EAST AFRICAN COMMUNITY SECRETARIAT

TERMS OF REFERENCE FOR A GAP ANALYSIS ON DATABASE MANAGEMENT SYSTEMS THAT CAPTURE CROSS BORDER FINANCIAL FLOWS IN THE EAST AFRICAN COMMUNITY (EAC)

EAC SECRETARIAT
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1 Background

The East African Community (EAC) is a regional inter-governmental organization established under Article 2 of the Treaty for the Establishment of the Community that entered into force in July 2000. The membership of the Community comprises the Republics of Burundi, Kenya, Rwanda, Uganda, the United Republic of Tanzania and the Republic of South Sudan. The Community is now implementing the Customs Union Protocol (2005), Common Market Protocol (2010) and the Monetary Union (EAMU) Protocol (2014) after its ratification by all Partner States. The EAC integration agenda is guided by the Treaty and Protocols.

The East African Community (EAC) Secretariat in collaboration with the World Bank and other development partners, established the Financial Sector Development and Regionalization Project I (FSDRP I). The project was designed to provide a foundation for financial sector integration among EAC partner states and supporting the broadening and deepening of the Financial Sector through the establishment of a single market in Financial Services. It is envisaged that with a single market, a wide range of financial products and services will be available efficiently and effectively to the region's population at competitive prices.

The FSDRP I was structured in six components. The components were: (i) financial inclusion and strengthening market participants (ii) harmonization of financial laws and regulations against common standards; (iii) mutual recognition of supervisors; (iv) integration of financial market infrastructures; (v) development of a regional bond market and (vi) capacity building at the EAC, of financial sector regulators and market practitioners as well as the general public through mass education.

The period for first grant US$ 16 million came to an end on 30th September 2016 and the EAC was granted an Additional Financing (AF) of US$10.5 million to be allocated across four of the six original project components. The four components under AF are: (i) Financial Inclusion and Strengthening of Market Participants; (ii) Harmonization of Financial Laws and Regulations; (iii) Institution Building and (iv) Project Management. These additional funds will support the project activities up to end September 2019.

One of the key activities under the FSDRP Component (3) of Institution Building   is to establish a regional database of cross border financial flows in the region

2   Objective

The overall objective of this assignment is to guide on the EAC Secretariat on the establishment of a centralised database for capturing cross border financial flows in the region.

Having a robust, reliable and up to date database to capture cross border financial flows in the EAC, will ensure that Partner provide pertinent and accurate information that Partner States will use to support the conduct of regional monetary policy in line with the objective of the EAMU protocol of promoting and maintaining monetary and financial stability in the region.

3   Scope of Assignment

The scope of the assignment is as follows;

1. Carry out a gap analysis on capturing the cross border financial flows in each of the six EAC Partner States;
2. Carry out an assessment of the processes at EAC level for capturing cross border financial flows;
3. Carry out an assessment of existing IT Infrastructures at the EAC Secretariat and in each Partner State to determine the resources requirements for the cross border financial flows database;
4. Review the draft EAC conceptual framework for collecting the cross border financial flows against findings under (1) to (3) above and produce a revised conceptual framework;
5. Determine the cost implications of acquiring an appropriate data management system for the cross border financial flows as follows:

   (i) : Cost for establishing National Centralized Databases for cross border financial flows in the EAC Partner States for those countries which do not have databases or those which need updated databases

   (ii) : Cost for establishing the centralized database at regional level by linking the national databases for cross border financial flows.

Note: In establishing the centralized databases at both national and regional level, the following Business and Technical requirements must be taken into consideration;

3.1 Business Requirements:

1. Capture cross border financial flows using customizable variables.
2. Retrieve cross border financial flows in different formats.
3. Integrate with national statistical databases in the Partner States
4. Integrate with 3rd party database platforms.

5. Provide Business Intelligence (BI), and Data Analytics (DA).
6. Generate statistical Reports and Graphs.
7. Output customized statistical Information requested by stake holders.
8. User Access via the Internet.
9. Support International Time Zones and Languages
10. Enable authorized users to manage a data dictionary.
11. Compatibility with other leading Econometric, Statistical, and Forecasting Software Packages.

