Terms of Reference
for
Development of e-Services Web applications for Government Organizations-2017 L III

ICTA/SG2/GOSL/CON/QCBS/2017/002

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 thl.e 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.

2. **Background;**

Lanka Gate was launched in 30th December 2009, along with the first e-Government transactional eService i.e. online issuance of Revenue Licence (e-RL). Since then ICTA has been working in collaboration with key government organizations and has launched nearly 50 eServices by now.

The success of the existing eServices has raised lot of interest among Government Organizations to implement eServices for their organizations as well. Since the Government Organizations do not have the capacity and knowledge to implement eGovernment solutions alone, they have expressed the interest to work in collaboration with ICTA to offer more eServices. Therefore in addition to the existing eServices, ICTA intends to initiate new projects to implement more e-Services.

3. **Concise statement of the objectives;**

ICTA intends to procure and obtain the services of a consultant firm to implement selected set of new eServices for Government Organizations. The consultant firm is required to gather requirement, design and develop eServices, which will be delivered to citizens via the Official Government Web Portal.

The consultant is required to adopt person days based effort estimating approach.

The total duration of the assignment is 15 months. For requirement gathering, designing and developing eServices is 6 months & for support & maintenance is 9 months.

4. Scope of Work;

(a) Implementation approach;

4.1 ICTA has identified number of potential eServices to be offered by various government organizations. Out of these potential eServices, ICTA intends to implement selected set of e-Services adopting the Virtual Business Process Transformation (VBT) approach.

4.2 The focus of VBT is to leverage on the existing ICT infrastructure of government organizations to deliver selected electronic services to citizens. This means, unlike other e-government projects, VBT approach does not involve in business process reengineering effort, rather, it attempts to extract possible services having minimal effect to the operational process of the respective government organization. In this regard, the focus is for government organizations which are already having an ICT infrastructure in place. However; if the respective government organization does not have an ICT system in place, a backend application (to be used for Government Organization users) to be developed.

4.3 The eServices scope usually includes;

- 4.3.1 An interface to the respective government organization ICT infrastructure
- 4.3.2 e-Service web application including the web service (eServices Web applications) will be accessible to citizens through www.gov.lk
- 4.3.3 Backend operational application (if required)
- 4.3.4 Development of relevant APIs to integrate with National Payment Platform in order to expose the transaction service via Digital Instruction Providers (If required)
- 4.3.5 Development of relevant APIs to integrate with National Authentication Platform (If required)

4.4 Therefore once this contract is awarded, the consultancy firm, in collaboration with ICTA, is able to select the implementing eServices from of the available list of potentials.

4.5 Each selected Government Organization will be considered as a sub-project.

4.6 At the inception phase of each sub-project, the consultant firm is required to submit the number of Person days along with the DSRS and other documents. The value of a given sub-project is calculated based on the person day rate.

4.7 ICTA intends to develop eServices in 6 months' time period, to obtain support & maintenance service for 9 months of this assignment. It is expected that the consultancy firm will implement as many sub-projects as possible during this period, provided, the accumulated total number of person days is within the total estimated number of person days for this assignment.

4.8 Consultant is expected to deploy multiple teams to work in sub-projects in parallel

4.9 Key consultants are required to be available on-site as and when needed by the respective sub-project.

4.10 All consultants are required to sign a Non-Disclosure Agreement (NDA) where applicable.

4.11 The consultant firm is required to manage each service for one year period from the date of launch.

(b) Scope of Work;

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

4.12 Identify eServices to be implemented from the potential list of eServices in collaboration with ICTA. Refer Annex 1

4.13 Conduct a system study of the potential eServices.

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

- 4.14.1 Requirement specification of the e-Service
- 4.14.2 Number of person days of the assignment
- 4.14.3 eService implementing schedule
- 4.14.4 Operational and backend support requirement from the organization
- 4.14.5 Specifications for devices for the organization) if required. Eg. Mobile devices, Scanners, Barcode readers)
- 4.14.6 Deliverables acceptance criteria
- 4.14.7 User Acceptance Test (UAT)

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

4.16 Implement e-Services, upon obtaining ICTA approval for the above.

4.17 Adherence to e-Government Policy of Sri Lanka [3].

4.18 Adherence to open standards and Service Oriented Architecture (SOA) principles.

4.19 Adherence to LIFe standards [4].

4.20 Study and get a clear understanding of Non Functional Requirements, eServices Development Guideline and Overall Architecture of Lanka Gate. Refer Annex 2,3 and 4

4.21 Implement the e-Service in collaboration with the SQA consultants appointed by ICTA, or review committee and facilitate the 'Software Project Audit Process' specified by ICTA. Refer Annex 5.

