Public Utilities Commission of Sri Lanka

Request for Proposals (RFP) – Incident Reporting System

Established by the Public Utilities Commission of Sri Lanka Act No. 35 of 2002 by the Parliament of Sri Lanka, the Public Utilities Commission of Sri Lanka (PUCSL) performs a vital role as a multi-sector supervisory body regulating certain physical infrastructure industries in the country. The PUCSL came into operation in 2003 and more information about PUCSL & what it does could be learnt from its website (www.pucsl.gov.lk).

PUCSL being the technical, economic and safety regulator for the Electricity industry in Sri Lanka, the Inspectorate Division of it is entrusted with the task of improving electricity safety and reducing the number of electrocutions and other electricity related accidents. In order to gather information with respect to both fatal and non-fatal accidents, it has been decided to implement an information system, known as Incident Reporting System (IRS), which would be used by different stakeholders to submit information to PUCSL.

(i)   The first version of the new implementation of IRS, which would be implemented in 2020 and described in this document, will have two sets of user interfaces. (The subsequent versions of the IRS are beyond the scope of this document, this phase of the project and the financial consideration)
   a.   One set of interfaces is for the designated information submitting organizations like Ceylon Electricity Board (CEB), Lanka Electric Company (LECO), Department of Police, Ministry of Health, Department Labour, Insurance organizations, etc. or members of general public (which is known as external data input interface)
   b.   and the other for PUCSL staff (which is known as internal data input interface)

   (There will be automatic transitions of data (received from the external interface) to the internal interface so that PUCSL staff can save their time. The system must be aware of how the fields in the external interface(s) are matched to the fields in the internal interface(s) matched for the purpose of automating the transfer of data transferring.

(ii)   The user interface of the (1st version of IRS) used by designated information submitting parties (such as CEB, LECO, Department of Police, Ministry of Health, etc.) or general public will require minimum effort from the staff of those organizations and they are only required to report the incident along with Who, What, When, Where, How information (& the contact information of the person who is providing information such as name, phone number, postal address, email address, etc., in the case of a member of general public submitting information)

   Eg:- 2 persons got electrocuted in Kalutara on July 2nd due to unauthorized tapping.

   It must be possible to upload photos related to the incident also. If the Web application is accessed using a smart phone, it is necessary that the user is able to access the camera to take photos and also geolocation so that the user can provide those information without a hassle. Therefore it is important to ensure that Progressive Web Application (PWA) is delivered to the users who use a smartphone or tablet to access the system so that necessary hardware can be accessed. If the person who is providing information wants to

keep any field, including the fields for providing contact information, blank, he or she may do so. However if the person who submit information is keeping any field black he or she must be tactfully encouraged to fill that field in a very polite and user friendly manner by displaying a message to inspire that person to fill that field (by explaining the importance of providing information to PUCSL, that this is a national cause, etc.), etc. Not only the members of general public but also the staff of designated organizations (such as CEB, LECO, etc.) can use smartphones, tablets, etc. to access the system.

Staff of designated organizations will be issued user name and password and they always have to sign-in before providing information. Members of general public can submit information without signing-in but they must be encouraged to provide their contact details so that PUCSL staff can contact them and make further clarification. However if someone wants to provide information anonymously they can do it (because receiving information about accidents is the primary goal). It must be possible for the administrator to determine (via the Admin panel in the external interface) which fields in the form meant for members of general public are mandatory and which fields are optional (by clicking checkboxes in the admin panel). If it is required to ensure that general public cannot submit reports without providing contact information then it must be possible to do so via the admin panel.

(This interface has to be highly intuitive, user friendly and self-guiding. It should assist any person to enter data in minimum time, without any training and without any hassle. The interface must engage the user without intimidating him or her. For instance, the user must be assisted to provide the best possible cause of incident though it might involve some technical knowledge and/or jargon. The screen area available for displaying the interface to the user must be properly used. The best available technology for implementing the most productive and friendliest user interfaces must be used.)

