**Terms of Reference**

**Enhancement of the Bhutan Electoral Roll Management System (BERMS 2.0)**

**Background**

The Constitution of the Kingdom of Bhutan and the Electoral Laws of the country mandates the Election Commission of Bhutan to register all eligible voters of the country and maintain an updated list of voters for any type of elections, at all times. Therefore it has become of utmost importance in the update and maintenance of a reliable and accurate system which shall render uninterrupted services in all types of electorate management.

**Objectives of the System**

The main objectives of the updated system from the previous shall be;

1. Management of Electoral Registration for production of accurate and credible Electoral Rolls and Voter Photo Identity Cards for any type of Elections at any point of time.
2. Flagging eligible Postal Voters which will assist in registration of all interested and approved Postal Voters and further capturing their correct postal details This will help in the production and listing of accurate and credible Postal Voters List as and when required.
3. Further improve the electoral process by speeding up identification and verification of registered voters through the use of EROLL Search System in every Polling Station.
4. Develop mobile app for users to search voter and postal voter information, and view notifications.

**Technical Terms and Conditions**

1. **System Architecture**
The architecture of the system should be component based on the previous version of BERMS and the components should be able to be separated or integrated easily. The components must be well defined so that modules can be reused where and when necessary with the adoption of the Modular Approach in the design. The vendor must identify some of these modules and must be described in their technical proposal on how it shall be achieved. It is highly expected that the vendors would add more value to the existing and proposed solution by incorporating their suggestions and recommendations, which will further address increase in Performance, High Availability, Optimum Security, Scalability, and Manageability.
2. **Platform and Technology**
	1. The proposed system must be developed on the open-source web-based technology, with database storage in MariaDB normalized database, and run on a Linux based server.
	2. Laravel Framework, with bootstrap for front-end UI, with backend script of PHP and JQuery must be used, and the same should be spelled out in the SRS.
	3. SMS Based Notification must be incorporated whenever and wherever required.
	4. The proposed system should be integrated with the Civil Registry Database via API to capture information (Details and Photo).
	5. The application shall have tutorial documentation, for the purpose of educating new users as well as point of reference.
	6. In case the vendor choose to propose any third-party tool(s) for the solution for tuning performance, adding security features, or rapid application development, or any specific add-in software package required for analysis and processing data, full justifications must be provided in the proposal.
	7. Mobile app should be developed both for android and ios.
3. **Security and Audit Trials**
The audit trail feature should be available in the proposed system, which will contain log information on the usage (Create, Update & Delete) of data in any form. The system should also have the capacity to capture and preserve time series data so that certain information is not lost with the passage of time and repeated update. The system should be free of bugs and malfunctions which inadvertently or by design, permit the users to tamper, alter or modify any data without the appropriate permissions. The following are some of the security issues, but not limited to, which must be addressed in the proposal.
	1. The system would ensure that the users follow login procedures with two-step verification (SMS based). The login should also be secured with Google reCaptcha.
	2. The access to the database should be based on the user roles assigned by the Administrator of the Commission.
	3. A proper audit trail must be built within the proposed system.
	4. SSL Certificate should be installed.

In case of any failure in the implementation of the above, the vendor shall be liable for penalty.

1. **Development Methodology**The development of this assignment shall extend to the following major milestones of the Project:
	1. Brainstorming with Officials from related office (Dzongkhag and Head Office) of the Election Commission of Bhutan to draw a **detailed Software Requirement Specifications (SRS)**.
	2. The SRS will be discussed with other stakeholders recognized by the Election Commission of Bhutan and related Departments and Divisions for further improvement wherever necessary. The vendor shall then develop the To-Be workflow diagram accordingly with the detailed SRS.
	3. The SRS document along with To-Be workflow diagram will be presented to the Commission for approval.
	4. After the adaption, the vendor will step in to the design of a prototype system and further present it to the Commission. The prototype shall be endorsed for further development after the Commission’s agreement.
	5. Coding and development of a complete solution for the requirements as specified in the SRS Document and the prototype system endorsed by the Commission shall begin.
	6. Conduct comprehensive system testing and end user acceptance testing for at-least a month prior to the implementation of the system.

However, while enhancing the Bhutan Electoral Management Systems (BERMS), the vendor must ensure that the working of previous version is not disturbed.

