Terms of Reference

Obtain services of a consultancy firm to carryout Support & Maintenance and service enhancements of Sri Lanka Police and Department of Commerce eServices

ICTA-GOSL-CON-CQS-2017-07

1. Introduction;

'Lanka Gate' is a Service Oriented Architecture (SOA) based messaging infrastructure, which is envisioned to be the gateway for electronic information and electronic delivery in Sri Lanka. It is envisioned by the e-Sri Lanka initiative, and also stated in the e-Government Policy Document approved by the Cabinet of Ministers, that practically all the electronic services (eServices) and electronic information in Sri Lanka will be delivered via Lanka Gate. (Refer: http://www.icta.lk/en/programmes/re-engineering-government/131-main-projects/556-the-lanka-gate-initiative.html)

Lanka Gate would include a comprehensive collection of infrastructural mechanisms to easily 'plug-in' any eService(s), such that these eServices would be readily and easily available to other applications and portals through Lanka Gate. For this purpose, it is envisioned that the projects within Lanka Gate would be designed to leverage open standards and a SOA, enabling dynamic, customizable, collaborative and compose-able services via multiple delivery channels.

ICTA launched Lanka Gate, along with the first e-Government transactional online service; i.e. Online Revenue License Renewal (e-RL) in December 30th 2009.

By now ICTA has leveraged Lanka Gate to deliver more than 50 eServices offered by approx. 23 government organizations, to their clients.

2. Background;

Issuance of the Certificate of Origin for exporters is one of the key services provided by the Department of Commerce (DOC). Similarly, Issuance of the Certificate of Clearance for citizens who go abroad for many reasons is also an important service provided by the Sri Lanka Police (SLP)

By considering the importance of the above services, ICTA developed eServices allowing both DOC and SLP to automate their processes and allow their clients to obtain services online through the Lanka Gate infrastructure.

Since the inception of both eservices, the respective departments processes all the certificate request through the developed systems. Following are the statistics of the service usage up to 10th January 2017

eService Name	Service Launch Date	No of Applications Processed	Application Fee (Rs.)	Total Collection (Rs)
Issuance of Certificate of Origin (DOC)	20th Oct 2015	44824	1000.00	44,824,000.00
Issuance of Certificate of Clearance (SLP)	24th Aug 2015	37981	500.00	18,990,500.00

Internal processes and workflows of issuing certificates in SLP have been changed due to the need of additional security verifications and many other reasons (i.e: Verification of Passport details from the Department of Immigration and Emigration).

A need has raised to introduce new additional workflows in DOC certificate issuance application to cater requests under new Free Trade Agreements.

Moreover, there are identified enhancements of existing processes in both SLP and DOC applications which can be further enhanced to provide better service to their clients.

3. Concise statement of the objectives;

ICTA intends to procure and obtain the services of a consultant firm to carry out enhancements and support and maintenance for eServices of SLP and DOC for a period of 3 Months.
The consultant firm is required to gather requirement, design and develop during the assigned period for the identified enhancements.
The consultant is required to adopt person days based effort estimating approach.

4. Scope of Work;

(a) Implementation approach;

4.1   The consultant should review and understand the overall architecture of the Lanka Gate initiative and functional and technical background of both the services

4.2   The consultant should take over the Support and Maintenance of the existing services with the commencement of the contract. A proper knowledge transfer will be provided by the existing support team.

4.3   The consultant should take already developed systems as the baseline for the enhancements.

4.4   The consultant should implement the required enhancements to existing eServices while following and utilizing the already developed modules.

4.5   The enhancements shall not affect the functionality of the existing system

4.6   At the inception phase the consultant is required to study and estimate the effort to develop the enhancements and submit the number of person days required for the development for

each service. The value of the development of enhancements for both services will be calculated based on the person day rate.

4.7 At the inception phase the consultant is required to study and estimate the support and maintenance cost schedule of the existing system including the enhancements.

