TERMS OF REFERENCE FOR THE DEVELOPMENT OF A DATA MANAGEMENT SYSTEM

BACKGROUND

The National Communications Authority (NCA) is the statutory body responsible for licensing and regulating Electronic Communications Services in Ghana.
The NCA was established under the National Communications Act, 1996 (Act 524), which was later repealed and replaced by the National Communications Authority Act, 2008 (Act 769).

To fulfil its mandate, the NCA collects and analyses data on various electronic communications indicators to generate information on trends and developments in the industry to inform regulatory practice and policy direction.

In line with its obligations under sections 2(8) and 26(2) of the Electronic Communications Act, 2008 (Act775), the NCA also produces and publishes reports on industry statistics on a quarterly and annual basis for the information of the public, industry players, government ministries, agencies, departments, the academia, as well as the investor community.

The NCA seeks to automate its data collection and analysis processes with a Data Management System (DMS) through the HISWA Project. The system would facilitate the collection and storage of data through a portal and perform analysis, visualisation and generate statistical reports.

The Harmonization and Improving Statistics for West Africa Project (HISWAP) aims to improve the quality, availability, and use of statistical information in West Africa. It is implemented by the Ghana Statistical Service (GSS) in collaboration with relevant Ministries, Departments and Agencies (MDAs) to address statistical gaps within the MDAs.

2.0 OBJECTIVES OF THE PROJECT

2.1 Overall Objective

The main objective of the project is to automate the data management process from the point of data production through storage, analysis, and visualization to data usage. Achieving this objective would ensure the provision of quality, reliable, and timely data to support the development of evidence-based policies in the Electronic Communications Sector and the country.

2.2 Specific Objectives

The specific objectives are to:

- Develop an online portal for the collection of data on Information Communication Technology (ICT)/Telecommunications indicators from licensed electronic communications service providers.
- Develop a database to house and simplify the management of data collected from such licensed electronic communications service providers to be hosted on the NCA Data Center and
- Produce an online data visualization platform to be used for collating, analyzing data, and displaying ICT/Telecommunications indicators.

3.0 SCOPE OF WORK

The Data Management System will encompass a Data Portal to collect data from licensees and service providers on services regulated by the NCA, including Mobile Network, Fixed Network, Infrastructure Services, TV and FM Broadcasting, etc, and store them in a centralized repository. The system will have an embedded intelligence that is able to profile the data that is submitted by comparing it with the historical data for verification. The system will be characterised by an analytical tool that will readily produce visualisation with a click on the various indicators for timely production and publication of the statistical reports.

3.1 Menu and Organization of the Content of the DMS

The Contractor must advise on and propose to the NCA, an organisation of the content (menu, organisation of the homepage and the different pages) that will meet the NCA's objective to build a clearer and more user-friendly DMS.
The NCA and the Contractor will engage on the proposal for an unlimited number of times to finalise the Project. The Contractor must propose a technical solution to allow some specific pages and elements to be visible at different places of the web site without having to copy/past the content in the DMS.
The Contractor must propose and implement templates to accommodate the different types of content of the NCA DMS.

3.2 Scope for System Design and System Support

The Contractor must provide additional design and support services on an "as needed" basis for the new Data Management System (DMS). The Contractor must identify and provide a team with the necessary know-how and experience required to perform all the tasks to provide additional design and support service requirements. The proposed design must make provision for offsite backup infrastructure.
A programme manager contact point, as well as a back-up programme manager must be identified and provided by the Contractor. The Contractor must be able to respond to NCA staff during business hours.

The Contractor will be responsible for various tasks which will include but not be limited to those detailed below:

- Creating and changing templates;
- Developing and implementing web-based functions and/or feature sets; including Access Control functionalities to ensure security and data protection.
- Acting as a helpdesk for NCA staff in resolving all issues related to the operation and management of the new DMS;
- Cooperating and coordinating with other NCA Contractors that provide related services if necessary and/or where applicable.

3.3 System Design Operability

The DMS must be fully available and operational on all major browsers (Microsoft Edge, Google Chrome, Mozilla Firefox, Apple Safari etc.).

3.4 RSS Feeds/PDF/Print Facility

RSS feeds must be implemented on the DMS. Every page must include a print function and, where applicable, an easy PDF function.

3.5 Other Technical Requirements

The Contractor may be asked to provide the following services:

- Offering professional advice concerning website content, structure and design.
- Designing and implementing new templates for the website and related documents based on any new technological features available.
- Testing and validation of DMS security patches or version updates for compatibility in addition to the provision of any technical guidance for deployment of such patches or updates.
- Cooperating and coordinating with other NCA Contractors providing related services if necessary.

The System Design and System Support effort is expected to last for at least one (1) year, with an option for a further renewal period thereafter.

Any expenses or products needed to perform this contract must be included in the proposed price.

Any software code used that is either proprietary or subject to specific license requirements must be disclosed and properly registered for authorized solution use.

