



TERMS OF REFERENCE (TOR)

The creation of a data-centric, searchable, digital archive.

INTRODUCTION

The purpose of this document is to outline the terms of reference for the development of a Digital Land Registry System. The system aims to provide an efficient and secure platform for registering lands, managing land-related data, and issuing Certificates of Occupancy. The system will be built using the MERN stack and will incorporate features for seamless data management, searchability, and certificate generation.

**SOKOTO STATE MINISTRY OF LANDS, HOUSING, SURVEY,
TOWN & COUNTRY PLANNING**

22/12/2023



GOVERNMENT OF SOKOTO STATE
MINISTRY OF LANDS, HOUSING, SURVEY, TOWN & COUNTRY PLANNING

Terms of Reference

Consultancy services for the Implementation of the Digital Archive System for Sokoto State.

A. OBJECTIVE

The objective of this consultancy is to create a digital archive of Certificates of Occupancy (CofOs) that is centred around data and meets the minimum requirements outlined in Section D of this TOR. The digital archive can be created using existing commercial or open-source products or by developing a custom solution. It is recommended to use free and open-source platforms to avoid recurring license fees. If commercial products are used, a perpetual license should be included in the overall cost.

The Consultant is responsible for delivering the digital archive system, integrating it into the Sokoto Geographic Information System (SOGIS) of the Ministry of Lands and Housing, training local staff, providing all relevant documentation, and offering technical support services for three (3) months.

B. SCOPE OF WORK

In undertaking the assignment, the Consultant shall work in close collaboration with the Sokoto Geographic Information System (SOGIS) of the Ministry of Lands and Housing, 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 for 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 the Ministry of Lands and Housing Offices to understand the required hardware to run and operate the digital archive system;
- Draft technical specifications for computer hardware required for the digital archive implementation.

- Consult with the Ministry of Lands and Housing (MOLH) officials 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 MOLH/SOGIS for testing and training;
- Prepare the training plan and program;
- Deliver user and administrator training to all relevant MOLH/SOGIS staff and users.
- Introduce the digital archive system into production in the MOLH/SOGIS.
- 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 REQUIREMENT

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 at least 10 users.
- 5) If the system is supplied as a custom development, the MOLH/SOGIS 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 MOLH/SOGIS prior to using them and a required number of licenses provided, allowing access to MOLH/SOGIS staff users at least.
- 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 bug 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 a 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 page navigation.
- 5) The system shall allow records search by the key attributes (e.g. document type, range of registration dates, CofO number, owner name, NIN number, status, etc.).
- 6) The system shall allow viewing of CofOs and relevant evidence 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 them under the 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 are 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 / Survey number;
 - f. CofO issuance date;
 - g. CofO registration date;
 - h. CofO reference number;
- 11) The system shall allow the scanning and attaching of paper copies. It shall allow selecting file format, scanning resolution, color mode and pages setting (single or multipage). It shall also allow editing of a scanned document, adjusting its brightness/saturation, rotating and cropping scanned images. Native scanner applications can be used, but it shall be integrated with the user interface of the digital archive system;

- 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 the user's department/office shall be displayed and accessible.
- 14) The system should track the history of record creation and modification, capturing the user name, event type, date and time of such events. Recording modified fields and their previous values would be beneficial.
- 15) Every record shall simply display its modification log.
- 16) The system shall allow the 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 the page and placed into logical groups if needed.
- 3) Fonts and colours 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 the maximum width to 1024 pixels.
- 6) Form elements, which are not supposed to be modified, shall be displayed in different colours to distinguish them from editable elements and be disabled for user input.
- 7) Before submitting page results, a simple field 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, servers, computers, scanners, network equipment).
- 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 Commissioner Ministry of Lands and Housing. The Consultant shall closely collaborate with the staff of the MOLH/SOGIS 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 modelling;
- 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 clearly and correctly.

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, and 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 clearly and correctly.

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 clearly and correct.

K. DURATION OF THE ASSIGNMENT

The assignment will be fully implemented within Eighteen (18) months, starting from the contract signing date; and will be primarily conducted in Sokoto State.

L. INPUTS BY THE CLIENT

The MOLH/SOGIS 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 MOLH/SOGIS will provide the required equipment for the installation and testing of the digital archive system and arrange office space for conducting user training.

The MOLH/SOGIS 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 MOLH/SOGIS premises, Or its Annex.

M. REPORTING REQUIREMENTS

All reports will be shared with the management of the MOLH. 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.

Sign:

Honourable Commissioner

Ministry of Lands and Housing

Sokoto State

22nd of December 2023.

Appendix

Appendix 1: Digitization Stages/Workflow:

We seek to build a digital archive system using a MERN Stack application. The system will be hosted on an on-premise server, and we will also have a failover repository on an online dedicated server. To ensure the security of the server, we will thoroughly encrypt it and install a Cisco firewall. The archive will be searchable through key alpha-numeric data and a unique identifier number. We have outlined the stages, relevant desks, and processes that will be involved during the digitalization process and database maintenance.