4.22 Implement required APIs (for payment services only) which will be required to integrate with National Payment Platform (NPP). Refer Annex 6.

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

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

4.25 Adopt a proper application release procedure to release the e-Service to ICTA for deployment in the staging / production environments.

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

4.27 Fixing issues identified during the audit conducting by ICTA-SLCERT.

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

4.29 Adherence to support level agreement with ICTA (Ref to annexure-7)

4.30 The level of support requirement will be medium.

4.31 Deploy into production in a Cloud Computing Platform.

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

4.33 Refer following Annexes which form a part and parcel of the Terms of Reference.

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

4.35 On completion of project, knowledge transfer process to be done after re-validating the guide documents given.

Annex 1 - Potential eServices
Annex 2 - Non-Functional Requirements
Annex 3 - Developing eServices for Country Portal - Standards and Guidelines
Annex 4 - The Lanka Gate Initiative - Overall Architecture & Design
Annex 5 - Software Project Audit Process
Annex 6 – National Payment Platform
Annex 7- Support Level Agreement

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

Project duration is **15 months** including requirement gathering, designing, and developing, support & maintenance.

ICTA intends to develop eServices in 6-month time period of this assignment. The Estimated total number of Person Days for assignment is 600.

It is expected that the consultancy firm will implement as many sub-projects as possible during this period, provided, the accumulated total number of Person Days is not exceeding 600.

Consultancy firm is required to submit the following list of deliverables for each sub-project (Government Organization wise eServices implementation project).

No	Deliverables	Phase
5.1	e-Services Implementation Proposal 5.1.1 Requirement specification of the e-Service 5.1.2 Number of person days of the assignment 5.1.3 eService implementing schedule 5.1.4 QA Plan and Test Cases 5.1.5 Operational and back office support requirement (from the organization) 5.1.6 Specifications for devices if required (Eg. Mobile devices, Scanners, Barcode readers) 5.1.7 Acceptance criteria for Deliverables, UAT 5.1.8 Proper maintenance of issues in the Issue tracking System	Inception
5.2	5.2.1 Design document 5.2.2 Data migration and integration plan (if applicable) 5.2.3 Proper maintenance of issues in the Issue tracking System	Elaboration
5.3	5.3.1 Proper maintenance of source code in SVN	Construction
5.4	5.4.1 Solutions installation guide 5.4.2 User manual 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	Transition

5.5	5.5.1 eService Management Plan for a period of one year	eServices Management phase

Refer http://en.wikipedia.org/wiki/IBM_Rational_Unified_Process for more information about RUP (Rational Unified Process) phases.

6. Services and Facilities Provided by ICTA

7.1 Web-based access to the ICTA SCM system
7.2 Access to staging/ production servers
7.3 Issue Tracking System
7.4 SQA dashboard

7. Review Committees and Review Procedures

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

References:

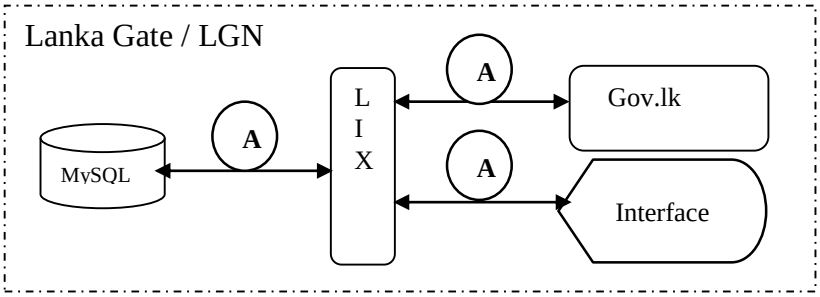
[2] Constructive Cost Model - http://en.wikipedia.org/wiki/COCOMO
[3] e Government Policy Approved By Cabinet of Sri Lanka - https://www.icta.lk/icta-assets/uploads/2016/03/eGov-Policy-structured-v4-0.pdf
[4] Lanka Interoperability Framework - http://www.life.gov.lk/