3.2 Technical Specifications

The solution should have the capabilities to provide the following:

1. Include Software that is compatible with other statistical software. The Application Software, Hardware, and Network must be designed using an appropriate Architecture.
2. The IT Infrastructure must include Licensed Hardware running the latest Operating System, middleware, and Relational Database Management System.
3. The System features include Responses and Throughput, Controls and Monitoring, User Interfaces, System Interfaces, Communication Interfaces, System testing, and System Processing.
4. The Security system must include logical access controls for user identification.
5. Designed using industry standard ISO 27001 for Information Security.
6. A Unified Threat Monitor (UTM) to provide multiple Information Security functions.
7. End user Business and Technical Training.
8. Online documentation including manuals and training materials
9. Support and Maintenance.
10. Scalability to meet growing demands.
11. Business Continuity Support and Disaster Recovery

See **Annex I** for detailed Business Requirements and Technical Specifications

4   Deliverables and Assignment Duration

The assignment is expected to be completed over a period of **120 working days**.

No	Deliverable	Duration	Payment Schedule
1	**Gap Analysis**		
1.1	An Inception Report	10 working days after signing of contract	20% upon approval of the inception report
1.2	Draft Report including the following:	80 working days after approval of inception	20% upon submission and approval of the draft

No	Deliverable	Duration	Payment Schedule
	(i) Gap Analysis on capturing the cross border financial flows in the EAC region (both at national and regional level), (ii) Assessment of IT Infrastructure at EAC data centres, (iii) Cost estimates for acquiring an IT equipment/software for the centralized database	report	report and the revised Conceptual Framework for capturing cross border financial flows
1.3	Revised EAC conceptual framework for collecting cross border financial flows;		
1.4	Stakeholders Validation Workshop to present revised conceptual framework and draft report	5 working days	30% upon successful validation of the draft report (with its specific sub-reports as detailed above) and the Revised conceptual framework
1.5	Final Report including action Plan, Road map, and cost implications of the two phased implementation process	15 working days after validation workshop	30% on successful submission of Final Report and Conceptual Framework.
	Approximate duration for the assignment	**120 working days**	**100%**

5   Planned Work Breakdown

The table below summarizes the work breakdown in terms of the level of efforts that each team member is expected to spent per milestone in undertaking the assignment.

	Level of Efforts of Each Team member per activity	Team Leader (Staff-days)	Data Base Management Expert (Staff-days)	Business Intelligence expert (Staff-days)	Total (working days)
1.1	Inception Report	5	2.5	2.5	10
1.2	Draft Report	16	32	32	80
1.3	Revised EAC conceptual framework	4	3	3	10
1.4	Stakeholders Validation Workshop	2	1.5	1.5	5
1.5	Preparation and submission of Final Report and conceptual framework	6	4.5	4.5	15
	Total (Staff-days)	33	43.5	43.5	**Grand Total: 120 Working Days**

6 Facilities to be provided by EAC Secretariat/ EAC FSDRP

The EAC Secretariat/EAC FSDRP will introduce the consultant to the relevant stakeholders in the Partner States. The EAC FSDRP will also facilitate the stakeholders' validation workshop

7 Qualifications of the firm and its consultants

The firm should have at least 5 years' experience in undertaking similar assignments in developing countries in Africa, Asia or South America. Partnering with other firms to enhance the skill set and experience of the lead firm is permitted. The personnel of the firm(s) who will work on this assignment should have a multi-set of academic qualifications, skills and experience in the following areas: Financial Statistics, Business Intelligence and Data Analytics, Information Technology, Database Management Systems.

The team leader could be a specialist in any of the above areas. In particular, the key consultants in the team should possess the following qualifications at least to constitute a three-person team:

Key staff	General qualifications	Specific qualification	Experiences in the region
Team Leader (TL)	Minimum MSc/MBA in, Information Technology, Management Information Systems, Statistical Computing or any other related disciplines 5 years working experience as a TL in a Statistics, Business Intelligence, or Information Technology	The TL should have proven track record of leading and managing at least 2 multidisciplinary tasks of similar nature in any of the following disciplines; Statistics, Business Intelligence, Database Management, Information Technology	Relevant experience in the EAC region is an added advantage
Data Base Management Expert	A minimum of a Bachelor's degree or higher. Relevant data Security credentials is	The consultant should have undertaken Database	Relevant experience in the region will be an added

Key staff	General qualifications	Specific qualification	Experiences in the region
	an added advantage At least 3 years working experience in Database Development, and Management	Implementation assignments, and have good subject knowledge with at least 2 similar assignments	advantage.
Business Intelligence expert	Minimum Bachelor's Degree in Technology, Statistics, Engineering, Computer Science or related field. At least 3 years working experience in Business Intelligence and / Data Analytics.	The consultant should have undertaken at least 2 similar assignments as a Business Intelligence expert	Relevant experience in the Region is a plus

8   Method of selection

The Consultant's will be selected in accordance with the World Bank's procurement regulations for borrowers, July 2014. The selection of the Consultant will be based on the method "Consultant Qualifications Selection" **(CQS)** as defined in the same Guidelines.

