

Terms of Reference for

Hiring a Firm to carry out the Software Application Migration Process to LGC 2.0 ICTA/SG2/GOSL/CON/QCBS/2018/003

1. Introduction;

Aligned with the national policy of 'Digitization of Economy', ICTA intends to implement several initiatives across the government to increase the efficiency of the government processes and to provide government services effectively and efficiently. In this context, development and improvement of digital infrastructure has been identified as a key area.

Accordingly, ICTA intends to implement an industry standard cloud environment to serve as the 'Lanka Government Cloud 2.0' (LGC 2.0) to provide efficient, cost effective, reliable and secure infrastructure services. When the current technology enhancements and trends are considered, a fully-fledged cloud environment has become an essential need and to serve to the emerging needs of the government.

2. Background

The LGC 2.0 will be the central and common government cloud, and it is expected that all types of government applications will be hosted in LGC 2.0. This approach will minimize or eliminate purchasing and maintaining of servers and/or data centers by government organizations which could be time consuming, ineffective, and insecure.

As the implementation of LGC 2.0 project is in its final stages, ICTA has decided to migrate applications which located in the "Lanka Government Cloud 1.0" (LGC 1.0) to LGC 2.0.

3. Concise statement of the objectives;

ICTA intends to procure and obtain the services of a consultant firm to migrate applications from LGC 1 to LGC 2. The consultant firm is required to gather requirements for the migration purposes in order to smoothly function the process. Further, the consultant is required to adopt person days based effort estimating approach. The total duration of the assignment is 200 days, including the monitoring period.

4. Scope of Work;

- 4.1. Software Applications to be migrated from the potential list of Software Applications in collaboration with ICTA.
- 4.2. Each selected application will be considered as a sub-project.

- 4.3. Conduct a high level study of the potential Software Application including risks analysis associate with migration process and propose the migration method.
- 4.4. On completing the above, submit proposal comprising of the following, among others;
 - 4.15.1. Number of person days for the sub-project:
 - 4.15.2. value of the sub-project (calculated based on the person day rate):
 - 4.15.3. Software Application Migrating schedule:
 - 4.15.4. Deliverables acceptance criteria:
 - 4.15.5. User Acceptance Test (UAT):
- 4.5. Conduct the migration process upon approval of ICTA.
- 4.6. Obtain User Acceptance (UAT) for the migrated Software Application.
- 4.7. Facilitate the Transition in collaboration with ICTA (Production).
- 4.8. Closely monitor the application maximum up to 3 months from the User Acceptance Date. (The monitoring period will be decided by the ICTA according to the criticality & usage of the service)
- 4.9. All the documents affected due to the migration process should be updated.
- 4.10. In case of an incident in the migrated application during the monitoring period a root cause analysis should be carried out and report should be submitted to ICTA.
- 4.11. Consultant is expected to deploy multiple teams to work in sub-projects in parallel if required.
- 4.12. Key consultants are required to be available on-site as and when needed by the respective sub-project.
- 4.13. All consultants are required to sign a Non-Disclosure Agreement (NDA) where applicable.
- 4.14. Maximum total number of person days for this assignment is two hundred days (200).
- 4.15. Refer following Annexes which form a part and parcel of the Terms of Reference.

Annex 1. Non-Functional Requirements

5. Minimum Qualifications of KEY CONSULTANTS

- a) Software Application Migration Team

Key Professional Staff	Academic	Experience in the <u>PROPOSED ROLE</u>	Experience in working in SOA / web services / integration projects in cloud environments.
Project Manager	B. Sc or equivalent	5 years	3 Projects
Software Architect	B. Sc or equivalent	3 years	5 Projects
Technical Lead	B. Sc or equivalent	2 years	5 Projects
Lead System Engineer	B. Sc or equivalent	2 years	5 projects
Quality Assurance Lead	B. Sc or equivalent	2 years	3 Projects

6. Review Committees and Review Procedures

Each migrated software application will be reviewed by a team appointed by ICTA.

References:

[1] e-Government Policy Approved By Cabinet of Sri Lanka - <https://www.icta.lk/icta-assets/uploads/2016/03/eGov-Policy-structured-v4-0.pdf>

[2] Lanka Interoperability Framework - <http://www.life.gov.lk/>

- **END** -

NON-FUNCTIONAL REQUIREMENTS

1. SECURITY

1.1. User authentication and authorization

All applications should be able to access via ICTA's common infrastructure/application itself and independently via respective department's web site if required. Any authorization requirements should be implemented within the specific web/mobile application.

However, the solution should have the provision to integrate with the ICTA's proposed Identity Management solution in future.