4.8 Consultant is expected to deploy multiple teams to work in both systems in parallel

4.9 Key representatives of the selected consultant are required to be available on-site as and when needed by the project.

4.10 All staff of the consultant who are engaging with both the assignments are required to sign a Non-Disclosure Agreement (NDA) where applicable.

4.11 Once the enhancements are implemented a proper release management plan should be followed and deploy the solution into the production environment and continue the support and maintenance.

(b) Scope of Work;

Therefore, the scope of work can be listed as indicated below;

Support and Maintenance Services

4.1 Review and understand the overall architecture and design of the Lanka Gate initiative.

4.2 Review and understand business/ technical documents of the 2 eServices identified for this assignment to determine the overall functional and technical scope of the system.

4.3 Maintain and troubleshoot the eServices frontend citizen application (independent web applications) which is hosted in Lanka Government Cloud (LGC) to be offered through the country portal

4.1 Maintain and troubleshoot all relevant backend applications, other utilities and respective web services hosted in LGC, which enable department users to perform routine operational and admin tasks.

Refer below annexures for a detailed understanding of the existing systems of SLP and the DOC.

4.1.1 Annex C: Software Requirement Overview – Issuance of Clearance Certificate(SLP)

4.1.2 Annex D: Software Requirement Overview – Issuance of Certificate of Origin(DOC)

4.2 Attend and resolve issues which may arise during the support and maintenance phase in accordance with the SLA.

4.3 The consultant firm should ensure adherence to the Service Level Agreement (SLA) indicated in Annex E. The **Support Level applicable** to this project is "**Medium**".

4.4 Attend to relevant service integrations to Lanka Gate core applications related issues.

4.5 Attending any configuration changes related to certain parameters proposed for the system (e.g. Tariff changes, etc).

4.6 Carryout minor changes, such as changes to the resource files/ configurations.

4.7 Handover the eServices to ICTA at the end of the maintenance period. This includes verification of the technical/functional documents and source code; and knowledge transfer sessions (if required).

Development of Enhancements

4.4 Identify internal process changes and workflow changes of current eServices of SLP and DOC, and understand the enhancements to be implemented in collaboration with ICTA.

4.5 On completing the above, submit a Proposal comprising of the following, among others;

    4.5.1 Requirement specification of the enhancements of e-Services

    4.5.2 Number of person days of the assignment

    4.5.3 E-Service enhancements implementing schedule

    4.5.4 User acceptance criteria

4.6 The above Proposal should include all deliverables as specified in below item '5 – Deliverables and time lines'

4.7 Implement enhancements to e-Services of SLP and DOC, upon obtaining ICTA approval for the above.

4.8 Maintain project source code in the ICTA Source Code Management system (SCM).

4.9 Maintain all issues in the Issue tracking system maintained by ICTA.

4.10 Adopt a proper application release procedure to release the new modules of e-Services to ICTA for deployment in the staging / production environments.

4.11 Participate for Project Review Committee meeting and Project Implementation Committee (PIC) Meetings as a member

4.12 Obtain User Acceptance (UAT) for the implemented eService.

4.13 Deploy into production in a Cloud Computing Platform.

4.14 Work collaboratively with ICTA and government organizations throughout the tenure of the project duration.

4.15 Update Help Desk Templates. (Knowledge Tree and T1 Documents)

4.16 Provide training to user departments on enhancements in both the assignments

4.17 Refer following Annexures which form a part and parcel of the Terms of Reference.

    Annex A - Non-Functional Requirements

    Annex B - The Lanka Gate Initiative - Overall Architecture & Design

    Annex C - Software Requirement Overview – Issuance of Clearance Certificate (SLP)

    Annex D - Software Requirement Overview – Issuance of Certificate of Origin (DOC)

    Annex E - Service Level Agreement

5. Final outputs, Reporting Requirements, Time Schedule for Deliverables;

Project duration is **3 months** including requirement gathering, designing, development of identified enhancements and support and maintenance of existing eServices.