(iii)   Once such information is received by PUCSL, it is up to the PUCSL staff to contact the information submitting party (or any other organization) and obtain other necessary information (which can be input to the system via the set of internal interfaces, mentioned in (i) (b) above). PUCSL staff is expected to make telephone calls, send emails/faxes/letters, make inspections, etc. to obtain other necessary information to complete the record, initiated by an external data submitting party such as a designated party of a member of general party. (When entering additional information, obtained via offline means, in the internal interface, it must be possible for the PUCSL staff to record the identity of the information provider, date of receipt of information, so that if a requirement to audit arises to find out who provided what, when, etc., it must be possible. With respect to the same incident, it may be possible that PUCSL obtains additional information from multiple parties, via offline means, such as telephone, email, fax, letters, etc. and also by making inspections.)

There is an existing system used by certain licensees (such as CEB, LECO) to submit data to PUCSL. This system has been developed using a MySQL database. Details of incidents can be submitted to this system and it is required to display the information in this system also using the internal interface so that PUCSL staff can automatically transfer data in that MySQL database of the existing system to the system to be developed via the internal user interface. Some of the tables in that MySQL database server are

mentioned in the appendix at the end of this document. It must be possible for PUCSL staff to selectively transfer data from the existing system to the system to be developed. i.e. the facility must be there to deselect a field (by unticking a checkbox appearing adjacent to that field) that is not required to be transferred from the existing system. Also the fields used to display data, to be transferred, must be editable so that if PUCSL staff need they can edit data before transferring.

(iv)   As described above, external interface will be available for the members of general public and they also can provide information about incidents anonymously or after providing identification details to PUCSL. If the person who has submitted information about an incident has provided his contact details such as a phone number then, PUCSL staff can obtain further information from that person also but if that person has not submitted any contact details then PUCSL will have to depend on police stations, hospitals, etc. nearby to obtain further information.

(v)   As mentioned above, if any person (i.e. staff of designated organization or a member of general public) uses a smart phone or tablet to access the external interfaces of the system to provide information to PUCSL, a Progressive Web Application must be delivered to that user because mobile devices could be the best method of reporting incidents, due to the possibility of capturing GPS coordinates, photos, etc., which are not very easy with computer based applications) to provide information to PUCSL. PWAs must be able to access necessary hardware (such as camera, geolocation, etc.) on both Android and iOS devices to the maximum level possible. The primary purpose of allowing those who provide information to use a PWA is to let them to use the camera of a phone via the PWA so that they can easily take one or more photograph of the incident, victims, cause of incident, unsafe, risky, dangerous, etc. situations, etc.) and send them to the PUCSL. The PWA should minimize keying-in of data. For instance, it should detect the area that the user of the handheld device is currently in and it should fill location details for the user (which the user can edit if he or she desires.) For this purpose a mapping system can be used to map the location of the device to a region in a list. The Date field can also be treated in the same manner. Filling the other fields in the external interface must also be user friendly. i.e. suggestions should be displayed so that the user can select what is appropriate. (For this, a dictionary of frequently used terms for reporting incidents will be made use of. This dictionary must be consisting of words belonging to Sinhala, Tamil and English languages and relevant as far as reporting incidents to PUCSL is concerned. External interface running on both mobile devices and computers would contain forms with fields where suggestions appear based on the few characters that a user keys-in or types – not necessarily the first few characters or adjacent characters of words – so that user can pick a suggestion or keeps on keying-in or typing if the user is not satisfied with the suggestions. However it must be ensured that the algorithm and its implementation used in this regard consumes only the minimum amount of computing resources required for the purpose and the computing resources are not unnecessarily wasted. It must be possible to periodically update the dictionaries –in all three languages – used for making suggestions, via the admin panel.) The PWA must be able to access the camera of the device and the user must be able to operate the camera via the App to take photos and upload them instantly (like in popular mobile apps such as WhatsApp). The PWA should ask the user whether he or she wants to send location details by sending GPS coordinates and if the user agrees PUCSL should receive those location details. (This is in addition to

the region selected based on the location of the device. That field is viewable and editable by the user and based on the location of the device a region is selected from a list, which the user can change if the user wants. However the GPS coordinates of the device are separately sent to PUCSL if the user agrees and the user is not required to view or edit them.) External interfaces (PWA or otherwise) should ensure that they provide best possible user experience to the end users by using the best technologies available. Users should not feel a difference with respect to the user experience provided by external interfaces of the proposed system and the user experience provided by other web based systems developed using the best technologies available. PWA must be aware of the presence the computing resources available on mobile device and if the PWA experiences any resource constraints then the PWA must behave in an appropriate manner. As certain users may be using mobile devices that have only a limited amount of computing power, it is necessary to execute programs in a resource conscious manner.