1.2. Confidentiality and Integrity

All migrated web/mobile applications should ensure "confidentiality" and "integrity" whenever required by adhering to transport and message level security standards. (i.e.: HTTPS, WS-Security)

1.3. Authentication

The web/mobile application should be able to verify the users.

1.4. Authorization

The web/mobile applications should be able to verify that allowed users have access to resources.

1.5. Non-repudiation

All Web/mobile applications should ensure non-repudiation by having standard audit-trails and provisions to have WS-Security using digital signatures.

1.6. OWASP Guidelines

All web/mobile applications should ensure that the OWASP guidelines for security are followed when designing, developing and deploying the web/mobile application.

2. AUDIT FACILITIES

Wherever applicable, an audit trail of all activities must be maintained. On a service or operation being initiated, the system should log the event, creating a basic 'audit log entry'. It should not be possible for the operation to be executed without the log entry being made.

The information recorded in the audit trail depends on the type of activity which takes place. Each service would be responsible for logging detailed information. The different types of operations are -

- Data Capture & Maintenance

- Creation of an entry / item
- Modification an item
- Deletion
- Control (or status change)
- Process execution
- Data synchronization
- Print (only selected item)
- Retrieval
- Monitor

Detail logging may be enabled or disabled for each type of operation, and/or for each business object. It should be possible to configure which attributes of a data item should be traced at the detail level. Tracing of some attributes may be considered mandatory, and they should not be turned off.

3. BACKUP AND CONTINGENCY PLANNING

The main contingencies that should be considered and the training with regards to these shall be given to the relevant staff -

- Equipment failure
- Physical / natural Disaster
- Messaging or communication facilities.
- Changes in operations and policy
- Sudden absence of key personnel
- Breach in Security

Automatic Backups daily, weekly and monthly should be taken. All the backup procedures and backups needs to be tested regularly for restoration.

4. PERFORMANCE TESTING

Please find the below index as a guide to determine the benchmark values for the Application under the test.

Following performance criteria is provided as a guideline only. If the actual performance is falling below the stipulated figures, the consultant is to justify the reasons. However, the performance level must be accepted by the technical evaluation committee appointed by the client. The bandwidth is assumed at 1mbps (shared) with 1,000 concurrent users (50% load factor) in total.

Item	Performance
Screen Navigation: field-to-field	< 5 milliseconds
Screen Navigation: screen-to-screen	< 3 seconds
Screen Refresh	< 3 seconds
Screen list box, combo box	< 2 seconds
Screen grid – 25 rows, 10 columns	<3 seconds
Report preview – (all reports) – initial page view (if asynchronous)	< 40 seconds in most instances. It is understood that complicated / large volume reports may require a longer period
Simple inquiry – single table, 5 fields, 3 conditions – without screen rendering	< 4 seconds for 100,000 rows
Complex enquiry – multiple joined table (5), 10 fields, 3 conditions – without screen rendering	< 6 seconds for 100,000 rows
Server side validations / computations	< 10 milliseconds
Client side validations / computations	< 1 millisecond
Batch processing (if any) per 100 records	< 120 seconds
Login, authentication, and verification	< 3 seconds
Daily backups (@Dept.) – max duration	1 hour (on-line preferred)
Total Restore (@Dept.) – max duration	4 hours

4.1 Performance Test Process Outputs

- Performance Test Scripts
- Performance Test Results

5. AVAILABILITY

The web/mobile application should be performed as follows,

- 99.99% available unless the web/mobile application is designed with expected downtime for activities such as database upgrades and backups.
- Hence to have high availability, the web/mobile application must have low downtime and low recovery time.

6. ROBUSTNESS

The web/mobile application should be able to handle error conditions gracefully, without failure. This includes a tolerance of invalid data, software defects, and unexpected operating conditions.

- Failure Detection
 - Once deployed, there should be appropriate tools to discover anomalies and failures of the system
- Fault Tolerance
 - When transferring the Applications, transferor should anticipate exceptional conditions and transfer the application to cope with them. After the application transfer process, the application should continue its intended functions, rather than falling completely if previously available the same functions.

7. MAINTAINABILITY

The migration process should be properly documented with appropriate if needed diagrams to do modifications such as corrections, improvements or adaption.

8. SCALABILITY

The web/mobile application should be both scalable and resilient. A well-designed application should be able to scale seamlessly as demand increases and decreases. It should be resilient enough to withstand the loss of one or more hardware resource.

9. LEGAL AND LICENSING

The web/mobile application should comply the national law.

10. NOTES

- Some of the none-functional requirements shall be excluded based on the project requirement with the approval of the ICTA Technology Team.
- The vendor can propose similar standards/requirements for the above-mentioned standards/requirements with the approval of the ICTA Technology Team.