BUSINESS PROCESS DOCUMENTATION

TRAINING COURSE

October 1, 2008

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COURSE OBJECTIVE

The objective of this training course is to introduce a methodology for business process analysis and documentation, for use by the Ministry of Finance (MoF), to:

- Document three automated MoF business processes: Taxpayer registration, Taxpayer card, and Tax Declaration.
- Provide MoF senior leadership with a management overview of each business process and a template for future ones.
- Provide tools and techniques to MoF trainees to properly document MoF business processes, so requirements can be easily understood by functional and technical staff alike.
- Furnish sufficient details to MoF programmers, to develop required software applications and easily maintain them in the future.

Questions to be answered during this course manual include:

- ❑ What is the objective of the business process we want to document?
- ❑ What inputs and outputs are involved in this business process?
- ❑ What are the sources of such inputs and the recipients of such outputs?
- ❑ What primary sub-processes, activities, and steps exist and in what order they perform?
- ❑ Which staff roles are involved in each function/process?
- ❑ What processing functions exist and how they perform?
- ❑ Where and when each process begins and ends?
- ❑ What internal and external data flows are involved?
- ❑ What data entities are used to store data?
- ❑ What policy, procedures, rules, workflow assumptions are made during execution?
- ❑ What is automated and what is not automated in this business process?
- ❑ What inputs and outputs are included in each business process (e.g. documents, reports, file transfers, etc)?
- ❑ What opportunities exist for business process improvement or further automation?

Examples of what this course will not cover

- Software development methodology life-cycle
- Quality control and quality assurance procedures and standards
- Business improvement and change management tasks
- Project management methodology
- Database design and structure beyond basic data structures and entities
- Information on data and process volumes, frequencies, etc

Throughout this course manual, the focus is on:

- The use of structured analysis tools and techniques to maximize graphic representation, enhance requirements understandability, and reduce documentation to the minimum required level.

- The distinction between WHAT is done (logical model) and HOW it is done (physical model).

BASIC DEFINITIONS

- Processing Function
- Data Flow
- Data Store
- External Entity

What is a Processing Function?

A processing function is a specific ordering of work activities that transform incoming data or information (e.g. document, file, report information, etc) into outgoing data or information.

Examples of Processing Functions:

- Taxpayer Registration
- Taxpayer Declaration
- Tax Withholding
- Tax Audit
- Etc.

INPUT   ?   **OUTPUT**

Processing Function
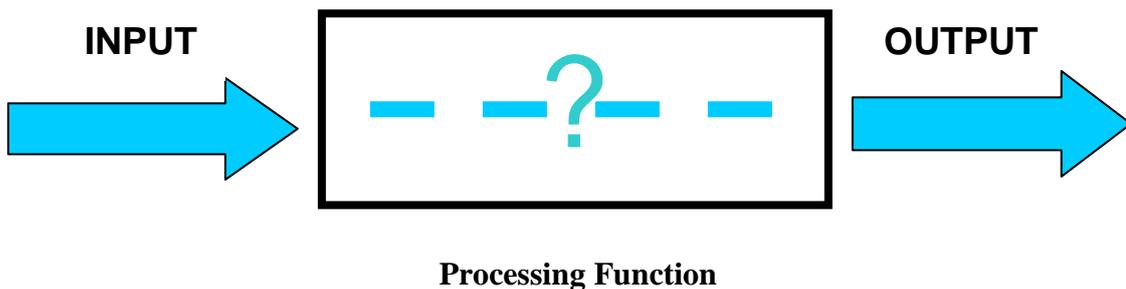
A processing function is a series of steps designed to produce a product or service. A Processing Function is a set of activities that converts input (something needed in order to carry out activities) into output (the end result of activities). Every MoF staff is involved in one Processing Function or another.
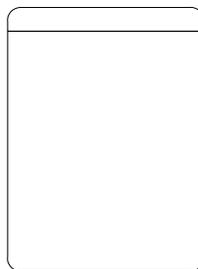
What is a Data Flow?

