Terms of Reference (TOR) [Draft]
Intelligent Land Knowledge Management System

Ministry of Land
Government of Bangladesh

Date:

Background

Bangladesh is now going through a digital age. Peoples are deeply involved with land. The common people have to receive land related various services on in regular basis. Ministry of Land (MoL) has launched online activities to make land related services more accessible to the people. Various laws/acts, ordinance, rules/regulations, policies, circulars, guidelines, notifications, office order, memorandum of understanding (MoU), manuals, gazettes and other documents with legal status are related to land. Most of the time citizens are not aware with their required public documents and all those documents are not available to them. That's why the citizens are facing huge losses in the land related matters. As a result, it becomes necessary to approach the middlemen / brokers. Bangladesh government took decision to empower the citizens in every sector who can directly operate the GoB service sector as well as land service through Information and Communication Technology (ICT).

Ministry of Land is responsible to form various land related laws/acts, ordinance, rules/regulations, policies, circulars, guidelines, notifications, office order, memorandum of understanding (MoU), manuals, gazettes, and other documents with legal status. And they are also responsible for amending/correcting and canceling all those documents. Citizens are frequently use the need based above public documents in regular basis. So, it is very much important to make it available for the citizen.

For the empowerment of the citizens regarding land service Ministry of Land took several initiatives from the last couple of years. In the reference of these activities Ministry of Land launched Website (www.minland.gov.bd) which is consisting huge volume of data (like laws/acts, ordinance, rules/regulations, policies, circulars, guidelines, notifications, office order, manuals, gazettes etc.), Land Service Portal (www.land.gov.bd) for ensuring land service from a single point. From the above activities there are a lot of published data haphazardly and which is not citizen centric regarding land related public documents. Ministry of Land also published scanned land manuals on website and launched an EBook (www.ebook.land.gov.bd) of scanned land related small number of public documents. But using this EBook citizens couldn't easily or frequently search the documents and failed to traverse the documents also. This existing system don't consist of the segregated documents and the status of the documents. At that time the system has partially developed as static online version for the service provider, citizens by which Ministry of Land couldn't reduce the gap between them. So, Ministry of Land can make all the public documents available, accessible, authenticate, advice to the citizen from a single platform as like as international popular EBook with extraordinary deep learner advisory feature for reducing the gap with service provider. The system will preserve all segregated documents, knowledge so that land related information will be smartly accessible. Book creation and publishing facilities with a particular land service sections of an act, rules, circulars, and other documents that will help to provide land services.

Objectives

The overall objectives of this proposed system are mentioned below:

1. To available all public documents (laws/acts, ordinance, rules/regulations, policies, circulars, guidelines, notifications, office order, memorandum of understanding (MoU), manuals, gazettes, other documents with legal status and to publish) from a single digitized platform and easily can be accessible from anywhere in the world.
2. To mitigate the knowledge gap and to establish a strong interrelation between service provider and stakeholder (like citizens, legal practitioner etc.).
3. To transformation and preservation of all public documents into full text data with national/international standard bibliographic metadata format so that all documents can be reusable and promotable.
4. To provide necessary text reference on public documents for acquiring deep knowledge and provide authorized GoB public document reference (such as Laws of Bangladesh, Bangladesh Gazettes Archive, National *Archives* of *Bangladesh* etc.) with scanned original copy from which the documents are stands for. Providing facilitation among the related documents so that user can traverse (Back and Forth) from one document to another.
5. To produce the different books/documents with different standard/customized templates so that service provider can easily be publish and all the published documents must be authenticated by QR code/Barcode/other new technology in block chain for legal use.
6. To promote proactive stakeholders by ensuring grouping facility to get notification of immediately published documents that are necessary for them. Users/stakeholders easily can customize the group of the documents (Example: Digital Guard File, LandTax, Mutation, Record, Mouza map etc.) for notification. Keeping notification facilities with like/follow/comments for registered users and share on different social media (Internally developed EBook Blogging, Facebook, YouTube, WhatsApp etc) for the promotion of the document.
7. To develop Artificial Intelligence (AI), Machine Learning (ML) & Deep Learning based advisor who will advise users and learn from outsider for knowledge enhancement.

