



**TERMS OF REFERENCE FOR THE CONSULTANCY SERVICES FOR DATA CENTRE MARKET STUDY FOR ESTABLISHMENT OF THE 3RD (THIRD) DATA CENTRE IN UGANDA**

**February 2024**

# TABLE OF CONTENTS

<b>TABLE OF CONTENTS</b> .....	2
1. INTRODUCTION.....	1
2. OBJECTIVE OF THE STUDY .....	2
3. SCOPE OF THE DATA CENTRE MARKET STUDY .....	2
4. METHODOLOGY AND APPROACH.....	5
5. DELIVERABLES FROM THE DATA CENTRE MARKET STUDY.....	6
6. KEY QUALIFICATIONS AND EXPERIENCE OF THE FIRM.....	6
6) PAYMENT STAGES.....	9
7) DURATION OF THE STUDY .....	10

# 1. INTRODUCTION

## Project Overview

The Government of Uganda (GOU) represented by the National Information Technology Authority-Uganda (NITA-U) secured financing from the World Bank/IDA toward the cost of the Uganda Digital Acceleration Project – Government Network (UDAP-GovNet) project ID NO. P171305, and it intends to apply part of the proceeds to payments for goods, works, non-consulting services and consulting services to be procured under this project.

The project includes the following components:

Component 1: Expanding Digital Connectivity in selected areas

Component 2: Enabling Digital Transformation of the Government

Component 3: Promoting Digital Inclusion of Host Communities and Refugees

Component 4: Project Management

Procurement of Contracts financed by the World Bank under these components will be conducted through the procedures as specified in the World Bank's Procurement Regulations for IPF Borrowers (November 2020) (Procurement Regulations) and is open to all eligible firms as defined in the Procurement Regulations. The World Bank shall arrange the publication on its external website of the agreed initial procurement plan and all subsequent updates once it has provided a no objection.

## Uganda's Context - ICT

The ICT sector contributes 4.8% to Uganda's Gross Domestic Product (GDP). The use of ICT in day-to-day life is necessary for lowering the cost of doing business and improving the efficiency of service delivery and community mobilization. The Government of Uganda under the National Development Plan III embarked on the Digital Transformation Programme.

The Digital Transformation programme seeks to promote the use of ICT in the entire economy and society through:

- i. Deployment of secure, integrated, and cross-sector infrastructure
- ii. Developing and promoting the usage of quality communication and e-services
- iii. Digital inclusion and citizen participation
- iv. Ensuring standardization and interoperability of systems
- v. Enhancement of national cyber security
- vi. Promoting innovation and commercialization of ICT products
- vii. Enhancing digital literacy and developing skills

- viii. Supporting development and uptake of emerging technologies such as Fourth Industrial Revolution Technologies
- ix. Process re-engineering and automation for end-to-end government business and service delivery.

Presently, the GOU through NITA-U under the Strategy for Rationalization of IT initiatives and services across Ministries Departments, Agencies and Local Governments 2012 established a National Data Center and Disaster Recovery Site.

At present, the National Data Centre is hosting over one hundred and sixty (160) critical e-government applications belonging to over eighty-two (82) government Ministries, Agencies and Departments (MDAs). However, there is a need to undertake a data center market study to assess the government's data hosting requirements and explore options on how to leverage private sector participation.

To this effect, with support from The World Bank International Development Association, GOU through NITA-U intends to engage the services of a consultant(firm) to undertake a Data Center Market study in Uganda.

## **2. OBJECTIVE OF THE STUDY**

To assess the government's data hosting requirements and explore options on how to leverage private sector participation.

## **3. SCOPE OF THE DATA CENTRE MARKET STUDY**

The scope of the study is listed below.

1. **Data Hosting Demand:** Conduct detailed Data hosting requirements analysis of Government Institutions and Private Sector organizations in Uganda and from the region with a 10-year view, aimed at gathering and documenting key requirements to develop an integrated and appropriate future state National Data Hosting strategy. Assess the overall size of the data center market and its projected growth rate. Analyze historical data, current trends, and future forecasts to determine the market's potential.
2. **Data Hosting Supply – Existing National Data Center:** Assess the current National Data Centre's capacity to cater to current and projected data hosting needs of the government agencies, ministries, and departments, determine if capacity will be available to provide data hosting services to private sector organizations with a 10-year view, based on the needs assessment exercise above.
3. **Data Hosting Supply – Public and Private Data Centers:** Assess existing private- and public-sector operated data centers in Uganda, their services, their capacity, location, power supply, cooling systems, security measures,

compliance with industry standards, pricing for their services like colocation (both prices per rack and prices for smaller installations starting from 1U), virtual server hosting (VPS) and dedicated servers, business continuity and disaster recovery services available to enterprises. Document their market share, offerings, strengths, weaknesses, and competitive strategies.

