

**GOVERNMENT OF BORNO STATE
BORNO GEOGRAPHIC INFORMATION SERVICE**

Terms of Reference

Consultancy services for “Implementation of the Digital Archive System”

A. OBJECTIVE

The objective of this consultancy is the implementation of a data centric digital archive of Certificates of Occupancy (CofOs), which fully meets the minimum requirements outlined in section D of this TOR. The digital archive can be implemented using existing commercial or open-source products or as a custom development. The preference should be given to free and open-source platforms, avoiding recurrent license fees. For commercial products a perpetual license should be provided and included in the overall cost.

The Consultant is expected to deliver the digital archive system, introduce it in the Land Administration System of Borno Geographic Information Service, train local staff, handover the system with all relevant documentation and provide technical support services for [three] months.

B. SCOPE OF WORK

In undertaking the assignment, the Consultant shall work in close collaboration with the Borno Geographic Information Service, plan and agree required activities for the implementation of the digital archive system. The specific tasks to be performed are as follows:

- Review existing workflows, rules and procedures of managing CofO records. It should be noted whether any information system is used for processing CofO records and how it can be potentially integrated with the digital archive system;
- Review and gather the statistics of CofO paper archives in Borno Geographic Information Service in order to understand the required hardware to run and operate the digital archive system;
- Consult with the Borno Geographic Information Service and prepare the final list of requirements for the digital archive system. It should be the System Requirements Specification (SyRS) in the case of a custom development;
- Develop and test the digital archive system as per SyRS (for custom development);
- Prepare user and administration guides on operating and administration of the digital archive system;
- Introduce the digital archive system in the Borno Geographic Information Service for testing and training;
- Prepare the training plan and program;
- Deliver user and administrator trainings. It is expected 30 users attending the training;

- Introduce the digital archive system into production in the Borno Geographic Information Service Office;
- Handover the system, documentation and source codes (for custom development);
- Draft the final report;
- Provide technical support online [and offline] for [three] months after the system introduction;

C. SYSTEM REQUIREMENTS

The system requirements described below should be considered as a minimum set of system functions and capabilities, required for the implementation. Existing products can deliver more features.

General requirements

- 1) The system shall allow multiuser access over the network.
- 2) The system should be a Web or Desktop application with server-side component, implementing business logic and database access.
- 3) The system can be supplied as a commercial, open-source or custom development solution.
- 4) If the system is supplied as a commercial solution, it shall have perpetual licenses for multiusers.
- 5) If the system is supplied as a custom development, the Borno Geographic Information Service shall have full ownership rights and unrestricted access to the source code. If a custom development is using any licensed components, it shall be agreed with Borno Geographic Information Service prior to using them and a required number of licenses provided, allowing access to multiusers.
- 6) The system shall be supplied with the user and administration guides, as well as system documentation in case of custom development (e.g. database description, system architecture).
- 7) In the case of a custom development, the supplier shall provide a warranty for 6 months, covering bugs fixing.

Functional requirements

- 1) The user shall be required to log into the system using the username and password, assigned by the administrator.
- 2) The main screen shall have a list of folders (or categories or workflow steps) on the left side and relevant list of records on the right side, allowing quick filtering of records in the system.
- 3) The displayed list of records shall allow sorting by visible columns and ordered by the registration date by default.
- 4) The list of records shall be displayed in paged format (e.g. 20 records per page) and allow pages navigation.