STAGE/TEAM	TEAM/DESK RESPONSIBLE	TASK(S)	DELIVERABLE	EST. TIMELINE
Project Design/Planning	Director Lands Registration / Head of SOGIS, IT Head	<ul style="list-style-type: none"> Review the existing CofO process and document system to inform the design and business process for the proposed digital archive. 	Baseline assessment and system improvement report.	1 Month
		<ul style="list-style-type: none"> Develop digitization plan in consultation with relevant stakeholders/MOLHS. The plan will cover all requirements including business process engineering, ICT infrastructure, change management, maintenance, etc. 	Approved digitalization plan	
		<ul style="list-style-type: none"> Develop ToR and procurement plan. 	Approved ToR and Procurement Plan	
		<ul style="list-style-type: none"> Cost plans and develop a possible budget for project execution. 	Approved project budget	
Assignment of operational space	Hon. Commissioner	<ul style="list-style-type: none"> Assignment of operational space for digitalization operation and data/server room 	Assigned operational space	1 Month
Deployment, configuration, and installation of the digitalization system	Consultant/Head of GIS	<ul style="list-style-type: none"> Procurement, deployment, and installation of all software and hardware required for the digitalization system. 	Digitalization system – digital archive application, hardware, etc.	2 Months
		<ul style="list-style-type: none"> Configuration of the system including business process integration, access control definition, and data security parameters. 		
Document sorting, arrangement, and preparation for scanning	Deeds/Land Registry staff, Land and GIS Support Staff,	<ul style="list-style-type: none"> Document review and sorting, ensuring folders contain all relevant information including Certificate of Occupancy (CofO), Land parcel survey diagram/location map, Owner’s ID, and Allocation letter (if applicable). This includes repairing worn-out/age-weakened documents/folders. 	Reviewed and sorted CofO documents/folders by index checklist	2- 3 Months for clearing backlog while subsequent documentation is reviewed and sorted upon processing.
		<ul style="list-style-type: none"> Arrange documents with index tags using an indexing checklist. 		

Scanning And Digitization	Data entry GIS technicians, Land Staff & ICT technicians	<ul style="list-style-type: none"> High-resolution scanning of documents reviewed and sorted by index checklist. Scanning is based on the following requirements. <ul style="list-style-type: none"> Format: PDF scanning colour: Grayscale 8-bit Scanning DPI: 150DPI for good quality documents, 300DPI for poor quality documents, One multipage document (PDF) per physical document. Metadata assignment 	Documents scanned for data entry.	2- 3 Months for clearing backlog while subsequent documentation is digitalized upon processing.
Data Entry	Data Entry Operators, Land Record Managers	<ul style="list-style-type: none"> Indexing, feeding metadata and all needed to the document management system. Searchable fields will include Owner type (For example, corporate entity/private individual); Owner(s) name; Owner(s) gender; Ownership type (e.g., single owned; joint/co-owned between man and woman); Property unique ID; CofO issuance date; CofO registration date; CofO reference number (a certificate or document number that matches the number on the physical record) Automated unique identifiers are assigned, ensuring the indexed information for each CofO will be linked to a scan of the respective paper documents 	Digitalized CoF O records according to indexing and metadata checklist as well as unique identifiers	2- 3 Months for clearing backlog while subsequent documentation is digitalized upon processing.
Storage and Management	GIS/IT Specialist, Database Administrator, Data Center Manager	<ul style="list-style-type: none"> Implement backup and disaster recovery measures including periodic system, data and information security audits Preservation and maintenance of physical archives 	Robust data storage and security	2 months Real-time
Document management	Land Department Records Managers, GIS/IT Support, DB admin	<ul style="list-style-type: none"> Configure access controls (including API) and permissions for document retrieval protocols to support data sharing. Day-to-day administration of EDMS application as well as periodic updates and monitoring of applications and records on the backend 	Access controls and APIs assigned Optimal and updated EDMS	Real-time Real-time

Appendix 2: Snapshot of the Database Schema

The table below depicts the snapshot of the database schema.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1 parcel_id	int(20)			No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/>	2 location_state	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	3 location_city_or_town	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	4 location_lga	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	5 location_parcel_number	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	6 location_streetname	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	7 type_property_occupancy_type	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	8 location_ward	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	9 parcel_main_use	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	10 parcel_main_use_others	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	11 parcel_title_type	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	12 parcel_title_type_others	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	13 parcelfenced	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	14 parcel_have_swimming_pool	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	15 parcel_have_generator	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	16 parcel_area	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	17 parcel_main_water_supply	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	18 parcel_main_electricity_supply	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	19 parcel_waste_disposal_system	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	20 parcel_main_sewage	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	21 image	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	22 owner_type	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	23 owner_name	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	24 parcellegalentityname	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	25 parcel_owner_nin	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	26 parcel_owner_tin	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	27 owner_gender	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	28 parcel_owner_marital	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	29 parcel_owner_phone_home	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	30 parcel_owner_phone_mobile	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	31 parcel_owner_email	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	32 owner_parcel_number	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	33 owner_street_name	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	34 owner_ward	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	35 owner_lga	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	36 owner_state	varchar(155)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	37 created_on	datetime			No	current_timestamp()			Change Drop More

Appendix 3: Digital Archiving System