9   Reporting Structures

The consultant will report to the FSDRP Technical Project Manager on all matters related to the management of this assignment once the contract has been signed. Contact details will be provided in the commencement letter once the contract has been signed by both parties.

ANNEX I: Business Requirements and Technical Specification for EAC Regional Financial flows database

No	Business Requirement	Functional Requirement	Technical Solution
B1.	Ability to capture statistics for example cross boarder financial flows different variables	To be able to Input Data	Validation
B2.	Ability to retrieve statistical data in different formats.	To be able to use Excel, csv files, and xml format files	Secure Transfer Protocols
B3.	Ability to integrate with National statistical data bases	Automated transfer of Data	Database Compatibility solutions, Application Program Interface (API)
B4.	Ability to integrate with 3rd party database platforms.	Automated transfer of Data	Database Compatibility solutions, Application Program Interface (API)
B5.	Ability to provide Business Intelligence (BI)	Business Intelligence, Data Analytics, Early warning signals that can be shared among Partner States for example AML	Dashboards, Application Software Application Program Interface (API)
B6.	Ability to generate statistical Reports and graphs	To be able to Output data in different formats eg pdf or excel	Dashboards, Export of data in different formats for example pdf or excel.
B7.	Ability to output customized statistical Information requested by stake holders	Automated File Transfer	File dumps over Secure Transfer Protocols, Application Program Interface (API)
B8.	User Access via the Internet	The platform must be accessible via the internet with easily navigable menus and links.	Graphical User Interface (GUI), and Business Intelligence for

No	Technical Requirements	Functional Requirement	Technical Solution
			Reports and Dashboards
B9	Support International Time Zones and Languages	Users in different time zones and languages should be able to use the system.	Time Zones: International Languages: International
B10	The solution must enable authorized users to manage a data dictionary.	Automated coding based on international standards.	The solution should provide standard coding to manage data dictionary.
B11	Compatibility with other leading Econometric, Statistical, and Forecasting Software Packages	Users must be able to input and output data from other Software packages.	Examples of other Software Packages include Eviews, Stata, Matlab
No	**Technical Requirements**	**Functional Requirement**	**Technical Solution**
T1.	Software	Must be compliant with industry standard protocols for inter-application data transfer.	Secure File Transfer (SFTP), Simple Object Access Protocol (SOAP) and Restful API's
T2.	Architecture	To provide separation of data storage, processing and presentation / interfacing in order to leverage performance	System must be designed as web enabled or N-Tier architecture
		To provide Data warehousing and Business Intelligence	Multi-layer (Data, Application, Presentation)
T3.	System Platforms: i) Database,	i) Relational Database Management System (RDBMS) ii) Licensed and Supported OS iii) Licensed and Supported Server class	Processors: Shall be intel based with processors adopted for scalable enterprise servers. Memory and Storage: The solution is expected to run on sufficient

	ii)Operating System (OS),	hardware that supports virtualization	scalable enterprise solution. Network: The solution must be implemented over a secure network running UpToDate protocols.
	iii)Servers	The hardware provided must be rack mountable. At User Acceptance the solution must not have utilized 50% of the storage and processing resources.	
T4	System Features		
	(i)Responses and Throughput, Controls and Monitoring	Responses and Throughput, are based on the elapsed time between the user instruction and the response from the system. Controls and Monitoring facilities enable detection and correction of faults	The response and throughput will be specified in the Service Level Agreement (SLA). Report to a centralized logging and events management and monitoring tool.
	(ii)User Interfaces	The system must be compatible with the latest internet browsers on all computers and mobile devices. The solution must have multi browser support.	Compatible with HTML 5 and latest Middleware.
	(iii)System Interfaces	System must support Open Architecture model	Application Programming Interface (API) to connect to other systems.
	(iv)Communication Interfaces	Interface with communication services	Configurable Interface with Mail Exchange System and SMS gate

			way Service for notifications
	(v) System testing	The solution must have test and production environments	The solution will have both Production and Test environments
	(vi) System Processing	The solution must have large enough in memory to support the Business Intelligence module	The system must support Realtime synchronization of data with the National and third-party databases.
T5	System Security;		
	(i)Logical Access Controls: User Identification, Password Control, Audit Trail, Segregation of duties, Support,	The system must provide a user management module, which has configurable parameters. The user management module should maintain user status e.g. Active: Enabled users who have accessed the system. Inactive: Enabled users who have not accessed the system Disabled: Users whose access has been revoked. Locked: A user locked out after a specified number of failed login attempts. The system must provide Role based user	The system must have customizable user roles, and configurable user profiles. The user management module should be configured to support user access management by Partner States. The system should support both local and LDAP authentication, which supports simple or hash. The system must be able to support password complexity and

		management.	frequency of change.
		It should be possible for each Partner State to administer its users (provide for decentralized user management).	
		The system must maintain audit trails and attribute data manipulation to a specific user. The audit trails must also provide comprehensive information for example source IP addresses, user ID's, login status, access modules, etc. Audit trails remain read only	
		The system should support automated password recovery via email or sms, and should lock a user out after a specified number of failed attempts. Users should also be prompt to change passwords on first time access and at periodic intervals when passwords are due to expire.	
		The system should keep a password history and enforce complete password change.	