(vi)   While the first version of the proposed system of IRS is expected to build a culture of information submitting to PUCSL with respect to electricity related accident by using an information system, the 2nd, 3rd, etc. version of IRS (which would be implemented in 2021, 2022, etc,) would move fields from the internal interface to the external interface (based on the experiences such as whether the information submitting parties are actually in possession of such information and are willing to provide them to PUCSL, whether PUCSL really needs them, etc.) The interfaces developed in the 2nd, 3rd, etc. versions of the IRS would be more customized and each designated organization will have a separate customized interface that matches the context pertaining to that organization. (i.e once an officer of any designated organization signs-in the interface customized for that organization will be displayed to that officer. As far as the first version of the proposed system is concerned, the customization would be limited to displaying the name, logo, etc. of the designated organization to the signed-in user.) However these subsequent versions (i.e. 2nd version, 3rd version, etc.) are beyond the scope of this document, the scope of this phase of the project and the financial consideration.

PUCSL will have to make some effort as far as this social engineering aspect is concerned in order to evolve this culture and encourage those designated organizations and their staff (and the members of general public) to provide more and more information to PUCSL. The external interface of the 1st first version of IRS should support is effort. The external interface of the 1st first version of IRS should not become a barrier between PUCSL and the designated organization and their staff. It should bridge the PUCSL and the designated organizations and their staff (and also the members of general public). Similarly PUCSL will have to make the general public aware about the availability of this web based application and encourage them to provide information to PUCSL with respect to electricity related accidents.

(vii) As explained above, 2nd, 3rd, etc. versions of the system will have customized interfaces for CEB, LECO, Department of Police, Ministry of Health, Department of Labour, etc. based on what information they have and what they are willing to provide to PUCSL (and also what PUCSL really needs). The goal is to move all the fields (or as much fields as possible) in the internal data input interface to the respective external interfaces used by CEB, LECO, Department of Police, Ministry of Health, Department of Labour, Insurance Organizations, etc. with the nth version of the IRS and get those organizations to provide

those information without waiting for PUCSL to prompt them. However PUCSL has realized based on its experience so far that it is not something that can be achieved soon. Therefore even though PUCSL has planned it, those subsequent versions are neither included in this stage of the project nor are they scheduled yet. Therefore neither the user interfaces nor the fields in the interfaces used by external parties (in the 1st version of IRS and therefore pertaining to this stage) should not discomfort the staff of information submitting organizations (or members of general public) and discourage them from reporting incidents to PUCSL. The 1st version of IRS must ensure that the relationship it builds between the PUCSL and the designated organizations (and also the PUCSL and the general public) is healthy and it is receiving the basic information pertaining to incidents without straining the relationship with the designated organizations (and also the members of general public) and there will be subsequent versions of IRS also.

(viii) PUCSL will accept information from members of general public through the Web based information system, email, fax, telephone calls, postal mail, telegram, messaging systems (such as WhatsApp, Viber, Telegram, Imo, facebook messaging, Instagram messaging, etc.) etc. and PUCSL staff will have to input any information received via methods other than web based information system through the internal interface of the system. (It must be possible for the PUCSL staff record from which method it has received information i.e. whether Web based application, postal mail, fax, WhatsApp, etc.)

(ix) PUCSL staff will determine which information is reliable and based on that, it will transfer such believable information to a trusted system (which is accessible via the internal interface), which would be used for generation of reports. The IRS should automate this transferring of information from the first system (i.e. the system that receives information from the external interface) to the second system (i.e. the trusted system) so that the manual work that needs to be carried out PUCSL staff is very minimum. The second system must be capable of generating and providing all necessary reports that can be generated with the available data (in various formats, tabulated data, bar charts, pie charts and various other types of charts, including 3-D charts, CSV files, PDF files, charts as PNG, JPG images, that can be inserted into MS Word documents, etc.). There must be a graphical method to construct the query that can be run to get the report. Output of some of the queries can be a PDF file. It must be possible to show geographical reports using maps of Sri Lanka where it may be required to depict the boundaries of districts and provinces in Sri Lanka in order to generate reports. It must be possible to click a certain geographic area (such as a district or province) or hover a mouse point over a geographic area and obtain further reports pertaining to that area.