Consultancy firm is required to submit the following list of deliverables for both DOC and SLP eServices project.

No	Deliverables	Phase
5.1	Enhancements Implementation Proposal 5.1.1 Requirement specification of the enhancements 5.1.2 Number of person days of the assignment 5.1.3 Enhancements implementing schedule 5.1.4 QA Plan and Test Cases if required (Eg. Mobile devices, Scanners, Barcode readers) 5.1.7 Acceptance criteria for Deliverables, UAT	Inception

5.2	5.2.1 Design document of enhancements	Elaboration
	5.2.2 Data migration and integration plan (if applicable)	
5.3	5.3.1 Proper maintenance of source code in SVN	Construction
5.4	5.4.1 Updated Solutions installation guide	Transition
	5.4.2 Updates User manual with enhancements	
	5.4.3 Updated Lanka Gate Help Desk templates for the eService (Knowledge Tree and T1 Document)	
	5.4.4 QA Status Report	
	5.4.4 Proper maintenance of issues in the Issue tracking System	
	5.4.5 Successful UAT acceptance of the eService	
	5.4.6 User training for both assignments	
5.5	5.5.1 Monthly Support and Maintenance Report of DOC and SLP eServices for the period of 3 Months	eServices Management phase

6. Services and Facilities Provided by ICTA

6.1   Initial eservices SRS of DOC and SLP.

6.2   Source code of the existing eService solutions of DOC and SLP

6.3   Access to staging/ production servers

7. Review Committees and Review Procedures

All deliverables will be reviewed by the team appointed by ICTA.

References:

[1] eGovernment 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 –**

[ANNEX A]

Non-Functional Requirements

1. **Security**

   1.1. User authentication and authorization

   All eService web applications should be able to access via Lanka Gate and independently via respective department's web site. Any authorization requirement should be implemented within the specific eServices web application.

   However the solution should have the provision to integrate with the Lanka Gate Identity Management solution in future.

   An administrative application need to be developed wherever applicable.

   Wherever applicable internal small applications need to be developed to capture and store relevant data.

   1.2. Confidentiality and Integrity

   All developed eServices Web applications/ back end e-services should ensure "confidentiality" and "integrity" whenever required by adhering to transport and message level security standards. (i.e. HTTPS, WS-Security)

   1.3. Availability

   All eServices Web applications / back end e-services should be developed to ensure "High Availability" to remain the system available all the time. (e.g. eServices Web applications clustering capability should be taken into consideration in the development)

   1.4. Non-repudiation

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

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**

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 512kbps (shared) (point to point between LIX and the Department web service) with 1,000 concurrent users (50% load factor) in total.

Item	Performance
Screen Navigation: field-to-field	< 10 milliseconds
Screen Navigation: screen-to-screen	< 5 seconds
Screen Refresh	< 3 seconds
Screen list box, combo box	< 3 seconds
Screen grid – 25 rows, 10 columns	< 5 seconds
Report preview – (all reports) – initial page view (if asynchronous)	< 60 seconds in most instances. It is understood that complicated / large volume reports may require a longer period
Simple enquiry – single table, 5 fields, 3 conditions – without screen rendering	< 5 seconds for 100,000 rows
Complex enquiry – multiple joined table (5), 10 fields, 3 conditions – without screen rendering	< 8 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

[ANNEX B]

THE LANKA GATE INITIATIVE - OVERALL ARCHITECTURE & DESIGN

(a) Introduction to Lanka Gate

As an important component of the e-Sri Lanka initiative, it is envisioned that practically all the eServices and electronic information in Sri Lanka will be delivered via a comprehensive integration platform. This wide collection software infrastructure and systems which is envisioned to be the gateway for electronic information and electronic interactions in Sri Lanka, is generally referred to as the 'Lanka Gate' initiative.