#### **4. National Data Center Enhancement:**

- 4.1. Assess the existing National Data Centre Disaster Recovery Design and setup and suggest improvements in the design and technologies to improve business continuity through improved resilience and better disaster recovery.
- 4.2. Study and suggest Data Centre services for example colocation, managed services, cloud services, disaster recovery, connectivity options etc. that should be introduced and/commercialized at the National Data Centre to generate sustainable Non-Tax Revenue (NTR) income for the government of Uganda to sustain the National Data Centre operations and benefit both the private sector and government. Include the suggested pricing model the government should charge for each service visa-v pricing of the same services at the other existing Data Centers within the country.
- 4.3. Recommend Low-Level Designs and High-Level Design architectural considerations leveraging the existing appropriate technologies, equipment selection etc. to achieve a full self-service private cloud active-active-active architecture with automatic/quick failover, and real-time or near replication for applications at the national data centers.
- 4.4. Recommend private cloud software solutions that can be integrated into existing National Data Centers to meet cloud characteristics of on-demand self-service, Broad network access, Resource pooling, Rapid elasticity, and Measured service. Propose design and architectural considerations and solutions that need to be put in place to offer cloud services such as platform as a service, containers, software as a service, and infrastructure as a service with considerations of maximum and seamless interoperability with the existing infrastructure.
- 4.5. Include suggestions for greening and improving the PUE to 1.3 or lower of the existing National Data Centre and Disaster Recovery Sites.

5. **Data and Cloud regulations assessment in Uganda.** Assess the Ugandan data and cloud regulations, particularly on personal data protection, non-personal data, cross-border data flows, and cybersecurity to

identify any potential blockers to data hosting and cloud market development. Review Uganda's data classification framework and identify any blockers or limitations for hosting government or other sensitive data in the cloud.

6. **Scenario Analysis and Costed Options paper:** Perform a scenario analysis and develop a costed options paper for various data hosting scenarios to meet the Ugandan government and the private sector needs (single-, hybrid-, multi-cloud, commercial public cloud, government data centers). Evaluate financial feasibility and fiscal sustainability for each scenario, providing detailed descriptions of key characteristics including, but not limited to, costs and benefits, environmental impact and sustainability, cybersecurity and data protection, disaster recovery and resilience, financial and operational sustainability, as well as flexibility, scalability and speed of deployment.

For each scenario recommend the Human Resource requirements to successfully operationalize it, highlighting role titles, job descriptions, skill sets including certifications, aptitudes and training needs, etc.

Identify the challenges and potential risks that the data center market in Uganda may face in the future (changes in technology or regulations, evolving customer demands, and potential disruptions to the industry) and specify how each scenario included in the analysis could respond to these challenges.

For each scenario describe opportunities for partnerships, particularly with the private sector, based on international best practice and specific data hosting needs in Uganda.

**Include a scenario for building a third national data center**, that would be built in accordance with relevant international standards and Tier III requirements. The scenario should include a private cloud solution and related IT infrastructure needed to provide a true cloud experience to customers (NIST SP 800-145), appropriate billing for customers for all services i.e PAAS, IAAS, Colocation, SAAS, racks and all necessary accessories for a colocation data center with customizable racks of 5U, 10U, 21U and 42U and with MFA access including biometric access, electrical power design (Power Cabling and Installation standard requirements: Power Distribution Units, UPS System, Emergency Power Off etc.), Precision HVAC, cyber security, CCTV, access control, fire control, data center monitoring systems, etc. The additional national data center should provide the required current capacity in terms of power and cooling, compute, memory, and storage and be able to scale up to medium to long demands for the private sector and government institutions by the addition

of modular components without requiring other significant infrastructure modifications.

7. **Validation Exercise:** Undertake a validation exercise with all Stakeholders to obtain inputs on the Scenario Analysis and Costed Options Paper. Update Scenario Analysis and Costed Options Paper based on the feedback from the validation exercise and develop a final report which provides a comprehensive overview of the suggested scenarios, including the scenario of building a 3<sup>rd</sup> National Data Centre.

#### **4. METHODOLOGY AND APPROACH**

The study shall be carried out according to this term of reference and according to a contractual framework to be defined between the NITA-U and the consulting Firm.