A data flow is a flow of data from source or process to another location. A data flow is always assigned a name (e.g. taxpayer payment, taxpayer details, etc) that best describes its set of data elements (e.g. taxpayer ID, tax amount, data of tax payment, means of payment, payment location, etc). If difficult to describe a data flow, it simply means that our analysis is incomplete and more is required.

Tax payer details

Tax payer payment
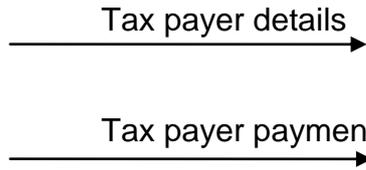
What is a Data Store?

Is a data repository which represents a single data entity (e.g. taxpayers, tax declarations, appeals, refunds, purchase orders, invoices, etc), or a set of entities such as a database.

Sometimes, we have a small number of entities (e.g. orders and receipts, etc) grouped at high level, then exploded to a larger grouping of entities on the lower levels (e.g. orders, receipts, etc).

Data stores should always have in and out data flows, otherwise it indicates an error in our analysis, such as an incomplete analysis.

A data store with only in or out data flows is not useful for any system.

Manual
Data
Store

Automat
ed Data
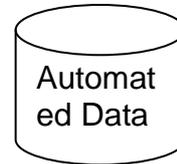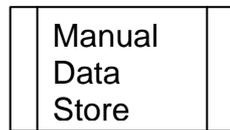
What is an External Entity?

It is an individual (e.g. taxpayer), an organization (e.g. Ministry, Parliament, corporation, International Organization, etc), department (e.g. HR Department, Audit Department, Accounting Department, etc), or an external information system, etc . An external entity receives and provides information to the business process. For clarity, we will use some symbols with names under them to indicate the type of the respective entity in question. Examples are below:

Taxpayer

taxpayers

Accounting Dept
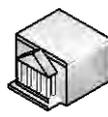
BUSINESS

BASIC CONCEPTS IN STRUCTURED ANALYSIS

Four primary tools/techniques used in business process structured analysis:

Data Flow Diagram (DFD):
Provides a method to focus on representing a set of activities or steps of what needs to be processed rather than how it is done. In other words, it focuses on the business (using the logical definition of WHAT needs to be done), rather than on the used technology (using the physical definition of HOW it is done). The highest level DFD should describe the entire system, sub-system, or business process, without much details, before a partitioning (e.g. into 2 to maximum of 7 processes in one level) and leveling is carried out (e.g. Level 1, level 2, and Level 3, etc). Usually 2 to 3 levels are more than sufficient for most systems, giving a possibility to document 343 processing functions (7X 7 X 7 = 343 total), followed by one level describing additional details (e.g. validation rules, algorithm, exception handling, clauses in the Law, or action diagrams for programmers).

It is important:

- Not to include varying levels of details, in one level of DFD, since it indicates incorrect analysis of some part of the business process.

- Not to attempt to draw data flows between external entities, since it is outside the scope of the business process in question which are trying to document.

2. **Data Dictionary:**
Provides a complete repository of the definition of data entities and attributes, data flows, external entities, and a description of each processing function.

3. **Action Diagram:**
A narrative description of the logic of a processing function. They may include an algorithm, using SQL language, to describe the overall logic of the application or precisely describe a part of the logic to programmers, such as formulas, validation and verification rules, exception rules, etc.

4. **System Modeling:**
Structured analysis often produces the four following process models below:

- Current Physical DFD (AS IS or existing physical model, HOW it is done at present). This is our starting point to best document and understand how is the MoF system is currently performing its tasks.

- Current Logical DFD (AS IS or the resent logical Model, WHAT does it presently perform). This logical model will be driven from the Current Physical Model by adding the manual processing functions, the manual data stores (such manual records of data, such as contracts, vendors, etc.).

- NEW Logical (TO BE or future logical Model, WHAT is required to do). Although, this is outside the scope of this course, it will be automatically done by completing the Current Logical DFD. The reason for that is, based on MoF IT Department staff, the existing automated MoF system and sub-systems (Tax, treasury, customs, etc), mirror correctly the requirements of MoF for the present and future system. Therefore, there is no difference between the Current Logical Model and the New Logical Model of the MoF System. Any new best practices to be introduced for various modules, such as for Treasury operations, need to be reflected in this New Logical Model before deriving the New Physical Model from it.