(x) Designated organization can review and/or edit any information submitted by them after signing-in and also obtain certain reports involving the information submitted by them. However this facility will not be available for the members of the general public. It is available only for the designated organizations who can access the system by providing the credential issued to them. The system should log all the history of modifications made with respect to who did what when from where etc. so that the modifications (including what was there before the modifications) can be easily seen. The users must be able to change their passwords, reset passwords via an email link if they forget passwords, etc.

(A diagrammatic representation of the proposed system is added as a supplement to this document.)

What is mentioned about is a summary of the requirements (for instance this document does not describe details such as a designated organization can assign multiple officers to provide information to PUCSL, those officers can change, new officers can come, etc. and how the multiple signing-in accounts provided for each designated organization must be managed, etc.) and the selected bidder is expected to carry out an exhaustive and accurate requirement gathering and prepare a requirement specification before starting the implementation The selected bidder must be able to design user friendly interfaces (for instances, for facilitating editing previously provided information, etc.) This document does not discuss how UX must be taken care of. For instance, consistency must be maintained across different devices, screen sizes, resolutions, etc. in the best possible manner because a user can alternatively use any of the client side (external) interfaces. By using the same credentials, a user can sign-in to the system using any client side device and submit information to the PUCSL (in the case of a staff member of designated organization providing information to PUCSL).

The internal interface, where information received by PUCSL is managed, will have three tabs. The first one for displaying / editing / transferring information received from the external interface. The second one to display / edit / transfer information received by the existing system. The third one to enter data received via offline systems such as postal mail, fax, etc. The internal interface will have 25 – 50 fields, which would be filled by PUCSL staff (after obtaining information from various parties) and their details are not included in this document. Those fields can be of different types such as text boxes, text areas, drop down menus, check boxes, radio buttons, file uploads, etc. In the internal interface it must be possible to earmark either a report (submitted by a designated organization or a member of general public) or any filed in such a record as trustworthy information and when generating reports it must be possible to select whether all information are used for report generation or only the records or fields marked as believable are used. It must be possible for the PUCSL staff to use the internal interface to create new records (based on information received via postal mail, WhatsApp, fax, etc) and it must be possible to upload evidence of such information also. (For instance, a scanned image of a fax received, screenshot of a WhatsApp message received, etc.) The External interface must support all three languages, i.e. Sinhala, Tamil and English. It is sufficient for the internal interface to be available in English. However it must be possible for both internal and external users to be able to input data using multiple languages even within a single field. The users of mobile devices must also be able to provide information in all three languages.

General Requirements

Based on above the descriptions, the vendor should gather and analyze requirements thoroughly to ensure that the vendor completely understands the requirements, existing business processes and objectives of PUCSL and provide a solution that can fulfill the requirements of PUCSL. The vendor should exhaustively test the solution before providing the solution and assure the quality of it before delivering. The vendor should carry out verification testing and validation testing for ensuring that it has fully understood the requirements of PUCSL and the solution it provides can meet the requirements of PUCSL. The user interfaces must be intuitive so that external users and PUCSL staff can know what needs to be done without depending on user manuals. The user interfaces must facilitate carrying out the tasks in an efficient manner and with minimum effort without negatively affecting the staff productivity. The vendor should provide adequate training for PUCSL staff to ensure that they can use the system on their own without waiting for assistance. The vendor should provide separate user manual for each user role and the user manual must be updated if the solutions is amended from time to time.

Paths of the websites should not be hard coded and no frame-work that requires to hard code the paths should be used. It is essential that PUCSL must be able to change the IP address, domain name, etc. of the server where the system is hosted without having to modify the system (or deploy the system on a different platform with a different IP address, domain name, etc. without having to modify any configuration, code, etc. This is important for automating the restoration and testing of backups.). As the system to be hosted in the in-house data centre of PUCSL, it is important that outside users (such as the members of the general public or any designated organization) can access the system using a public IP address or a domain name and the internal users (such as PUCSL staff) can access the system using a private IP address. (The PUCSL firewall requires to impose rules as to who can access what.) Therefore it must be possible to access the same application using multiple paths (for defining different security levels) and the access path must not be hard coded under any circumstances.