	(ii)Data Security	The system must provide Database and application level security to ensure information security. The industry standard to follow is ISO 27001	Enforce secure browsing and confidentiality by using secure transmission protocols between applications and users. (HTTPS), with registered server certificates. All data must be securely transmitted.
	(iii)Network Security	There is need to plan for Information Security using an industry standard like ISO/IEC 27001. Some of the features include; Block unauthorized access to the network using Next generation Intrusion Prevention Systems (IPS), Advanced Malware Protection (AMP), Secure Virtual Private Networks (VPNs) services, Network Monitoring System Anti-virus, Network segmentation using Virtual Local Area Network (VLAN)	A Unified Threat Monitor (UTM) is a Network product performing multiple security functions within one system. The main advantage of an UTM solution is its ability to reduce complexity. Designed with redundancy, a UTM provides the features of a firewall and virtual private network gateway and provides defense mechanisms, antivirus, Web content filtering, intrusion prevention and antispam.
T6	Training	Training must be provided for end users and system administrators.	Business Training for End users Technical Training for System administrators.

		The supplier must provide transfer of technical knowledge to system administrators including; supply of data dictionary to enable generation of user defined reports, flexible database querying and creation of additional database queries.	The supplier must also plan for training of trainers, and train the users on how to customize reports, scripts.
T7	Documentation	The supplier must provide comprehensive documentation including System User Manuals, Training materials and technical manuals The Documentation must cover all aspects of the solution (database, application, network, backup and recovery).	The documentation of the system must be available on-line and context sensitive, on the same platform being developed
T8	Support and Maintenance	The supplier must develop a Service Level Agreement (SLA) together with the purchaser, and must include a clear support and maintenance schedule. The SLA must include guarantee or warranty of response times outside business hours. The supplier must provide an incident management tool for recording and tracking incidents. The supplier must be able to remotely support the solution at both Primary	Maintenance schedule includes, support and license recurrent costs, plus change management process. The solution must include a helpdesk system. Both parties will agree on a Warranty, Post Maintenance and

		and Disaster Recovery sites.	licensing period to be included under support and maintenance.
		The supplier should indicate if they have a 3rd party supplier has any role in software or hardware maintenance and support.	The system must be running the latest versions of software updates. New releases and Updates of the solution will be provided at no additional cost to the Purchaser
		The Supplier must notify the purchaser of all new system releases and updates to the system.	
T9	Scalability	It must be possible to scale up capacity resources, for example additional tables.	Resources like Memory, CPU and Storage must be increased depending on the need. Technologies like RAID storage can help achieve this.
		In the event that new requirements evolve, the solution must be expandable to cater for more storage and processing.	
			The solution must have error checking, and early warning mechanisms for example exceptions from failed processing, running out of disk space.
		The supplier must not charge for growth of users accessing the system in form of additional fees.	
T10	Business Continuity Support: Availability and Reliability, Backup and Recovery	There must be a clear support structure and escalation procedure.	The Systems Disaster Recovery solution must include Automated failover / redundancy, Hot backup site for replication, Cold backup for periodic data dumps.
		The solutions provider must demonstrate Disaster Recovery (DR) capabilities of the solution. DR capabilities include how quick it	

		is to recover,	The solution must have an inbuild feature to facilitate automated backups and restoration.
		Both supplier and purchaser will agree on an escrow arrangement to ensure the source code of the solution is available to the purchaser. The source code can be maintained by a mutual 3rd party, and will be updated at no cost to the purchaser with the latest releases.	The Disaster Recovery Solution should maintain an acceptable system performance in the event of failover.
			The solution should maintain a Recovery point objective. (A reference from which lost data can be requested from the source)

The EAC Cross Boarder System	Partner States	Data Providers within Partner States

EXCELL, CSV, XML

EXCELL, CSV, XML

DATA PROVIDER

RDBMS

PARTNER STATE EDW

RDBMS

EAC EDW

RDBMS

3rd PARTY SYSTEM

RDBMS