



**Government of the People's Republic of Bangladesh  
Land Management Automation Project  
Ministry of Land  
Dhaka, Bangladesh**

**DRAFT TERMS OF REFERENCE (TOR)**

**For**

**Design, Development, Maintenance &  
Support Service of Case Management and  
Information System (CMIS)**

Prepared By

Land Management Automation Project;  
Ministry of Land



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## **Abbreviations:**

16122	Land Ministry Hotline
333	National Information Call Center
AP	Assistant Programmer
BCC	Bangladesh Computer Council
CC	Call Center
CSMS	Civil Suit Management System
CMIS	Case Management & Information System
DBA	Database Administrator
FD	Front Desk
ICT	Information and Communication Technology
ID	Identification
IVR	Interactive Voice Response
LAB	Land Appeal Board (LAB)
LMAP	Land Management Automation Project (LMAP)
LDTax	Land Development Tax
LT Notice	Land Transfer Notice
MOL	Ministry of Land
NDC	National Data Center
NID	National Identification
OAT	Operational Acceptance Test
RCMS	Revenue Case Management System
SA	System Analyst/ System Administrator
SDD	System Design Document
SLA	Service Level Agreement
SME	Senior Maintenance Engineer
SMS	Short Message Service
SRS	System/Software Requirements Specification
TCV	Time, Cost & Visit
ToR	Terms of Reference
UAT	User Acceptance Test
UDC	Union Digital Center



## **1. Background**

The Case Management and Information System (CMIS) is a key initiative aimed at modernizing and streamlining land-related case management processes. This system is designed to enhance efficiency, transparency, and accessibility in handling civil suits and revenue cases under land administration. By leveraging digital solutions, CMIS will facilitate case monitoring, supervision, and data management to support both government officials and citizens.

The initiative aligns with the broader vision of transforming public service delivery through digital innovation. A significant number of government services, including over 100 land-related e-services, are being transitioned to digital platforms. CMIS will play a crucial role in creating a centralized case data bank, enabling seamless integration with other land management systems. This will ensure that land-related disputes and cases are efficiently managed, reducing delays and administrative complexities.

The system will be developed, customized, and implemented across all districts, ensuring uniformity and accessibility. By adopting a whole-of-government approach, CMIS will contribute to a more organized and data-driven land management ecosystem, addressing long-standing challenges and bottlenecks in the sector.

The Ministry of Land initiated to develop a case management & information system which consists of civil suits and revenue cases which are of the Ministry of Land and its organizations. The CMIS has a high impact to create a case data bank, monitoring, supervision from citizen points of view and Ministry of land users' point of view. Case data is also important to other land management systems in different stages for different purposes. So, the system needs to develop, customize and implement to all districts and integrate with other land management systems.



## **2. About the organization**

The Ministry of Land (MoL) is managing the entire land related activities on behalf of the Bangladesh Government. The formulation of different Act, policies and subsequent implementation is done by MoL. Moreover, the entire land administration, citizen services and co-ordination among the stakeholders are done by MoL and its different organizations. MoL is implementing the land related activities through its organizations like Land Appeal Board, Land Reform Board, Land Record & Survey Department, Land Administration Training Center and various stakeholders like Cabinet Division, Divisional Commissioner's offices and Deputy Commissioner's Offices. It also works with the Registration Department.

Currently, MoL is developing and implementing various automation activities under the Land Management Automation Project (LMAP).



### **3. Objective of the Project**

Its main objective is to develop high-quality and high-capacity software for an integrated and automated land management and implement it in all land management offices, including at the field level.

To increase dynamism and transparency in all land related activities by implementing software called "Land Management Automation" for an integrated land management:

- Creating an inter operable land database
- To sensitize all relevant manpower involved in land administration on modern land management.
- Development of Electronic Revenue Case Management
- All services related to land management are easily accessible and modernized to the citizens and synchronization of other services of the government with this system.
- Launching online and electronic land services simultaneously through the use of automation technology in around 5247 land related offices of Union Land Office, Upazilla Land Office, Deputy Commissioner's Office related to land management.
- Creating a database of all categories of land in the country.
- Services related to land administration viz. Rectification of records/updating records (registration, allotment and consolidation of deposits in integrated process) Rent certificate cases: Land acquisition, Khas Zami settlement (agricultural-non-agricultural land, tea plantation term lease), Sairatmahal, vested property, waqf, devattar and management of private assets Government-side civil litigation information management, mutation, khatian through digitization to easily reach citizens and modernize and link other services of the Government with the system.



## 4. Objectives of the Assignment

The Ministry of Land aims to build a robust **"Case Management & Information System (CMIS)"** which will provide a digital service platform for easy access by all districts **excluding** three hill districts (Bandarban, Rangamati and Khagrachari) to digitalize the Case Management processes. CMIS will use the latest technologies like AI, Big Data, and Deep Learning to provide better services and support. All related data will be preserved in the database for prompt retrieval. All front-end/UI will be in familiar formats for ease at use. It should be interlinked with all other necessary internal and external applications using API gateway. It will be a distributed load balanced system. A central Single Sign on (SSO) via Land Service Gateway (LSG) will be used for all applications. This system needs to be capable of adapting these operations in the land ministry.

The overall objectives of this proposed Case Management & Information System for Ministry of Land and its organizations are mentioned below:

- Develop Case Management System and Ensure full cycle management of [Revenue Case Management and Civil Suit Management System and Miscellaneous Case Management] appeals through an integrated Land Appeal Board Module.
- Online Case Information Entry, Appeal, Review, Hearing etc.
- Configurable workflow setup, application template setup etc.
- Develop Digital Case Attendance module and witness management module
- Develop digital court certificate module
- Govt. allowance (খোরাকী ভাতা) module including TA/DA.
- Integration with the other Land Management systems and others 3rd party system through Land Service Gateway (LSG) system
- Development of mobile apps for android and iOS
- Legacy Data migration of the system
- Develop interoperable database for case management & information system
- Case status, notification and various types of customization reports.
- Using a common service recipient profile account using recipients' mobile number, NID number or any other unique IDs would be used as a Single Signing On (SSO) to the system with proper verification and validation (Like using captcha, OTP etc.) through LSG.



- Citizens can submit cases, track progress, make payments, and access relevant information in a transparent and accessible manner. Additionally, features like notifications, FAQs, and voice-enabled support enhance the overall user experience.
- Land Appeal Board module is integral to the CMIS, designed to manage and streamline the case handling processes at the appellate level. Land Appeal Board's operations will benefit from real-time updates, role-based access, and automated reminders. This ensures comprehensive oversight and timely resolution of appeals.
- The migration of existing data from the legacy systems of the Land Appeal Board into the CMIS will not be undertaken, as the board currently handles approximately 30,000 cases. Attempting to migrate such a large volume of data poses significant risks to data integrity and operational continuity. CMIS will provide a mechanism for manual entry of previous case data into the new system by the Land Appeal Board.
- Integration with Judicial Services for sharing land related cases information and other misc. Data to create a cross checking platform between Ministry of Land and Ministry of Law and Justice.
- Integration facility with other systems
- Ensuring up to date standard of security and protecting facility that makes the systems hack-proof & zero penetrated.
- Implement AI-based automation for notifications, chatbot assistance, and sentiment analysis.
- Strengthen audit trail features for tracking changes in case records.
- Ensure high-performance security measures, including encryption and role-based access controls.
- Support & Maintenance Service for the System as per SLA.



## 5. Scope of work

### 5.1 Requirement analysis:

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- ✓ Collect requirements and assessment for the development of the land case management & information system and prepare a detailed Requirement Analysis Report, assessment report, functional requirement specification (FRS) & SRS etc. for CMIS.
- ✓ Interviews and workshops with government officials, citizens, and legal experts.
- ✓ Assessment of existing infrastructure and compatibility with LRCS and CMIS.
- ✓ Analysis of the systems that will be integrated with the system.
- ✓ Provide a concrete development plan with all required Designs (System design, UI Design, Database Design, Architecture Design etc.) which should include context diagram of the proposed system - Use Case Diagram, Class Diagram, Process Flow Diagram along with an appropriate project implementation plan.
- ✓ Adherence to national data protection and cybersecurity laws for regulatory compliance.
- ✓ Evaluation of technical compatibility, scalability, and integration risks, operational efficiency and training needs, and regulatory compliance with ICT policies and cybersecurity standards.

### 5.2 System architecture and technology:

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The establishment of appropriate standards and guidelines for the Land Sector e-Government Architecture covering business processes, information/data formats and application technologies under the Whole of Government (WoG) approach is of paramount importance. The Ministry of Land has established standards for development, APIs and architectures of the systems which will be developed for the Ministry of Land. Land Case Management & information systems will follow those standards for technology and system architecture updates.

Additional:

- Microservices-based design for scalability and modular deployment.
- Integration with NeSB (National e-Service Bus) to enable seamless government-wide service access.
- Web and mobile application support for accessibility on various devices.
- Secure API integration with external systems including payment gateways, e-Mutation, and Digital Land Records.



### 5.3 Development of the CMIS:

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The solution will include platform components, specific solution components, Core Services, and Shared services etc. The solution will cover the whole country **excluding** the three hill districts (Bandarban, Rangamati and Khagrachari). Dynamic workflow management facility should be available. Other system requirements are:

- a) **Web application modules:** Responsive UI with easily understandable UX web portal.
- b) **Mobile Apps Development:** Development and deployment of Android and iOS mobile apps for the CMIS.
- c) **Integration:** The platform/solution will have integration scope to share data and service as an integrated service among all stakeholders (i.e., systems and organizations.) using standard API technology. **Land Services Gateway (LSG)** shall route all such API calls and is a major integration component.

Architecture and standards will be followed as per LSG guidance. CMIS shall integrate Middleware - Land Service Bus, Message Oriented Middleware, API gateway, Access Control, Payment Gateway and other common components of the LSG system.

### 5.4 Data Migration and Management:

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All legacy data will have to be migrated to the upgraded CMIS and data will need to be segregated into a Normalized usable format conforming to the ACID property of RDBMS.

- **Data Entry & Updating Platform:** This platform will facilitate efficient data entry/update according to templates of all related offices.
- **Data Backup:** There must be a plan for data backup at different stages of the assignment including software application source codes without using any encryption and periodically check if data backup is okay or not. Secure repository with metadata tagging and controlled access.
  - Ensure periodic backup of critical Data.
  - Every 24 hours take a backup.
  - Share monthly backup reports.
  - Execute backup restore every 3-month
- **Case Disposal Process:** Streamlined handling of new and historical cases.
- **Regulatory Adherence:** Compliance with ISO/IEC 27001, Data



Protection Act, and Bangladesh National Digital Architecture (BNDA) standards.

- **Existing Cases Management**
- **New Case Entry and Manual Case Entry Option**
- **Archiving System for Resolved Cases**
- **Digital Repository**
- **Metadata Management**

## **5.5 Capacity Development:**

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Capacity development of the stakeholders (i.e., Government/non-government agencies, industry, academia etc.) should be done for the front-end users before UAT and for the back-end operation team during Software Development.

### **i. Operational Training: 20 persons**

The consultant should be arranged batch wise day long operational training in two batches. Around 10 persons in a batch.

- 1) Conduct operational training sessions for 10 personnel.
- 2) Provide hands-on experience with the LRCS interface, workflows, and system features.
- 3) Training materials, including manuals and step-by-step guides.
- 4) Recorded video sessions for future reference.

### **ii. Training of Trainers (ToT): 700 persons (10 to 15 persons from each District)**

The consultant should arrange batch wise 2/3-day long ToT training for around 40-60 persons from every 2/3 districts. Not more than 20 persons in a batch.

- 1) Divisional Commissioner, District Commissioner, Upazila Land Office should participate with designated end users in this training.

**iii. Pilot Testing:** Trial deployment with key user groups before full-scale implementation.

- 1) Implement the system for a targeted group of users after the Final Report UAT.



- 2) Gather feedback and make necessary adjustments to optimize the system before full-scale deployment.
- 3) Pilot test report detailing user feedback and system refinements.
- 4) Updated version of the system reflecting feedback.

## 5.6 Support & Maintenance:

Provide extensive 24x7 support services for the current platform until the upgraded system is ready for operation. Similarly provide a full range of support services during the tenure of the contract for the upgraded CMIS as per SLA.

