BANGLADESH BANK
Head Office, Motijheel, Dhaka
Financial Sector Support and Strategic Planning Department
**Terms of Reference for Selection of**
**Individual Consultant: Internal Audit Consultant (International)**
**Package No. BB-S10 under Financial Sector Support Project: IDA Credit No. BD 5664**

**Background**

Bangladesh Bank (BB) has undertaken the Financial Sector Support Project (FSSP) with the financial assistance of the World Bank with a view to improving financial market infrastructure, regulatory and oversight capacity of BB and access to long term financing for manufacturing firms in Bangladesh. For maintaining the stability and efficiency of the financial system, FSSP is envisaged to implement a number of components aiming to strengthening BB's regulatory, supervisory and IT framework. Under the project, the existing automated financial infrastructure will be upgraded in order to cope with the probable challenges to be emerged from ever-changing financial system. As a part of strengthening BB's IT framework, there is a provision to hire "Internal Audit Consultant (International)" under the project.

Bangladesh Bank has implemented a number of IT applications like SAP ERP, Core Banking System (CBS), BACH, RTGS, BEFTN, NPSB, goAML, EDW, MI, Treasury. There are many in-house developed software. These software are being used by BB officials for discharging regular duties. Therefore, it is required to ensure the management of software and also to validate the correctness of different functionalities of the IT systems. It necessitates to assess the operational integrity of the systems, verifying that confidential data is not exposed to unauthorized individuals. Considering these provisions, BB intends to hire the services of an International Internal Audit Consultant.

**Objective**

The objective is to cover the entire lifecycle of the technology under scrutiny, including the correctness of computer calculations by an independent on its objective. With huge amount of IT installation, audit will ensure the management of IT assets. The consultant will validate the correctness of the systems calculations, confirming that systems are appropriately accounted for as assets, assessing the operational integrity of an automated process, verifying that confidential data is not exposed to unauthorized individuals.

**Scope of work**

The Consultant will work as part of the Project Implementation Unit (PIU) under the supervision and guidance of the Project Director (PD) of FSSP. The Consultant should do all necessary work in a collaborative mode with the PIU, Internal Audit Department and IT departments during the project implementation to help plan and develop a strong governance in IT systems of Bangladesh Bank.

**Duties and Responsibilities of the Consultant:**

**A. Phase-1 : Preparation of appropriate Technical Specification- Prepare Technical Specification in collaboration with Internal Audit Department (IAD) for extracting data from different software/applications of heterogonous platforms:**

1. All off-the-shelf Software -SAP ERP, Core Banking System (CBS), BACH, RTGS, BEFTN, NPSB, goAML, EDW, MI, Treasury
2. All in- house developed Software: About 75 (Seventy Five) Software including widely used public oriented application CIB
3. System Management and Monitoring tools: Microsoft System Center

**The Technical Specification contains the following key elements to serve the chief purposes of implementation of CAATs:**

1. Determine the scope of applicability of CAATs considering BB's System, Network, Hardware, off-the-shelf and in-house developed software/applications, data management, and the scope of the audit following risk based approach.
2. Measure and prioritize the risks in processes and control thereof to justify effectiveness of CAATs in the assurance process.
3. Take inventory and analyze system facilities/functionalities, interdependency, integration, data flow and data management to justify access to whole process to form audit findings. It is noted that in process of said analysis built-in audit trail, system documentation and testing processes would be analyzed to prepare risk profile of auditable unit and audit plan
4. Prepare the composition of data by quantity, type, format, and layout to tag with the risk assessment and ICT audit planning process.
5. Categorize the detail of inputs (data, file, layout etc.), criteria, periods and processing (e.g. CAATs high level flowcharts, logic).
6. Design as required the high level flow charts, data flow diagram regarding the various systems integration through CAATs
7. Define process of identifying appropriate data security mechanism based on confidentiality and sensitivity.
8. Define in detail output requirements out of CAATs applications (log files, reports etc.)
9. Develop the outline of the operating instructions by system and modules to enable the auditors to produce desired output through CAATs application.
10. Help Implement the Level of Audit Risks and control to be exercised through CAATs
11. Define and identify the step by step procedure attending risky areas on priority basis (statistical and audit sampling, calculation and reconciliation, agreement with confirmation etc.).
12. Assess staffing and staffing pattern along with skill and capacity to deploy in the audit process to ensure standard rating process of the audit findings.
13. Assist during run instructions for producing desired output through CAATs.