Scope of Works

a) ***System Analysis, Design & Development:*** Conduct a need assessment to prepare the precise System Requirement Specification (SRS) for designing and developing EBook System with artificial intelligence (AI) based expert advisor and provide concrete development plan in the SRS, which should include business process model and notation **(BPMN) diagram**, context diagram of the proposed system, sequence diagram, use case diagram and process flow diagram. Design the solution architecture of this system in a matter for better performance, flexibility, scalability, extensibility and multi tenancy of the system for the future expansion. System development should follow the proper Software Development Process. Full process should be well documented for the farther development and integration. The entire system must be designed and developed by following microservice architecture so that inter dependencies and integration functions among the modules and features of different components will be smooth but very organized. Must have to follow Bangladesh National Standards & Guidelines and

international standards (like ISO/IEC/IEEE) of all technicalities (like Metadata/Data, Development, Coding, Security, Testing, Technical documentations, Evaluation etc).

b) **Deployment:** After releasing the developed and tested application as Beta Version the actual user feedback and review will be taken and finally the application will be accepted by the implementing organization after passing certain tests & check by the third-party organization as per final SRS and other required documents. Then the required training as per predefined training plan will be provided and after taking necessary measures the deployment will be done successfully to make this application LIVE as per the Project Management plan.

c) **Data Migration**: Segregate different types of existing public documents and scan approximately 10,000 pages from all types of segregated documents. Optimize and migrate all those as error free full text data & bibliographic metadata with linking all other referenced data by licensed OCR & inbuild powerful editor which has developed as EBook feature with proofing approval.

d) **Support & Maintenance:** After final deployment and going live with the acceptance of implementing organization, the support and maintenance service will start for extra 01(one) year. Required software development issues which will be decided by mutual understanding. Small development will provide within 06(six) hours and large development will provide within 02(two) days. After the expiration of support & maintenance period this service will be continued as per agreement.

Expected Outputs/Deliverables

Considering the scope of works the vendor is requested to deliver as part of this project mentioned below:

1. Project inception report with project management plan.

2. Detailed System Requirement Specification (SRS) in standard format consisting External Interface Requirements, System Features, Nonfunctional Requirements and Other Requirements (if any) based on assignment objectives, scope of works & proper documented customers' requirements.

3. Detail system design documents (HLD and LLD as Software Design Descriptions [SDD] IEEE standards).

4. Development of Intelligent Land Knowledge Management System with extraordinary advisory feature as per requirements stated in ToR and agreed SRS, HLD, LLD of the project with proper standard documentations.

5. Test plan with its testing acceptance (vendor, user and third-party organization nominated by MoL like Bangladesh Computer Council or others) report based on the detailed required documents.

6. System Installation & Deployment on Live Server

7. Knowledge transfer through workshop/training with manual (Text and Video)

8. Delivered final version of the software along with the properly documented source code, database & other required credentials, user manual (text and video) containing screenshots

9. Project completion report with upcoming challenges (if any)

10. Data migration, System Support & Maintenance SLA with reports

11. Other different reports (like domain experts hiring proof documents)

Technological Requirement Specification

1. *System Overview*

Ministry of land is going to digitize all the land related services and activities. So, it is needed to transform all books and documents to be a digitized form (like ebook) and keep in a single platform so that a land service provider/seeker can easily access the system through digital device to provide/get a service/information.

In Intelligent Land Knowledge Management System, the existing public documents / books / other documents can be digitized by OCR and make it as an error free soft version by a powerful editor with required reference (authorized links such as bdlawas.gov.bd, BG press, BD archives etc, authorized documents, back and forth documents etc.) linking and can preserve data in standard bibliographic metadata format. The powerful editor can also be used for public document / book / other document generation itself. There will be a facility to create various documents using customizable templates or not as creative nature. The template can contain the Cover Page, Word/Quotes, Contents, Selected Topics (Act, Rules, Policy, Circular etc), Appendix etc. After completion of the document generation, it is ready for proofing & approval process and completion of the proofing & approval process Book / Document will be ready to publish. Published document will contain QR code for authentication and barcode for basic information. The published documents can be notified to registered users. Registered user can configure to get notifications based on users' requirements. Free user or browsers will see new published documents and can search required documents. Citizen can access the system to get land related information and can access separately identified all documents such as rules, regulations, notifications, office orders, etc. They can give like, share, comments etc. on the published document in internal blogging or external media. Authorized user will be notified and can drill all the feedbacks and can update published documents with the re-publishing process. Published documents will continuously get update requests and get general users feedback analysis will promote the book and its references. So, there will be an extended editor so that one can receive link requests for previously updated & preserved books also.