- NEW Physical (TO BE or future physical model, HOW is required to perform in the new system). This is outside the scope of this course, however MoF intends, as result of its business process definition exercise and system documentation, to either seek the procurement of an enterprise-wide information systems (e.g. an off-the-shelf enterprise solution from SAP, Oracle, Free Balance, etc) or to improve its current applications and migrate them into new web-based technologies.

CURRENT

REQUIRED
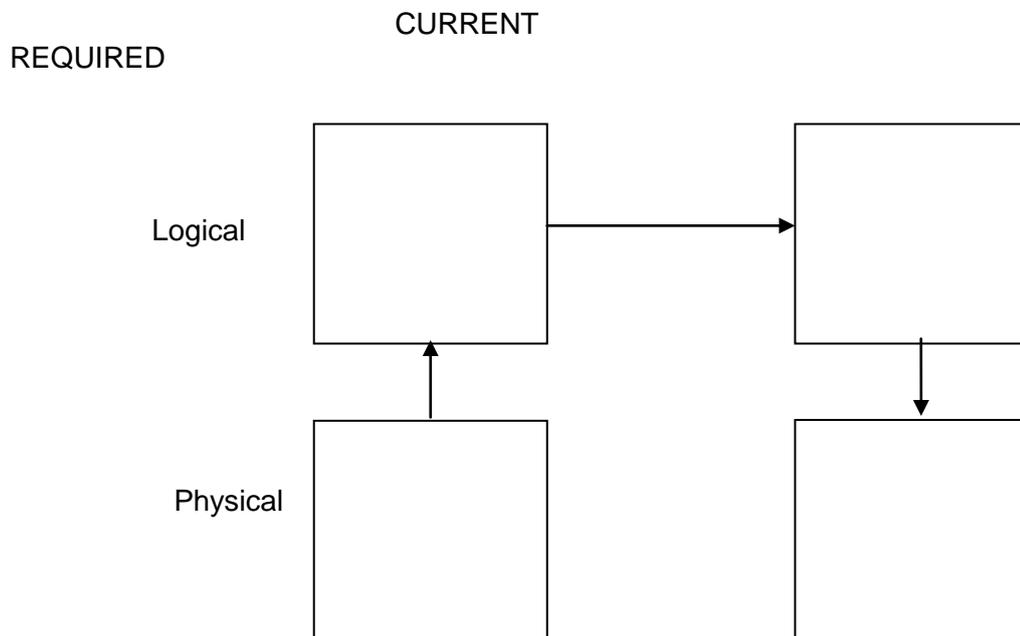
Logical

Physical

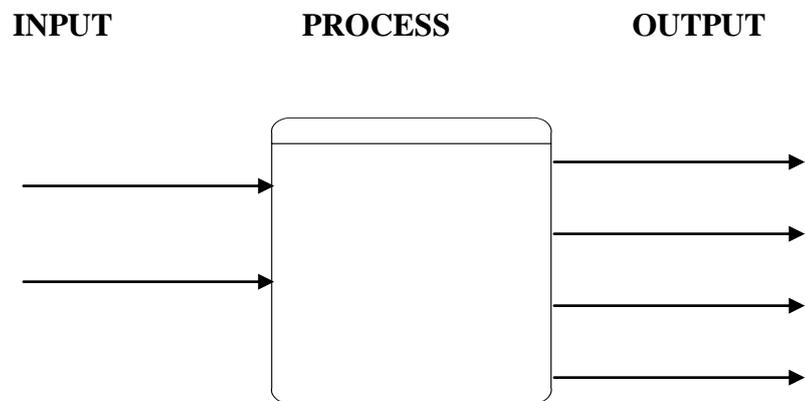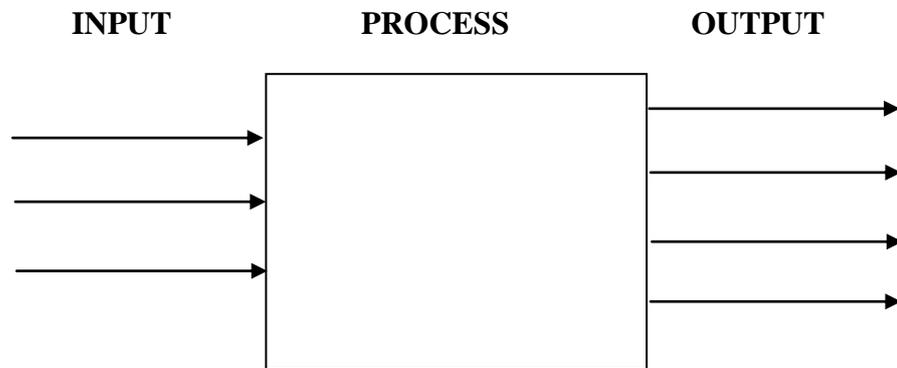**Step by Step Approach for Documenting Existing MoF Business Processes**