## 5.7 Some Key Features of Land Case Management & Information System:

Module	Sub-Module	Features
Admin	Workflow setup	<ul style="list-style-type: none"> <li>● Application-wise Workflow setup</li> <li>● Approval condition/pre-requisite setup</li> <li>● Reviewer/Approver Setup</li> <li>● Approval Process Setup</li> <li>● Appeal Process Setup</li> <li>● Appeal Approver Setup</li> <li>● Committee Process Setup</li> </ul>
	User Management	<ul style="list-style-type: none"> <li>● Role Management</li> <li>● User Privilege Setup</li> </ul>
	Revenue Application Setup	<ul style="list-style-type: none"> <li>● Application forms template setup</li> <li>● Required Document Setup</li> </ul>
	Committee Setup	<ul style="list-style-type: none"> <li>● Committee Creation/Update</li> <li>● Committee Member setup</li> </ul>
	Performance Management	<ul style="list-style-type: none"> <li>● Performance Indicator setup</li> <li>● Performance Indicator update</li> </ul>
	Template Setup	<ul style="list-style-type: none"> <li>● All Type of Application Template</li> <li>● All Type of Reporting Template</li> <li>● All Type of Form Template</li> <li>● Order Sheet Template setup</li> </ul>



Module	Sub-Module	Features
		<ul style="list-style-type: none"> <li>• All Type of Reporting Template</li> <li>• All Type of Form Template</li> </ul>
	Civil Suit Case Configuration	<ul style="list-style-type: none"> <li>• Entry Form configure</li> <li>• Civil Suit Type setup</li> </ul>
	Notice Configuration	<ul style="list-style-type: none"> <li>• Application wise notice configuration</li> </ul>
	Case Dairy Configuration	<ul style="list-style-type: none"> <li>• Case Dairy configuration</li> </ul>
Revenue Case Management Reviewer Portal	Appeal Case	<ul style="list-style-type: none"> <li>• New Case Entry/Create</li> <li>• New Case Checking</li> <li>• List of New Case</li> <li>• Current Case Entry</li> <li>• List of Current Case</li> <li>• Manual Disposal Case entry</li> <li>• System Disposal Case List</li> <li>• Manual Disposal Case List</li> </ul>
	Revision Case	<ul style="list-style-type: none"> <li>• New Case Entry/Create</li> <li>• New Case Checking</li> <li>• List of New Case</li> <li>• Current Case Entry</li> <li>• List of Current Case</li> <li>• Manual Disposal Case entry</li> <li>• System Disposal Case List</li> <li>• Manual Disposal Case List</li> </ul>
	Review case	<ul style="list-style-type: none"> <li>• New Case Entry/Create</li> <li>• New Case Checking</li> <li>• List of New Case</li> <li>• Current Case Entry</li> <li>• List of Current Case</li> <li>• Manual Disposal Case entry</li> <li>• System Disposal Case List</li> <li>• Manual Disposal Case List</li> </ul>
	Rent certificate case	<ul style="list-style-type: none"> <li>• New Case Entry/Create</li> <li>• New case entry from LD-tax system</li> <li>• New Case Checking</li> <li>• List of New Case</li> <li>• Current Case Entry</li> </ul>



Module	Sub-Module	Features
		<ul style="list-style-type: none"> <li>● List of Current Case</li> <li>● Manual Disposal Case entry</li> <li>● System Disposal Case List</li> <li>● Manual Disposal Case List</li> </ul>
	Miscellaneous cases: <ul style="list-style-type: none"> <li>● Mutation by LT Notice Misc. case</li> <li>● Misc. case for Change the Land Class</li> <li>● Khas Land Declaration Misc. case</li> <li>● Record correction by the order of court</li> <li>● Khai-khalasi Bandok Misc. case</li> <li>● Eviction Misc. case</li> <li>● Auction Case</li> <li>● Bonafide mistake case</li> <li>● Others</li> </ul>	<ul style="list-style-type: none"> <li>● New Case Entry/Create</li> <li>● New Case Checking</li> <li>● List of New Case</li> <li>● Current Case Entry</li> <li>● List of Current Case</li> <li>● Manual Disposal Case entry</li> <li>● System Disposal Case List</li> <li>● Manual Disposal Case List</li> </ul>
Civil Suit Management Reviewer Portal	Review Case	<ul style="list-style-type: none"> <li>● New Case Entry/Create</li> <li>● New Case Process</li> <li>● List of New Case</li> <li>● Current Case Entry</li> <li>● List of Current Case</li> <li>● Manual Disposal Case entry</li> <li>● Schedule Change</li> <li>● System Disposal Case List</li> <li>● Manual Disposal Case List</li> </ul>
	Appeal case	<ul style="list-style-type: none"> <li>● New Case Entry/Create</li> <li>● New Case Process</li> <li>● List of New Case</li> <li>● Current Case Entry</li> </ul>



Module	Sub-Module	Features
		<ul style="list-style-type: none"> <li>● List of Current Case</li> <li>● Manual Disposal Case entry</li> <li>● System Disposal Case List</li> <li>● Manual Disposal Case List</li> </ul>
	Writ Case	<ul style="list-style-type: none"> <li>● New Writ Case Entry/Create</li> <li>● Case Docket Entry</li> <li>● New Case Process</li> <li>● List of New Case</li> <li>● Current Case Entry</li> <li>● List of Current Case</li> <li>● Schedule Change</li> <li>● Manual Disposal Case entry</li> <li>● System Disposal Case List</li> <li>● Manual Disposal Case List</li> </ul>
	Statement of fact (SF)	<ul style="list-style-type: none"> <li>● Notice Entry</li> <li>● New SF Entry/Create</li> <li>● New SF Process</li> <li>● List of New SF</li> <li>● Current SF Entry</li> <li>● List of Current SF</li> <li>● Manual SF entry</li> <li>● Linking RM Section and GP Section to update and verify citizen information.</li> <li>● System Generated SF List</li> <li>● Manual SF List</li> </ul>
	Others Report/Inquiry Report	<ul style="list-style-type: none"> <li>● Notice Entry</li> <li>● Process</li> </ul>
Land Appeal Board Module Development	Land Appeal Board Benches	<ul style="list-style-type: none"> <li>● Bench               <ul style="list-style-type: none"> <li>❖ Member 1</li> <li>❖ Member 2</li> <li>❖ Chairman</li> <li>❖ Full Bench (Depends on Approval)</li> </ul> </li> <li>● Role-based case management</li> <li>● Case Entry Panel</li> <li>● Existing Data Archive with Scanning</li> </ul>



<b>Module</b>	<b>Sub-Module</b>	<b>Features</b>
		<ul style="list-style-type: none"> <li>● Notification Management for users</li> <li>● Admin Panel for Appeal Board Members</li> <li>● Documentation Management for Case Files</li> <li>● Causelist</li> <li>● Case Diary</li> <li>● Case Disposal Process</li> <li>● The module shall be updated as per Appeal Board regulations, with provision for resolving hat-bazaar related writs through the RM section of the Deputy Commissioner's office.</li> <li>● SMS and Email integration for notice</li> </ul>
Dynamic Order sheet Management	Order Sheet	<ul style="list-style-type: none"> <li>● Dynamic Order sheet management</li> </ul>
Notice Management system	Notice Create	<ul style="list-style-type: none"> <li>● Create Notice against the order</li> <li>● Manage Multiple Notice</li> <li>● Mobile SMS, E-mail notice</li> </ul>
Smart Case diary management system	Case Diary	<ul style="list-style-type: none"> <li>● Create/Entry Case Diary</li> <li>● History</li> <li>● Order</li> <li>● Status</li> </ul>
Court Management module	Lower (Subordinate) Court/High Court/Others Court	<ul style="list-style-type: none"> <li>● Court Entry</li> <li>● Case type wise Court configure</li> <li>● Others</li> </ul>
	Tracking	<ul style="list-style-type: none"> <li>● Solicitor including tracking</li> <li>● System for Attorney Generals</li> </ul>
Hearing Calendar	Hearing Calendar	<ul style="list-style-type: none"> <li>● Hearing History</li> <li>● Next Hearing Schedule</li> </ul>



Module	Sub-Module	Features
		<ul style="list-style-type: none"> <li>● Hearing details</li> </ul>
Witness management	Witness Information	<ul style="list-style-type: none"> <li>● Case wise govt. witness info entry</li> <li>● Case wise external govt. witness entry</li> <li>● Witness Approval</li> <li>● List of govt. witness</li> <li>● List of external witness</li> <li>● Others as per requirement</li> </ul>
Digital Case Attendance	Digital Case Attendance	<ul style="list-style-type: none"> <li>● Case wise Attendance Entry</li> <li>● Case wise Attendance List</li> <li>● Others as per requirement</li> </ul>
TA/DA and Govt. allowance (খোরাকী ভাতা)	TA/DA	<ul style="list-style-type: none"> <li>● Case wise TA/DA Entry</li> <li>● TA/DA Approval process</li> <li>● Pay TA/DA</li> <li>● List of TA/DA</li> </ul>
	Govt. allowance (খোরাকী ভাতা)	<ul style="list-style-type: none"> <li>● Case wise allowance (খোরাকী ভাতা) Entry</li> <li>● Approval allowance (খোরাকী ভাতা)</li> <li>● Pay allowance (খোরাকী ভাতা)</li> </ul>
Payment	Payment Status	<ul style="list-style-type: none"> <li>● Payment Receive List</li> <li>● Payment Tracking</li> <li>● Payable Payment List</li> <li>● TA/DA Payment</li> <li>● Allowance (খোরাকী ভাতা) Payment</li> </ul>
Certified Judgement	Certified Judgement	<ul style="list-style-type: none"> <li>● List of Certified Judgement Sale</li> <li>● Revenue of Certified Judgement</li> </ul>
Court Certificate	Court Certificate	<ul style="list-style-type: none"> <li>● Case wise court certificate info entry</li> <li>● Court Certificate upload</li> </ul>
Citizen Portal	Revenue Case	<ul style="list-style-type: none"> <li>● Review Case Application</li> <li>● Appeal Case Application</li> <li>● Case Status</li> <li>● Case feedback</li> <li>● others</li> </ul>



<b>Module</b>	<b>Sub-Module</b>	<b>Features</b>
	Others Misc. Case	<ul style="list-style-type: none"> <li>● Application</li> <li>● Application Status</li> </ul>
	Hearing Calendar	<ul style="list-style-type: none"> <li>● Hearing Date</li> <li>● Hearing History</li> <li>● Next Hearing Schedule</li> <li>● Hearing details</li> </ul>
	Notice	<ul style="list-style-type: none"> <li>● All Types of Case and hearing notice</li> </ul>
	Payment	<ul style="list-style-type: none"> <li>● Single Payment</li> <li>● Batch Payment</li> <li>● Part Payment for govt. organization</li> <li>● Payment Receipt</li> <li>● Payment History</li> </ul>
	Certified Judgement	<ul style="list-style-type: none"> <li>● Purchase Certified Judgement</li> </ul>
	Dashboard	<ul style="list-style-type: none"> <li>● All Case Status</li> <li>● Hearing Status</li> <li>● Next Hearing Date</li> <li>● Other as per requirement</li> </ul>
Other Dept. Application	Others Misc. Case	<ul style="list-style-type: none"> <li>● Application</li> <li>● Application Status</li> </ul>
Archive	Archive	<ul style="list-style-type: none"> <li>● The case those are completed will be archived.</li> <li>● The system also should have a tracking process for inactive / reported cases present appearance with the help of the archiving system.</li> </ul>
Dashboard Management System		<ul style="list-style-type: none"> <li>● Notification</li> <li>● Application Status</li> <li>● Payment Status</li> <li>● Graphical Reporting</li> <li>● New/Working in progress (WIP)</li> <li>● Application Notify</li> <li>● Applications Status</li> <li>● Category Based Case Info</li> <li>● Year wise List &amp; Status</li> </ul>



Module	Sub-Module	Features
		<ul style="list-style-type: none"> <li>● Next &amp; Last Hearing Information</li> <li>● Required as per Requirement</li> </ul>
Multi-Layered Dashboard		<ul style="list-style-type: none"> <li>● Hierarchical Design for administrators, appeal board members, and citizens.</li> <li>● Role-Based Views to each user's responsibilities and access permissions</li> <li>● Dynamic Updates of case tracking &amp; status reporting</li> <li>● Time based Status (Yearly Monthly, Daily range selection for customized data filtering)</li> <li>● Granular Selection (Drill drill down into specific time periods for detailed analysis and reporting)</li> </ul>
	User Customization	<ul style="list-style-type: none"> <li>● Personalized Dashboard Views and configure layouts according to their preferences.</li> <li>● Options to save and manage dashboard settings for quick access and improved productivity</li> <li>● Report Export in multiple formats (e.g., PDF, Excel, CSV)</li> <li>● Enable printing of customized views and reports</li> </ul>
	Admin dashboard	<ul style="list-style-type: none"> <li>● Layered Presentation for data visualization, reporting, and operational management.</li> <li>● Grouping and Subgrouping mechanisms organization of dashboard</li> </ul>



Module	Sub-Module	Features
		layers, reports, and presentations
	Performance Optimization	<ul style="list-style-type: none"><li>● Efficient Data Loading with large datasets or high user traffic</li><li>● Caching and preloading to enhance performance and reduce loading times</li></ul>

The key features shall be revised, updated and upgraded any time, during pre-proposal meeting, negotiation, development of SRS, based on the practicalities of the implementation of the system.