Published document will be sent to website, enothi/dnothi through API calling and will be share to facebook, whatsapp, email etc. Provide dynamic search option by auto complete and auto suggestion. Facilities of speech to text for searching and reading documents for physically impaired person. The system will have several types of users. User can create group with various document and can create sub-group in a group. The authorized user can follow/subscribe topics of various category and will get notification about the subscribed topics.

Generated soft version of public documents/books/other documents must be store as segregated bibliographic metadata & data with referenced documents & links to introduce user fasciitis. The physical document that has been digitized is the authentic and original version which can be used as reference in future. If there is ever a controversy about the digital version, the original can be examined. All documents and data should reusable

format for general, AI, ML & Deep learning process purpose and authenticate by new technology like block chain. As an extra ordinary feature of Intelligent Land Knowledge Management System registered user can get advising facility from an expert AI based advisor who can learn day by day and who can help to users both in Bangla & English.

Conceptual Model of Intelligent Land Knowledge Management System
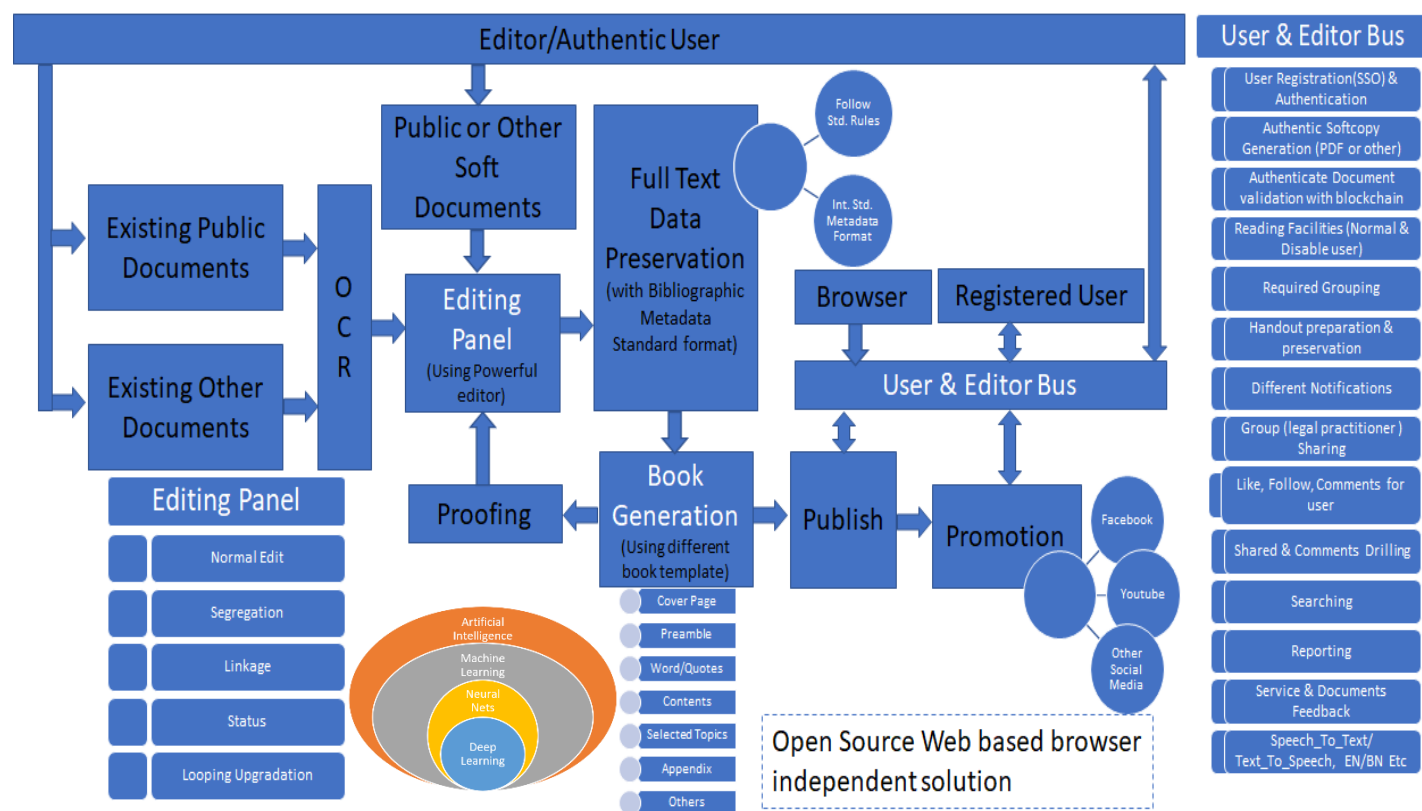

Fig: Overall Conceptual Model of Intelligent Land Knowledge Management System

Note: The interested vendor must comply with all the above-mentioned modules and features but do not have to be limited with this list only. It should be precisely noted here that at the time of system requirement analysis phase, the implementation organization/agency will have full right to include other relevant features and functionalities.