Many eServices will be generated as a result of various projects done at the ICT Agency, such as the Population Registry project, the ePensions project and the Samurdhi Services project. In addition, many other eServices could be generated by government, public and private sector organizations as well as by community groups. Lanka Gate would include a comprehensive collection of infrastructural mechanisms to easily 'plug-in' an eService or to 'compose' a set of eServices in order to generate an composite eService, such that these eServices would be readily and easily available to other applications and portals that comprise Lanka Gate. For this purpose, it is envisioned that the projects within Lanka Gate would be designed to leverage Web 2.0 concepts, open standards and a Service Oriented Architecture (SOA), enabling dynamic, customizable, collaborative and compose-able services via multiple delivery channels.

Thus the collection of software systems that comprise Lanka Gate would collectively provide an *enabling infrastructure for rapid integration and delivery of eServices*, leveraging loosely-coupled architectural principles to encourage the creation of innovative applications, solutions, and business models, communication models, pricing models and service mash-ups by various stakeholders across the country.

The intention is that this architectural blueprint will guide the various software engineering projects that would eventually be integrated into Lanka Gate. Since Lanka Gate will always be in a state of flux with the continuous addition of eServices from new projects, removal of old eServices as well as the generation of new applications, portals or composite eServices via services mash-ups or services composition, it is hoped that this overall architectural blueprint would continue to 'live' as a vision of what the end result should embody. Furthermore, it is expected that the launch of the Lanka Gate initiative will be coupled with the roll-out of a strong SOA Governance Model.