## 6. Functional Requirements

Comprehensive requirements for CMIS have to be collected, compiled and analyzed. Workshops will need to be arranged for stakeholders and Technical Experts to review the current process and the analysis.

### 6.1 Requirement Analysis and Assessment:

Collecting requirements for CMIS and conducting workshops, focus group discussion (FGD), key informant interviews (KII) with technical experts and end users to study the existing manual case management processes and design a user-friendly modern application system. The consultant needs to develop a sustainable case management system based on collected requirements and assessment for the system.

Consultant have to prepare a Requirement Analysis, Assessment Report, SRS for CMIS and will provide a concrete development plan with all required Designs: System design, UI design, Logical Design, Database Design, Architecture Design, context diagram, Sequence Diagram, Use Case Diagram, Class Diagram, CRC, Process Flow Diagram. The consultant will have to ensure the following-

- ❖ Preserving data in the database using proper manners to analyze, search and report easily.
- ❖ Latest technologies along with micro service architecture.
- ❖ Data security with a stable data backup solution and audit trail.



- ❖ In case of credentials, digital signature, biometric authentication, role-based authentication.
- ❖ preserving all documentation related to development.
- ❖ Using Elastic/search/similar or more efficient technology for data analysis.
- ❖ Conducting STQC and VAPT from Bangladesh Government approved organization.
- ❖ GEO data and any other usable data formats that would be used for the overall Land Ministry automation.
- ❖ Creation and maintaining all required technical documentation related to development and support.
- ❖ Automated support for citizens using voice and text-based interaction.
- ❖ Multi-layered data visualization with real-time updates.
- ❖ Encryption, role-based access, and multi-factor authentication.

## **6.2 Architecture & Technology**

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For Architecture & Technology, TOGAF (The Open Group Architecture Framework) will be used as the core architecture development methodology. The consultant will develop enterprise principles, standards, frameworks, artifacts and best practices. The consultant will use TOGAF 9++ components which are: ADM (Architecture development Method), ADM Guidelines & Techniques, Architecture Content Framework, Enterprise Continuum, Reference Models, Architecture Capability Framework. They will need to develop a detailed baseline business architecture, identify required catalogs of Business Building Blocks (such as Organization/ Actor catalog, Driver/ Goal/ Objective catalog, Role catalog, Business Service/Function catalog, Location catalog, Process/ Event/ Control/ Product catalog and Contract/Measure catalog etc.).

The consultant will need to provide Statement of Architecture Work, validated data principles, Baseline Data Architecture, Target Data Architecture (such as Business data model, Logical data model, Data management process models, Data Entity/ Business Function matrix etc.), Data Architecture requirements (such as Gap analysis results, Data interoperability requirements, Relevant technical requirements, Constraints on the Technology Architecture, Updated business requirements etc.).

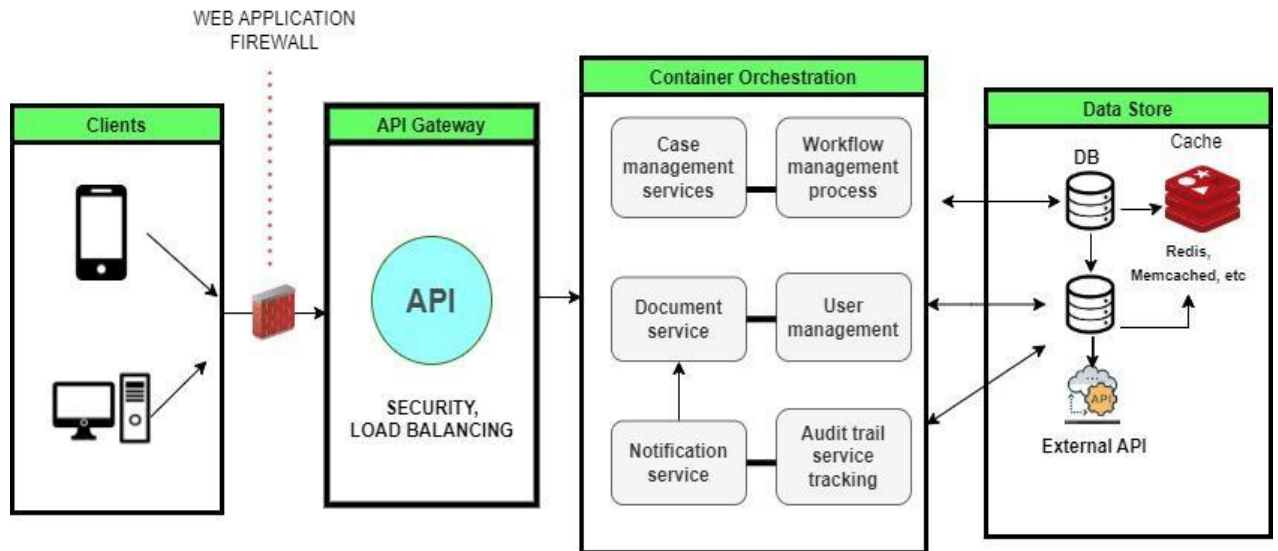


Figure: Micro-service Architecture

## 7. Standards & Guidelines:

The Case Management & Information System (CMIS) will follow the LMAP's provided standards and guidelines while developing and enhancing the system. The LMAP has developed the following standards and guidelines in collaboration with stakeholder's acknowledgement:

- Application architecture standard
- Business architecture standard
- Data architecture standard (Data and metadata standard)
- Security standard
- Technology architecture standard
- Hardware specification standard (Physical architecture standard)
- API documentation standard (API standard)
- Integration Standard
- Functional architecture standard
- Technical architecture standard [Offline syncing]
- Deployment and runtime standard
- Mobile service delivery platform standard
- UI/UX Standard
- Documentation Standard
- Handover standard



CMIS should follow these standards and guidelines.

### **Standards and Guidelines Compliance:**

- Alignment with **Ministry of Lands** Standards for the whole of Government (WoG) approach.
- BNDA's enterprise architecture and National e-Service Bus (NeSB) for integration with government systems

### **National Law and Policies:**

- **Cybersecurity Act 2023:** Comply with policies protecting Critical Information Infrastructure (CII).
- **Data Protection:** Follow the Draft Data Protection Act 2023 for safeguarding personal and sensitive data.
- **ICT Division Policies:** Adhere to policies on user access management, network security, and incident response.

### **International Standards:**

**ISO/IEC 27001 & 27701:** Adopt international information security (27001) and privacy management (27701) standards.

**TOGAF 9.2:** Implement TOGAF principles for standardized data formats, business processes, and application technologies.

### **Cybersecurity Best Practices:**

**WAFs & SSL Encryption:** Utilize Web Application Firewalls (WAFs) and Secure Socket Layer (SSL) encryption for secure data transmission and protection against attacks.

**Incident Management:** Establish comprehensive logging, monitoring, and proactive incident management.



## 8. Functions and Features

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The major modules functional features are described hereunder which are required to be considered in scope finalization of this “**Development of Land Case Management and Information System**” All processes and reports should have advance searching option as per requirements. The system will be bilingual. Citizens can choose the language as their comfort and continue with the procedures.

- ✓ Develop revenue case and civil suit management system
- ✓ Notification Management
- ✓ Template configuration and management
- ✓ Payment (Batch, Single, Part etc.)
- ✓ Information on khas land, various government-owned trees, and the purchase and sale of assets must be incorporated into the system.
- ✓ Archiving system
- ✓ Real time AI Based dynamic dashboard for all Users
- ✓ Development of AI chatbot to provide support different types of service recipient and users
- ✓ Audit Trail & Log Management

### 8.1 Revenue Case Management System

Revenue case management module needs to be developed based on requirements.

This module needs to include whole processes of

- ✓ Appeal Case
- ✓ Revision Case
- ✓ Review case
- ✓ Rent certificate case
- ✓ Miscellaneous cases
- ✓ Mutation by LT Notice Misc. case
- ✓ Misc. case for Change the Land Class
- ✓ Khas Land Declaration Misc. case
- ✓ Record correction by the order of court
- ✓ Khaikhalasi Bandok Misc. case
- ✓ Eviction Misc. case



- ✓ Auction Case
- ✓ Others

## **8.2 Civil Suit Management System**

Civil suit management module needs to be developed based on requirements. This module needs to include whole processes of Civil Suit

- ✓ Review Case
- ✓ Appeal case
- ✓ Writ Case
- ✓ AT Case
- ✓ AAT Case
- ✓ Contempt Case

## **8.3 Workflow Engine Development**

- ✓ Workflow setup as per the user activities
- ✓ All user related to civil suit management
- ✓ All user related to revenue case management

## **8.4 Dynamic Order Sheet Management system**

- ✓ Development dynamic order sheet management
- ✓ Implement Voice to Text system in order sheet to manipulate the order faster and easily.
- ✓ Management the Order sheet dynamically.

## **8.5 Notice Management system**

- ✓ Create Notice against the order
- ✓ Manage Multiple Notice
- ✓ Template Management
- ✓ Version Management
- ✓ Noticed can be send to citizen through SMS, Email, Hard copy can be sent after generating by the system.

## **8.6 Smart Case diary management system**

- ✓ Specific case from start to end
- ✓ History



- ✓ Order
- ✓ Status

#### **8.7 High court module**

- ✓ System for solicitor including tracking
- ✓ System for Attorney Generals

#### **8.8 Land Case Portal**

The citizen and landing portal should be developed as per approved UI/UX design of the LMAP.

#### **8.9 Citizen case information module**

Citizen will be able to get case related data from this module, such as

- Case date
- Hearing Date
- Case tracking
- Case update
- Case related notice

#### **8.10 Development of support management system**

As case management systems will be built for citizens, a support management system will be developed for providing support to the citizens. This support management system will be integrated with LSG's support management system.

#### **8.11 Notification Management:**

- A notification tool needs to be added in the CMIS. This tool will add both for back-office users as well as citizens. Both back-office users and service receivers can create and send customized messages by using this tool through SMS and email.
- Authorized user will be able to configure notification media/content
- The system should have option to configure notification template
- The system should have provision to keep logs for every notification.
- Should have configurable push notification
- Notification for citizen application status, history, progress etc.
- Based on this integration the admin user will modify the case info, hearing, status of CMIS as per business rules.



#### 8.12 Online Payment

- Batch Payment (All Revenue cases)
- Part Payment (Rent Certificate case for organization)
- Single Payment

#### 8.13 Template manager:

All types of templates will be configured through this feature like:

- Case certificates
- Order sheets
- Notices
- SMS
- Email

#### 8.14 Other Dept. Application

The others govt./private/govt. agencies can apply for various types of applications and the related officer can proceed with this application.

#### 8.15 Archiving system for completed cases:

- The case those are completed will be archived.
- The system also should have a tracking process for inactive / reported cases present appearance with the help of the archiving system.

#### 8.16 Real time AI Based dynamic dashboard and analytics for all Users:

Artificial intelligence platforms will be used for transforming the decision-making processes with AI dashboards.

#### 8.17 Development of AI chatbot to provide support different types of service recipient and users:

- The chatbot has to be capable of simulating human conversation through voice commands or text chats or both.
- The AI based chatbot should have features that can be embedded and used through any major messaging application.
- This Chabot will make an artificial conversation with a service seeker.

Chatbot must have the following features;

- ✓ Voice-based and text-based assistance



- ✓ Rich conversations using natural language
- ✓ Sentiment analysis
- ✓ IoT integration support etc.

#### 8.18 Audit Trail:

This e-Service system will maintain an audit trail of any changes or updates made in any information that are considered as vital and should maintain the audit log with information such as

- User IDs
- Date and time records for when Users log on and off the system
- Terminal ID, MAC Address, IP Address, OS, Browser etc.
- Access to systems, applications, and data – whether successful or not
- Files accessed
- Networks access
- System configuration changes
- System utility usage
- Exceptions
- Log the fields that are being modified
- Log the results of these modifications
- Log the attempted breaches of access
- Log the attempted breaches of modification rights
- Timestamp.

It should be ensured that an audit trail is kept for all transactions and all audit transactions logged are kept on the trail file or trail database from where the system can generate different audit reports as and when required. Consultant is requested to submit their proposed “**Audit Plan**” including strategy & standard measures in their technical proposal.