Apart from this, the interested vendor should analyse the other scopes which are relevant to the areas covered above and should propose the best possible and comprehensive ICT solutions in their technical proposal. The ultimate modules and features of the proposed system will be finalized at the requirement study and analysis phase of SDLC based on customer requirement acceptance and vendor's best proposal/solutions relevant to the above-mentioned area and scope.

2. Functional Requirements

The major modules functional features are described hereunder which are required to be considered in scope finalization of this service development at the requirement study and analysis phase. The following requirements are described here

Ensure facility to,

1. Scan/open, edit (after text conversion by BN/EN OCR) and save all public documents. All public documents will be error free full text data.
2. Segregate full text data into acts, ordinance, rules, regulation, policy, circular, guideline, notification, office order, memorandum of understanding, other document with legal status etc.
3. Interlinking between that interrelated segregated data & document
4. Linking metadata/keywords and scanned copy in reference for authentication with each document to other.
5. Create manuals, gazette notifications (weekly gazette, extraordinary gazette) etc. with the required data from the full text data and link to the scanned original manual and gazette.
6. Create and publish books, handouts and various reports with full text data and necessary data from various documents from these data.
7. Current status facilities (latest update, amendment, repeal, others.) of a document.
8. Link in a document with the document of different Govt. organization such as bdlawas.gov.bd, BG press, BD archives etc.
9. View the published EBooks/documents in full text format
10. Convert a Word, PDF version of a full text published document as online version.
11. Create different types of users (like authorized user, admin user, special user, general user etc.) to play different roles on it. User can create group with various document and can create sub-group in a group also. The rolled user can follow/subscribe topics of various category and will get notification about the subscribed topics.
12. Blogging facilities to communicate and comments regarding documents.
13. Create API where any document will be sent to a website, enothi/dnothi etc.
14. Sharing facilities to facebook, whatsapp, social media and email.
15. Provide BN/EN option and Unicode font.
16. Provide dynamic search option with categorized, keyword, calendar based, yearly based search engine (with auto complete and auto suggestion technology).
17. Facilities of speech to text for searching and text to speech for reading.
18. Facility to read the EBook for disabled persons.
19. Provide different book template.
20. Book creation facilities for special user can be published and the book will contain QR code/Bar Code/new technology for authentication and basic information of that book. The user will be notified if a document that has been used to create a book is updated and then the user can update his book.
21. Book creation facilities for authentic user and can change any document by getting notification by drilling browsers comments.
22. Facility of update requests for older books will also continue to be submitted If new information-rich books continue to be updated.

23. To provide an extended editor which will be ready to give a link to the old book i.e. the book that has been preserved before. And the admin will update by just clicking on it.
24. Introduce artificial intelligence (AI) to notify the users requirements as per predefined and browsing values. Introduce AI & ML based chatbot as an expert advisor using internal and external information with deep learning knowledge on both Bangla (General, Translation, Transliteration) & English. Preserve all knowledge & information day by day for farther deep learning & AI processing.
25. Introduce SMART dashboard system to monitor all the data related to EBook.
26. Promote web portal to meet the citizen's expectations for information.
27. Integrated export option to Word, PDF and Excel (if need).
28. Analytical functions for dedicated user groups.
29. Keeps track of an entire history of a specific under processing & published EBook.
30. Keep highly secured, reliable and easy to use features.
31. Authenticate the preserved, published documents using block chain technology
32. Introduce speech to text for searching for writing and text to speech for reading.
33. Provide reading the EBook for disabled persons.
34. Setup Information

- Different type of document parameter setup
- Type setup
- Different type of book template and template parameter setup
- Template type setup
- Rules & Roles setup
- Different types of user setup
- Etc as per requirement and as proposed by the vendor

35. Book/Public Document Information Management

- Scan/Read the Hard/Soft copy of different types of public documents and preserve the original pdf copy as reference link.
- Use licensed OCR for Hard/Soft copy to convert full text data and make this data error free using powerful editor (Editing User [Operator]).
- Use bibliographic metadata information to add/update/delete/archive based on different types of public document.
- Use Book template to generate an EBook (Editing User [Operator]). The book template may contain the following options to create/generate a book:
  - Cover Page
  - Preamble
  - Word/Quotes
  - Contents
  - Selected Topics (Act, Rules, Circular, GO……)
  - Appendix
  - Others…..