- 5) The system shall allow records search by the key attributes and advance search (e.g. document type, range of registration dates, CofO number, owner name, file number, status, land size etc.).
- 6) The system shall allow viewing of CofOs and relevant evidences through the search results or by opening it from the main screen.
- 7) The system may implement workflow steps for the data entry and its processing.
- 8) The system shall allow capturing various documents and recording it under CofO case. Those have to include, but not limited to:
 - a. Certificate of Occupancy (CofO);
 - b. Land parcel survey diagram / location map;
 - c. Owner's ID;
 - d. Allocation letter, if applicable.
- 9) All document types shall be defined with relevant metadata fields, which have to include, but not limited to the following:
 - a. Document type;
 - b. Document date;
 - c. Document number;
- 10) For CofO documents, the following fields shall be captured, but not limited to these fields:
 - a. Owner type;
 - b. Owner(s) name;
 - c. Owner(s) gender (mandatory);
 - d. Ownership type;
 - e. Property unique ID;
 - f. CofO issuance date;
 - g. CofO registration date;
 - h. CofO reference number;
- 11) The system shall allow uploading of PDF scanned documents and provide additional text field for comments on the filing process.
- 12) Captured and committed documents shall stay read-only in the system. They can be enabled for editing by a user with a dedicated role and the system should request and record the reason for modification.
- 13) In the case of multi-department/office access to the digital archive, the system shall allow configuration of user access by department/office. Only records, relevant to user's department/office shall be displayed and accessible.
- 14) The system should track the history of record creation and modification, capturing user name, event type, date and time of such events. Recording modified fields and their previous values would be beneficial.
- 15) Every record shall display its modification log in a simple way.
- 16) The system shall allow generating of parameterized reports (e.g. by dates), for statistical reports, including, but not limited to the following:
 - a. Overall number of CofOs;
 - b. CofOs by gender;
 - c. CofOs by ownership type;
 - d. Captured documents by types;

- 17) The system shall implement various user roles, defining their access to system features.
- 18) A dedicated system administration role shall be implemented for managing user accounts and system settings.

Non-functional requirements

- 1) The system shall be easy to use and require minimum training for the end users.
- 2) All elements on the page shall have a clear style and proper spaces between them, not overcrowding page and placed into logical groups if needed.
- 3) Fonts and colors shall be consistent for the same UI elements throughout all pages.
- 4) Navigation elements shall be clear and help easy navigation between pages.
- 5) Horizontal scrolls shall be avoided to keep maximum width to 1024 pixels.
- 6) Form elements, which are not supposed to be modified, shall be displayed in different colors to distinguish from editable elements and be disabled for user input.
- 7) Before submitting page results, simple fields check shall be done and highlight occurred errors instantly with a clear description or appropriate alert message displayed.
- 8) Partial page updates shall be implemented where appropriate, to avoid a full-page reload and get faster feedback.

D. DELIVERABLES

- Technical specification for hardware to run the digital archive system (including, server, computers, scanners, network equipment)[subject to the equipment availability in the land administration office];
- Digital archive system and its source codes (if custom development);
- System documentation (user guide, administration guide). Other technical documentation in the case of a custom development (data base catalog, architecture description);
- Training plan and program;
- Trainings;
- Final report;

E. LINE MANAGEMENT

The Consultant shall report directly to the Executive Secretary, Borno Geographic Information Service. The Consultant shall closely collaborate with the staff of the Borno Geographic Information Service to elicit system requirements and introduce the system.

F. PROPOSED TEAM COMPOSITION FOR CUSTOM DEVELOPMENT

- Team leader / Business Analyst (1);
- Senior Software Developer (1);
- Software Developer (1);
- Tester/Technical support (1);

G. QUALIFICATION AND SKILLS (TEAM LEADER/BUSINESS ANALYST)

- A master's degree in Computer Science, business or related field;
- A minimum of 5 years of proven work experience as a business analyst;
- Exceptional analytical and conceptual thinking skills;
- The ability to convince stakeholders and work closely with them to determine acceptable solutions;
- Proven experience in stakeholder analysis, requirements engineering, costs benefit analysis and processes modeling;
- Understanding of networks, databases and other IT technologies;
- Advanced technical skills and knowledge of CASE tools;
- Experience creating detailed reports and delivering presentations;
- A track record of following through on commitments;
- Excellent planning, organizational, and time management skills;
- Experience leading and developing top-performing teams;
- A history of leading and supporting successful projects;
- Experience and knowledge of digital archive systems is an additional advantage;
- Proficient English and excellent technical writing skills. Ability to write in technical English clear and correct;

H. QUALIFICATION AND SKILLS (SENIOR SOFTWARE DEVELOPER)

- Masters or similar degree in Information Technology;
- A minimum of 10 years of proven work experience as a software developer;
- Managerial experience is an additional advantage;
- Advanced knowledge of programming languages including JavaScript, HTML5, Java, SQL, ASP.NET and PHP;
- Knowledge of system frameworks including .NET, Git, AngularJS;
- Ability to use version control software such as GIT and SVN;
- Experience designing and maintaining databases;
- Experience working with Agile development technologies;
- Understand emerging web and mobile development models;
- Experience with digital archive systems is an additional advantage;
- Proficient English and excellent technical writing skills. Ability to write in technical English clear and correct.

