GOVERNMENT OF AKWA IBOM STATE OF NIGERIA

MINISTRY OF LANDS AND WATER RESOURCES

Telephone:

Our Ref:

Your Ref:

Website:

Ministry of Lands & Town Planning
State Secretariat Complex
Block 4
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Uyo

AkwaGIS Terms of Reference (TOR) for the Creation of a Data Centric Digital Archive System

A. OBJECTIVE

This Consultancy service seeks to implement a data centric digital archive of Primary and Secondary title documents in Akwa Ibom State Land Registry, comprising:

i. Certificates of Occupancy (C of Os)

ii. Power of Attorney

iii. Deeds of Assignment

iv. Deeds of Sublease

v. Deeds of Legal Mortgage

Minimum specification required for the creation of Digital Archives of the aforementioned are clearly elaborated in Section D of this Document to ensure compliance in its design and implementation using either off-the shelve commercial, bespoke or free open source products (In the case of adopting an off-the-shelve commercial software product or a bespoke development, the overall cost of licenses and ownership agreements should be provided in detail; However, preference should be given to free and open source platforms to avoid recurrent license fees. The Consultant is expected to deliver the digital archive system through AkwaGIS Office, introduce it in Ministry of Lands and Water Resources alongside partner MDAs in Land Administration: Office of The State Surveyor General, Uyo Capital City Development Authority and Akwa Ibom Internal Revenue Service; train local staff, carry out detailed system documentation, handover the completed tested and functional system, and provide technical support services for [three] months.

SCOPE OF WORK

The Consultant is expected to collaborate with AkwaGIS Office at The Ministry of Lands and Water Resources and the aforementioned partner MDAs in Land Administration to develop, plan and agree on work tasks, procedures and actions needed to successfully implement the data centric digital archive system as follows:

• Conduct an appraisal on the current workflows, rules and procedures involved in creating, storing and managing Certificate of Occupancy (C of O) records. This appraisal should highlight and seek to integrate existing systems used for processing C of O records with the digital archive system;

• Generate statistics of paper-based C of O archives in the Ministry of Lands and Water Resources as a measure to determine the most appropriate hardware required for the digital archive system;

• Document the technical specifications for computer hardware required to implement the digital archive (optional if the required equipment is already within The Ministry of Lands and Water Resources);

• Consult with AkwaGIS office at the Ministry of Lands and Water Resources and prepare the final list of requirements for the digital archive system and a Sytem Requirements Specification (SyRS) in the case of a bespoke product;

• 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 Ministry of Lands and Water Resources and Partner MDAs in Land Administration for testing and training;

• Prepare the training plan and program;

• Deliver user and administrator trainings. It is expected [10] users attending the training;

• Introduce the digital archive system into production in the Ministry of lands and Water Resources.

• 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;

B. **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 10 (Ten) users or more.

5. If the system is supplied as a custom development, Ministry of Lands and Water Resources 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 Ministry of Lands and Water Resources prior to using them and a required number of licenses provided, allowing access to 10 (Ten) 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 bugs fixing.

Functional requirements

1. The user shall be required to log into the system using the username and password, assigned by the administrator (Director or Head at AkwaGIS/ICT Department, Ministry of Lands and Water Resources, Akwa Ibom State).

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 (e.g. document type, range of registration dates, C of O number, owner name, folio number, status, etc.).

6. The system shall allow viewing of C of Os 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 of various documents and recording it under C of O case. Those have to include, but not limited to:
   a. Certificate of Occupancy (C of O);

   b. Land parcel survey diagram / location map;

   c. Owner's Identification Details;

   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 C of O 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; /Residential/ commercial/industrial/Agricultural/ institutional

   e. Property unique ID /Survey plan number

   f. C of O issuance date;

   g. C of O registration number

   h. C of O reference number.

   I. Ground Rent.

   j. Revision Period

k. Improvement Premium

11. The system shall allow 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 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 C of Os;
    b. C of Os by Gender;
    c. C of Os 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.

C. **DELIVERABLES**

• Technical specification for hardware to run the digital archive system (including, server, computers, scanners, network equipment) [subject to the equipment availability in AkwaGIS 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.

D. **LINE MANAGEMENT**

The Consultant shall report directly to the Permanent Secretary, Ministry of Lands and Water Resources. The Consultant shall closely collaborate with the staff of AkwaGIS at the Ministry of Lands and Water Resources to elicit system requirements and introduce the system.

E. **PROPOSED TEAM COMPOSITION**

• Team leader / Business Analyst (1);

• Senior Software Developer (1);

• Software Developer (1);

• Tester/Technical support (1);

F. 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 Program 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;

G. 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, AngluarJS;
• 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.

H.   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, AngluarJS;
• 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.