PUCSL has virtualized its servers using ESXi and CentOS Operating system and Apache Web server would be used for hosting the system. MySQL would be the database. The server has both PHP and Node.js. The Web based information system must be developed using Linux Apache MySQL PHP (LAMP) Technologies. The OS used is CentOS 7. The selected bidder must be ready to work with the existing MySQL database Server of PUCSL (which would be either MySQL 5.7 or MySQL 8). The selected bidder can use either PHP (version 7) or Node.js (version 13) for development.

Full strength of the latest front end technologies such as HTML5, CSS3, JavaScript libraries must be used for ensuring that the user interfaces have been implemented in the most user friendly manner in order to provide the best user experience and the users, who are familiar with the web based systems that make use of latest front end technologies, should not feel a difference when using the Incident Reporting System.

It is essential that all user interfaces, forms, dashboards, workflows, etc. are designed and implemented in the most rational manner. It is imperative that the most logical, efficient and user friendly interfaces, forms, dashboard, workflows, etc. (realisable with the currently available technology) are achieved by the developer and it should not be possible for others to propose more logical, more efficient, more user friendly interfaces, forms, workflows, dashboards, etc. Improving the efficiency, user-friendliness, etc. of forms, dashboards, interfaces, work-flows, etc. is always the responsibility of the selected bidder. All user interfaces, forms, dashboards workflows, etc. must be optimized for the requirements of PUCSL and the users must be able to complete their tasks in the minimum possible time and in the minimum possible number of steps. The Dashboards, forms, interfaces, workflows, etc. must be designed and implemented in a professional manner and their appearance must suit an official environment.

All data must be recoded in a database in the common PUCSL MySQL database server and any report required must be able to be generated.

The system should not unnecessarily consume the computing resources of client devices (CPU, memory, network, storage, etc.) and inconvenience the users. The developers should ensure that the system runs with the minimum amount of computing resources necessary.

Latest practices pertaining to development of Web based information systems (including Progressive Web Applications) must be used.

Web based information system must be efficient and no unnecessary delays must be added to user experience by generating unnecessary http requests and downloading unnecessary files, which are not needed to generate the content that is displayed to the end user. (Some of the users who access this

system – i.e. the external set of interfaces – may be accessing it from remote areas of the country, who might experience bandwidth constraints.)

Filling forms, proceeding along workflows, etc. must be free of unnecessary steps, unnecessary mouse-clicks, etc. that can add only delays, inefficiencies and inconveniences.

All content that is sent to the users' browsers (or required to generate content) must reside within the PUCSL Web server. The system should not download files from external sources (except where it is unavoidable such as generating captcha).

If the selected bidder is using any third-party frameworks, libraries, etc. their limitations should not prevent the developer company from fulfilling requirements of PUCSL or achieving the best possible solutions.

The selected bidder must ensure that the system (including but not limited to user interfaces, dashboards, forms, workflows, etc.) can only be used for the intended purpose and user cannot use the system in unintended manners.)

Captcha must be used in a user friendly manner. Captcha should not be displayed to users every time a user loads a form into his or her client device. A user must be prompted to prove that he or she is a human, only if suspicious behaviour is detected. If the system experiences an unusual increase in traffic, it must be possible to display captcha in the forms and challenge users to prove that they are humans and not robots. Tightening of security should not badly affect the user experience.

IRS (including the database) must be implemented in a secure manner.

There must be two different sets of PHP (or Node.js) files – one to be used by the external users and another to be used by the internal PUCSL staff and should reside in two different directories. If it is required to prevent the outside users accessing the directory meant for the internal users, it must be possible to do so.

Email notifications must be sent to all relevant stakeholders, with respect to all necessary activities.