## **9. API integration (with other systems) through LSG**

The following are the key expectations on interoperability requirements:

For system-to-system communication it will be necessary to provide combined easy and managed API access with full API governance and analysis:

- An online repository needs to be developed for all the common components/modules/features. The repository will manage all the reusable assets



- and should include integration prerequisite, integration compliance, integration guideline, integration standards and integration specification segregated by asset.
- Systems should have the ability to build and publish APIs/Services to a selected set of gateways in a multi-gateway environment.
  - System should support enforcement of government and system policies for actions like API/Service subscriptions, application creation, etc., via customizable workflows.
  - Manage API/Service visibility and restrict access to specific agencies or systems
  - Manage API/Service lifecycle
  - Ensure API/Service security by restricting API access tokens to domain/IPs, validating APIs payload contents against a schema, applying security policies to APIs authentication and authorization and provide threat protection, bot detection and token-fraud detection
  - System should generate JSON web tokens for consumption by back- end servers
  - System should have proper capabilities to manage and scale API traffic and enforce rate limiting and dynamic throttling based on usage quotas and bandwidth quotas.
  - System should have configuration payment schemes to monetize API usage
  - System should monitor SLA compliance for the API
  - System should have provision to do the proper/required integration with SSO System
  - 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 systems or external institute systems.
  - System should have provision to connect with the LSG system for central payment.
  - The system shall have functionality to export/import files based on the standard template defined through web services and/or API



Full API documentation must be provided so that third party integrators can integrate their system with this system. The following list of connectivity is given, however, while implementing the project more connectivity may be required:

The Firm/Service Provider will integrate the following External System using Land Service Bus but not limited to:

<b>Sl</b>	<b>External System</b>	<b>Integration Scope</b>
1.	LDTAX	The Firm/Service Provider needs to analyse the integration scope and do the necessary enhancement if required to integrate.
2.	e-mutation system	The Firm/Service Provider needs to analyse the integration scope and do the necessary enhancement if required to integrate.
3.	ePorcha/DLRMS	The Firm/Service Provider needs to analyse the integration scope and do the necessary enhancement if required to integrate.
4.	Khas land database	The Firm/Service Provider needs to analyse the integration scope and do the necessary enhancement if required to integrate.
5.	Payment gateway and A Challan	The Firm/Service Provider needs to analyse the integration scope and do the necessary enhancement if required to integrate.
6.	Others land related system and organization	If the client identifies any new scope for integration with the government/non-government/relevant stakeholder system. The consulting firm needs to analyse the integration scope and do the necessary enhancement if required to integrate with enhancement and customization of CMIS and Others land related system and organization
7.	3 <sup>rd</sup> Party System Integration	Any 3 <sup>rd</sup> party integration needs to conduct using Land Service Gateway (LSG)
8.	Other's system integration	The consultant needs to analyse the others integration scope as per the requirement of the project office, \ministry of land for their needs.

#### **External API Integration:**

- Payment Gateway and A-Challan
- Involvement with Other Land-Related Systems (eg., NID, IBASS++ etc.) and Organizations



- AI Voice Bot Integration for the Citizen Panel

The consultant should provide the list of data / records that can be used for other systems by the Ministry of Land and other Government databases for providing better services / management.

## **10. Security and Privacy Policy**

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The consultant should submit an extensive “**Security and Privacy Plan**” including comprehensive security architectures in their technical proposal for this CMIS considering the following issues:

- Project technical scopes.
- Functional and nonfunctional requirements and ultimate objectives.
- Concerned service provider organization’s operational environments and capacity.
- User roles, Accessibility, Authentication, Authorization and Accountability.
- Importance of data management & data privacy.
- Strength of technologies to be used for development, operation & maintenance.
- Deployment & hosting.
- Service recipients and providers’ security, confidentiality and privacy.
- A checklist of security measures to be taken for this solution.
- Overall security standards which should be applicable for an e-government system.
- Apart from these, the consultant should keep in account the following considerations as well as the consultant should provide a checklist based on the system and hosting security plan (i.e. fraud, hacking, money laundering etc.) & the test report of that checklist.

## **11. System Security Requirements**

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In the whole system, the following security threats as well as any new security threats should be taken into consideration and protections against these threats must be ensured by building networks, infrastructures, and applications safe, dependable, and secure against any such malicious attack.



### **11.1 Application and System Security:**

It will be programmed within the application itself in order to implement a user group. To eliminate the security threats, authentication and authorization have to be built into the security design of the application with password and/or multi-factor access control that will limit intruders or unauthorized users to retrieve any information, using modules, or generate reports, etc.

Following security measures should be considered:

- Must have self-encryption technique
- Two-step verification
- Session auto logout
- Secured Password Policy Platform, etc.

### **11.2 Server/Machine Security:**

It refers to physical limitation to access a machine and generally would require an additional login in order to gain access.

### **11.3 User/User Group-level Security:**

Since the system is a web and mobile based application where users are managed by separate managements at different locations, a multi-layered user right policy is needed to be applied.

### **11.4 File/Database Security:**

Unauthorized user activity at the database resources must be blocked. Both user level security and data level security should be ensured. All security related documentation should have for the system.

### **11.5 Fault Tolerance and disaster management:**

Fault of the system and hardware may cause collapse in the whole system. One server will be kept a cold backup so that faults in one server could easily be recovered. Hosting of the application outside the country will work as a mirror copy and Disaster recovery site.

- The consultant 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.
- The consultant should consider (but not limited to) common vulnerabilities such as SQL Injection, Cross Site Scripting (XSS) etc.
- Consultant will undertake responsibility for Input Validation Controls, Authorization/Authentication Control and other security controls in place in both testing and production environments of application.



- The following vulnerabilities must be checked and ensured security from the beginning:
  - a. Cross Site Request Forgery (CSRF)
  - 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
- The consultant shall minimally provide Access control, Authentication and accountability security mechanisms for backend operations of the System.
- 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.
- 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.



## **12. Non-functional requirements:**

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### **12.1 Sentimental Analysis Management:**

The consulting firm needs to develop AI based sentiment analysis component so that system can detect the citizen feedback whether the feedback data is positive, negative or neutral. It should be incorporated with support ticket system which will extract feedback data and authority could monitor the customer satisfaction and needs.

### **12.2 Dashboard requirements:**

- Ensure the system is capable of managing a large number of users efficiently. Ensure different user grouping & tree/subgrouping facility for efficient user management.
- Provisioning reconciliation facility with LSG/SSO user so that dashboard user administration can be easier and user can access dashboard using SSO also.
- Ensure date wise dashboard presentation history saving with keeping note, loading, removing facility so that monitoring user can compare the performance with respect to another dashboard information. Also, user can view all those selected dashboard presentations in run time.
- Ensure user facility to set/arrange his default dashboard view and settings.
- Ensure user facility for printing and exporting dashboard and presentation view.
- Ensure user login access through mobile apps to web apps and web apps to mobile apps. Also, a user can log out web apps by his mobile apps and vice versa.
- User can change his password efficiently.
- Linkage multiple dashboard presentations from single dashboard presentation information using its different values.
- Presentation, Report, Dashboard layers of a dashboard system should have grouping & tree/subgrouping facility for efficient management.
- Provisioning custom date range / month range / year range selection facility with month wise and year wise dashboard selection criteria.



- Ensuring efficient data loading facility.

All above functionalities are not limited to and as proposed by the consultant for modernization.



### **12.3 Data analysis and visualization tools:**

The consulting firm will use data analysis and visualization tools for land ministry authority so that the admin user can monitor information in an actionable and meaningful way. The data visualization tools will focus on a specific type of chart or map or any required data. This feature's design will be formed with various charts and graphs on a single screen providing land case related information which will be presented in real time. The admin user can take any decision based on that dynamic data and analyze the findings of this system. These visualizations will make it easy for land authority to understand and forecast the trends and decisions through visuals when it comes to analyzing big datasets and understand the insights collected.

### **12.4 Service recipient account management**

The system will integrate with the NID and NTMC system using the Land Service Gateway (LSG). The service recipients should provide their Mobile/NID for taking any service. The system will automatically create a service recipient account communicating through LSG and retrieving the service recipients name, address etc. The system will keep the service history of the service recipients and depending on the service recipient's location, personal information, service taking nature etc. the integrated AI will guide and help him/her to request and receive any service in a very quick, easy and efficient way with minimum interaction with the system. This system will collaborate with the service portal. If any service recipient's information is already existed in any other MoL enterprise application, then CMIS have to fetched that information for its use instead of new insertion.

### **12.5 Service Portal:**

The consulting firm will develop a unified gateway for all kinds of users of this system for sharing information, getting & providing services, FAQ, upload contents, searching, reporting, payment, and so many tasks according to the access of users. Service Portal allows the users to interact and mobile/web-



friendly service experience. This portal will interact with parts of all platform features. It should be developed based on more modern technologies.

- This service portal will act like a physical repository of architectural artefacts & deliverables.
- The Portal should have standard and document uploading panel using HTML structure and also using proper DDL.
- The Portal should have its own document/content management system from admin panel where documents can be listed/uploaded using various filters. Users with proper permission will be able to modify/remove standard and guideline documents as needed. Also, for each revision, system should track versioning properly.
- The Portal should have management dashboard and usage analytics and shares the data to the stakeholders and administrators
- The Portal should provide efficient search mechanism to allow users explore their queries navigating through different standard catalogues or tools of interest allowing options like keywords, different types of filters.
- FAQ for most commonly asked questions and answers.
- Should have provision to integrate AI based support

## **12.6 Service access point management:**

The solution will provide different facilities to the service recipients to access the platform by different way from any place any time. The system will have many dynamic facilities to enable/disable different service mode, service access point, service counter etc. like below but not limited to:

- Web Portal
- Mobile Apps
- Hotline
- Digital Centre

### **12.6.1 Payment settlement system:**

Citizen will complete the payment process through the several payment methods like Bkash, Nagad, Upay, Master Card, Visa Card and so on. These



payment amount will be distributed in systematic way by A-challan Payment Gateway of Finance Ministry.

#### **12.6.2 Office wise payment collection and settlement reporting:**

System has to be provision to generate several kinds of reports based on settlement bank money distribution. Admin can view those reports whether the A-Challan and bank transfer money is properly distributed or not. Admin will view each of the segregated payment collection reports in every transaction and also view the other payment settlement related reports.

#### **12.6.3 High Performance**

Each of the portals should be able to handle thousands of concurrent visitors and should be able to render simple pages within 5 seconds or less. Visitors of the portals should not feel any lag in response time when they are browsing through different sections of the portals.

#### **12.6.4 Highly Optimized Database:**

The portal databases are needed to be highly optimized and normalized so that performance stays high as the data volume increases.

#### **12.6.5 High Scalability:**

The portal framework will be scalable in order to sustain more and more users as it grows. The Land Case Management platform is going to handle a large volume of information as well as large number of users in the following days. To handle this large amount of data, the consulting firm need to pay a great effort on infrastructure management CMIS service delivery Platform.

#### **12.6.6 High Availability:**

The portals should have a very high availability rate. There should be real-time monitoring of server health and in document of any trouble, backup servers should be available to continue providing services as needed

- Monitor the operating system, database, application, application server and the integration among them to ensure the availability of **CMIS** service delivery Platform



- To implement the load balancer, database replicator, cluster software etc. to ensure high availability computing environment as and when required
- Update the security settings and version of the operating system, database, application, application setting to ensure secure computing environment and service.
- Develop and maintain installation and configuration procedures and system standards.

**The consulting firm shall have to satisfy the following resourcefulness to ensure infrastructure services;**

- Configure necessary staging & production server.
- Security: Protection & security of content, hosting environment, servers, network elements, access & network must be ensured.
- Ensure necessary configuration and management of IP addresses & bandwidth arrangement as collaborated derived requirements with the ministry of land to accommodate scalability, user growth & integration to other systems.
- Provide version control solution, user feedback recording system, incident management mechanism, CMS & DB tuning services for the aforesaid systems.
- Continues server monitoring sizing and tuning.
- Maintain system uptime as per standard SLA.
- Server configuration as a continuous job of operation as and when required.
- Data Migration as an active support assignment during integration.
- Change Management of both application and infrastructure



## 13. Common Services Configuration Module

Common Services Configuration		
Module 1: Information service management		
Feature	Features description	Integration
1.Content management	Manage digital content dynamically Using the system's control panel.	
2. Smart search	Text content searching option having intelligent search suggestion.	
Module 2: Complaint management		
Features	Feature description	Integration
1. Add Complaint	Any user or service consumer can add Complaint as a registered user or anonymously	LSG and Complaint management
2. Add Complaint types	There can be different types of Complaint. It can be service specific or any other issue specific. The system will have the option to add Complaint types. The Complainer will select the Complaint type to lodge the Complaint. For service specific Complaint, the Complaint should put a service application ID for tracking the service status to manage the Complaint.	
3.Configuration (Add, update Complaint Management Officer (CMO), Appeal Officer (AO), other settings)	There will be options to add, update Complaint Management Officer (CMO), Appeal Officer (AO) and other settings to manage the Complaint management module.	
4. Assignment of CMO, AO with specific jurisdiction	Assign CMO, AO with specific jurisdiction like assign CMO, AO for any organization, department, section or Complaint types	
5. Notification	There will be a setting to send notification from different steps of the Complaint life-cycle. The notification will be in 3 mediums: Email, SMS and System generated.	
6. Complaint feedback management	After resolving a Complaint, the Complainer will share his/her feedback with rating. This is very crucial to enrich the service process and ensure better Complaint management.	
Common Services Configuration		
Module 3: Access Control Management		
Features	Feature description	Integration
1. Multi-Layer Access Control Mechanism	The system will have a system access control panel. Every system user will be assigned to one or multiple roles. Every role should be assigned to a set of actions or activities. The system admin will have provision to assign roles to users and to assign a set of actions/activities to roles.	LSG



2. SSO	This should provide options to users to access all of his/her assigned systems with a single user and password. No multiple access credentials should be needed to access multiple systems.	
<b>Common Services Configuration</b>		
<b>Module 4: Document Management</b>		
<b>Features</b>	<b>Feature description</b>	<b>Integration</b>
1. Document store and management	Users will upload documents, the system will categorize, index and store those. System users will have provision to add, update and delete documents.	
2. Document optimization	The system will have a mechanism to automatically optimize raw documents, special image or video files uploaded from different devices. Usually, the sizes of files are excessive than the system really needs to process services. So, an automated and configured optimization mechanism is needed to optimize and make the system efficient.	
3. Document metadata management	There needs to have options to store metadata associated with the documents for better searching, sorting, indexing and archiving	
4. Document upload and download	There should be options to upload and download documents. There will be access control to documents download options depending on the sensitivity and security of the documents.	
5. Document archiving	There will be large number of documents stored in the system over the time. So, need to archive documents with proper indexing and mapping to faster and to ensure efficient document management	
<b>Common Services Configuration</b>		
<b>Module 5: QR generator engine</b>		
<b>Features</b>	<b>Feature description</b>	<b>Integration</b>
QR Code	Here are the features needed from the QR Generator Engine: - a Unique QR Code will be generated for each valuable document and in need basis - QR on SF will be generated using Land case data. - Any other document as per needed.	

