

Application Development Guidelines

Department of Information Technology
Ministry of Information & Communications

1	Introduction.....	3
2	Project Proposal Document.....	3
3	Requirements Definition.....	3
3.1	Requirements Definition Document.....	3
3.1.1	Scope and Objectives.....	4
3.1.2	Current System or Procedures.....	4
3.1.3	System Architect.....	4
3.1.4	Sources of Data.....	4
3.1.5	Processing.....	4
3.1.6	Major Outputs.....	5
3.1.7	Database.....	5
3.1.8	Audit and Authorization Features.....	5
3.1.9	Backup and Recovery.....	5
3.1.10	Hardware/Software.....	5
3.1.11	Conversion.....	5
4	Vendors scope of work (this could include).....	6
4.1	System study.....	6
4.2	Preparation of SRS (General Design).....	6
4.3	Review General Design.....	6
4.4	Detail Design.....	7
4.5	Review Detail Design.....	7
4.6	Plans to be finalized:.....	7
4.7	Construction Phase.....	8
4.8	Large Scale Tests.....	8
4.9	Training Phase.....	8
4.10	Implementation Phase.....	8
4.11	Documentation.....	8
5	Format of the TRD.....	9
5.1	Coversheet:.....	9
5.2	Statement of the requirements.....	9
5.3	Contents of the proposal should fulfill both the technical and financial proposal. 10	
5.4	Conditions of tendering.....	10
5.5	Selection criteria.....	10
5.6	Evaluation Panel and Evaluation Methodology.....	11
5.7	Example of an Evaluation matrix.....	12

1 Introduction

The purpose of this document is to describe guidelines for developing and implementing application systems at the RGOB. The reader should be advised that the document is not meant to be a formula for building systems but a set of guidelines that can be tailored to the local environment. The degree to which this document is followed is dependent on the complexity and constituency of the system.

2 Project Proposal Document

The Project Proposal Document must clearly state the problems to be addressed and brief description of the proposed solution. The Project Proposal could include but not limited to the following:

- **Statement of the problems to be solved**
- **Opportunity Statement**
- **Proposed System description**
- **Users of the proposed system**
- **Any special considerations**
- **The intended source of funding**
- **Interface such as electronic data transfer with other agencies**
- **Review and approval**

3 Requirements Definition

The Requirements Definition phase can be undertaken as soon as the Project Proposal is approved. The Requirements Definition phase of systems development must define the functional requirements of the new system.

3.1 Requirements Definition Document

The requirements definition document must describe what the system is expected to do. While technical issues are not necessarily addressed during the requirements phase, if certain technical requirements are already known, they may be included in the Requirements Definition Document.

The Requirements Definition documents should include but not limited to the type of information described below.

3.1.1 Scope and Objectives

The scope of the proposed system and the overall objectives are described in this section:

3.1.1.1 The section should include a statement of the general purpose of the proposed system.

3.1.1.2 Every functional office, which will use the new system, must be identified, and their use of the system described.

3.1.2 Current System or Procedures

This section must describe the system (if any) or procedures currently in place highlighting:

3.1.2.1 Braw backs/Shortcomings of the existing systems

3.1.2.2 Solutions to address the problems in the proposed systems.

3.1.3 System Architect

Include the description of the system architecture such as standalone PC based, client /server, web-based etc. If remote access to data is required, described how this has to be provided.

3.1.4 Sources of Data

Input sources for the proposed system must be fully described. The method for input must be identified, e.g., online data entry by the functional office, interfaces with existing systems, etc. For each input source, the functional office owning the data source (and responsible for the accuracy of the data) must be identified. The method for verification of the accuracy and integrity of the data must be specified. It should be noted if data accuracy and integrity is assumed to be outside the scope of the system (e.g., where data from another system is assumed accurate).

The frequency of data input and the approximate volume of data should be identified.

3.1.5 Processing

The proposed processing to be performed by the system must be described in general. The logic for updating the database, via either online data entry or batch update, must be described. Processing for outputs, whether reports, interface files FROM the system to other systems, or online inquiry, should be described. Any processing, not directly related to input or output of data, should also be described.