All necessary activities must be logged so as to facilitate investigating who did what when from where. (This logging is apart from what is mentioned under (x). Logging mentioned under (x) is visible to the external user also who did the modification. But logs mentioned here are accessible only by PUCSL staff.) If any piece of information is modified by a user, all previous data must be retained in the system and must be verifiable by the auditors. This includes all email messages sent and it must be possible to verify what messages were sent when and to whom.

It is the responsibility of the selected bidder to test the final system, to be delivered fully, and correct all bugs before delivering and the selected bidder is required to have sufficient QA staff and QA tools in order to deliver a defect-free system.

The system would be deployed in the in-house data centre of PUCSL where a virtual server (CentOS 7 running on ESXi) would be allocated for running the system.

Only the signed-in users can access the system (except the members of general public who would submit information).

Users have to sign-in before using the system and only the signed-in users are allowed to access the system (except the members of general public). Signing-in, signing-out, (there is no sign-up because

the PUCSL will register all the designated organizations and their staff in the system and the PUCSL will issue the user names and passwords), forget password, prohibiting weak passwords (including setting password validity periods, password expiry, character combinations, maintaining password history & avoiding repetitions, and other common password rules), encrypting/hashing passwords, etc. mechanisms pertaining to user authentication must be available. If a user forgets the password, a link that would get expired in a few hours would be sent to the email address registered in the system (i.e registered in the system by PUCSL). An admin user (i.e. PUCSL) must be able to block / unblock user accounts, reset passwords, etc. The admin user must be able to create new accounts while registering a new designated organization (such as CEB, LECO, Police, Hospitals, etc.) and their staff who are involved with submitting incident reports via the system to PUCSL. When creating a new account for a designated organization, it must be possible to (optionally) upload the logo of that organization so that the logo of the respective organization (and also PUCSL logo) would be displayed when staff of that respective organization signs-in (in order to present a customized view to the user). A designated organization may have more than one officer (therefore more than one account) for submitting information to PUCSL via the system. (Officers must be organized under each designated organization.) Admin panel may also use the logos of designated organizations for enhancing clarity. It must be a mandatory requirement to change any PUCSL issued password at the time of signing-in (users should not be allowed to sign-in without changing the password before signing-in, if the password has been issued by PUCSL). PUCSL must be able to change the email address and transfer an account to a different officer of the designated organization.

The delivered product must be of production grade. It should not be a proof of concept.

The entire project must be fully completed within six (6) months from the date of Purchase Order (PO). The selected bidder is advised to plan to finish the entire project before the end of the six month period so that any project slippage due to unforeseen issues can be accommodated and still the entire project can be fully completed within six (6) months from the date of PO. The selected bidder must ensure that adequate resources are available for the project at correct time and the issues that can result in delays are identified and addressed in advance. The tasks that can be executed in parallel must be carried out simultaneously to ensure that the selected bidder completes the project in the minimum possible time. The project managers of the selected bidder must ensure that the delivered product meets the necessary quality requirements, meets all deadlines and the entire project is fully completed within six (6) months from the date of PO.

The external interface of the system must be mobile friendly. The internal interface is not required to be able to be used with mobile devices.

Testing the software and assuring the quality of it for going live and using it in a production environment is the responsibility of the selected developer. Selected bidder should have adequate QA staff and QA tools for automated testing, etc. to ensure quality and as PUCSL has neither QA staff nor QA tools, PUCSL should not be expected to do any QA. The delivered product should pass the software verification and software validation tests and the selected developer must be able to confirm that the delivered product can be used for the operations of PUCSL in a productive manner.

All manuals (such as installation manual, administration manual, user manuals for different roles such as external applicants and internal PUCSL staff, etc.) must be separately provided. PUCSL should receive the manuals that need to be provided to the staff of designated organizations so that they can sign-in and use the external interface to provide information to PUCSL.

All source codes, including installation files, configuration files, etc. must be submitted to PUCSL.

Training must be provided to PUCSL staff. Updated user manuals must be also be provided for each user role. If the system is modified the user manuals (including the installation manual, if necessary) must also be updated and provided to PUCSL. (This includes the user manuals that are issued to the staff of designated organizations also.)

Warranty must be provided for a period of four (4) months from the date of going live. All errors, bugs, shortcomings, etc. within the scope of the project and affect the quality of the delivered product reported within the first four (4) months from the date of going live must be fixed by the vendor free of charge.