I. QUALIFICATION AND SKILLS (SOFTWARE DEVELOPER)

- Bachelor or similar degree in Information Technology;
- A minimum of 5 years of proven work experience as a software developer;
- Solid knowledge of programming languages including JavaScript, HTML5, Java, SQL, ASP.NET and PHP;
- Knowledge of system frameworks including .NET, Git, AngularJS;
- Ability to use version control software such as GIT and SVN;
- Experience designing and maintaining databases;

- Experience working with Agile development technologies;
- Experience with digital archive systems is an additional advantage;
- Proficient English and excellent technical writing skills. Ability to write in technical English clear and correct.

J. QUALIFICATION AND SKILLS (TESTER/TECHNICAL SUPPORT)

- Bachelor or similar degree in Information Technology;
- Five years of proven knowledge and experience in performing system and performance testing;
- Knowledge of best practices, methodologies and tools for conducting testing;
- Experience in preparation of test plans;
- Experience with Microsoft .Net, Java and databases;
- Experience of similar assignments in 3 different projects;
- Experience in providing technical support;
- Experience with digital archive systems is an additional advantage;
- Proficient English and excellent technical writing skills. Ability to write in technical English clear and correct.

K. DURATION OF THE ASSIGNMENT

The assignment will be fully implemented in [three (3)] months, starting from the contract signing date; and will be primarily conducted in Borno State.

L. INPUTS BY THE CLIENT

The Borno Geographic Information Service will provide the Consultant with all available information and materials, relevant to the implementation of the digital archive system. The Client will provide access to the paper archive for their review and quick assessment.

The Client will provide required equipment for the installation and testing of the digital archive system and arrange office space for conducting user trainings.

The Client will assist in arranging required meetings and delegate a focal person to work with the Consultant. If required, the Client will provide an adequate office space, located at the Borno Geographic Information Office premises.

M. REPORTING REQUIREMENTS

All reports will be shared with the management of the Borno Geographic Information Service. Reports shall be delivered in electronic form and hard copies for the final versions. Comments, provided by the Client will be discussed at virtual and physical meetings. Required report amendments will be incorporated not later than 2 weeks after receiving these comments.

APPENDIXES

Appendix 1: Digitization Stages/Workflow

The TALL Stack will be utilized to construct the digital archive system, housed within an offline on-premise server. To ensure data integrity and security, a robust backup strategy will be implemented, enabling daily recurring backups for swift and secure recovery. These backups will be retrieved from the isolated archive system and stored in various local and online storage backends.

The server will operate in lockdown mode, enforcing a high-security profile, restricting access to authorized personnel solely during routine maintenance. Additionally, the server's operating system will leverage the built-in firewall to enhance the overall security posture of the on-premise server.

The archive content will be meticulously indexed and made searchable through keywords embedded in the provided metadata during capture. The system will also boast advanced search functionality, facilitating superior keyword filtering.

Detailed below are the stages, relevant desks and processes to be engaged during the digitalization process and database maintenance.

Stage	Team/Desk Responsible	Task(s)	Deliverables	Estimated Timeline
Project Design/ Planning	Executive Secretary, Director Land, Surveyor General, ICT Supervisor	Review of existing Land Files, Land Registers and Document System to determine the design and business processes for the proposed digital archive.	Baseline assessment and system improvement report	2 Months
		Develop digitization plan in synergy with all relevant stakeholders and departments. The plan will cover all requirements including business engineering, ICT infrastructure, system requirements, efficient software, maintenance, and storage management.	Approved digitalization plan	
		Develop ToR and Procurement Plan	Approved ToR and Procurement Plan	
		Cost plans and develop a budget for project execution.	Approved project budget	
Assignment of Operational Space	Executive Secretary	Assignment of operational space for digitalization operation and data/server room	Assigned operational space	1 Week