1. **Network connectivity**The proposed system would use the existing Local Area Network (LAN) covering all its Divisions. The external agencies should connect and communicate with the premises using leased line facilities and/or web-based interfaces. The client will be responsible for initial setting up of the Linux Server and Database Server and providing connectivity to the LAN. However, uploading of the system, maintenance of the server once the application is uploaded will be done by the vendor under the Warranty Support and Annual Maintenance Contract thereafter.
2. **Re-engineering of the Processes**
The vendor must try to re-engineer the processes wherever possible so that system can be optimally utilized instead of merely adding features on the previous version of BERMS.
3. **Ownership of Source Code and other Intellectual Property**
The Election Commission of Bhutan (ECB) will be the rightful owners of the Source Code and all Intellectual Property associated with the system and they will have full rights over the ways they can use these resources. The Bhutan Electoral Management System so developed will be the sole property of the Election Commission of Bhutan. The Software Development Vendor (SDV) will have no right to commercially use or apply the software elsewhere.
4. **Warranty, Support, Maintenance & Change Management**
Provide necessary technical support in the management of the system, which may also include the addition as few functionalities that may have been missed out in the SRS Document, to the ICT Division for a minimum of two years after the completion of the project. During the above mentioned warranty period, the vendor will be responsible for making any changes as well as to fix the bugs.
5. **End User training.**
In coordination with the ICT Division, the vendor should carry out the Implementation of the system and training of key end-users.
6. **Knowledge transfer**The ICT Officials from the Election Commission of Bhutan shall work hand to hand with the selected vendor during the phase of development. Knowledge on Database Management, Coding, Backup and Recovery shall be shared from one to another during the process.
7. **Proposed Modules of the System**The proposed system shall consist of the following major modules, of which some are to be upgraded and some to be newly added.
* User Login
User login with Two-Step Verification (SMS Based) with Google reCaptcha and Forgot password functionality to reset password via email or OTP.
* Dashboard
Dashboard with at a glance summary reports in graphical and tabular format.
* System Administration & User Module
	+ User Management andRole Management
* Electoral Registration Module
The Electoral Registration Module is the core of this system and shall comprise of the following sub-modules;
	+ Voters Information Gathering
	+ Registration of new voters
	+ Deregistration of voters
	+ Change in address of individual voters
* Delimitation Module
The Delimitation Module should capture and maintain the details of all the Demkhongs as per the final Delimitation Order and map each household to their respective Parliamentary Demkhong and the Local Government Demkhong. The users should be able to find out the following details of every registered voter using their unique household numbers;
	+ Parliamentary Demkhong details
	+ Local Government Demkhong details
	+ Details of Polling Station allocated for both the types of elections
* Electoral Roll Module
This module should be able to generate the cover, summary and Electoral Roll, in draft and final versions. The Electoral roll should be available for both general and postal voters.
* VPIC Module
This module should be able to generate and print VPIC Card of voters (Single and Multiple) while keeping the record of issuer and receiver with time of issue.
* Postal Voters Management Module
This module should capture the information of Postal Voters for the particular election.
* ERoll Search and Identification of Voters Module
This module should be a replica of the Stand-Alone version, Electoral Roll Search System (ERSS), and should be able to update voter turnout information at a go.
* Reporting ModuleGeneral summary and detailed reports in tabular and graphical format as needed.
* SQL Generator
This module should be able to generate reports upon providing SQL Statements.
* Mobile app
The mobile app should be able to search for voter information and postal voter information using vpic and date of birth

The detailed functionality of every module shall be discussed during brainstorming and consultation meetings.Over and above any new ideas that may be conceived during that time.

**Bidder Selection/Firm Selection**

1. Study the existing system (BERMS 2.0) and its various stages of work in consultation with ICT Division and Department of Electoral Registration and apply re-engineering wherever possible.
2. In consultation with ICT Division and Department of Electoral Registration discuss inclusion of NEW modules. Develop a proposal along with TO-BE workflow diagram from re-engineering and new modules.
3. All the bidders shall present a project proposal to the commission for selection based on presentation and their financial quotation.

**Work Schedule**

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| --- | --- | --- | --- | --- | --- | --- |
| **Work Schedule** | **Nov 2019** | **Dec 2019** | **Jan 2020** | **Feb 2020** | **Mar 2020** | **Apr 2020** |
| Call for EOI |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Presentation, Evaluation and Awarding of Tender |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Signing of Contract Agreement |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Requirement Gathering and Brainstorming |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Completion of the SRS Document and adaption |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Completion of prototyping and Drawing Board and coding and development. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| System testing and Acceptance/Stabilization |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UAT (User Acceptance Testing) & End User Training |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Payment Terms**

The Election Commission of Bhutan shall release the payment for this assignment in phases, upon completion of the major milestones as indicated below;

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| --- | --- | --- | --- |
| Sl No. | Milestone | Payment % | Deliverables |
| 1 | Completion of Requirement Analysis | 10% | SRS Document |
| 2 | Completion of Prototyping | 10% | Prototype System |
| 3 | Completion of Coding/Development | 30% | Fully Functional System |
| 4 | Completion User Acceptance Testing | 20% | Acceptance Test Certificate |
| 5 | Completion of End User Training | 20% | User Manual |
| 6 | End of Warranty Period | 10% |  |

**Post Implementation Requirements**

The System shall be put through live testing phase during the up-coming LG Elections 2021 and finalized and accepted upon completion of the next Parliamentary Elections in 2023. Until then the ECB shall not release the final 10% of the total amount quoted and the firm must provide technical support and backstopping to the ECB.

**General Terms & Conditions**