- END –

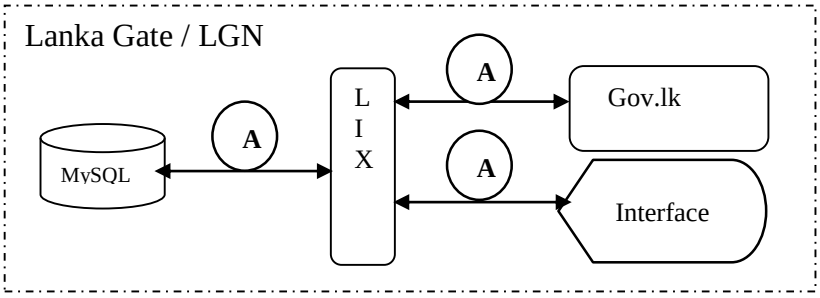
Annex 1

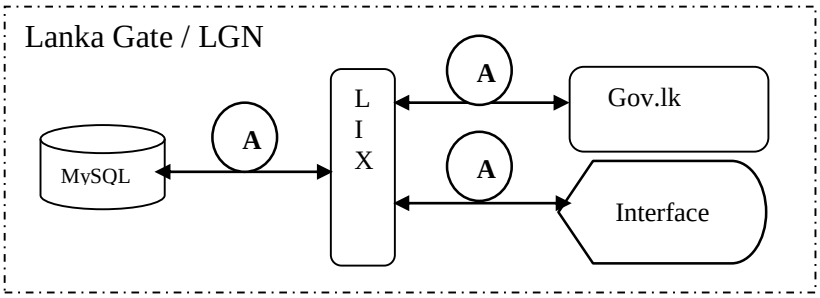
Potential eServices

Lot	#	Organization	eServices
Lot 3	1	National Aqua Culture Board	1.Online License issuing management system
	2	National Library and Documentation Services Board	1. Online request for ISBN/SSN/ISMN number issuing and to enable relevant payments to be made online by using a web based system.
	3	National Budget Department	1.Online Budget/Progress Monitoring system
	4	Sri Lanka Police Department	Accident Data Monitoring

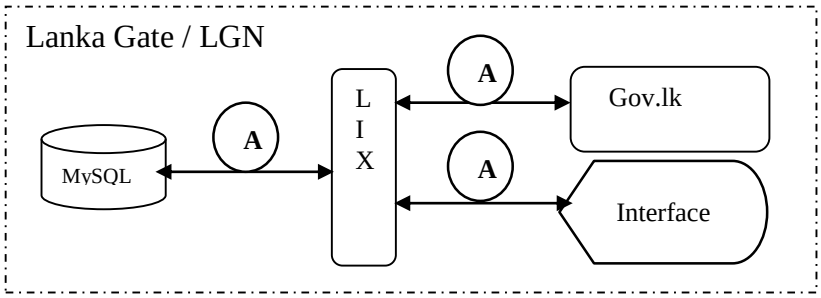
1) National Library and Documentation Services Board	
High-level view	
	• Publishers, authors, institutions will make request to ISBN/SSN/ISMN numbers online. • Payment will be made online & information will maintained at LGCC Data Center. • Require a web interface to enable Department users to manage data related to online services.

	• Web services (above A) need to be developed to retrieve and update ISBN number request related data with payment information, which will be securely connected to LIX (Lanka Gate core application - ESB) • Online service(s) will be hosted at gov.lk web site (Lanka Gate core application)
	• Connectivity between the service provider and Lanka Gate will be over LGN connection.
eService (1.1)	Request for ISBN numbers and to enable related payments to be made online using a web based system.