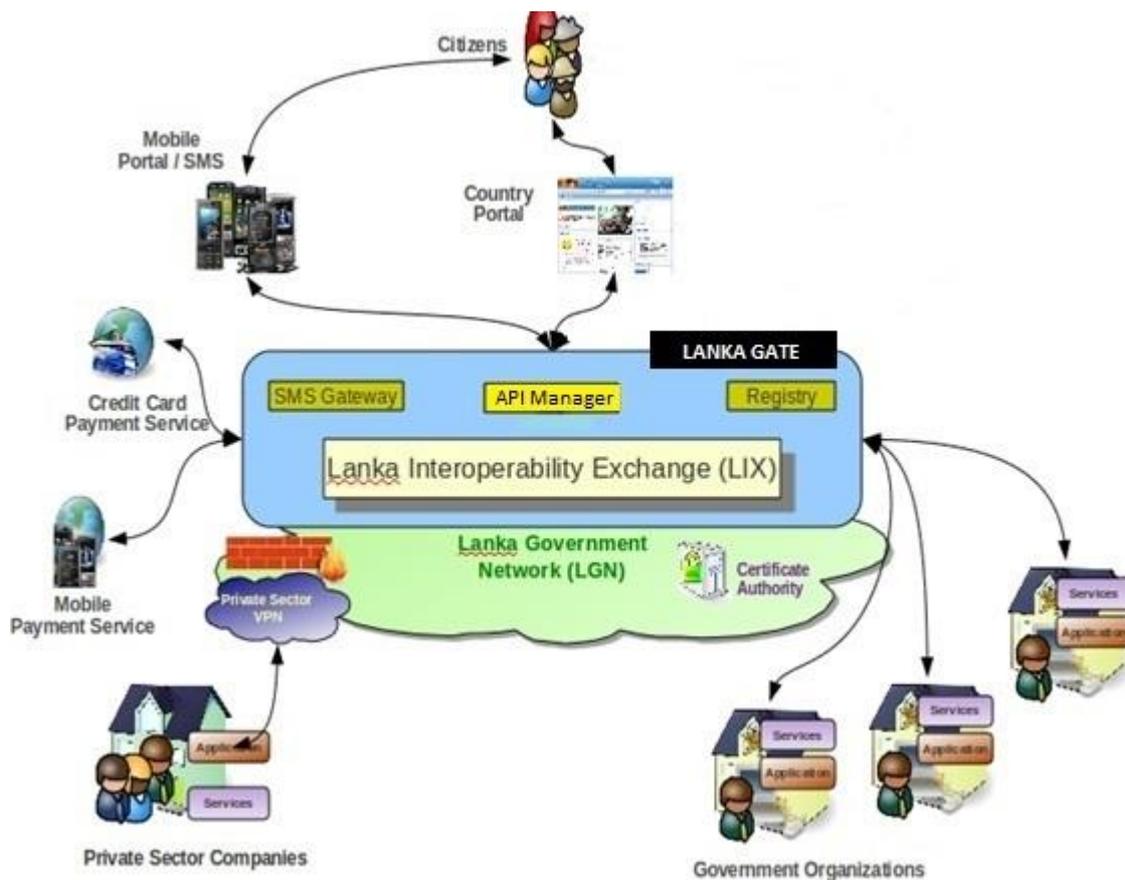(b) Lanka Gate: The Core Components

Figure 1 – The Conceptual Architecture

The conceptual design shown above in Figure 1 illustrates the loosely-coupled and flexibility of the Lanka Gate infrastructure. It is composed of following core components.

1. Lanka Interoperability Exchange Project (LIX)

The Lanka Interoperability Exchange (LIX) delivers all the interconnectivity and discovery capabilities that services implemented by the various projects need, by facilitating message routing, transport management, transaction management, mediation, transformation, policy enforcement and service discovery. As an example, considering the eGovernment domain, the LIX would provide the fundamental capabilities necessary for government-wide services to efficiently achieve the vision of re-engineering government in Sri Lanka. Likewise, considering the eCommerce domain, the LIX would enable businesses to create revenue-generating models that would be able to innovatively utilize the infrastructural interconnection capabilities of the LIX to consume the eServices.

LIX is built on top of an Enterprise Service Bus (ESB). It therefore harnesses ESB capabilities such as routing, mediation, messaging, service orchestration and management of eServices and allows

the use of a wide range of open protocols and open standards such as JMS, SMTP, XMPP, CORBA, REST and SOAP to connect existing and new systems/services.

In addition to providing message transport related services, the LIX also provides service discovery capabilities and features a collection of important authentication and authorization related eServices that would facilitate business & e-government transactions which require higher levels of security.

Thus the LIX and its associated protocols create an enabling framework that provides a secure, trusted channel through which government, public and private sector organizations may communicate and transfer information amongst each other. The LIX enables organizations to offload common functions such as authentication, authorization and payment, thereby allowing them to focus on business or domain specific functions. By providing such a shared infrastructure reduces the cost of implementation, enabling organizations to rapidly innovate and implement eServices that they otherwise may not even have considered. End users benefit from this shared infrastructure as it drives consistency in the way services are delivered compressing the user adoption and learning curves.

Conceptually, the capabilities offered by LIX are aligned with the enterprise computing notion of *integration-as-a-service (IAAS)* where businesses access a single hub that interconnects all trading partners, facilitated by SOA.

2. Country Portal (CP)

The Country Portal (www.gov.lk) serves as a primary web interface that connects users to the eServices provided within the Lanka Gate concept. Thus the Country Portal is a fundamental access point for citizens, non-citizens, businesses, agents and government employees to various government organizations and businesses in Sri Lanka. The Country Portal features multiple service delivery channels to accommodate various end user realities.

The Country Portal project is a container which provide access to eServices Web application which are self-contained front-end interfaces to either a single eService, several eServices from a specific project, or a transactional/mashup combination of eServices across several projects.

The web browser based delivery channel of the Country Portal features a highly user-friendly, dynamic interface, providing the end-user with the capability to design their own interactive user experience based on their particular needs and preferences. Most of the Web 2.0 capabilities available in Lanka Gate will be delivered through the web browser based delivery channel.

3. Credit Card On-line payment Services

A system to enable credit card payments for government enabled eServices, thereby facilitating electronic commerce for credit card holders.

4. Mobile Payment Services

A system to enable payment via a mobile phone for government enabled eServices, thereby facilitating electronic commerce for mobile phone users (This is yet to be integrated).