- ◆ Book/Public Document check by (Proofing User [Proof Reader])
- ◆ Book/Public Document approval (Approver User [Approving Authority]).
- ◆ Etc as per requirement and as proposed by the vendor

36. General/Advance Search
    - ✓ Office wise,
    - ✓ Document wise,
    - ✓ Date wise,
    - ✓ Date Between,
    - ✓ Land parameter wise
    - ✓ User wise
    - ✓ Year wise
    - ✓ Etc as per requirement and as proposed by the vendor

37. Monitoring Dashboard & Notification Management

A complete graphical representation using (Pie Chart, Bar Chart, Block, line graph etc) those will show the following information like:
    - ✓ Different Type Published of Books/Documents,
        - o Like
        - o Follow
        - o Comments
        - o Share
        - o Viewer
    - ✓ Editing
    - ✓ Proofing
    - ✓ Approval
    - ✓ Cancelled
    - ✓ Published
    - ✓ Document status
    - ✓ Etc as per requirement and as proposed by the vendor

38. Reports
    - ✓ Books/Documents different reports
    - ✓ User wise different reports
    - ✓ Monthly report /yearly reports
    - ✓ Date between report as per the desire information
    - ✓ Log reports/audit reports
    - ✓ Etc as per requirement and as proposed by the vendor

39. Security System
    - ✓ Create user group
    - ✓ Create role based user
    - ✓ Audit /Log Management
    - ✓ Users, Roles and Access management will be integrated part of the software
    - ✓ Etc as per requirement and as proposed by the vendor

40. System Backup/Restore

- ✓ Database Backup
- ✓ Database Restore

41. The system will be able to send configurable email & mobile SMS notification

42. The system will be able to enforce all data validation during entry and at time intervals

43. The system will be able to show instructions on maps using Google map or other online mapping services

44. The system should have a content management system (CMS) from where news, books/documents, articles, categories, photo/image, audio/video etc can be added and updated

45. *Etc as per requirement and as proposed by the vendor*

3. *Non-Functional Requirements*
1) *Application Compliance Requirements*

- ✓ The application, which is a web based solution, should be hosted in a centralized Web-server

- ✓ The application should be developed following Service Oriented Architecture (SOA)

- ✓ Considering the operating/client environment at different levels of this application, it should be developed in such a way so that it requires low bandwidth to run.

- ✓ The web-based application should be browser independent and must support cross browser platforms (popular web-browsers such Mozilla Firefox, Opera, Chrome, Internet Explorer, Safari etc.)

- ✓ The application should have the ability to seamless integration with future module / components / applications

- ✓ Application should be lightweight and rich client-side scripting

- ✓ UI should be developed based on the analysis of UX.

- ✓ Any web interface of this application should be fully responsive

- ✓ Platform & device independent application.

- ✓ Need to use Open-Source development platform & language by following Model-View-Controller (MVC) pattern.

2) *Coding Conventions*
The vendor must follow the standard coding styles to produce high-quality code for further usage of the code in terms of reusability, refactoring, task automation, language factors etc. The vendor should submit a standard coding convention approach, which may include different conventions like commenting, indent style, naming etc. following the best coding practices.

3) *Integration Requirements*
To establish an integrated digital government and ensuring the interoperability among the e-government/Services of Bangladesh, integration is one of the key factors which should

be considered as a topmost priority. Based on the consent and approval of implementing organization (concerned authority) at system requirement analysis phase of software development, vendor may follow customized integration framework complying BNDA guidelines, published e-government policies & acts and international standards/conventions for minimizing system's operational dependencies and strengthening sustainability. Here, vendor should come up with an integration plan in their technical proposal considering and understanding the scope of the application as per this TOR.

4) *Security and Privacy Requirements*

The vendor should submit an extensive "Security and Privacy Plan" including comprehensive security architectures in their technical proposal for this proposed application considering the following issues:

1. Project technical scopes

2. Functional and non-functional requirements and ultimate objectives

3. Concerned service provider organization's operational environments and capacity

4. User roles - Accessibility, Authentication, Authorization and Accountability

5. Importance of data management & data privacy

6. Strength of technologies to be used for development, operate & maintenance

7. Deployment & hosting

8. Service recipients and providers security, confidentiality and privacy

9. A checklist of security measures to be taken for this solution

10. Overall security standards which should be applicable for an e-government system.

Apart from these, the vendor should keep in account the following considerations as well as vendor should provide a checklist based on system and hosting security plan (i.e. fraud, hacking, money laundering etc.) & the test report of that checklist.