1. Prepare the Current Logical DFD Model of the business process in question.
2. Create the current physical model from the above current logical model by identifying the boundaries through a dotted line. We separate, by a dotted line, the processing functions, that are currently automated, from those that remain manual in the existing MoF IT system.
3. Analyze each existing application program, for that particular business process, to determine what correspondence exist between:
   3.1. The application program we are reviewing and a particular processing function in the current physical model, we have created under Step 2 above.
   3.2. How data stores, used in the existing application program we are reviewing, relate to the data stores in the current physical model, we have created under Step 2 above.
   3.3. How data flows, in the application program we are reviewing, relate to particular data flows in the current logical model, WE HAVE CREATED UNDER Step 2 above.

   NOTE: Application programs that do not have internal data flows usually correspond to the lowest processing functions in the current physical model. On the other hand, application programs that have external and internal data flows, usually correspond to a higher level (level 1 or 2) in the current physical model.
4. Repeat Step 3 till we have all applications programs clearly documented in the current physical model. Clarifications can be further enhanced through some action diagrams, indicating some internal temporary files and some internal validation rules, some specific formulas, etc., for some or all application programs to specify some validation rules, some internal temporary files, some security procedures, etc.
5. Make any changes to the current logical diagram, created under Step 1, to ensure its completeness and full correspondence to the final current physical model we have completed under Step 4.

CONTEXT DIAGRAM

- **Examples of a Context Diagram to model MoF information systems, sub-systems, or a single business process, etc.**

INPUT   PROCESS   OUTPUT

INPUT   PROCESS   OUTPUT

Context Diagram (option 1)

Fees details →

Forms 1,2,3,4,5 →

Extract Request →

Taxpayer Registration
- INSPECT
- Maintain Physical Taxpayer
- Maintain Legal Taxpayer
- Issue CERTIFICATE
- Generate EXTRACT

→ Rejected forms

→ Certificates

→ Extracts

Context Diagram (option 2)

Fees details →

Forms 1,2,3,4,5 →

Extract Request →

Taxpayer Registration

→ Rejected forms

→ Certificates

→ Extracts
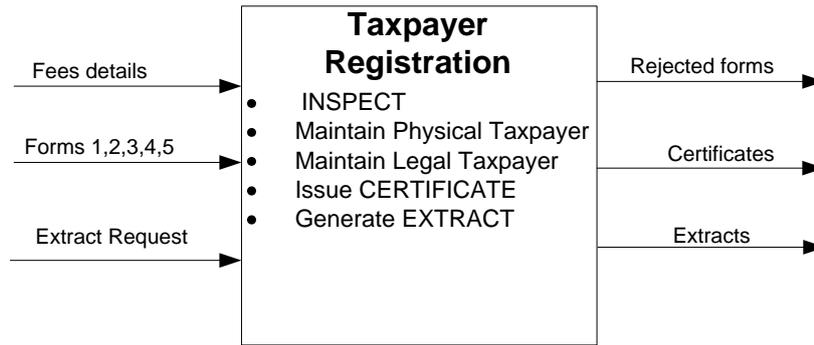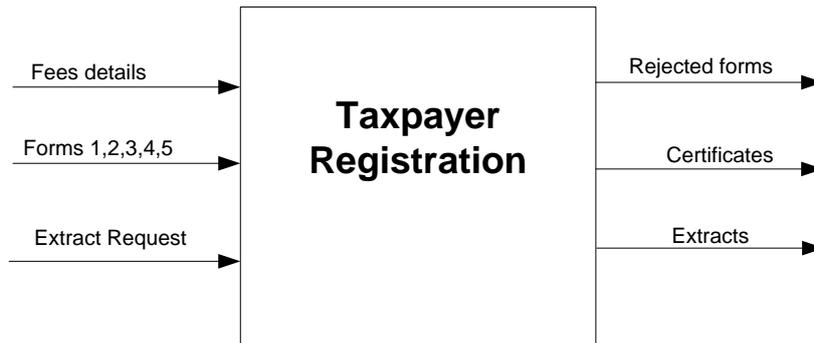
MANAGEMENT OVERVIEW DIAGRAMS