5. SMS Gateway (GovSMS)

A common interface open for mobile service providers to establish in-bound and out-bound Short Messaging Services (SMS) with Lanka Gate architecture. The mobile information and service gateway built as a part of Lanka Gate by ICTA to use the common, short telephone code "1919" should be used by all government organizations for delivery of such information and services.

6. Service Registry

The *service registry* provides the infrastructure to define and manage meta data of the SOA in a well structured manner. Features such as, access control, version management, tagging, linking, searching, and notification, can be utilized in order to implement the "design-time SOA governance".

LIX uses this *service registry* as the configuration store as well as the policy store to read policy information associated to each of the service. This is in combination with the monitoring capability of the LIX to formulate the "runtime SOA governance".

(c) Quick Win e-Services for Lanka Gate

As mentioned above, the Sri Lanka "Country Portal" is an already implemented web application, where citizens are expected to interact with eServices offered by various government departments, for a variety of citizen eServices. The Country Portal closely interacts with the Lanka Interoperability eXchange (LIX) Enterprise Service Bus backbone, to interact with the actual service implementations hosted by the various departments, in a Service Oriented Architecture (SOA) style deployment.

In "**Quick Win**" projects, the government department back offices are <u>not</u> going to be re-engineered fully but will undergo "minimum" business process changes. However, they are going to be important services with a very high impact.

The LIX is already connected with an on-line payment gateway and planning to be integrated to a Mobile Payment gateway. E-services that require payments from citizens are expected to use only these systems for the processing of the payments. An SMS gateway is also connected to LIX, so that citizens could make queries and receive status updates or receive other information from the eServices they utilize.

(d) E-service Development for Lanka Gate

As mentioned above, the eServices to be implemented are NOT expected to implement any major systems or replace any of the existing systems at the various government departments. They are expected to tap into any existing services already implemented, or expose new services as required with minimal disruption and changes to these existing systems. Hence, there can be two basic scenarios that can be envisioned (See Figure 2).

Scenario 1: This is where a minimal changes are required. The considered department consists of a working application with a connected database OR even it may have well-written web services that can be exposed to Lanka Gate. If not, it will be a matter of exposing some according to the requirement.
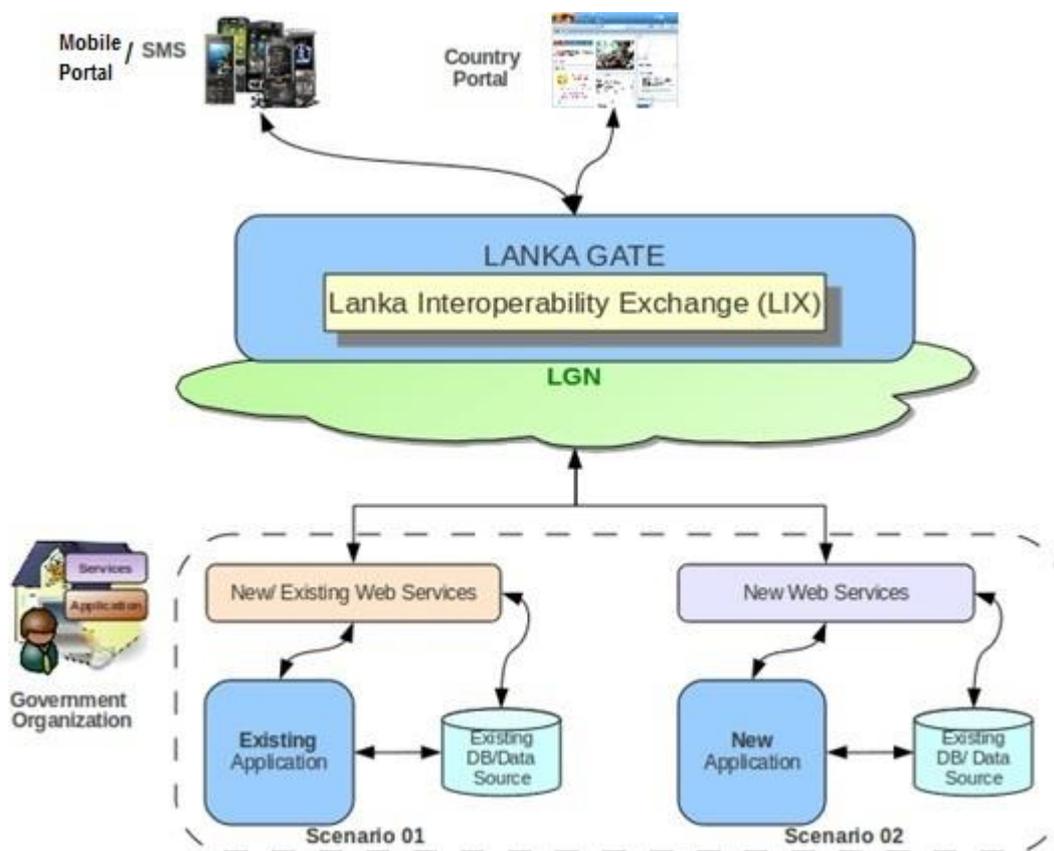