4.0 KEY DELIVERABLES

The deliverables expected at the completion of the project are as follows:

- A fully functioning web-based Data Management System with the following functionalities:
  - **Data Collection Module:** the data Management system would collect data from the various service providers and converge in a database that serves as a storage of data retrieval.
  - **Data Fetching and Integration Module**: the system should make fetching data from the main server accessible. There should be established connections that allow us to retrieve data using the appropriate APIs, and protocols and handle any challenges that may occur during data retrieval.
  - **Data Processing and Analysis Module:** design and implement a data processing and analysis engine that processes the fetched data, performs statistical calculations, generates relevant reports and presents insight based on the queries of the user.
  - **Interactive Visualization Tools:** An interactive data visualization tool that allows users to explore and analyze statistical data effectively. Based on the inputs of the user, the system will provide the appropriate graph. The system will be embedded with a custom report-generating functionality.
- Technical and Operating Manual (including evidence of licenses, warranties and all proprietary rights in the name of the National Communications Authority of Ghana).
- System Integration Test (SIT) Report.
- User Acceptance Test (UAT) Report.
- System Report (with Usage and Performance Data Analysis).
- Backup and Maintenance Plan/Schedule.

5.0 DURATION

The assignment is expected to be completed over a duration of Six (6) months.

6.0 PROPOSAL REQUIREMENTS

The bidding consultant will be required to provide three separate documents which are as follows:
i.   A project proposal which clearly addresses the following requirements:
- Company profile.
- Identification of Program Manager and secondary contact.
- Identification and expertise of project team personnel.
- Demonstrable experience together with reference contacts.
- Project management process (how do we work together throughout the process).
- Proposed Work Breakdown Schedule including clear service delivery milestones and timelines.
ii. A completed Integrity Compliance and Risk Assessment Form for each prospective supplier.

iii. A cost proposal which clearly addresses the following requirements:
- All activities detailed under the Scope of Works.
- Two (2) years maintenance and update of DMS modules.
- Two (2) years' service desk support for deployed solution (DMS).

All cost proposals must be submitted in Ghana Cedis (GHS).

7.0 QUALIFICATION AND EXPERIENCE

Qualification and Experience of the Firm

1. The firm must be a registered company in Ghana and should meet statutory requirements.

2. At least 5 years of experience in designing, developing, and deploying web-based data management systems.

3. Proven track record of successfully completing at least two similar projects involving web-based data management systems.

4. Proven track record of successfully completing the training of at least two institutions on the use and management of the Data Management System.

5. Must have the right mix of relevant staff with the required qualifications and experience to execute the assignment.

6. Experience with Government of Ghana related projects will be an added advantage.

Qualification and Experience of Key Staff:

Team Leader

- At least a university degree in IT/ Computer Science/ Data Analytics/ relevant engineering or related area
- At least five (5) years of relevant experience in software or database with local and/or international experience
- Relevant professional certification or experience in C# certification with competencies in Microsoft.Net, ASP.NET MVC, ASP.NET WEB API, .Net Core, ADO.NET/ Entity framework, Linq, JSON both SOAP and Rest architectures
- Experience in systems development lifecycle management
- Experience in project management Prince2 or its equivalent

Team Members

- Degree in IT/Computer Science/Data Analytics/ relevant engineering or related

area

- Professional experience in system development and database management systems
- At least, one of the team members should have an AI Azure certificate or AWS certificate
- At least one of the team members should have proven proficiency in TSQL, data normalization, IIS, TFS
- Proficiency programming languages such as python, Java
- The team should demonstrate their capacity to do the work

8.0 REPORTING PROCEDURES

The developer will report to the National Communications Authority during the period of the project, and any agreed maintenance period. All reports are to be submitted in three (3) hard copies and shall include detailed usage and performance monitoring report.

All manuals, as well as the final report must include an electronic copy.

9.0 TRAINING OF NCA STAFF

A specific training exercise on the must be provided by the Contractor to the NCA staff. This effort must at a minimum comprise up to ten (10) days of total time committed. The Contractor will be responsible for its travel expenses for this effort whether any training is delivered on-site and/or online. The ten (10) days can be divided into half-day sessions if needed and may be recorded for learning library purposes. The Contractor must also deliver comprehensive documentation on the management, maintenance and design of the website including project closure instructional documents that guide end users on how to use the new Data Management System. The end user instructional documentation must not be overly technical and should be easy to understand for NCA staff with minimum background in web management/information systems.

10.0 CONFIDENTIALITY AND INTELLECTUAL PROPERTY RIGHTS (IPR):

10.1 Confidentiality

- All project personnel of the contractor shall be required to sign a non-disclosure agreement immediately at the start of the project.
- All systems to which the project personnel of the contractor shall be granted access to, its components, parts, specifications, data, ideas, technology, and technical and non-technical materials (collectively referred to here as "Proprietary Information") are confidential and proprietary to the NCA.
- The contractor agrees to hold the Proprietary Information in strict confidence and

further agrees NOT to reproduce, transcribe, or disclose the Proprietary Information to third parties without the prior written approval of the NCA.

10.2 Intellectual Property Rights (IPR)

All intellectual property rights and the complete DMS and its contents, as well as all work performed under the contract are the express and exclusive property of the NCA.

11.0 STAGING SERVICES

The Contractor will be responsible for the transfer/redeployment of the DMS from the Contractor's servers (if applicable) via FTP or any other approved means to approved server(s) identified for deployment to ensure uninterrupted service.

At completion of contract term and after the successful transfer of all content to the DMS, the contractor shall ensure the deletion of all NCA-related content from Contractor's servers.