The selected bidder should agree to enter into a Service Level Agreement (SLA) for a period of three (3) years renewable at the beginning of each year so that the bidder can provide necessary support for PUCSL staff and also carry out minor modifications to maintain the application. The price quoted for SLA must include 50 man hours and the cost of any additional work carried out would be calculated at the same rate. The period of SLA would begin, after the end of the 4 month warranty period.

Suitability of the software development company

The selected bidder must fulfil the following criteria:

- The software development company must be in active business operations for a minimum period of 5 years in the field of implementing web based information systems (using LAMP stack) with an annual turnover not less than Rs. 25 Million.
- The software development company must be familiar with developing complex workflows in the most user friendly manner, using the best available technology.
- The software development company must have developed at least three web based information systems with a substantially large scope during the last two years for reputed clients whose annual turnover exceeds Rs. 50 million.
- Those software systems must be non-trivial and must successfully be used by multiple users in a frequent manner and generating heavy traffic and creating a considerable workload on the application. As far as those three software systems are concerned, the user interfaces, dashboards, workflows, forms, etc. must have been implemented in the best possible manner (without any unnecessary mouse clicks, inefficiencies, users having to waste their time due to limitations in the product, etc.) and it must be possible for the client to obtain any necessary reports from the system.
- If necessary, PUCSL will want to examine the software systems delivered to other clients as part of the proposal evaluation and the bidder must be prepared to allow PUCSL to check the systems that have been delivered to other clients. Clients must be using the delivered systems in production environment.
- The bidders must have employed qualified and experienced staff who can gather requirements of the client and deliver the correct system that can pass both verification and validation tests.

Appendix

Some of the tables in the MySQL database of the existing system are mentioned below:

The table for recording the details of Incidents

Column	Type	Null
incident_id	varchar(10)	No
incident_ref	varchar(45)	No
revision_no	int(11)	No
cat_id	varchar(10)	No
prev_reference	varchar(10)	No
date_of_incident	date	No
address	varchar(250)	No
district	varchar(10)	No
police_div	varchar(10)	No
div_sec	varchar(10)	No
lic_type	varchar(10)	No
no_of_cas	int(5)	No
no_of_prp_dmg	int(5)	No
tp_of_plc	varchar(20)	No
othr	text	No
sys_voltage	varchar(20)	No
sys_type	varchar(20)	No
prot_oprt	int(1)	No
ovrh_ln_height	decimal(10,2)	No
ovrh_ln_napp	int(1)	No
ovrh_ln_alive	varchar(20)	No
ovrh_ln_al_napp	int(1)	No
case_of_evnt	text	No
others	int(11)	No
others_dets	text	No
consq_evnt	text	No
sumry_evnt	text	No
action_tkn	text	No
pre_act	text	No
recorded_on	date	No
recorded_by	varchar(10)	No
last_updated_date	date	No
seq_no	int(11)	No
re_sbmt_seq	int(11)	No
prvs_incident_id	varchar(10)	Yes
rmnder_stats	int(11)	No

The table for recording human causalities

Column	Type	Null
rowno	int(11)	No
incident_id	varchar(10)	No
per_name	varchar(100)	No
gender	char(1)	No
nic_passprt	varchar(20)	No
age	int(5)	No
inj_type	varchar(100)	No
vic_occ_stat	varchar(20)	No
revision_no	int(11)	No

The table for recording property damage

Column	Type	Null
rowno	int(11)	No
incident_id	varchar(10)	No
prp_type	varchar(20)	No
descrpn	text	No
revision_no	int(11)	No

Incident Reporting System

To be Carried out by Information provider

To be Carried out by PUCSL staff

Existing System

Web Application
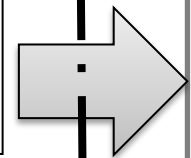
Can be accessed using computers, tablets, smartphones, etc.