NITA-U will assist the Consulting Firm, as far as possible, in seeking contacts and possible authorizations related to the scope defined in this document. Nonetheless, the Consulting Firm is expected to submit a proposal which includes but is not limited to a detailed project plan and inception report.

The study shall be carried out by the Consulting firm with stakeholders' onsite and online (hybrid) engagement workshops. The stakeholders shall be composed of government officials, private sector players, academia, etc. as well as national and global organizations.

The consulting firm's methodological approach must include the following principles and any other principle where appropriate:

- a) Integrate existing international guidelines and recommendations.
- b) Meet with key contacts in government and private institutions in Uganda or in the region as necessary interested in utilizing the services offered at the National Data Centre.
- c) Organize and participate in consultation and feedback hybrid (onsite and virtual) workshops during the consultancy service.
- d) Write draft reports for each planned item in the scope of work and provide a presentation of draft reports at workshops in the English language.
- e) Collect comments on each draft report and make consequential revisions in the final versions in English.

## **5. DELIVERABLES FROM THE DATA CENTRE MARKET STUDY**

Four (4) copies and an electronic copy on Pen Drive of the reports as per scope be submitted to the NITA-U. The reports must be written in English.

Other key deliverables

- All relevant reports and associated summary presentation decks from the scope of the study
- Draft business plan and model for the operationalization of the 3<sup>rd</sup> National Datacenter
- Two workshops with stakeholders and associated reports/Minutes. The workshops will be attended by 20 people and the consultant firm will cater for the venue, online equipment, licenses for the stakeholders online and accompanying refreshments (breakfast, lunch). In case the workshops require full-time residency, the consultant will cater for the accommodation and dinner in a hotel not less than 4-star rated.
- Final report incorporating contributions from stakeholders.

## **6. KEY QUALIFICATIONS AND EXPERIENCE OF THE FIRM**

The National Information Technology Authority – Uganda shall engage consultancy firms that meet the following requirements:

1. At least fifteen (15) years of experience in providing ICT consultancy services for country-wide studies that advise Governments or large private institutions on Data centres / ICT Policy and Strategy matters. Must provide information relating to their capacity and professional experience in one or all the following sectors: advising the government on ICT matters, operation of Data Centers and Cloud Services.
2. The Firm must provide evidence of at least four (4) similar assignments regarding Data Centre audit / design and Cloud Services. It shall clearly and precisely indicate the composition of the mission team only proven by duly signed and stamped recommendation letters / Award letters / Contract / LPO
3. Proof of the bidding firm being certified by an international standard e.g. ISO 9001:2015 certified etc. will be an added advantage.
4. Similar experience in Africa or other developing countries will be an added advantage.
5. The consultant should assemble a team of relevant experts that should include the following key personnel:
  - a. Team Leader:



- i) A Master's degree in a field such as business, IT, economics, or engineering, with a focus on market research or data analysis from a recognized University/Institution.
- ii) At least 15 years of demonstrated knowledge to lead teams of experts to undertake studies or Audits on Data centers / IT Related Market Studies on behalf of Governments or large private institutions.
- iii) Must have proven skills and experience in data center designs or managing data center or cloud services hosting related projects.
- iv) He/she shall have a demonstrable track record in Data center related project management and in coordinating large diverse teams/stakeholders, in complex working environments.
- v) He/she shall have a high-level understanding of regulatory, policy issues, and development issues pertaining to Data Centre infrastructural services, Cloud, and Network Infrastructure in Africa.
- vi) Excellent command of English and report-writing skills are required.
- vii) Any other relevant qualifications and experience will be an added advantage.

## **b. Team Members**

The team members assembled shall demonstrate but not be limited to the following competencies. The provider shall propose;

### **1. Data Centre Expert(s)**

- a) Minimum 10 years' proven experience in Data Center Advisory and Strategy consulting including Data Center topology design, implementation, facility selection, and portfolio rationalization.
- b) The Expert shall have a university degree in Engineering or Computer Science or a relevant area.
- c) Experience leading data center evaluation and selection programs
- d) Demonstrated experience with Data Centre/ Cloud Business Case Development, Cost Modeling, and ROI Analysis.
- e) Demonstrable deep understanding of the Data Centre and cloud industry, including its key players, technologies, and trends.
- f) Experience providing consulting services related to IT Strategy, IT Architecture, Infrastructure Management, Data Center Facilities Design and Management, Disaster Recovery and Business Continuity, Servers.
- g) Relevant certification based on the requirements identified above, like Certified Data Centre Design Professional (CDCDP®), Uptime Accredited Tier Designer (ATD), Energy Audits, Energy Designer etc. will be an added advantage.
- h) Demonstrated knowledge and or qualification in relevant International Datacenter design standards would be an asset. For Example, ISO/IEC TS 22237-1:2021, ANSI/BICSI 002-2019, ANSI/BICSI 009-2019, CENELEC 50600 or TIA-942, etc.