2) National Aqua Culture Board	
High-level view	
	• Request of license will be made online. • Require a web interface to enable Department users to manage data related to online services.
	• Web services (above A) need to be developed to retrieve and update ISBN number request related data with payment information, which will be securely connected to LIX (Lanka Gate core application - ESB) • Online service(s) will be hosted at gov.lk web site (Lanka Gate core application)
	• Connectivity between the service provider and Lanka Gate will be over LGN connection.
eService (1.1)	Request for License and to enable related payments to be made online using a web based system.

<table>
<tr><td colspan="2">3) National Budget Department</td></tr>
<tr><td rowspan="3">High-level view</td><td> 
</td></tr>
<tr><td>• Government Organizations will update budget forms like 1, 2A, 2 B, 3, 4,5,6 online
• Information will maintain at LGCC Data Center.
• Require a web interface to enable Budget Department users to manage data related to online services.</td></tr>
<tr><td>• Web services (above A) need to be developed to retrieve and update budget related information, which will be securely connected to LIX (Lanka Gate core application - ESB)

• Online service(s) will be hosted at gov.lk web site (Lanka Gate core application)</td></tr>
<tr><td></td><td>• Connectivity between the service provider and Lanka Gate will be over LGN connection.</td></tr>
<tr><td>eService (1.1)</td><td>Government organizations will make the request of budget online using a web based system & budget department will approve & monitor the budget through the system.</td></tr>
</table>

<table>
<tr><td colspan="2">4) Accident Data Monitoring</td></tr>
<tr><td rowspan="4">High-level view</td><td> 
</td></tr>
<tr><td>• Accident information will update to online system by different locations (Police stations, etc)
• Information will maintain at LGCC Data Center.
• Require a web interface to enable Police Department users to manage data related to online services.</td></tr>
<tr><td>• Web services (above A) need to be developed to retrieve and update accident related data, which will be securely connected to LIX (Lanka Gate core application - ESB)
• Online service(s) will be hosted at gov.lk web site (Lanka Gate core application)</td></tr>
<tr><td>• Connectivity between the service provider and Lanka Gate will be over LGN connection.</td></tr>
<tr><td>eService (1.1)</td><td>Accident related data will update & monitor online using a web based system.</td></tr>
</table>

Annex 2

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 3

Developing eServices for Official Government Web Portal - Standards and Guidelines

Please login to the Lanka Gate Developer portal-http://www.developer.icta.lk/documents/guides.html

Annex 4

THE LANKA GATE INITIATIVE - OVERALL ARCHITECTURE & DESIGN

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.