Designated Organizations

1) Ceylon Electricity Board
2) Lanka Electricity Company
3) Department of Police
4) Ministry of Health
5) Insurance Companies
6) Department of Labour

General Public
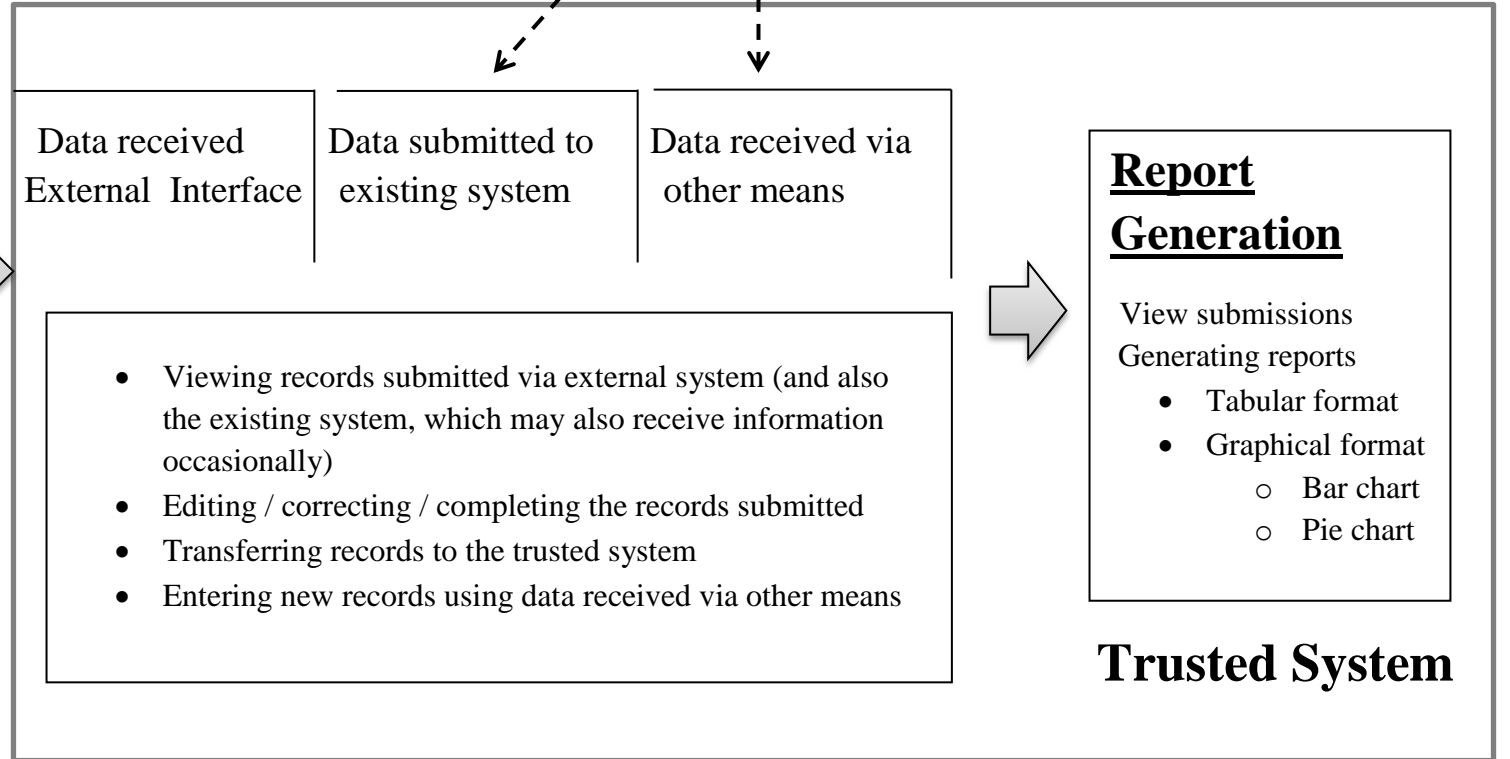
External System

Data received External Interface

Data submitted to existing system

Data received via other means

- Viewing records submitted via external system (and also the existing system, which may also receive information occasionally)
- Editing / correcting / completing the records submitted
- Transferring records to the trusted system
- Entering new records using data received via other means

Report Generation

View submissions
Generating reports
- Tabular format
- Graphical format
  o Bar chart
  o Pie chart

Trusted System

Postal mail
Fax
Email
Whats app/Viber/Imo/Telegram
Facebook/Instagram Messaging

Submitting data via other means

Internal System