- **Illustrative samples of Management Overview Diagrams that can be used by MoF to demonstrate the scope and the overall requirements of its information systems, sub-systems, and business processes.**

Management Overview Diagram (Option 1)

INPUT — REGISTRATION — OUTPUT

1, 2, 3, 4 (WEB)

Management Overview Diagram (Option 2)

INPUT — REGISTRATION — OUTPUT

Taxpayer → FORM1; Shareholder → FORM2; BUSINESS → FORM3

EXTRACT, SERTIFICATE

Home Page www.mof.ge

Management Overview Diagram (Options 3)

Input

Output

Bank

fees

Taxpayer

REGISTRATION

Forms 1,2,3

Certificates

Taxpayer

Forms 4,5

Extract

BUSINESS

Extract Request

BUSINESS

Management Overview Diagram (Options 4)

Input

Output

REGISTRATION

Forms 1,2,3

Forms 4,5

Certificates

Extract Request

Extract

Management Overview Diagram (Options 5)

Input

Output

–Form1
–Form 2
–Form 3
–Form 4
–Form 5
–Extract
Request

REGISTRATION

Inspect
Register Natural Entity
Register Legal En ity
Process Extract Request
Certificate

Certificate,
Extract

Example of a Physical Data flow diagram showing manual processes versus automation boundaries

Input **Business Process** **Output**

REGISTRATION

manual automation

Accounting

| 2 |
| Nat. P. |

| 1 |
| Issue Cert. |

Individual Legal Entity

Individual

| 1 |
| Inspect |

| 3 |
| Leg. Ent. |

| 1 |
| Gen. Ext. |

Internet

Legal Entity

| 1 |
| Issue Ext |

Extract (Leg. Ent)