Lanka Gate: The Core Components

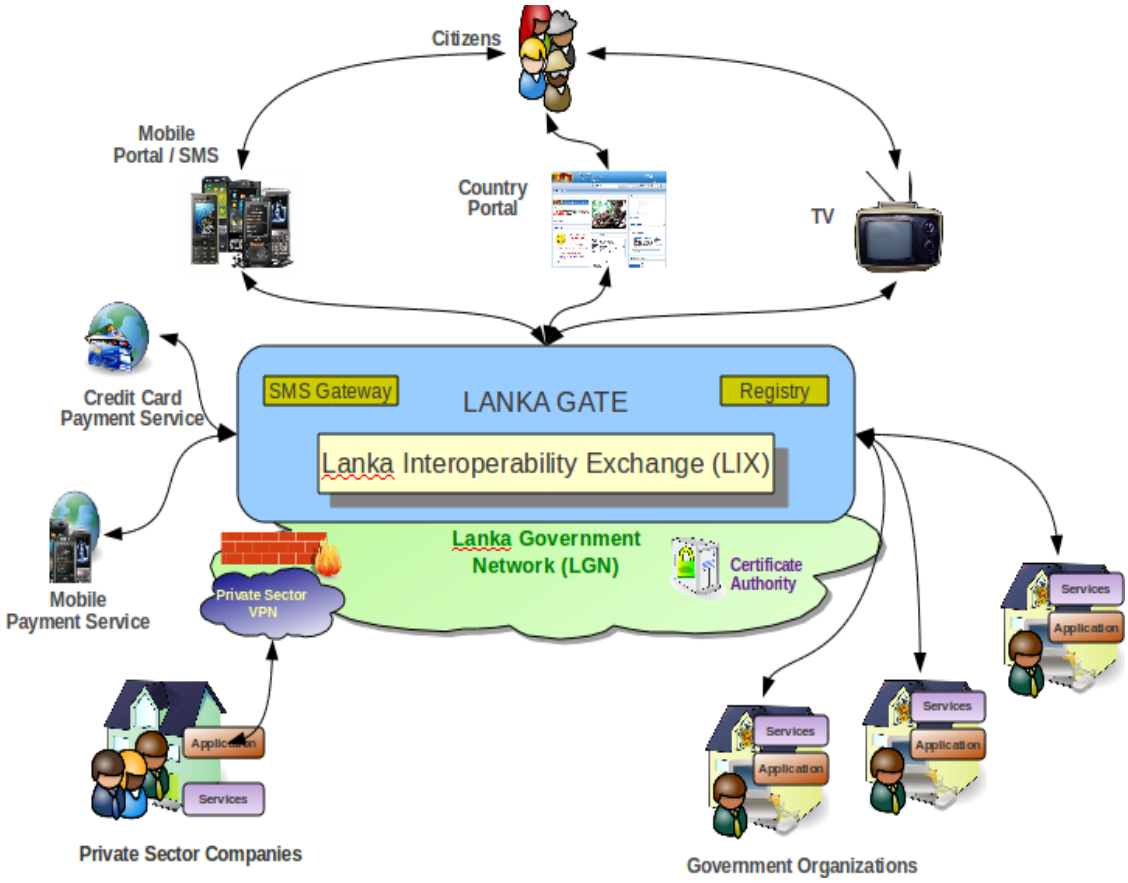


Figure 1 – The Conceptual Architecture

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 (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. Mobile Portal (MP)

The Mobile Portal (mobile.icta.lk) the repository of mobile applications delivering useful government services utilizing the Lanka Gate infrastructure.

4. 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.

5. 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).

6. 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.

7. 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".

Quick Win e-Services for Lanka Gate

As mentioned above, the Sri Lanka "Country Portal- gov.lk" 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 not 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.

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.