## 14. Solution Architecture

Solution architecture plays a useful role at the initial stage of understanding of the solution ideation, solution design, and solution implementation plan. Here the solution architecture is expected to establish the complete understanding of the business context. i.e. service delivery and receiving process in digital form, the vision, objectives and ultimate requirements of this solution for CMIS.



This architecture should define the process of developing and documenting covering the context of the proposed e-Service solution including all impactful and applicable architecture domains such as Microservice approach, accessibility, business, data, application, technology, integration, cross cutting issues like security, management operation etc. The consultant shall submit a technical proposal which may include business architecture, information architecture, application architecture, and technology architecture focusing on the scope mentioned in this TOR.

## **15. Mobile Application Requirements**

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- The mobile application version of the system should be developed for Android and iOS.
- The mobile app should have the capability of displaying system notifications
- Functionality for registration options for service recipients
- Apps should enable compact views of services for service recipients.
- There should be an option to auto synchronize with the central database with apps local database on the availability of the Internet connectivity.

## **16. Capacity Development**

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The consultant shall deliver a plan for training of this e-System. It is required that the consultant works in partnership with LMAP and other stakeholders identified by the LMAP to ensure knowledge transfer and further build local capacity for maintenance of the system.

### **Operational Training: 20 persons**

The consultant should be arranged batch wise day long operational training in two batch. Around 10 persons in a batch.

### **Training of Trainers (ToT): Around 700 persons (10 to 15 persons from each District)**

The consultant should be arranged batch wise 2/3 (Two/Three) days long ToT training. Around 20 persons in a batch with Audio-visual tutorial for the end user and must be linked in the Land Portal. The vendor shall provide honorarium to the participants as per government rules.



## 17. Security Management

This system will contain different land record related data which is highly valuable & crucial for both citizen/landowner and government. So, the solution needs to have security features to handle all types of data confidentiality, authentication, authorization etc. The CMIS has to ensure these security features for data encryption & VPN features so that any kind of land record related data entry/edit/modification. In order to ensure the security of the system the consulting firm will have to ensure the following.

### **Injection**

Injection flaws, such as SQL, NoSQL, OS, and LDAP injection, occur when untrusted data is sent to an interpreter as part of a command or query. The attacker's hostile data can trick the interpreter into executing unintended commands or accessing data without proper authorization.

### **Broken Authentication and Session Management**

Application functions related to authentication and session management are often implemented incorrectly, allowing attackers to compromise passwords, keys, or session tokens, or to exploit other implementation flaws to assume other users' identities temporarily or permanently.

### **Insecure Direct Object References**

This issue occurs when an application provides direct access to objects based on user-supplied input. As a result of this vulnerability attackers can bypass authorization and access resources in the system directly, for example database records or files.

### **Security Misconfiguration**

Security misconfiguration is the most commonly seen issue. This is commonly a result of insecure default configurations, incomplete or ad hoc configurations, open cloud storage, misconfigured HTTP headers, and verbose error messages containing sensitive information. Not only must all operating systems, frameworks, libraries, and applications be securely configured, but they must be patched and upgraded in a timely fashion.

### **Insecure Cryptographic Storage**

This is a common vulnerability that occurs when sensitive data is not stored securely. Insecure Cryptographic Storage isn't a single vulnerability, but a collection of vulnerabilities.



### **Insufficient Transport Layer Protection**

Not all traffic flowing between two endpoints is properly secured, which makes it possible for attackers to perform man-in-the-middle attacks. We have to implement HTTP Strict Transport Security in all browsers, which makes it possible to better enforce secure connections. Additionally, implementation of Certificate and Public Key pinning in browsers is necessary where applicable.

### **Invalidated Redirects and Forwards**

Invalidated redirect vulnerabilities occur when an attacker is able to redirect a user to an untrusted site when the user visits a link located on a trusted website. This vulnerability is also often called Open Redirect.

### **Sensitive Data Exposure**

Many web applications and APIs do not properly protect sensitive data, such as financial, healthcare, and PII. Attackers may steal or modify such weakly protected data to conduct credit card fraud, identity theft, or other crimes. Sensitive data may be compromised without extra protection, such as encryption at rest or in transit, and requires special precautions when exchanged with the browser.

### **Using Components with Known Vulnerabilities**

Components, such as libraries, frameworks, and other software modules, run with the same privileges as the application. If a vulnerable component is exploited, such an attack can facilitate serious data loss or server takeover. Applications and APIs using components with known vulnerabilities may undermine application defenses and enable various attacks and impacts.

### **Broken Access Control**

Restrictions on what authenticated users are allowed to do are often not properly enforced. Attackers can exploit these flaws to access unauthorized functionality and/or data, such as access other users' accounts, view sensitive files, modify other users' data, change access rights, etc.

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### **Insecure Deserialization:**

Insecure deserialization often leads to remote code execution. Even if deserialization flaws do not result in remote code execution, they can be used to perform attacks, including replay attacks, injection attacks, and privilege escalation attacks.

### **Insufficient Logging & Monitoring:**

Insufficient logging and monitoring, coupled with missing or ineffective integration with incident response, allows attackers to further attack systems, maintain persistence, pivot to more systems, and tamper, extract, or destroy data. Most breach studies show time to detect a breach is over 200 days, typically detected by external parties rather than internal processes or monitoring.

Clients should have prompt response for shake of security and protection from all other known and zero-day attacks from trusted/untrusted zones for a stable and uncompromised system.

### **Mime Type**

Mime types and file extensions provide hints to how to deal with a file. Whereas file extensions are commonly used for your OS to decide what program to open a file with, Mime types are used by browsers to decide how to present some data (or the server on how to interpret received data).

### **Ransomware prevention system:**

Ransomware is a type of malware that encrypts data and locks out access to infected computers until the ransom demand is paid. In one word, data format cannot be changed by the attacker at any cost.



## 18. Support & Maintenance

- Provide support service for current system and new developed system under structured SLA and Change Management Architecture.
- Continuous health check of Database and database back-up, tuning database, tuning codes & queries and mitigating the issues.
- Updating training manual adjusting the changes in the system.
- Managing database security/ integrity and backup procedures
- Fixing all bugs in the system irrespective of its nature and complexities.
- Fixing Authentic Data entered into the system following a structured authorization system.
- Enhance and/or re-arrange existing feature of extended development of any supplementary feature within the existing technology framework complying with core SRS.
- Consultant should introduce (install/enhance or develop) a centralized customer relationship management (CRM) tools by which users (basically, service provider type users) will have access to support service to open support ticket and track ticket for resolution
- Ensure system availability 24/7
- Time frame

## 19. Data Entry Platform

### Data Entry and Archive Management:

One of the major objectives of the Case Management & Information System (CMIS) platform is to ensure all Cases (Civil Suit and Revenue Case). As land related dispute and document management is a common issue, the proposed enterprise solution will keep record of previously generated land cases. This module will consist of the following features.



This feature will have the following provision in data entry panel;



- History and archive management for the entered/uploaded cases
- User Role Management from the admin panel.
- Track and retrieve cases /SF as and when required by authorized users
- Generate various reports of old version cases
- Creation of non-government users
- Users' organogram will be maintained
- Data entry officials can manage their profile
- Admin can track the activity of any data entry officials.
- Data entry operators will also view who is keeping track on him/her

## **20. User Acceptance Test (UAT)**

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User Acceptance Test (UAT) is a very vital and essential phase in the e-Service development lifecycle. At this phase, all types of users must test the developed e-Service application by themselves and must provide a detailed feedback/ test report. Based on the UAT report, consultants must update the application accordingly to ensure user satisfaction by making it more user-friendly. Here, it is expected that considering the type of users and their role in the e-Service application, the consultant must propose a comprehensive UAT plan in their technical proposal which may cover the followings:

- UAT activities to be performed (planning, designing test cases, selection of the testing team, executing test cases and documenting, Bug fixing, sign-off etc.)
- Types of user wise roles and test items distribution
- resource requirement,
- activity wise time requirement
- activity wise test case, test results/ deliverables
- detail user feedback/test reports
- System update plan

## **21. Management and Migration of Legacy Data**

Under the process of service to e-Service transformation, during e-Service activation or deployment, it may be necessary to move the legacy data of prevailing services. In this case, the consultant may require performing different relevant activities that may include



data collection, softcopy conversion, data filter, data cleansing, data verification, data process, data entry, data migration and overall data management. Here, it is expected that the consultant will propose their detailed data management and data migration plan for this e-Service application considering the estimation of legacy data mentioned below which will be required to migrate into the developed application.

The plan may cover the amount of data to be migrated, activities to be performed, number of resources to be used, required time for different data migration phases for different activities (data collection, hardcopy to softcopy conversion, data entry, data transformation from soft copy, data filtration, data cleaning, data verification) etc.

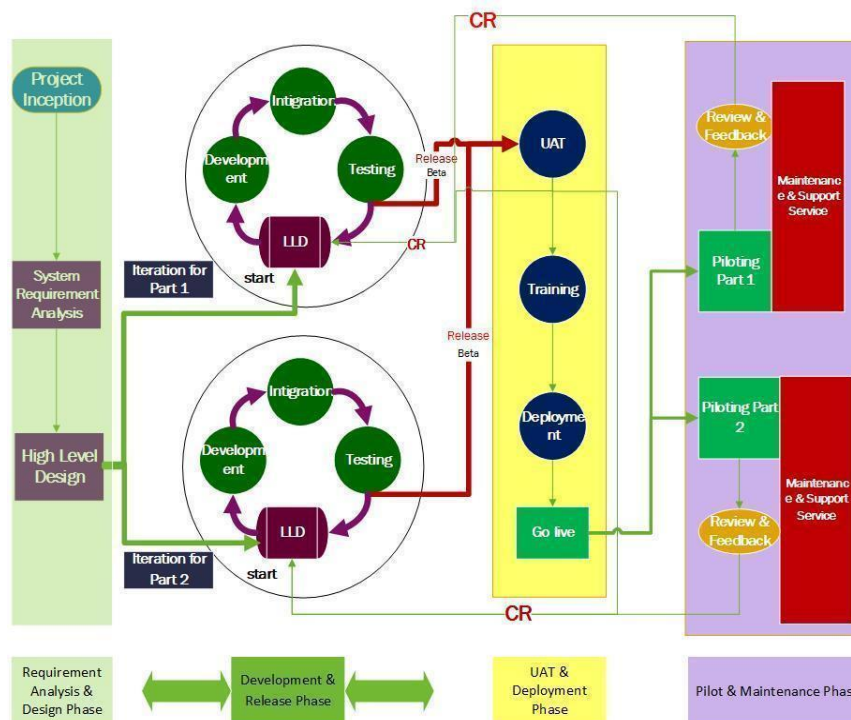
## **22. Operational Acceptance Test (OAT)**

Operational readiness of CMIS meds to be evaluated before releasing to the production through Operational Acceptance Test (OAT). It should ensure smooth operation in its standard operating environment. It will confirm that the product, system, service or process meets operational requirements such as performance, security, reliability, stability, maintainability, accessibility, interoperability, backup and recovery. The consultant should submit an OAT completion report.