- i) Certifications in IT Program/Project Management e.g. PMP etc. will be an added advantage.
- j) Excellent command of English and report-writing skills are required.
- k) Working experience in Africa will be an added advantage.
- l) Any other relevant qualifications and experience will be an added advantage.

## **2. ICT/ Cloud Computing Expert(s)**

- a) Must have at least 10 years of progressive working experience in cloud-based solution designs, and management of technology.
- b) The Expert(s) shall have a university degree in Engineering or Computer Science or a relevant area.
- c) Experience providing consulting services related to IT Strategy, IT Architecture, Infrastructure Management, Cloud, Disaster Recovery, and Business Continuity.
- d) Proven experience in cloud services deployment and operations
- e) Demonstrable deep understanding of the Data Centre and cloud industry, including its key players, technologies, and trends.
- f) Certification in Cloud technologies – Azure, GCP, AWS etc. will be an added advantage.
- g) Experience in developing solutions architecture and evaluating architectural alternatives for private, public, and hybrid cloud models, including IaaS, PaaS, and other cloud services.
- h) Experience architecting highly available systems that utilize load balancing, horizontal scalability, and high availability.
- i) Working experience in Africa will be an added advantage.
- j) Excellent command of English and report-writing skills are required.
- k) Any other relevant qualifications and experience will be an added advantage.

## **3. Business Analyst(s)**

- a) The Expert(s) shall have a relevant university degree in IT/ Business/ Economics or similar.
- b) At least 5 years of relevant IT-related experience business analysis experience and advising governments with a focus on market research.
- c) Demonstrable financial modelling analysis, market analysis, ROI analysis skills, etc for similar projects.
- d) Demonstrable deep understanding of the Data Centre and cloud industry, including its key players, technologies, and trends.
- e) Strong Experience in carrying out feasibility studies and in the formulation of Data Centre, Cloud, networking, and infrastructure strategies.
- f) Excellent command of English and report-writing skills are required.

- g) Working experience in Africa will be an added advantage.
- h) Certifications in TOGAF, SIX SIGMA, PMP, Financial Modelling etc. will be an added advantage.
- i) Any other relevant qualifications and experience will be an added advantage.

**4. Cybersecurity Expert(s)**

- a) The Expert(s) should have a university degree in Engineering or Computer Science or a relevant area.
- b) At least 5 years of relevant experience in executing consulting engagements in the areas of Security Strategy Risk and Compliance for Data Centres or Cloud environments.
- c) Demonstrable deep understanding of the Data Centre and cloud industry, including its key players, technologies, and trends.
- d) Experience with leading cybersecurity standards (e.g., IEC 62443, ISO 27001, NIST CSF) will be an added advantage.
- e) Cybersecurity certifications (e.g, IEC 62443, CISSP, GICSP, CISA, CISM etc.) will be an added advantage.
- f) Working experience in Africa will be an added advantage.
- g) Excellent command of English and report-writing skills are required.
- h) Any other relevant qualifications and experience will be an added advantage.

Note: All experience shall be proven by academic certificates and signed detailed CVs. The firm is encouraged to identify and propose any additional relevant expertise deemed necessary to successfully complete the assignment, beyond the initially suggested personnel skills.

**6) PAYMENT STAGES**

	Description	Percentage (%)
1	Inception Report	10% - After acceptance of the inception report
2	Draft reports and associated summary presentation of the findings per the scope of the study.	40%
3	Hold at least Two (2) workshops with stakeholders to discuss the draft reports as per the scope of the study pre and post-comments. All costs of the workshops shall be borne by the consultant.	20%
4	Delivery of all the associated reports and the final report in PDF and 4 print copies as per the scope of the assignment with agreed comments from the workshop incorporated.	30% after acceptance of the report
	<b>TOTAL</b>	<b>100%</b>

## **7) DURATION OF THE STUDY**

The maximum period of execution of the services of the consultant firm under this contract will be **Six (6) months** from the date of signing of the Contract.