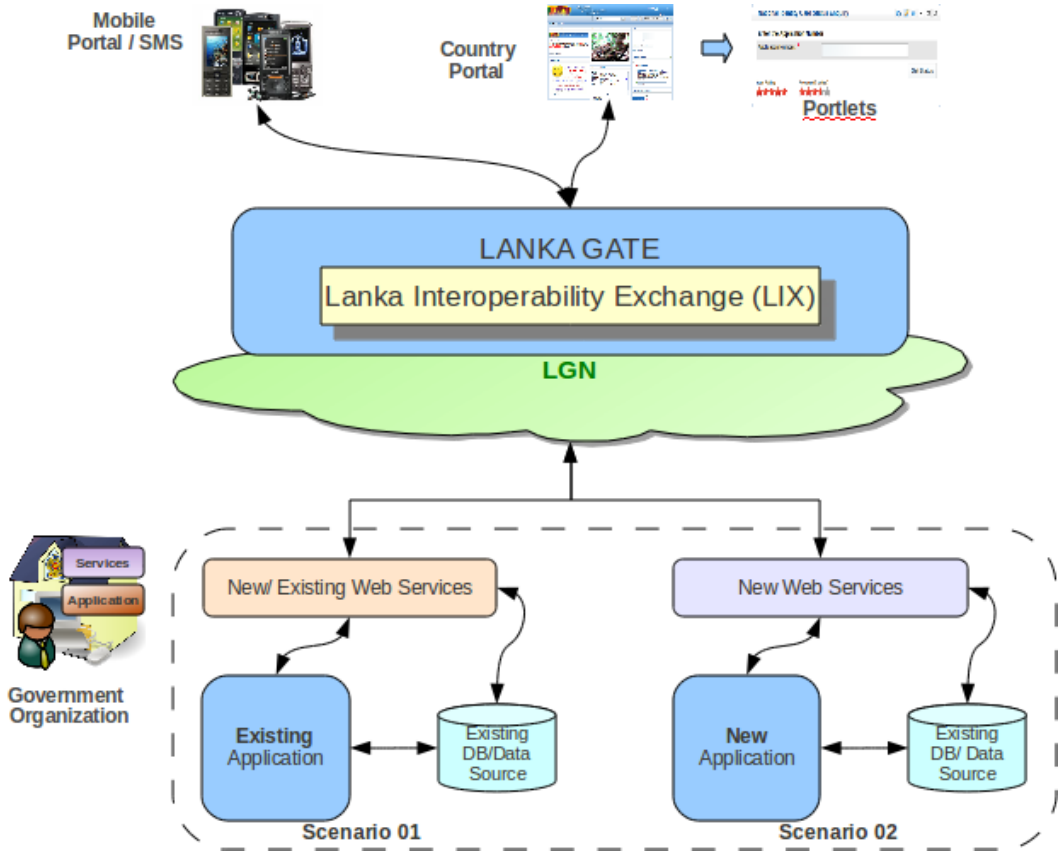


Figure 2: Developing eServices to Lanka Gate

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.

Annex 6 –
NATIONAL PAYMENT PLATFORM

The National Payment Platform is the national online payment platform in Sri Lanka is created and conceptualized in order to facilitate the transactional services offered from government organizations where any government departments can leverage this infrastructure. Architecturally it is a wide collection of software infrastructure and systems which is envisioned to be the gateway for multiple government which has the ability to connect to multiple government organizations, financial institutions (banks) and digital instruction providers (portals) in Sri Lanka. With this approach, citizens are able to consume the transactional services offered by any government organizations via digital instruction providers in a single interaction point.

The high-level design shown below in Figure 1 illustrates the loosely-coupled and flexibility of the NPP infrastructure. It is composed of following core components where components communicate using REST APIs.
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Digital Instruction Providers - The Payment portals serves as the primary web interfaces that connects users to the transactional services provided within the NPP concept. Thus the PP is a fundamental access point for citizens to initiates the transactions.

- Financial Institutes - Any given financial institute such as banks can be integrated into NPP where citizens funds are deposited.
- Government departments - Any government department which provide transactional services to citizens
- National Payment Portal middleware - Collection of wide variety software systems which used for integration and as a communication hub

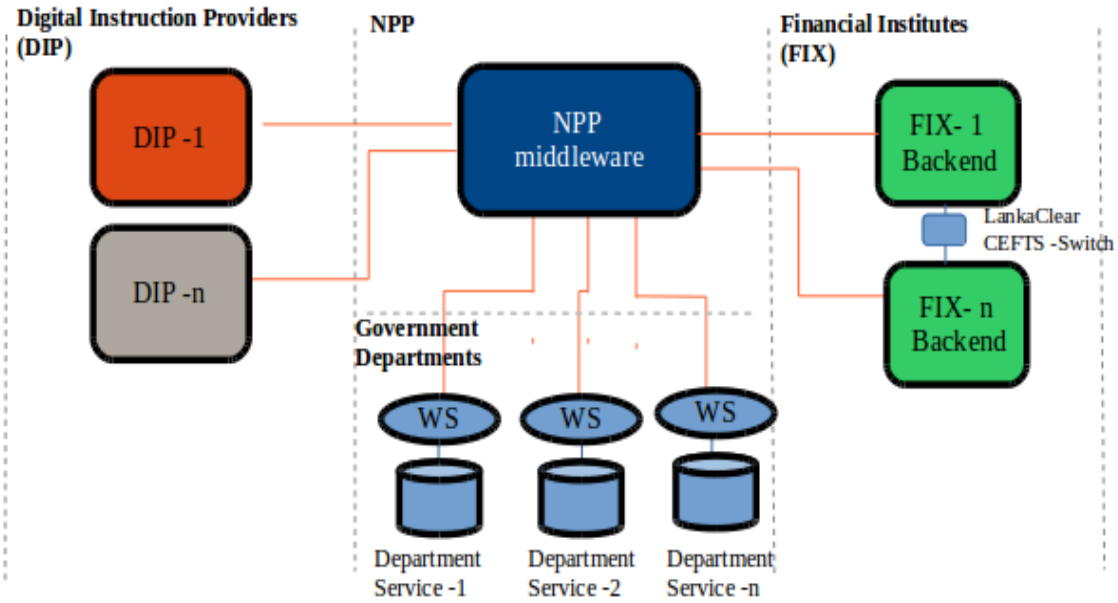

Figure 3 – National Payment Portal - High Level Overview

The main objective of having multiple digital instruction providers (portals) is to citizens to have alternative options where citizens are not bound to a single portal. A citizen can create user accounts in any portal as preferred and login. To do a transaction, it is required to add the citizen's bank

account within the portal. A bank account can be added to a user account in three ways that are manual, online and over-the-counter.