3.1.6 Major Outputs

All major outputs of the system should be described. This includes reports, and required interfaces to other systems, either within the organization or to outside agencies. If the format and frequency of required interfaces from the proposed system to other systems are known, then this information should be included.

3.1.7 Database

While it may be premature at this phase of the project to complete a detailed database design, the basic data entities required for the system must be identified, and the relationship between entities should be identified

3.1.8 Audit and Authorization Features

This section should identify any audit, control or security and authorization considerations required.

3.1.9 Backup and Recovery

This section describes the backup and recovery requirements from a functional standpoint. For example, if up-to-the-minute recovery is required for an online system (vs., for example, recovery to the end of the prior day), this should be noted.

3.1.10 Hardware/Software

If there are hardware and/or software requirements for the system that are known at this point of the development process, these must be noted. .

3.1.11 Conversion

This section should outline any conversions required for the system. If this system replaces an existing system, then the general approach for converting the existing data to the new system must be described. If there are major data entries of historical data, it must be described.

- Data Elements
- Review & Approval

4 Vendors scope of work (this could include)

4.1 System study

Al though the system requirement description will have been provided in the requirement definition document, it is always advisable to make an extra study to get the thorough understanding of the system. This would therefore involve:

1. Meeting the users of every level.
2. Thorough study of the existing system

4.2 Preparation of SRS (General Design).

The general design should capture and document a technology-independent view of the business process to automate as well as preliminary planning of other aspects of the project and should include:

- Business flow
- Data structures
- Data and procedure interaction Reports
- Screens
- Prototypes
- Data conversions
- Interfaces to other systems
- Preliminary training plan
- Preliminary test plan
- Preliminary implementation plan
- Coding and other appropriate infrastructure
- Technical architecture (development, testing, training, production environments, and capacity planning)
- Preliminary contingency plan
- Access and authorization plan

4.3 Review General Design

1. Business expert review
2. Quality assurance review to assure all requirements are being met

3. System architect to ensure that all designs have no integrity problems and are compatible and technical architecture is viable.

4.4 Detail Design

In this phase, you should identify technical specifications for all software objects to be built and finalize other plans.

Technical specifications for:

1. Screens
2. Reports
3. Batch routines
4. Callable modules
5. Data structure implementation
6. Data integrity implementation
7. Conversions
8. Interfaces
9. Technical architecture.

4.5 Review Detail Design

1. Business expert review
2. Quality assurance review to assure that all requirements are met and standards have been followed
3. System architectural review to ensure that designs have no integrity problems and are compatible.

4.6 Plans to be finalized:

- Training
- Test
- Implementation
- Configuration management (includes version control, code migration, security, application server)
- Contingency plan
- Disaster recovery
- Capacity growth
- Access and authorization plan
- Operations plan.

4.7 Construction Phase

It is time to build and unit test the following:

1. Technical architecture
2. Configuration environment
3. Software objects
4. Test data.

4.8 Large Scale Tests

After unit testing all software objects, it is time to perform full-scale tests that include:

- Integration - tests that all software works and produces expected results.
- System - tests that the technical architecture performs in the expected manner in terms of response, recovery, back-up, error-correction, loading, and stress
- Acceptance - ensures that users see the results they expect
- Security

4.9 Training Phase

- Users training
- Administrators training.

4.10 Implementation Phase

Implementation should include:

- Data conversions
- Completion of the production environment including intermediate servers
- Completion of the desktop environment
- Software support
- Emergency response
- Help-desk

4.11 Documentation

- **System Manual**

- Application description
- Technical environment
- Databases
- System flow charts
- Source code
- Application Interface
- Security and Authorization
- General Technical Approach
- Glossary of terms

- **Operation Manual**

- System Description
- Application control Information
- List of contact including the vendor
- Interfaces to the Application
- Accounts Information
- Data sets
- Reports
- Security
- A list of programs executed
- User manual

5 Format of the TRD

The Tender document could comprise of a coversheet and two other sections.