I.   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.

J.   DURATION OF ASSIGNMENT

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

K.   INPUTS BY THE CLIENT

The Ministry of Lands and Water Resources through AkwaGIS Office, Akwa Ibom State will provide the Consultant with all available information and materials, relevant to the existing digital archive system and paper archives. The Client will provide access to the paper archive for their review and 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 for demonstrating the digital archive system and working with the Consultant. If required, the Client will provide an adequate office space, located at the Ministry of Lands and Water Resources, Akwa Ibom State premises.

L. <u>REPORTING REQUIREMENTS</u>

All reports will be shared with the management of the Ministry of Lands and Water Resources, Akwa Ibom State. 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 1 week after receiving these comments.

THIS TERM OF REFERENCE IS ISSUED THIS 21ST DAY OF SEPTEMBER 2022 BY:

Hon Commissioner, Ministry of Lands and Water Resources, Akwa Ibom State.

APPENDIXES FOR DIGITAL ARCHIVE

Appendix 1: Digitization Stages/ Workflow
Appendix 2: Snapshot of the Database Schema
Appendix 3: Digital Archiving System

Appendix 1: Digitization Stages/Workflow:

The digital archive system will be built with a MERN Stack application that will be housed in an on premise server with a failover repository in an online dedicated server. The server will be thoroughly encrypted, and the necessary Cisco firewall is input in place. The archive will be indexed and searchable through key alpha-numeric data and a unique identifier number Detailed below are the stages, relevant desks and processes to be engaged during the digitalization process and database maintenance. Review

Appendix 1: Digitization Stages/Workflow

STAGE	TEAM/DESK RESPONSIBLE	TASKS	DELIVERABLE	EST. TIMELINE
Project Initiation/ Design/Planning	SSA ICT, Directors Deed and Lands, Program Analyst AkwaGIS	Analyze and review the current process for obtaining C of O and registering title deeds.	System Assessment and improvement reports	1 Month
		Consult relevant stakeholders to create workflow plan for digitization: process flowchart, infrastructure specification, maintenance and change management plan	Workflow and Project Design Specification	
		Create Terms of Reference (tor) and procurement plan	Approved procurement plan and TOR	
		Create budget plan	Approved Budget	
Identification/Assignment of Operational Space	Office Manager and Permanent Secretary MLWR	Identify, allocate and approve office spaces for Human Resource and Infrastructure/equipment.	Approval letters of Dedicated Offices assigned for project	1 Month
Deployment, installation and configuration of Systems	Program Analyst AkwaGIS, AkwaGIS Project Implementation Committee MLWR	Identify, analyze, procure and install system infrastructure, hardware, software and network components	Software/hardware systems for digitization of Land title documents	2 Months

		Programme, test, review, configure and integrate all deployed infrastructure.		
Preparation of Documents for scanning.	AkwaGIS front desk Officers, Data Processing Officers, Adhoc Data Entry Officers	Arrange folders with relevant data is well sorted: Data include C of O, Survey Plan, File Registry Detail, Registration particulars	Indexed Title documents	2-3 months
Capturing and Digitization of records	AkwaGIS front desk Officers, Data Processing Officers, Adhoc Data Entry Officers	High resolution scanning of documents in compliance to requirements: PDF formats for documents Jpeg for passport photographs, Scanning DPI: 150DPI for documents with high quality and 300DP for documents with lower quality., meta data assignment	Scan hard copies of Tile documents into Softcopy versions and index with file names, registration particulars, reference, and allocation number as searchable criteria for easy retrieval.	2-3 Months
Data Entry	AkwaGIS front desk Officers, Data Processing Officers, Adhoc Data Entry Officers	Indexing feeding meta data and all needed to the Document Management system. Searchable field to include Owner type, name, gender, Joint and single ownerships, unique ID, C of O issuance date and registration date, reference number, Automated Unique identifiers, linking Records to scanned documents	Digitally Indexed C of O records with meta data checklist and unique identifiers	2-3 months for Legacy Documents and continuous updates for new transactions
Storage and Management	Program Analyst, Database Manager, Program Developer	Implement Database backup and disaster recovery measures, security audits

Preservation and maintenance of physical archives | Robust data storage and security | Real-time |
| Document Management | Program Analyst, Database Manager, Program Developer, Data Processing Officers | Configure access controls including API and permissions for Document retrieval protocols to support data sharing

Daily administration of EDMS application | Access controls and API assigned | Real-time |

Appendix 2: Snapshot of the Database Schema

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

Appendix 3: Digital Archiving System

Document Entry Process

External Document preparation → Web Based Interface ↔ Document Upload process - (Metadata)

Search Engine

Security Protocols

Document Retrieval Process

Web Based Interface
- Search engine identifies document
- Security settings determine if document is available to user
- Document opened on user screen

Document Storage