- In the manual registration process citizen will enter his bank account details in the selected portal. The portal will generate a letter with a verification code that is used to identify the citizen's bank account uniquely. The citizen will have to physically present himself to the bank and produce the letter provided by the portal with his signature.
- In the online registration process citizen will enter his bank account details in the selected portal. The citizen will be redirected to bank's online payment portal where he should enter his credentials to verify himself. The verification of the citizen is done online by using his presence.
- In the over the counter registration process citizen will physically present himself to the bank rather registering bank account details on the portal's. Once the citizen is verified he will be given a verification code that can be used subsequently to add his bank account in any given portal.

In any given scenario bank account details are not stored in the portal slide rather transmitted over to the bank for verification. Once the citizen is verified he will be provided a security token that is unique to the citizen's bank account. During the transactions security token is used to identify the user in order to complete the transactions.

There are two types of transactions in NPP named as portal-oriented and financial-institute-oriented.

- The portal-oriented transaction is initiated from portals. In order to make transaction citizen will go to the portal. Then citizen will select government organization and the particular service that is provided by the government organization the citizen is willing to make the payment for. Citizen will enter payment related information that is validated before proceeding into the payment. The financial institute in which the citizen has the account will be informed through an API invocation. Eventually financial institute will debit and credit funds accordingly and will notify the portal regarding the completion of the transaction. Finally, the department will be informed and backend will be updated.
- The financial-institute-oriented transactions are supported since banks are great customer service points. Citizen will go to the financial institute to make a payment. Financial institute will obtain the payment related information from the citizen and proceed with the transaction. The given information by the citizen will be validated through an API invocation to the portal where the citizen is registered. Eventually financial institute will debit and credit funds accordingly and will notify the portal regarding the completion of the transaction. Finally, the department will be informed and backend will be updated.

Apart from above, corporate transactions are also in NPP where businesses in Sri Lanka are benefitted. Businesses can register themselves using one of the above-mentioned methods where they will be given the opportunity to add members of its business. One of the members can initiate the transaction and will be authorized by the other members. This approach is taken to mimic the requirement where multiple signatures are required to make a transaction in the businesses.

By using NPP citizen will have one place to make all the government transactions.

[ANNEX 7]

SERVICE LEVEL AGREEMENT *FOR* DEVELOPMENT & SUPPORT OF E-SERVICES WEB APPLICATIONS

1. Introduction

The aim of this agreement is to provide a basis for close co-operation between the Client and the Consultant for support and maintenance services to be provided by the Consultant, thereby ensuring a timely and efficient support service is available. The objectives of this agreement are detailed in Section 1.1.

This agreement is contingent upon each party knowing and fulfilling their responsibilities and generating an environment conducive to the achievement and maintenance of targeted service levels.

2. Objectives of Service Level Agreements

1 To create an environment conducive to a co-operative relationship between Client, Consultant and Client's representatives (government organizations) to ensure the effective support of all end users.
2 To document the responsibilities of all parties taking part in the Agreement.
3 To define the commencement of the agreement, its initial term and the provision for reviews.
4 To define in detail, the service to be delivered by each party and the level of service expected, thereby reducing the risk of misunderstandings.
5 To institute a formal system of objective service level monitoring ensuring that reviews of the agreement is based on factual data.
6 To provide a common understanding of service requirements/capabilities and of the principals involved in the measurement of service levels.
7 To provide for all parties to the Service Level Agreement a single, easily referenced document which caters for all objectives as listed above.

