of best practices and guidelines that will be used as a reference for the assessment of the current situation and then, the recommendations, (v) the assessment of the current situation; (vi) the recommendations, targets and objectives that have to be achieved by INE and (vii) the detailed operational work plan orchestrating the various recommendations and targets.

New data center setup

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The main objectives are to implement a server virtualization approach with the new generation of servers recently bought, a server redundancy within the site, raid technology and non-unattended data backup procedures, database and applications servers and all related features demanded. The set up will include a full migration from the Windows Server 2003 to 2008, within a System Center Configuration Manager (SMS) environment. It has been also decided that the mail system managed by Microsoft Exchange 2003 will be updated to the 2010 version.

INE Data Portal improvement

After being installed, the INE Data Portal Prognoz has been working for a reasonable period of time with some few problems. The main one seems to be related to the Flash technology adopted for the user interface, creating as a result a lot of lack of accessibility to majority of the users specially those who don't have the required software installed and/or updated. They also have been reported some other minor problems related to the eventual impact of hardware update or inability to change labels or add new link in the main page of the portal.

Due to all the above mentioned issues in fact earlier addressed to Prognoz, a mission from the software company came to present new prototype of a new version of INE Statistical Data Portal. Besides it Prognoz will also deliver (MDG) Millennium Development Goals Data Portal, Open Data portal, Data Uploading tool (back-end) and online documentation (both User Guide and Tutorial) together with training for business and IT users.

Annual activity based planning and budgeting software

It has been agreed that specific software for the planning and budgeting has to be written for INE and this is expected to be done prior to next March. The software debugging process will be using the already approved 2013 budget, an exercise that will require a disaggregation of the budget to the activity level. Currently the budget figures have been approved at a high level namely the investment projects.

A full set of the INE planning matrixes have been manually compiled so that it can be then entered in the above mentioned system as part of the testing process.

Since there some changes on the expenditure category classification by the Ministry of Finance, some update will have to be done to the budget *per si*, with participation of the different INE departments.

#### 3.2 DETAILED INFORMATION

Description	Comments	Status
C2D Consultancy	Alignment of the detailed operational work plan	Under
Report Draft and Final	recommended by the C2D to the operational plan	Implementation
Version	of DISI for 2013.	
	Analysis of the Action Plan within the context of	
	the National Statistics System Strategic Plan 2013 – 2017	started

- 6			
	INE Data Portal	Addressed all the main bottlenecks the impact	Implemented
	Improvement	negatively the use of the data portal	
		Agreed the running of a comprehensive test to be made within the new version provided by Prognoz	Under Implementation
	New data center setup	Evaluation criteria method formulated.	Implemented
		Bid offers technical evaluation.	Implemented
	Annual activity based	A full set of the INE planning matrixes manually	Implemented
	planning and budgeting	compiled to be used in the software debugging	
	software	process	
		Concluded Planning system analysis and design and initiated the development process	Under Implementation

#### **ACTIVITIES NOT FULFILLED**

According to the terms of the reference, the main activities for the consultancy were:

- Follow the installation of the new server, both hardware and software (including the virtual servers) making sure that all is documented properly;
- Produce 3 alternative scenarios on how ICT at INE could be organized.

As for the installation of the data center the main constraint has still been the availability of financial resources in a very short term due the failure of the initial plan. The African Development Bank has been approached to see if can sponsor the required consultancy shortly so that all the changes being made in the data portal can also be accommodated before the end of contract with the software provider.

Regarding the three alternative scenarios it can also be stated that the activity is under implementation. The understanding is that this activity can no longer be seen as a separate one from all the scope of the recent consultancy by C2D.

Essentially, the notes presented within DICRE as a result of the consultation process to the technicians and relevant documentation must be analyzed with the context of the Action Plan presented by the C2D.

### 4 List of persons met

#### **INE**

Dr. Cirilo Tembe

Dr. Salomão Muianga

Dr. Tomas Bernardo

Enga. Marta Chaquisse

Dra. Noélia Mabunda

Dr. Elias Macuácua

Sra. Verónica Mate

Sr. Domingos Marringue

# **Scanstat Consortium, LTA:**

Mr. Lars Carlsson, Team Leader

#### **Annex A ToR**

30 August 2012

# TERMS OF REFERENCE for a short-term work as consultant at the ITC-section of INE/DICRE 15 September – 31 December, 2012

within the
AGREEMENT ON CONSULTING IN INSTITUTIONAL CAPACITY BUILDING, ECONOMIC
STATISTICS AND RELATED AREAS
between INE and Scanstat.

Consultant:: Mr Adão Ernesto Saranga

Counterparts: Mr Cirilo Tembe - Director of DICRE, Mr Salomão Muianga - Head of DICRE/DISI -

Department for IT and Information systems

#### Background

The National Institute of Statistics, in its capacity as governing body of the National Statistical System has a responsibility to collect, produce and disseminate official statistical information.

Since its inception in 1996 ITC has been a central resource feeding the work of the Institute. The environment in which INE is working is constantly changing and it is important to always be in line with this development.

During November 2011 the INE moved to new premises offering a new internal data-network, new internet access and a new server room. The environment thus is favourable for an expansion and overview of the systems at INE. For example has a new server been ordered and it will be installed in the nearer future giving the possibility to virtualize many of the existing servers at the same time as it will meliorate the backup situation and security in general.

To reach at a common plan that offers a comprehensive view on actual situation and possible future expectations regarding ITC for the institution a diagnostic study is going on from July 23 to August 17, 2012 with the help of the Canadian company C2D Services compatible with the institutional objectives. A final report from C2D will exist at the end of September.

#### Objective

The assistance aims at contributing to the improvement of the situation regarding ITC at INE making sure that current activities are managed in best possible way taken into account recent recommendations, aiming to give the National Statistical Institute a good start in the renovation of its ITC systems, taking advantage of all ongoing activities.

#### **Activities**

- Coordinate the response on the diagnostic report from C2D;
- Follow the installation of the new server, both hardware and the software (including the virtual servers) making sure that all is documented properly;
- Produce 3 alternative scenarios on how ITC at INE could be organised;

#### Expected outputs

- Structured feedback on the draft and final C2D reports, within the diagnostic project's timeframe
- Available documentation relating to both hardware and software
- Documented scenarios for the ITC

Monthly reports regarding the activities and achievements of consultancy are expected. Format and examples on Scanstat reports can be found at <a href="https://www.dst.dk/mozambique">www.dst.dk/mozambique</a>

#### Beneficiaries of the mission

Production and management units of the National Institute of Statistics.

The work will provide INE with perspectives on how to organize its ITC systems and this will in the next turn benefit the users of statistical information, the informed public, the media, teachers, students, and libraries, and make INE's contribution to the society more valuable.

# Tasks to be done by INE to facilitate the mission

- Elaborate ToR for the mission
- Prepare and supply the consultant with necessary documents and information, such as mission reports, strategies, plans etc.
- Supply good working conditions for the consultant.

#### Source of Funding

Project: MPD-2008-0011 – Coordenação e Integração Estatística PAAO12 – 3.1.1 Construção de Bases de Dados Integrados

#### Timing of the mission

See above.

#### Place

The premises of the National Institute of Statistics in Maputo.

#### Language

Portuguese and English.

#### Reporting

In addition to the monthly reports the consultant will prepare a short final report to be discussed with INE before ending assignment. Statistics Denmark as Lead Party will publish the final version on <a href="https://www.dst.dk/mozambique">www.dst.dk/mozambique</a> within 3+ weeks of the end of the mission.