Stage	Team/Desk Responsible	Task(s)	Deliverables	Estimated Timeline
Deployment, configuration, and installation of the digitalization system	Executive Secretary, ICT Supervisor	Procurement, deployment and installation of all software and hardware required for the digitalization system.	Digitalization System – digital archive, application, hardware etc	1 Month
		Configuration of the system including business process integration, access control definition, data security parameters	Digitalization system – digital archive application, hardware, software and storage devices.	
Document sorting, arrangement, and preparation for scanning	Director Land, OC Record, Land Admin Staff, Management Committee	Document review and sorting, ensuring physical flat files contain all relevant information including, Right of Occupancy (RofO) and/or Certificate of Occupancy (CofO), Title Deed Plan and Owner’s ID. Removing of stapled pins and repairing worn-out/age-weakened documents/files.	Reviewed and sorted all files by layout, sheet and index checklist.	8 – 9 Months for clearing backlog while subsequent documentation is reviewed and sorted upon processing.
Scanning and Digitalization	ICT Staff, ICT Supervisor	High-resolution scanning of documents reviewed and sorted by layout, sheet and index checklist. Scanning is based on the following requirement. <ul style="list-style-type: none"> - Format: High pixel resolution JPEG, Compressed low pixel JPEG and PDF - Scanning color: RGB 24-bit - Scanning DPI: 150DPI for (>1000) high quality pixel JPEG, 150DPI for compressed (<800) low pixel JPEG. - One multipage document (PDF) per physical file. 	Files scanned and archived in repository for data entry	8 – 9 Months for clearing backlog while subsequent documentation is digitized upon processing.

Stage	Team/Desk Responsible	Task(s)	Deliverables	Estimated Timeline
Data Entry	ICT Staff, ICT Supervisor	Layout and Sheet Indexing, feeding all metadata to the electronic file management system. Searchable fields will include: Holder(s) name; gender; holder ship type (e.g., single owned; joint/co-owned between man and woman); unique File Number, Coordinates, CofO issuance date; CofO registration date; CofO reference number (a certificate or document number that matches the number on the physical record)	Digitalized CoFO records according to layout, sheet indexing and meta data checklist as well as unique identifiers	4 – 5 Months for clearing backlog while subsequent documentation is digitalized upon processing.
		Automated unique QR Code when scanned displays registration particulars (CofO name, number, page number and volume of registration register) that are assigned, ensuring the indexed information for each CofO which will be linked to a scan of the respective paper documents		
Storage and Management	IT Specialist, Database Administrator, ICT Supervisor	Implement backup and disaster recovery measures including periodic system backup, data and information security audits	Robust data storage and security	Bi-Weekly
		Preservation and maintenance of physical archives		Bi-Weekly
Document Management	Land Admin Staff, IT Support, ICT Supervisor	Configure access controls (including API) and permissions for document retrieval protocols to support data sharing.	Access controls and APIs assigned	Real-time
		Day-to-day administration of EDMS application as well as periodic updates and monitoring of applications and records on the backend	Optimal and updated EDMS	Real-time

Appendix 2: Snapshot of the Database Schema

land_records	
id	bigint unsigned
file_number	varchar(20)
original_holder_name	varchar(100)
current_holder_name	varchar(100)
original_holder_gender	varchar(20)
current_holder_gender	varchar(20)
phone	varchar(15)
nin_number	varchar(15)
email	varchar(255)
address	text
improvement_fee	bigint
document_type	varchar(255)
category	varchar(255)
layout_sheet_name	varchar(255)
layout_sheet_location	varchar(255)
acceptance_date	date
land_use_purpose	varchar(255)
tenure	varchar(255)
expiry_date	date
original_size_of_land	double(19,2)
size_of_land	double(19,2)
unit_of_land_size	varchar(255)
land_density	varchar(255)
last_groundrent_payment	varchar(6)
outstanding_groundrent	varchar(50)
admin_id	bigint unsigned
file_status	varchar(20)
is_archived	tinyint(1)
is_disabled_for_edit	tinyint(1)
created_at	timestamp
updated_at	timestamp

The figure above depicts the snapshot of the database schema.

Appendix 3: Digital Archiving System