3. Service Level Monitoring

The success of Service Level Agreements (SLA) depends fundamentally on the ability to measure performance comprehensively and accurately so that credible and reliable information can be provided to customers and support areas on the service provided.

Service factors must be meaningful, measurable and monitored constantly. Actual levels of service are to be compared with agreed target levels on a regular basis by both Client and Consultant. In the event of a discrepancy between actual and targeted service levels both Client and Consultant are expected to identify and resolve the reason(s) for any discrepancies in close co-operation.

Service level monitoring will be performed by Client. Reports will be produced as and when required and forwarded to the Consultant.

4. Support Levels

The consultant must provide support and maintenance services during Support Levels mentioned below;

Support Level: **Medium**

1) Component/Service — For mobile applications, supporting back end applications and required web services developed by

	the vendor along with the mobile application (deployed at Lanka Government Cloud (LGC))
Support Hours:	From 08:00 AM to 05:00 PM, on weekdays except public holidays

5. On-Call Services Requirements

Consultant MUST make at least ONE qualified personnel available to the Client by telephone and email for the reporting and resolution of non-conformities or other issues, defects or problems. Dedicated telephone numbers and emails should be available for reporting issues. Client will nominate the personnel who are authorized to report non-conformities or other problems with the system from the departments. Reporting of non-conformities includes requests by the Client to apply critical software updates or patches.

Table-1 shows the response priority assigned to faults according to the perceived importance of the reported situation and the required initial telephone response times for the individual priority ratings. All times indicated represent telephone response time during specified Support Levels. The indicated telephone response time represents the maximum delay between a fault/request being reported and a Consultant's representative contacting the Client by telephone. The purpose of this telephone contact is to notify the Client of the receipt of the fault/request and provide the Client with details of the proposed action to be taken in respect of the particular fault/request.

Support Level	**Business Critical**	**Business Critical**	**Non-Business Critical**	**Non-Business Critical**
	Fatal	**Impaired**	**Fatal**	**Impaired**
High	60 minutes within Support Hours	90 minutes within Support Hours	90 minutes within Support Hours	120 minutes within Support Hours
Medium	120 minutes within Support Hours	150 minutes within Support Hours	150 minutes within Support Hours	180 minutes within Support Hours

Table-1: Response Priority

Note:

Fatal	- Total system inoperability
Impaired	- Partial system inoperability
Business Critical	- Unable to perform core business functions
Non-Business Critical	- Able to perform limited core business functions

Consultant notification can occur outside Support Level time, and thus the response may occur after the next Support Level begins. Furthermore, “Time to Arrive On-Site (Table-3)” starts from Support Level starting time and “Time to Resolve the Problem” is Support Level time starting from the actual time of arrival on site.

6. Problem Resolution and Penalties

If problems have not been corrected within two (2) hours of the initial contact, the Consultant shall send qualified maintenance personnel to the respective Client’s site to take necessary actions to correct the issue reported (defect, problem or non-conformity).

If faults are not corrected within the time limits specified in the Table-2, the Client shall be entitled to a penalty payment for each hour that the Consultant fails to resolve the fault.

Maximum ceiling of penalty for a given month is 10% of the monthly support and maintenance price.

The time to arrive on-site is specified in the Table-3.

Support Level	**Business Critical**	**Business Critical**	**Non-Business Critical**	**Non-Business Critical**
	Fatal	**Impaired**	**Fatal**	**Impaired**
High	6 Hours LKR 5,000.00 per hour	10 Hours LKR 3,000.00 per hour	10 Hours LKR 3,000.00 per hour	15 Hours LKR 2,000.00 per hour
Medium	8 Hours LKR 5,000.00 per hour	12 Hours LKR 3,000.00 per hour	12 Hours LKR 3,000.00 per hour	20 Hours LKR 2,000.00 per hour

Table-2: Resolution Time and Penalties

Support Level	**Business Critical**	**Business Critical**	**Non-Business Critical**	**Non-Business Critical**
	Fatal	**Impaired**	**Fatal**	**Impaired**
High	Not applicable	Not applicable	Not applicable	Not applicable
Medium	2 Hours	3 Hours	3 Hours	5 Hours

Table-3: Time to arrive on-site