System Security Requirements (But not limited to)

1. The vendor should follow any of the industry standard secured development methodology such as (but not limited to) Comprehensive Lightweight Application Security Process (CLASP) by OWASP etc.

2. The vendor should consider (but not limited to) common vulnerabilities such as SQL Injection, Cross Site Scripting (XSS) etc.

3. Vendor will undertake responsibility for Input Validation Controls, Authorization/Authentication Control and other security controls in place in both testing and production environment of application.

4. The following vulnerabilities must be checked and ensured security from the beginning:

    a. Cross Site Request Forgery (CRSF)

b. Cross Site Scripting (XSS)

c. Session hi-jacking

d. Session Fixation

e. SQL Injection and Code Injection

f. Input Validation/Filtering

g. Output Escaping

h. Secure File Access

5. The vendor shall minimally provide Access control, Authentication and accountability security mechanisms for backend operations of the System.

6. The proposed security solution shall be scalable and should not affect the performance by creating a bottleneck or single point of failure to the overall system.

7. The system should provide tamper-proof audit trails and logs for administrator or auditor to check for the actions committed by users. The audit trails shall consist of following details but not limited to:

a. Login and logout

b. Attempts to access unauthorized resources

c. User profile changes

d. Past audit events.

e. Track all actions performed on documents attached/uploaded.

f. The system should have provision to assign the access rights of other resources on need basis to authorized users.

g. Information in the System that is deemed to be sensitive shall be encrypted and protected from accidental and/or unauthorized modification.

h. The System shall provide automatic session disconnection for inactive user after session time [Proposed best practice session time] is over.

i. The system shall protect the audit trails from being modified by unauthorized personnel or privileged users.

5) *Sizing, Performance and Scalability Requirements*

✓ The system processing shall be scalable to support the volume estimates for a period of 10 years at a 20% annual growth rate.

✓ The system shall be designed to handle estimated 100000 simultaneous connection (online users) when it is ultimately rolled out.

✓ The vendor must conduct an extensive load testing task taking above factors into consideration and submit a load testing results.

✓ The database architecture should be such that the system is available to user 24x7x365 days a year without any unapproved downtime.

- ✓ Page load time, login response-time, on-click load time for the web application should be less than 3 seconds while this is accessed over the intranet.

- ✓ Average transaction response time, on-submit response-time, or any other database access/search time should be less than 5 seconds when the system solution is accessed over the intranet.

- ✓ Considering the network infrastructure challenges in Bangladesh, the solution must support low bandwidth conditions for the services defined in the functional requirements.

- ✓ The proposed solution should be highly scalable to accommodate current and future requirements within the scope of the scope mentioned in the TOR

6) *Interoperability and Data Exchange*

The selected vendor must develop the system with following all the standards and protocols of interoperability, integration and data exchange with other systems. It is expected that the system will be based on open architecture and will be fully interoperable with current and future systems.

The following are the key expectations on interoperability requirements:

- ✓ The system should be designed for interoperability using industry standard protocols.

- ✓ System must expose data by Advanced Message Queuing Protocol and REST via TLS

- ✓ All imported data must undergo data validation to ensure full integrity.

- ✓ Data exchange within the system at different levels via the internet shall be encrypted.

- ✓ The system should have functionality to exchange data with other own systems or external institute systems.

- ✓ The system shall have functionality to export/import files based on the standard template defined through web services and/or API

7) *UI/UX*

The vendor must propose a "UI/ UX Plan" containing UI designing method and tools, UI design Activity plan, prototype or Mock Up design expected result & their finalizing process of that UI/UX design. Apart from this, the vendor should consider the following issues as requirement at the time of UI/UX plan.

- ✓ The system interfaces should be highly user friendly, easy to navigate and ensure fast loading.

- ✓ The UI shall be designed by using well-established, supported and lightweight UI framework so that it follows widely used industry flow patterns

- ✓ UI shall be easily configurable if any changes are needed

- ✓ Menu, content and navigation shall be based on the user entitlements, roles and permissions.

- ✓ Vendor is requested to include five important features considering service recipient five UI. Those UI should be design professionally & hardcopy color page so that UI design capacity & standard will be able to measure.