B. **Phase-2: Preparation of Proper Bid Document- Prepare realistic and practical bid documents for procuring CAATs package. Following issues regarding compatibility and security should be considered carefully:**

1.  Various Operating Systems such as Windows, Linux, Solaris, Cloud based infrastructure (VMware), AIX, Domain Controller (ADC) etc.
2.  Various Application Software platform (such as Java, PHP, Oracle, C#, Python etc.)
3.  Heterogeneous Database Platform (Oracle database, MySQL, MSSQL etc.)
4.  Heterogeneous Web Services Platform (Such as Apache, IIS, Tomcat, Jellyfish, Web Firewall (F5), email and Web services gateway CISCO Iron Port)
5.  SDN-ACI Network Platform (such as CISCO, Juniper etc.)
6.  Hardware, Storage Infrastructure  (i.e. HP EVA)
7.  Security concern for all vendors, off-the-shelf and in-housed developed Applications/Software, Systems and Network

C. **Phase-3: Proper Implementation Plan of CAATs: To assist on following arena by providing technical support and consultation during implementation:**

**Data Analytics**
1.  Collect, review, interpret, evaluate, and integrate data from the available and the other sources (if any) pertaining to extensive, inter-related financial or functional fields.
2.  Design and develop strategies, methodologies or techniques suitable for data analytics and risk analysis initiatives focused on fraud/forgery and emerging risk.
3.  Plan special research studies, and comprehensive assessments of broad complex, or highly sensitive issues within the assigned and relevant areas.
4.  Develop methods of evaluating the validity, accuracy, and reliability of a broad array and high volume of information, for transformation into intelligence relevant to the organization.

**Application Design and Development**
1.  Develop policy and guidelines for the development of data analytical applications and access strategies that conform to business and mission requirements.
2.  Lead projects to develop and implement web based reports and data visualization applications in providing analytical data to investigators and auditors in a timely manner.
3.  Build and implement various predictive models for advanced data analytics to efficiently manage and optimize the business processes and add value to the management in taking strategic and operational decision making process.

**Technical Advice and Assistance**
1.  Provide technical consultation as well as assistance in the support of complex audits and investigations and carries out other activities in connection with the organization's audit programs.
2.  Typically serve in a technical advisory role to match complex audit and investigative objectives with effective technical solutions.

3. Routinely accomplish extraction and analysis of computerized files from Departmental information systems and other external sources and is knowledgeable in data warehousing, data mining, and computer data modeling.

**Capacity Building and Training**
1. Provide on the job formal and special training for required capacity building of ICT audit staff, system people and above all the target group of the operational people.

**Testing and Acceptance Criteria**
The bid document contains the ideal and standard steps involved in testing and acceptance criteria of CAATs.

## Required Skills and Experience
**The Consultant should preferably possess following qualifications:**

1) Having Bachelor's degree in a technical discipline preferably in Accounting/Auditing/Finance
2) Having relevant experience, clear and sound knowledge in CAAT applications, guidelines and procedures.
3) Real experience of Generalized Audit Software like ACL (Audit Command Language), Arbutus Analyzer, Interactive Data Extraction and Analysis (IDEA) etc.
4) Should be qualified and certified professional having successful implementation tracks.
5) Should be Certified Analytics Professional.
6) Should have proven demonstrable exposure CAATs & Data Analytics in bigger organization like Bangladesh Bank.
7) Should have Demonstrable knowledge of RDBMs & their structures.
8) Working experiences with World Bank funded projects will be an added advantage.

**Selection Criteria and Process:**
The position will be selected solely based on experience and qualification criteria. Procedure mentioned in the *Guidelines on Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers* revised up to July 2014 will be followed in hiring the Consultant. Interested Consultants must provide information to substantiate that they are qualified to perform the services.

**Reporting and Co-ordination:**
The Internal Audit Consultant (International) will work under direct supervision and in close contact with Project Director/Deputy Project Director of FSSP. The Consultant will be required to prepare monthly summaries of work performed and cover issues or concerns that he/she foresees along with the possible solutions and submit the same to his supervisor.