## **23. SDLC Approaches & Methodology**

Considering the current context of digital government implementation of Bangladesh, we've proposed agile with devops SDLC methodology for the development of this integrated service delivery platform. Under the scope of this SDLC methodology, for effective, efficient, timely and fruitful development of this system and achieving early release as a tangible result, the scope of this assignment can be divided into multiple parts (components & modules) based on priority and dependency of the modules and features to be developed and released.

In the inception phase, the parts of the components/modules will be defined by the concerned authority (implementing agency) discussing with the vendor.



**Figure:** Sample Hybrid SDLC Methodology (Dividing scopes into two parts)

The methodology covers the following phases:

## 24. Phase-1: System Analysis & Design

### 24.1 Requirement Collection:

Collections of requirements using appropriate methods and analysis of previous reports of current lease and settlement process. Collection of information by interviewing, meeting, seminar and conduction tour in field office, circle, region office etc. for the input of the system.

### 24.2 Inception Report:

Proposed project management plan with time schedule indicating milestone, resources plan, Gantt chart, clearly mansion the slack time, overhead, risk and its mitigation plan etc. Time-slot (deliverables, deployment, maintenance) according to TOR.



### **24.3 System Requirement Specification (SRS):**

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Software Design Document (SDD), Software Requirement Specification (SRS), Functional Requirement Specification (FRS), User Story, Use Case, E-R diagram, DFD Level 0, Level-1. Also estimated time-slot for each module The software must include the necessary conditions for component-based implementation as per PPR-2008, and the SRS should be designed accordingly.

### **24.4 High-level System Design (HLD):**

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High-level design document or HLDD, all levels of DFD, Database Template Design and UI based non-functional prototype/ Mock. Share the QC reports.

### **24.5 Phase-2: Development & Release:**

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As the system will be developed from scratch the assignment scope will be developed in a single Part as per organizational consideration and decision. This Part will be completed through an iteration. The iteration process may follow the scrum process with several sprints of Agile Methodology. The iteration includes several steps such as LLD (Low Level Design), Development, Integration, Testing, Review and Release. For detail clarification the "Iteration 1" steps for this Part are described below:

### **24.6 Development:**

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Developed features/modules/components/ applications, code documentation, database and related files, Git Repository (For code-review, understanding), algorithm & interface related documents, development & versioning report, Test Design, Test driven development (TDD) approach should be included at this stage to ensure smooth development etc.

### **24.7 Integration**

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The system shall be capable of seamless integration with others leading software both for import and export of data and reports in multiple formats Interface to other applications and databases.

Proposed system shall provide simple integration between different software



applications whether they are web-based, or desktop-based. It should have provision to integrate with other Govt. applications and third-party solutions. The vendor should have provided Integration testing reports, test-cases, Integration activity report, User manual, Architecture design etc.

## **24.8 Testing**

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Software testing process is one of the most vital phases through which it will be expected to evaluate each and every functionality of the proposed software application with an intent to find whether the developed application's functional features meet the specified requirements or not.

The Consultant should prepare an extensive testing plan so that any functional failure can be detected and corrected timely and properly. The scope of the software testing should include the examination of code as well as the execution of the code in various environments and conditions as well as examining the aspects of the code; does it do what is required.

The Consultant must propose a comprehensive testing plan in their technical proposal for this e-Service application starting from development to deployment that is covered in the full test life cycle. This testing plan should cover all the standard testing approaches applicable for this e-Service solution which may include phase wise testing activities like test scripting, test documents, testing tools, testing process, test log, result and report formats i.e., expected test deliverables. The Consultant should submit a testing plan which may include standard test approaches.

The supplier shall deliver a test plan of all tests. This plan shall follow IEEE 829-2008 guidelines. The test plan shall contain

- A list of test scenarios (test cases)
- Detail test cases associated to the scenarios

The supplier shall also prepare the test data.

Supplier shall ensure black box testing with DAST (Dynamic Applications Security Testing) and negative testing done and evaluated by third party with relevant certification for validity check



The hardware platform required for UAT/SIT/OAT shall be provided by the customer from its Data Centre.

There shall be performed three types of testing Functional testing and non-functional testing, Acceptance testing. Some are mentioned below as examples for reference: -

**For functional testing, there shall be performed:**

- Unit Testing
- Smoke testing
- Integration Testing
- System Testing
- Regression testing
- Localization
- Interoperability

**For non-functional testing, there shall be performed:**

- Performance Testing
- Volume Testing
- Scalability
- Load Testing
- Stress Testing
- Compliance Testing
- Portability Testing

**For Acceptance testing, there shall be performed:**

**o User Acceptance Test (UAT)**

- Alpha Testing
- Beta Testing

**o Operational Acceptance Test (OAT)**

- i. Recovery Testing
- ii. Backup and Restore Testing
- iii. Security Testing
- iv. Accessibility Testing
- v. Usability Testing
- vi. Destructive Testing.



**All test results shall be recorded and delivered to the client.**

**Deliverables:** Test Plan, Test Scripts, Test Logs, All Tests Reports, Feedback.

**Note:** Based on the Test reports and received feedback (Change Request) the LLD, version, developed application may be changed accordingly.

## **24.9 Release:**

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**Deliverables:** Released application modular/part wise with appropriate versions control mechanism and details release notes of each release

## **24.10 Phase-3: UAT & System Deployment**

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As soon as one iteration releases any developed application after completing the predefined steps and processes, this released version will be entered into this immediate phase i.e. UAT and system Deployment. The basic objective of this phase is to receive user feedback, adjust them, take final consent or acceptance of the user, and ensure system testing for deployment, training and taking final deployment actions to GO LIVE. There may be basically 3 major steps are involved in this phased which are described hereunder:

### **24.10.1 User Acceptance Test (UAT):**

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**Deliverable:** User Acceptance Test report of module/tasks of all features in application is met clearly. After UAT, submit a showcase/piloting report.

### **24.10.2 Operational Acceptance Test**

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Bug fixing and modification due to smooth operation of the product. Bug fixing report and updated operational manual.

### **24.10.3 User Training**

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**Deliverables:** Training Manual, Training Plan, Training Feedback, Training Report





## **24.10.4 Deployment**

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Deployment is a very important step in the SDLC before going LIVE where different types of necessary and standardized activities should be performed as per predefined plan. The deployment plan should be prepared in a comprehensive manner choosing the appropriate deployment method and right deployment checklist. Automating the deployment process as much as possible is a wise decision at this step. For ease deployment, we can use an automation server (i.e: Jenkins). Obviously adopting continuous delivery and using an integration server is necessary. Deployment preparation also may include checking that the required server is running smoothly and configuring the staging environment properly. At this step, there are various testing processes that should be performed as a part of the obvious process. Finally, this deployment process may continue with copying the updates to the production environment, running any necessary scripts, setting changes for live and testing on the live server before going LIVE.

## **24.10.5 Go Live**

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Successful deployment of any developed and tested application will lead finally to the "GO LIVE" state. The inauguration of the application may take place immediately when it enters into this stage. As inauguration is the formal session to expose or open the application to the end users/citizen, therefore proper consent of the concerned implementation Organization/Agency is required before going LIVE.

## **24.11 Phase-4:**

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### **24.11.1 Support & Maintenance**

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It may be stated that the pilot phase will be started immediately with the starting of "GO LIVE" which should last a maximum of 3-6 months based on the decision of the implementing Agency/Organization and predefined accepted pilot implementation plan. The Consultant will provide all necessary support to ensure smooth operation in the pilot phase. It may be mentioned here that some change requests (CR) based on the end users review and feedback at this piloting stage may be required to be accepted and CRs



will be adjusted through predefined development cycles. Obviously at this stage, those CRs must be considered aligned to the Terms of Reference (ToR) of the assignment avoiding major functional changes that may create alternation on architecture, database structure and development complexity. In this document, CRs related to UI and UX, frontend scripting and content presentation level may be accepted. In this piloting phase, technical support, continuous training, timely reporting, receiving end user's feedback and measuring the overall performance of the application are the important factors that should be taken care of by the Consultant at this stage.

Maintenance phase will be started in this SDLC methodology. This phase is very important because the actual maintenance support service will be started by the Consultant and the implementing organization will also take measures for scale up implementation of this software based on the result of the pilot. Some of the factors mentioned below are very important at the time of maintenance support service by the vendor.

- The developed and deployed digital e-service application should run smoothly and bug freely.
- In a document of any technical problem or support requirement, the Consultant's response for a solution must be very prompt.
- Based on the type of technical complexity and support requirement, the response and problem solution plan have to be predefined and precise through a signed SLA.
- The Consultant must consider contingency plan to manage and solve sudden complexity, technical problems arose and support request.
- The help desk remote support should be comprehensive, strong, standard and adequate.
- Improving user engagement, user training and receiving user review & feedback should be considered in the maintenance support plan.
- Communication, software performance evaluation, continuous improvement for user satisfaction and right time reporting to the concern authority should be planned well ahead and execute the same timely as standard service.



Based on the analysis of the impact of piloting phases and adjusting the plan, scale up implementation has to be done. In this document, the Consultant will provide proper guidelines and different kinds of planning support to the organization so that the implementing organization can complete the scale up successfully

**Deliverables:** Support and Maintenance Plan, SLA, Running Digital Service

**Note:** The above-mentioned hybrid methodology is proposed based on the e-Government Application/Digital Service implementation context, priorities, dependencies and challenges. This hybrid methodology has been proposed here customizing a few popular SDLC methodologies like Agile Scrum, etc. Understanding the scope of the assignment and other important context and factors, the Consultant may follow this proposed hybrid methodology, or may customize it as per necessity or may propose any other different SDLC methodology with proper justifications in their technical proposal. The project implementation time plan /schedule should be proposed in the technical proposal completely based on the chosen SDLC methodology by the vendor. But the Consultant is requested to describe the SDLC Methodology\_for this assignment in details in their technical proposal covering the following;

- Diagrammatic representation of the proposed SDLC showing the phases, methods, processes, flow, steps, deliverables etc.
- Proper justification/rationality for choosing the SDLC and context/factors considered in choosing the same. The advantages of this SDLC should be stated very clearly and precisely in respect of this assignment scope/context.
- Detailed activities/tasks and description of each and every phase /step which will be performed under the scope of this SDLC for this assignment like Inception, Requirement analysis, Design, Testing, Development, Deployment etc. This description of each phase/step should also include the purpose, deliverables/documentation, dependencies of this SDLC.



## 25. Implementation Timeframe

The consulting firm must complete the assignment within a stipulated timeline based on the proposed SDLC methodology. The assignment timeline can be divided in four below phases that is – Requirement Analysis, design & document, Development, UAT and Maintenance & Support. As the entire assignment’s functional scope will be divided into 2 parts, therefore the release and deployment of the part for going live will be based on the completion of the iteration.

The assignment is divided into three phases. The entire assignment is divided as following phases:

### PHASE-I: Requirement Analysis, Design – 2.5 Months

Title	Duration
<ul style="list-style-type: none"> <li>▪ Inception report</li> <li>▪ Gap Analysis Report</li> <li>▪ Functional Requirement Analysis (FRS)</li> <li>▪ Requirement Analysis, SRS</li> <li>▪ High Level Design (HLD),</li> <li>▪ LLD Design</li> <li>▪ Others</li> </ul>	2.5 (Two and half) Months

### PHASE-II: Development, Data Migration, UAT & Deployment – 8.5 Months

Part	Duration
<ul style="list-style-type: none"> <li>▪ Software Development</li> <li>▪ Mobile Apps Development</li> </ul>	6 (Six) Months
<ul style="list-style-type: none"> <li>▪ UAT</li> <li>▪ Data Migration</li> </ul>	1 (One) Month
<ul style="list-style-type: none"> <li>▪ UAT Feedback incorporation</li> <li>▪ Mobile Apps UAT feedback incorporation</li> <li>▪ Final UAT</li> <li>▪ SQTC Parallel with feedback incorporation</li> </ul>	1.5 (One and Half) Months

Some Activities could be done in parallel manner.