8) *Language Support*

System's default language will be Bangla. The system should support multilingual option i.e. Bangla and English. All the user interfaces will be able to display and input controls can take input both in Bangla and English. System/App users can choose and set his/her preferred language in profile setting for the system interfaces. The system should support Unicode for the Bangla Language.

4. *Other Requirements*

- ✓ The software source code, must have sufficient comment and be delivered without encryption
- ✓ Future technology Change, iterative prototyping and agility in product design are the generic expectation.
- ✓ Technology and all related design/data will be open to Client.

Project Timeline

SN	Activity	Time
1	Project inception report with project management plan	Within 5 days of contract signing
2	Conduct background scoping and finalizing the detailed System Requirement Specification (SRS)	Within 30 days of contract signing
3	Software design document (HLD and LLD as SDD)	Within 45 days of contract signing
4	Software Development as per requirements stated in ToR and agreed SRS, HLD, LLD of the project	Within 3 months of contract signing
5	User level feedback collection and incorporation with testing, debugging & update	Within 3.5 months of contract signing
6	Delivery of UAT and 2nd level feedback collection & incorporation	Within 4 months of contract signing
7	Testing acceptance report based on UAT & 3rd party organization based on the detailed required documents	Within 5 months of contract signing
8	Installation & Deployment	Within 5.5 months of contract signing

9	Knowledge transfer through workshop / training	Within 6 months of contract signing
10	Delivery of the final version of the system along with all required documentation including source code, database, recured credentials, user manual & all technical documentations with detailed final SRS version	Within 6 months of contract signing
11	Data Migration, System Support & Maintenance Report	Every month after successful deployment of the system

Supervision and performance evaluation

Awarded vendor will be working with the direct supervision of technical committee of MoL and will report to them. Must be liable to business domain expert committee of MoL for acquiring business domain for business process analysis & re-engineering. As the assignment will be time constrained the vendor will provide weekly updates on the progress during the assignment.

Project management

The vendors are expected to provide a proposed detailed project plan and implementation strategy of the project. This plan is expected to include:
1. Brief information regarding the system development process consisting as below points:
   a. System Functional Requirements Description
   b. Comprehensive Solution Architecture
   c. SDLC Methodology
   d. Development method, technology (tools, language and database requirements), technical approaches & standards (List of Standards, Tools & Technology plan, Security and Data Privacy Plan, User Management Plan, Integration Plan, UI/UX Plan, Digital Service Toolkit and Guide)
   e. Project Implementation Work Plan
      i. Project implementation schedule with indicative timeline (Gantt chart)
      ii. Work Distribution and Team Composition Plan
      iii. Quality Assurance & Testing Plan
      iv. Risk Management Strategic Plan and quality control mechanism
      v. Audit Plan
      vi. Strategic & Action Plan for System Optimization
      vii. Pilot Implementation Plan
      viii. Documentation Plan
      ix. Knowledge Transfer Plan

      x.   Project Deliverable Plan
     xi.   Data Management and Migration Plan
    xii.   End-User Engagement Plan
   xiii.   Support and Maintenance Plan
   xiv.   Performance Review Plan

2. Maximum lead time for delivery of services
3. Any development tasks or assumptions that may be required to render the solution fit for purpose
4. Any anticipated integration tasks
5. Comprehensive contingency plan

Vendors Qualification

1. Must submit valid business documents.
2. Must have experience in design, development, and implementation of 05 (five) large scale software projects in the field of web or desktop-based application software/e-government application. Among the projects, at least 01 (one) project must be in digitalization/automation of government service/function where all the design, development, implementation, and maintenance support services were provided (covers SDLC full cycle). At least 01(one) successfully implemented project which has been introduced Artificial Intelligence (AI)/Machine Learning (ML) technology for deep learning process and at least 01 (one) successful project that has national/international bibliographic metadata standardization for data utilization.
3. Should have experience on similar type of work.
4. Must demonstrate its management capacity (website link/brochures and other documents describing similar assignment, experience, availability of appropriate professional staff and experience among applicant's staff, resource to carry out the assignment).
5. Firm should demonstrate its logical capability (well-equipped office space at Dhaka with necessary facilities).
6. List (Name, designation, years of experience, number of projects, expertise) of IT personals who can be engaged to perform the assigned task except domain expert. Mention the required hiring hours for domain expert consultation. However, for proper execution of the project i.e application development, the vendor shall include at least the following HR positions as minimum project team requirements:

Role (For application development)	Qualification	No. of persons
Project Manager / Team Leader	M.Sc in computer science/ computer engineering or equivalent. Minimum 10 (Ten) years of experience as Project Manager	1
Software Architect / System Analyst	B.Sc in computer science/ computer engineering or equivalent. Minimum 08 (Eight) years of experience as Software Architect / System Analyst	1

Role	Qualification	Count
System Administrator	B.Sc in computer science/ computer engineering or equivalent. Minimum 08 (Eight) years of experience as a System Administrator	1
Database Administrator (DBA)	B.Sc in computer science/ computer engineering or equivalent. Minimum 07 (Seven) years of experience as a Database Administrator	1
Sr. Developer / Sr. Programmer	B.Sc in computer science/ computer engineering or equivalent. Minimum 06 (Six) years of experience as Sr. Developer / Sr. Programmer	1
AI & Deep Learning Expert	B.Sc in computer science/ computer engineering or equivalent. Minimum 05 (Five) years of experience as a Developer / Programmer and 02 (Two) years of experience on AI, ML, Deep Learning project	1
SQA Expert (Test Engineer)	B.Sc in computer science/ computer engineering or equivalent. Minimum 05 (Five) years of experience as SQA/Test Engineer.	1
Interoperability Expert	B.Sc in computer science/ computer engineering or equivalent. Minimum 05 (Five) years of experience as Interoperability Expert.	1
Developer/Programmer	B.Sc in computer science/computer engineering or equivalent. Minimum 04 (Four) years of experience as Developer/Programmer.	1
App. Developer/Asst. Programmer	B.Sc in computer science/computer engineering or equivalent. Minimum 03 (Three) years of experience as a App. Developer/Asst. Programmer.	2
UI/UX Designer	B.Sc in computer science/computer engineering or equivalent. Minimum 03 (Three) years of experience as a UI/UX Designer.	1
Technical Document Expert	B.Sc in computer science/computer engineering or equivalent. Minimum 03 (Three) years of experience as a Technical Document Expert.	1
Grand TOTAL		**13**

Role (For business process analysis & re-engineering)	Qualification	No. of persons
Domain Expert (Can be hired for per-time consultation on hourly basis)	Graduation in any subject. Minimum 05 (Five) years of experience in the field of assignment business domain	1
Grand TOTAL		**1**

Role (For Maintenance Service & Support)	Qualification	No. of persons
Software Maintenance & Support Engineer	B.Sc in computer science/computer engineering or equivalent. Minimum 03 (Three) years of experience as Software Maintenance/ Support Engineer.	1
App. Developer/ Asst. Programmer (On Demand)	B.Sc in computer science/computer engineering or equivalent. Minimum 03 (Three) years of experience as App. Developer/ Asst. Programmer.	1
Grand TOTAL		**2**

Note: Please consider the above-mentioned project team composition has been proposed here mentioning minimum size of team with required HR positions for evaluation only. Vendor may propose any additional HR positions as per their SDLC methodology and work plan in the technical proposal as their plan.

Financial proposal

The financial proposal by the form should contain itemized cost, at least for the following broader deliverables: System analysis and requirements gathering cost; software development and testing cost; orientation training for User (IT team, different level wise officers & staffs and Job placement team); Data optimization & migration cost; and post-handover troubleshooting support & maintenance cost.

Proposed Payment Schedule

The Payments are made upon satisfactory completion and acceptance by the Technical Committee of MoL for the deliverables:

10% of the contract value upon submission of Inception Report and SRS (milestone 1)

40% of the contract value upon submission of Software developed as per technical requirements stated in the ToR and SRS (milestone 2)

20% of the contract value upon successful deployment of live final version along with the properly documented source code, database & other required credentials (milestone 3)

15% of the contract value upon submission of the user manuals (text and video) containing screenshots with the completion of different layered training & data migration (milestone 4)

15% of the contract value upon the completion date of SLA for support & maintenance (milestone 5).

Special Notes

1. MoL will preserve full rights to be confirmed security clearance of the personnel [if necessary] who will be working for this assignment through proper agency.
2. Contractor may need to sign separate non-discloser agreement with MoL considering date/information sensitivity [if needed].
3. Intellectual Property Right will strictly be controlled under regular state law for IPR protection.
4. MoL will preserve full rights to assign for testing, monitoring & evaluation of the project by third-party organization.
5. Vendor will have to have clear concept on the expected components before starting work.

Support or assistance to be provided by MoL

1. Training venue will be provided.
2. System design support
3. Coordination on hosting