Figure 2: Developing eServices to Lanka Gate

Scenario 2: This is where SOME changes required. If the department only has a data source such as a spreadsheet, it is required to write a new application allowing the data source to be connected to the newly written web services. Otherwise, if the existing DB needs cannot be used directly to a web service, again a new application should be written to bridge the DB with web services. This complexity of this newly created application will depend on the complexity of other back office applications within the department. A proper *Business Process Modeling* (BPM) tool can be leveraged to ease this task depending on this complexity.

However, irrespective of the DB or the data source, it is required to write new web services to expose the back office systems to the Lanka Gate.

Certain eServices may allow the citizens to save information into the new systems, and these systems would require a database for persistence of this information. In addition, certain services may require a citizen to make payments – and these would be facilitated via the mobile or on-line payment gateways, or any existing payment mechanisms used by the department – such as via direct payment to a bank. Thus the back-end support systems would need the ability to interact with the payment gateways and any direct interfaces to bank payment information, to ensure proper payments have been made.

In addition, some of these new systems may require an internal web based system to query information on these new eServices, as well as generate reports etc. To support these use cases, an internal web based application may need to be developed, supporting role based access for use by the internal departmental staff. As an example, if a citizen applies for some facility and electronically submits a set of documents, and makes a payment, the citizen should be able to visit the department with the relevant reference numbers, and a staff officer would then be able to verify the authenticity of the supporting documents, and confirm the payment, so that the facility could then be made available to the citizen with a shorter processing time. In addition, some of these eServices may allow a citizen to schedule such a visit to the department – to ensure expected levels of service. Hence such a scenario would require the back end system to perform a simple scheduling of the applicants to the department depending on certain variables.

Developing Web Applications for Lanka Gate eServices

For any eService, a simple web application should be developed adhering to the guideline given under "Annex 3 – Front-end eServices Web Application Development". These web applications must be able to access via country portal as well as independently via the respective department's web site. The web applications must be able to support English, Sinhalese and Tamil. If the eService is a simple query (e.g. status check), the web application would be able to call into the existing web services or a new web service developed to cater to the use case in question, through a SOAP web service call through the LIX.

Developing SMS Services for Lanka Gate eServices

If the query service in question, is also offered over SMS, the SMS gateway would be able to invoke this same web service, and respond back to the user with the results. Some eServices may allow the user to subscribe to certain events (e.g. change of status, delay of an application etc), at which point, the system should push SMS updated back to the user via the SMS gateway – if the user has specified a mobile number, and requested SMS notifications. When a new SMS is received by the SMS gateway, it will be routed to a SOAP service of the target department, and each department will then have to implement the SMS request processing logic, and optionally response where applicable. Note that unless explicitly specified, all communication through LIX would be SOAP web services calls only.