### PHASE-III: Final Deployment, OAT, Fix Bugs and Go Live – 01 Months

Title	Duration
<ul style="list-style-type: none"> <li>▪ TOT Training</li> <li>▪ Deployment</li> <li>▪ OAT and Bug Fixing</li> <li>▪ Functional Traceability Matrix</li> <li>▪ Integration (All integrated Application through LSG) Traceability Matrix</li> </ul>	01 (One) Months



**PHASE-IV: Support & Maintenance– Total: 12 Months**

Title	Duration
Support and Maintenance service after new version development and go live	12 Month

## 26. Professional Staff Requirements

### 26.1 Key Person Man Month

Land Case Management & Information System					
SL	Key Position	No	Input Person-Months (For Costing)	Intermittent (In Months)	Total Man Months (For Costing)
1	Project Manager	1	10	26	10
2	Domain Expert	1	5	12	5
3	Team Leader	1	7	12	7
4	System Analyst	1	4	12	4
5	Database Administrator/Database Expert	1	4	12	4
6	Data Migration Expert	1	3	8	3
7	Sr. Software Engineer	3	7	12	21
8	Software Engineer	6	7	12	42
9	Mobile App Developer- Android & iOS	2	3	10	6
10	API Expert	1	4	8	4
11	UI/UX Expert	1	3	6	3
12	Technical Document Writer	2	4	12	8
13	Tester/QA Engineer	2	4	10	8
14	Quality Controller	1	6	10	6
15	Training Expert	2	4	12	8
16	System Administrator	1	4	12	4
17	DevOps specialist	1	4	8	4
18	AI Expert	1	4	8	4
19	BI & Data Visualization Expert	1	4	10	4
20	Solution Architect	1	4	8	4
21	Infrastructure support Engineer	1	6	14	6
22	Security Expert	1	5	10	5
23	Support Manager	1	12	12	12
24	Support Engineer	3	12	12	36
<b>Sub-Total</b>		<b>37</b>	<b>130</b>		<b>218</b>



SL	Non-Key Position	No	Input Person-Months (For Costing)	Intermittent (In Months)	Total Man Months
1	Asst. Support Engineer (New development)	3		12	36
<b>Total</b>		<b>37</b>			<b>218</b>

Note: Non-Key Positions are not included in the total as they are not considered for costing.

## 26.2 Key Personnel Requirements

The minimum required qualification and experience of the Key professional staff are as follows:

SL	Position	No of Personal	Minimum Qualification	Responsibility
1	Project Manager	1	<ul style="list-style-type: none"> <li>i) Minimum academic requirement is graduation in Computer Science and Engineering/ICT preferably having a degree from a reputed university.</li> <li>ii) Minimum <b>5</b> years of experience in managing large scale IT projects with minimum total of <b>15</b> years of experience in ICT industry.</li> <li>iii) Past Experience in leading such an assignment, role including software design and development, preferably in Bangladesh Government IT projects.</li> <li>iv) Must have minimum 2 (Two) e-Government application/ Digital Service application (For design, development, deployment and implementation) project for the public sector with the Govt. Organization.</li> <li>v) ITIL/PMP/Prince2 certification is preferable.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Overall management of the project activities</li> <li>➤ All kinds of reporting to the LMAP</li> <li>➤ Define Statement of Work (SoW).</li> <li>➤ Requirement Collection, Analysis and Prepare SRS.</li> <li>➤ Communication with the clients (PMU) and other stakeholders if required.</li> <li>➤ Managing own Team and providing work plans and progress reports regularly.</li> </ul>
2	Land Domain Expert	1	<ul style="list-style-type: none"> <li>i) Bachelor/Master's degree in BBA/MBA/IT/ICT/CS/Engineering related field</li> <li>ii) Preferable in related Certification/Degree in any reputed institution.</li> <li>iii) Minimum 15 years of working experience in Land Sector.</li> <li>iv) Should have practical experience on case management in</li> </ul>	<ul style="list-style-type: none"> <li>➤ Guide, supervise and give inputs to Business Analyst</li> <li>➤ Optimizing Land related processes</li> <li>➤ Conduct needs assessments to identify operations requirements of stakeholders or end users.</li> </ul>



SL	Position	No of Personal	Minimum Qualification	Responsibility
			<p>any public office.</p> <p>v) Sound knowledge about information systems</p>	<ul style="list-style-type: none"> <li>➤ Assist in overall implementation and UAT, OAT</li> <li>➤ Ensure to incorporate CMIS related functionalities into SRS.</li> <li>➤ Work with PM and solution architect to provide uninterrupted land Case Management related service in simple &amp; easy manner</li> </ul>
3	System Analyst	1	<p>i) Minimum academic requirement is graduation in Computer Science and Engineering/ICT preferable having a degree from a reputed University.</p> <p>ii) Should have minimum <b>12</b> years of profound experience in the field of System analysis and design for ICT based application or Software Development project.</p> <p>iii) Must have minimum 5 ICT enabled software project experience in the field of system analysis and design.</p> <p>iv) In which 2(two) should be for the e-Government application /Digital Service application (For Analysis and design) project will be preferable.</p> <p>v) TOGAF / CBAP certified</p>	<ul style="list-style-type: none"> <li>➤ Analysis the upcoming systems as well as other systems which will be integrated to LSG.</li> <li>➤ Assist Project Manager for designing and implementing system for application.</li> <li>➤ Monitor the system as per design.</li> </ul>
4	Database Administrator/Database Expert	1	<p>i) Minimum graduate in Computer Science and Engineering/ICT relevant disciplines from any reputed University. Having additional Degree/Certification in the</p>	<ul style="list-style-type: none"> <li>➤ Design, implementation and configure Database.</li> <li>➤ Preparation of Relational Database</li> <li>➤ Preparing ER diagram and onwards.</li> </ul>



SL	Position	No of Personal	Minimum Qualification	Responsibility
			<p>field of database administrator or database management will be preferable.</p> <p>ii) At least <b>10</b> years of experience in database design. data normalization, data analysis, database management and administration for ICT based applications or Software project, installing, configuring and troubleshooting SQL Database systems on RDBMS such as Oracle, MS SQL Server, PostgreSQL, MySQL, etc.</p> <p>iii) Must have minimum 4 ICT enabled application or software or applications projects experience in the field of Database related skills.</p> <p>iv) A professional database administration certification, preferably Oracle-certified, will be an advantage.</p> <p>v) Knowledge of Windows Server and Linux environments</p> <p>vi) Oracle Certified Professional / Microsoft SQL Server Certified</p> <p>vii) Strong experience in data migration, backup &amp; recovery</p>	<ul style="list-style-type: none"> <li>➤ Ensure data transfer as per security expert.</li> <li>➤ Prepare script for data back-up while interconnection among another module.</li> <li>➤ Preparation of complete dataset (.csv,.txt, .dbf)</li> <li>➤ Ensure quality data for the data-bank.</li> </ul>
5	Team Leader	1	<p>i) Minimum graduate in Computer Science and Engineering/ICT relevant disciplines from any University.</p> <p>ii) At least <b>15</b> years of demonstrated experience in projects of similar size and nature, of which <b>5</b> years in the capacity of Project Manager or Team leader.</p> <p>iii) Minimum <b>5</b> IT /ICT enabled software projects management (Design, Development and Implementation) experience</p>	<ul style="list-style-type: none"> <li>➤ Setting up IT systems covering the project's activities and ensuring their smooth operation</li> <li>➤ Customization of CMIS application &amp; coding as per statement of work (SOW), i.e., APIs'</li> <li>➤ Lead the technical persons (SSE, SE), review the code, help to deploy the</li> </ul>



SL	Position	No of Personal	Minimum Qualification	Responsibility
			iv) Must have minimum <b>2</b> e-Government application/ Digital Service application (For design, development, deployment and implementation) project for the public sector with the Govt. Organization. v) PMP/Prince 2/ITIL certification preferable	system when ready. ➤ Ensure that development has done maintaining standard sw design, development pattern. ➤ Monitoring the deliverables are done as per system design and if troubleshoot in case of any incident occur during deployment
6	Sr. Software Engineer	3	i) Minimum graduate in Computer Science and Engineering / ICT relevant subjects ii) Minimum <b>10</b> years of experience in the field of IT solution development. iii) Must have experience in web and mobile application development. iv) Must have minimum <b>4</b> ICT enabled application or software project experience in the field of web-based software programming/coding/scripting as a core development team member.	➤ Customization of CMIS application & coding as per statement of work (SOW), i.e., APIs' ➤ Software installing, testing, debugging & running, etc. ➤ Understanding the SRS and Plan to implement business logic maintain coding standard ➤ Conduct pair-review, white box testing, deployment, bug review. ➤ Ensure code quality, system performance, fine tuning etc.
7	Software Engineer	6	i) Minimum graduate in Computer Science and Engineering / ICT relevant subjects ii) Minimum <b>3</b> years of experience in the field of IT solution development.	➤ Customization of CMIS application & coding as per statement of work (SOW), i.e., APIs' ➤ Software installing, testing, debugging



SL	Position	No of Personal	Minimum Qualification	Responsibility
			iii) Software Engineer team must include minimum 1(one) iOS expert and 1(one) android expert. iv) Must have minimum 2 ICT enabled application or software project experience in the field of web-based software programming/coding/scripting as a core development team member.	& running, etc. ➤ Implement business logic and maintain coding standards. ➤ Perform unit testing, Bug fixing, help SSE to deploy the system.
8	App Developer- Android & iOS	2	i) Minimum graduate in Computer Science and Engineering/ICT relevant disciplines from any University. ii) Must have minimum <b>03</b> years of profound experience in the field of android apps & iOS design and development iii) Have published at least two original Android app iv) Experience with Android SDK v) Experience working with remote data via REST and JSON vi) Experience with third-party libraries and APIs vii) Working knowledge of the general mobile landscape, architectures, trends, and emerging technologies viii) Solid understanding of the full mobile development life cycle. ix) Understanding of Apple's design principles and interface guidelines x) Experience with offline storage, threading, and performance tuning xi) Experience with iOS frameworks such as Core Data, Core Animation, etc.	➤ Support the entire application lifecycle (concept, design, test, release and support) ➤ Produce fully functional mobile applications writing clean code ➤ Write unit and UI tests to identify malfunctions ➤ Troubleshoot and debug to optimize performance ➤ Liaise with Product development team to plan new features ➤ Ensure new and legacy applications meet quality standards



SL	Position	No of Personal	Minimum Qualification	Responsibility
9	BI & Data Visualization Expert	1	<ul style="list-style-type: none"> <li>i) Minimum graduate in Computer Science and Engineering / ICT/ Business Administration relevant subjects</li> <li>ii) Minimum <b>5</b> years of experience in the field of IT solution development.</li> <li>iii) Must have experience in BI &amp; Data Visualization project</li> <li>iv) Must have minimum <b>3</b> ICT enabled application in BI &amp; Data Visualization project.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Collecting data from DB, implement system to generate report as required.</li> <li>➤ Developing and managing business intelligence solutions for the organization</li> <li>➤ Creating and maintaining documentation that includes the design, requirements and user manuals for the organization</li> <li>➤ Ensuring that data is being correctly gathered, stored, and analyzed.</li> <li>➤ Ensure data visualization with highest performance.</li> </ul>
10	AI Expert	1	<ul style="list-style-type: none"> <li>i) Minimum graduate in Computer Science and Engineering / ICT relevant subjects</li> <li>ii) Minimum <b>3</b> years of experience in the field of Emerging Technology such Image Processing, AI, machine learning, big data etc. system with a total of <b>7</b> years of experience in ICT industry.</li> <li>iii) Must have minimum <b>4</b> ICT enabled application or software project experience in the field of web-based software programming/coding/scripting as a core development team member.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Transforming the machine learning models into APIs that other applications can interact with this application.</li> <li>➤ Manage and direct research and development (R&amp;D) and processes to meet the needs of AI strategy</li> <li>➤ Automating required important features in Application.</li> </ul>
11	Solution Architect	1	<ul style="list-style-type: none"> <li>➤ B.Sc. in computer science/ engineering or equivalent</li> </ul>	<ul style="list-style-type: none"> <li>➤ Analyzing the technology environment</li> </ul>



SL	Position	No of Personal	Minimum Qualification	Responsibility
			<ul style="list-style-type: none"> <li>➤ Minimum <b>15</b> years of relevant experience including implementation of Kubernetes platform and microservice architecture in any Govt. project.</li> <li>➤ Experience with IT architecture methodologies</li> <li>➤ TOGAF, further formal certification in architecture preferable</li> </ul>	<ul style="list-style-type: none"> <li>➤ Analyzing enterprise specifics</li> <li>➤ Setting the collaboration framework</li> <li>➤ Creating a solution prototype</li> <li>➤ Controlling solution development</li> <li>➤ Supporting project management</li> </ul>
12	UI/UX Expert	1	<ul style="list-style-type: none"> <li>i) Minimum graduate in Computer Science and Engineering / ICT relevant subjects.</li> <li>ii) Minimum <b>6</b> years of experience in the field of IT solution User interface design and Experience.</li> <li>iii) Must have minimum <b>4</b> ICT enabled application or software project experience in the field of user experience design.</li> <li>iv) In which minimum <b>2</b> should be for the ' e-Governance application/Digital Service will be preferable.</li> <li>v) UX certification (e.g., Nielsen Norman, HFI)</li> <li>vi) Proficiency in Figma/Adobe XD</li> <li>vii) Experience in citizen-facing portal design</li> </ul>	<ul style="list-style-type: none"> <li>➤ Gathering and evaluating user requirements, in collaboration with product managers and engineers</li> <li>➤ Illustrating design ideas using storyboards, process flows and sitemaps</li> <li>➤ Prepare user interface aligned with SRS/business logic.</li> <li>➤ Creating user flows, wireframes, prototypes and mockups</li> <li>➤ Translating requirements into style guides, design systems, design patterns and attractive user interfaces</li> </ul>
13	Technical Document Writer	2	<ul style="list-style-type: none"> <li>i) Minimum graduate in any Computer Science or ICT relevant discipline.</li> <li>ii) Should have minimum <b>5</b> years of profound experience in field of technical documentation with a total of <b>8</b> years industry experience.</li> </ul>	Prepare varies types of manuals (User manual, training manual, API integration manuals).