5.1 Coversheet:

- Title of the Tender
- Description
- Names of officers capable of addressing enquires
- How and where to submit tender
- Closing date and time

5.2 Statement of the requirements

- Introduction
- Background of requirement

- Define and describe exactly what is being sought &
- What the clients is trying to achieve through this tender.
- Requirement definition document
- Warranty terms and conditions
- Schedule of key events
- Payment terms and conditions

5.3 Contents of the proposal should fulfill both the technical and financial proposal.

- Technical
- Financial

5.4 Conditions of tendering

Conditions of tender explain the rules governing the contents and submission of tender, the conduct of the tender process and any relevant government policies. These include information relating to (but are not limited to):

- I. Number of tender submission copies required
- II. Cost of tendering
- III. Late tender offers
- IV. Tender validity period
- V. Details concerning tender briefings
- VI. Details about any general conditions of contract that will apply
 - Rights of amendment of bidding document by the clients and its notification to the firms
 - Bid opening information such as date, time and venue
 - Clarification of Bids
 - Examination of Bids whether the bids are properly sealed, signed, complete, conforms to the terms and conditions of the bidding document.
 - Rights for rejection/acceptance of bids
 - Performance security after the award of the tender and its associated conditions
- VII. Precedence of documents in the event of conflict
- VIII. Quality assurance details
- IX. Disclosure of contract information and documents
- X. Insist Instruction for two-envelope system; technical and financial proposal.
- XI. Bid security (bid security lump some not % of the quoted value)

5.5 Selection criteria

Some of the important criteria to be considered while evaluating the tender proposal are:

- i. Qualification of the firm
 - Compliance of the bidders to the TRD provided by the client
 - Company profile
- ii. Adequacy of the proposed methodology
 - Suggestions/recommendations on requirement definition document
 - Understanding of the requirement document
 - Suitability of Project Management approach and methodology proposed by the bidders to the client
 - Suitability of methodology for system analysis, design and implementation
- iii. Standard of technology to be applied
 - Technical platform, RAD tools (templates) proposal for both the front-end and back-end
- iv. Qualification and competence of key staff for the assignment.
 - Project leader
 - Professionals
 - National staff involvement
- v. Training methodology proposal
 - Users training
 - System administrator training
- vi. Long term support proposals

5.6 Evaluation Panel and Evaluation Methodology

- Evaluation Panel

The evaluation panel must consist of not less than four people from relevant mix of skills and experience:
- Evaluation Methodology
 - The evaluation panel should agree on the method of evaluation to be adopted. Care should be taken to ensure that the methodology matches the need.
 - In the software development contract, DIT would like to insist for the practice of two-envelope system: one containing the technical details and the other containing cost proposal (*Non-weighted cost method of evaluation*). This would ensure panelists couldn't be influenced by cost when assessing non-cost criteria.

5.7 Example of an Evaluation matrix.

Criteria	Weight	Tender A	Tender B	Tender C
1. Qualification of the firm Compliance of the bidders to the TRD provided by the client Company profile	Yes/No			
2. Adequacy of the proposed methodology Suggestions/recommendations on requirement definition document Understanding of the requirement document Suitability of Project Management approach and methodology proposed by the bidders to the client Suitability of methodology for system analysis, design and implementation	25%			
Standard of technology to be applied Technical platform, RAD tools (templates) proposal for both the front-end and back-end	15%			
Qualification and competence of key staff for the assignment. Project leader Professionals	25%			
Training methodology proposal Users training System administrator training	15%			
Long term support proposals	10%			

Floor % for qualification of the technical proposal = 70%

Vendors	Technical Score (x)	Technical Weight (X)	Financial Score (y)	Financial Weight (Y)	Total score (x * X)+(y * Y)
A					
B					
C					

Technical Score (x): Is the score that a vendor got from the Technical Tender Evaluation.

Financial Score (y): Is the score that a vendor got from the Financial Tender Evaluation.

Technical Weight (X): Is the weight given to the Technical capability of the vendor.

Financial Weight (Y): Is the weight given to the Price for the project.

** Note: For the Technical and Financial Weight a score out of 10 can be given. This score can be adjusted according to importance. That is whether Price is more important or Technical capability.*

If say, a critical software needs to be developed, with no constraints on the cost of development, then more weight should be given to Technical Capability, then to Financial Weight, and vice versa.

Total Score = [Technical Score (x) * Technical Weight (X)] + [Financial Score (y) * Financial Weight (Y)]