| 1 |
| Proc. Ext. |
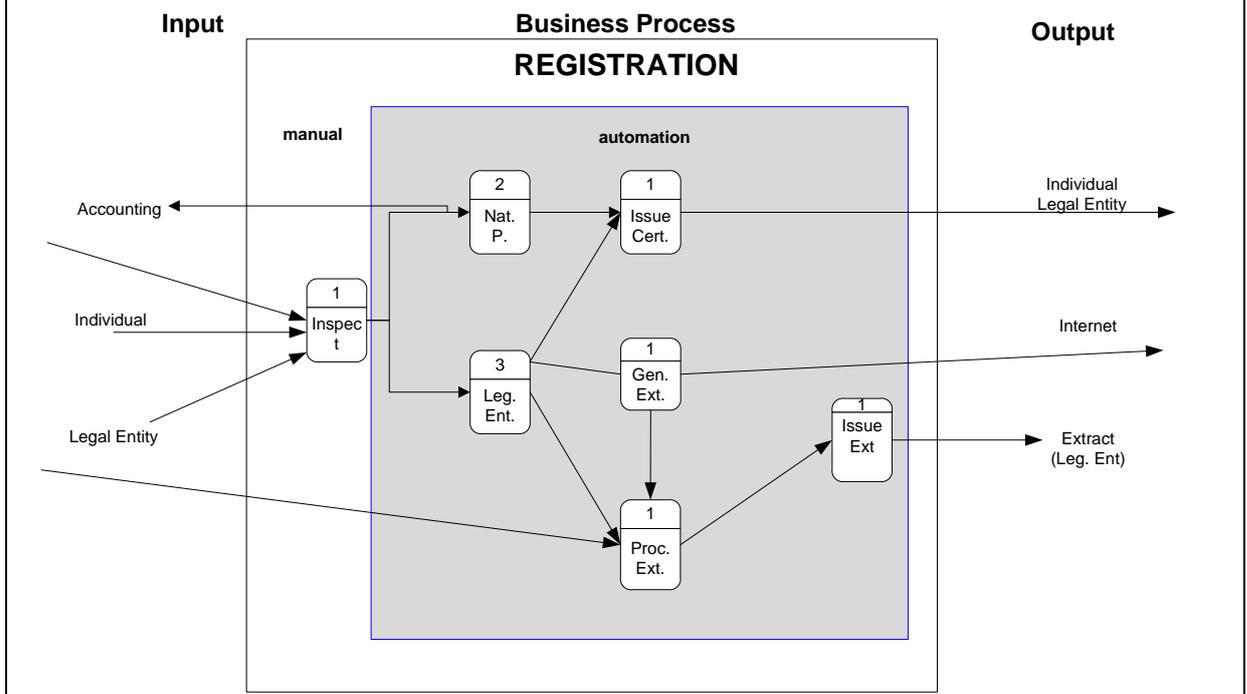
Data Entity Relationship Model (ERM example)

Physical Taxpayer — Has → Physical TP History Record

Legal Taxpayer — Has → Legal TP History Record
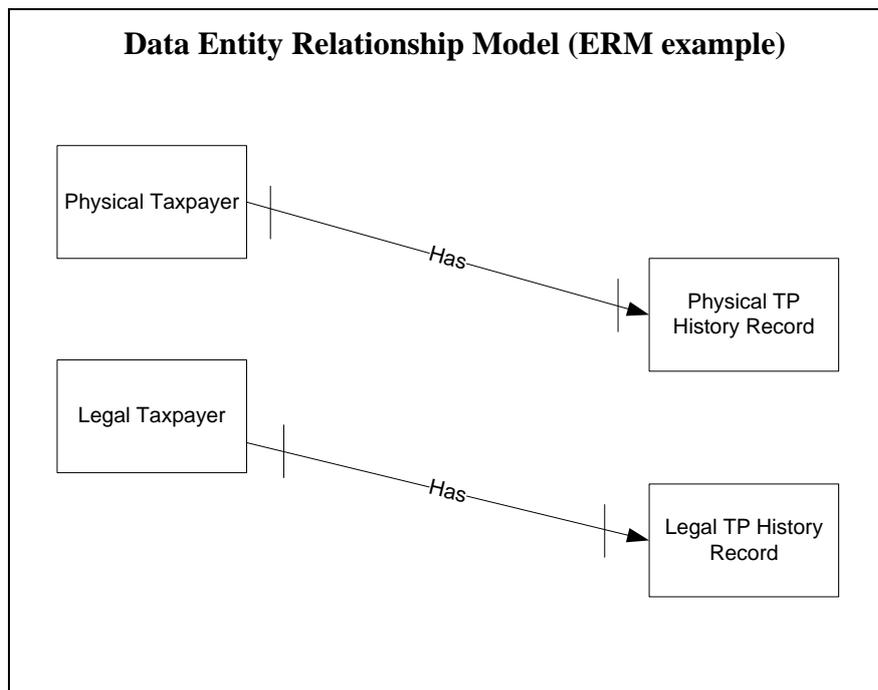
CONCLUSION

We have seen how to:

- Reverse engineer an existing system and create documentation that is fully documented graphically and with some textual narratives.
- Provide management overview of IT system or a business process in question, at any desired hierarchy level.
- Provide a clear statement of requirements for technical designers for a new custom software development initiative.
- Define a common understanding of business requirements
- Define what is expected from MoF IT Department to provide in automated processes, output, and services for the user and MoF management to approve.
- Define an opportunity for further analysis, should enhancements to existing or new IT systems/sub-systems be necessary.