SL	Position	No of Personal	Minimum Qualification	Responsibility
			iii) Must have technical documentation experience for minimum <b>2</b> ICT enabled applications or software projects as core team member.	
14	Training Expert	2	i) Minimum graduate in any disciplines from any reputed University. Having specialized degree or diploma in relevant field will be preferable. ii) Should have minimum <b>5</b> years of profound experience in the field of user training of web-based application or Software. Same experience for the e-Governance application or Digital Service for the government organization will be considered as an added skill and expertise.	<ul style="list-style-type: none"> <li>➤ Prepare a plan to transfer knowledge through training</li> <li>➤ Provide local training</li> <li>➤ Prepare support documentation and training materials for end users of Core Insurance System and CRM systems.</li> </ul>
15	Quality Controller	1	i) Minimum graduate in ICT relevant subject from any University. Having master's degree or specialization degree/certification in software Quality Assurance/Software Testing/relevant subject will be preferable. ii) Should have minimum <b>7</b> years of profound experience in the field of software Quality assurance in web-based application or Software development with a total of <b>10</b> years industry experience. iii) Must have minimum <b>3</b> ICT enabled applications or software project experience in the field of software Quality assurance.	<ul style="list-style-type: none"> <li>➤ Design test plans, scenarios, scripts, or procedures to ensure replicability and compliance with standards.</li> <li>➤ Document software defects, using a bug tracking system, and report defects to software developers.</li> <li>➤ Develop testing programs that address areas such as database impacts, software scenarios, regression testing, negative</li> </ul>



SL	Position	No of Personal	Minimum Qualification	Responsibility
				<p>testing, error or bug retests, or usability.</p> <ul style="list-style-type: none"> <li>➤ Conduct software compatibility tests with programs, hardware, operating systems, or network environments.</li> <li>➤ Update automated test scripts to ensure currency.</li> </ul>
16	Tester/QA Engineer	2	<ul style="list-style-type: none"> <li>i) Minimum graduate in ICT relevant subject from any University. Having master's degree or specialization diploma/degree/certification in software Quality Assurance/Software Testing/relevant subject will be preferable.</li> <li>ii) Should have minimum 5 years of profound experience in the field of software Quality assurance in web-based application or Software development with a total of <b>8</b> years industry experience.</li> <li>iii) Must have minimum <b>2</b> ICT enabled applications or software project experience in the field of software Quality assurance.</li> <li>iv) ISTQB Certified</li> <li>v) Experience in test automation (Selenium, JMeter)</li> <li>vi) Security &amp; performance testing knowledge</li> <li>vii) Familiarity with Jira, TestRail</li> </ul>	<ul style="list-style-type: none"> <li>➤ Executing software test plans (System, Integration, Regression, post-release/post-implementation testing etc.)</li> <li>➤ Reviewing quality specifications and technical design documents to provide timely and meaningful feedback</li> <li>➤ Track quality assurance metrics, like defect densities and open defect counts</li> <li>➤ Design, develop and execute automation scripts using open-source tools</li> </ul>



SL	Position	No of Personal	Minimum Qualification	Responsibility
17	Infrastructure Support Engineer	1	i) Minimum graduate in Computer Science /ICT/CSE/Software Engineering or ICT relevant disciplines from any University. Having master's degree or specialization diploma/degree/certification in ICT/Cyber/IT infrastructure or relevant subject will be preferable. ii) Minimum <b>3</b> years of experience in leading IT solution infrastructure team with a total of <b>5</b> years of experience in infrastructure management. iii) Working experience with Cloud infrastructure, data center management are expected.	<ul style="list-style-type: none"> <li>➤ Installing and maintaining operating environments.</li> <li>➤ Monitoring these operating environments.</li> <li>➤ Responding effectively and speedily to any problems.</li> <li>➤ Providing training and support.</li> <li>➤ Updating any software and hardware where necessary.</li> <li>➤ Documenting all reported malfunctions and actions taken in response.</li> </ul>
18	System Administrator	1	i) A bachelor's or master's in Computer Science and Engineering/ICT related Subject preferably having a degree from a reputed university. ii) Must have minimum <b>8</b> years of profound experience in the field of infrastructure management with a total of <b>15</b> years of industry experience. iii) Minimum <b>5</b> years of profound experience Develop and maintain infrastructure in cloud environments to power different standard networks ensuring the highest security standards and best practices. iv) Professional certification is essential.	<ul style="list-style-type: none"> <li>➤ Readiness of System in different phase of SDM to deploy the Application.</li> <li>➤ Manage network servers and technology tools.</li> <li>➤ Provide necessary access in server/VM to user to complete their tasks.</li> <li>➤ Monitor performance and maintain systems according to requirements.</li> <li>➤ Troubleshoot issues and outages.</li> </ul>



SL	Position	No of Personal	Minimum Qualification	Responsibility
				<ul style="list-style-type: none"> <li>➤ Ensure the backup/load balance/redundancy of system.</li> </ul>
19	Implementation Expert (API)	1	<ul style="list-style-type: none"> <li>i) A bachelor's or master's in Computer Science and Engineering/ICT related Subject preferably having a degree from a reputed university.</li> <li>ii) Should have minimum <b>6</b> years of profound experience in the field of software deployment, implementation planning and support.</li> <li>iii) Strong record of working with government organizations and their personal structures.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Prepare and implement API for communication with the other systems.</li> <li>➤ Validate and verify the API of internal and external services.</li> <li>➤ Complete API related work maintain API Standard.</li> </ul>
20	DevOps specialist	1	<ul style="list-style-type: none"> <li>➤ B.Sc. in computer science/ engineering or equivalent</li> <li>➤ Professional skills in designing &amp; deploying scalable, highly available, cost-effective, fault-tolerant systems &amp; infrastructure on AWS using EC2, RDS, IAM, S3, ELB, VPC, EBS, Route 53, Auto-Scaling, CloudWatch, etc. services.</li> <li>➤ Professional knowledge in Containerized platform (Docker).</li> <li>➤ Minimum <b>5</b> years of relevant experience. DevOps experience in Government large system / experience in managing project hosted in data center.</li> <li>➤ Professional skills in MySQL/PostgreSQL (Including Replication);</li> <li>➤ Professional skills in Linux (RHEL, CentOS);</li> <li>➤ Professional skills in Load Balancer (Nginx, HA Proxy)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Building and setting up new development tools and infrastructure</li> <li>➤ Testing and examining code written by others and analyzing results</li> <li>➤ Ensuring that systems are safe and secure against cybersecurity threats</li> <li>➤ Identifying technical problems and developing software updates and 'fixes'</li> <li>➤ Working with software developers and software engineers to ensure that development follows</li> </ul>



SL	Position	No of Personal	Minimum Qualification	Responsibility
				established processes and works as intended
21	Security Expert	1	<ul style="list-style-type: none"> <li>➤ B.Sc. in computer science/ engineering or equivalent with advance training on data and system security or equivalent</li> <li>➤ Minimum <b>8</b> years of relevant experience in managing Government projects</li> <li>➤ Certification on information, system or network security would be an added advantage</li> <li>➤ Multi-Domain knowledge, Security Frameworks and Methodologies understanding, Public Cloud knowledge</li> </ul>	<ul style="list-style-type: none"> <li>➤ Actively look for security vulnerabilities in our application and network, reporting issues and describing possible solutions.</li> <li>➤ Design and maintain our security infrastructure.</li> <li>➤ Actively liaise with the development team to ensure a secure architecture.</li> <li>➤ Provide regular reports auditing our current services and latest changes, as well as our internal practices.</li> </ul>
22	Support Manager	1	<ul style="list-style-type: none"> <li>➤ Minimum graduate in Computer Science and Engineering/ICT from any reputed University</li> <li>➤ Should have minimum <b>12</b> years of profound experience in the field of helpdesk or Call Centre</li> <li>➤ Help desk support service for the software maintenance support service/help desk will be preferable</li> </ul>	<ul style="list-style-type: none"> <li>➤ Research, diagnose, troubleshoot and identify solutions to resolve customer issues</li> <li>➤ Follow standard procedures for proper escalation of unresolved issues to the appropriate internal teams</li> <li>➤ Prepare accurate and timely reports</li> <li>➤ Follow the SLA for issues</li> </ul>



SL	Position	No of Personal	Minimum Qualification	Responsibility
23	Support Engineer	3	<ul style="list-style-type: none"> <li>➤ Minimum graduate in Computer Science and Engineering/ICT /any disciplines from any reputed University</li> <li>➤ Should have minimum 3 years of profound experience in the field of helpdesk or Call Centre</li> <li>➤ Help desk support service for the software maintenance support service/help desk will be preferable</li> </ul>	<ul style="list-style-type: none"> <li>➤ Follow standard procedures for proper escalation of unresolved issues to the appropriate internal teams</li> <li>➤ Provide prompt and accurate feedback to customers</li> <li>➤ Prepare accurate and timely reports</li> <li>➤ Document knowledge in the form of knowledge base tech notes and articles</li> <li>➤ Follow the SLA for issues</li> </ul>
24	Data Migration Expert	1	<ul style="list-style-type: none"> <li>➤ Minimum graduate in Computer Science and Engineering/ICT relevant disciplines from any reputed University.</li> <li>➤ Having additional Degree/Certification in the field of database administrator or database management will be preferable.</li> <li>➤ Should have minimum <b>6</b> years of profound experience in the field of database design, data normalization, data analysis, Data migration, data segregation, simplification, database management and administration for ICT based applications or Software project.</li> <li>➤ Must have minimum 4 ICT enabled application or software or applications projects experience in the field of Database related skills.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Prepare a plan to check the quality of all kinds of data</li> <li>➤ Quality Control of all database</li> <li>➤ Responsible for data migration from other enterprise systems through API</li> <li>➤ Responsible for Extract, Transfer and Loading of data from various systems</li> <li>➤ Responsible for changes in storage and database or applications</li> </ul>

## **27. Technology Specification**

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The consulting firm will follow the TOGAF 9.x or similar open source-based technologies, frameworks, platforms and guidelines. Following are some technical specifications which the consulting firms should consider as reference but not as the ultimate method of revamping of CMIS Platform for Developing New Generation of CMIS System.

- TOGAF compatible or similar open-source platform to ensure enterprise level management
- The ArchiMate3.x Modelling Language Common data platform
- e-Service bus (Enterprise Service Bus)
- Java, PHP, Laravel, Node JS, Spring Boot or Go or Python or any other language at back-end or server-side scripting layer
- React, Next JS, View JS or similar types open source for front end.
- API centric enterprise level design using JSON or other data delivery format.
- Micro service architecture following micro-service design approach.
- Secure interaction with Core-service and shared service using dynamic token
- API lifecycle, policy and community governance using proper analytics
- Multi-tenancy support in platform
- SAML2 bearer grant type, JWT assertion grant type and NTLM-IWA grant type
- Messaging protocol support e.g., AMQP 1.0, STOMP, MQTT, HTTP
- OAuth2 token revocation support
- OAuth token introspection
- SAML 2.0 or above based Single Logout, metadata profile and
- assertion query/request profile
- OpenID connect based session management, discover and dynamic client registration
- Federated SSO via SAML2 or OpenID with external identity providers to incorporate with central SSO/LSG
- White label login and registration process
- Rule-based authorization support for SSO
- Support for multi-option/multi-step authentication
  - X.509 Authentication



- 2-factor authentication (2-FA) (hardware based or soft OTP)
- Time-based one-time password (TOTP) based authentication
- Apache Maven, Apache Ant and Oracle JDK
- Maven or Gradle build is recommended to use.
- Enterprise Linux to host all application
- Bootstrap, jQuery and Ajax for best UX
- Oracle 12c or higher RDBMS or Any Similar Open-Source DB.
- MySQL, MongoDB or any other NoSQL database as/when required with proper justification
- Redis, Memcached, CDN or Varnish for caching and faster data delivery
- Must ensure load balancing for scalability and failover for high availability of service endpoints
- Code Version Controlling using GIT or Bitbucket in private mode
- GIT issue board or Jira or Asana for issue tracking and feature change management
- Notification to web and mobile with current and future OS of corresponding devices must be ensured
- Future technology change, iterative prototyping and agility in framework design are the generic expectation



## 28. Expected Deliverables

The deliverables under software development:

Sl.	Deliverable Type	Deliverables	Time in Month (Starting date will Contact date)
1	Inception Report	Inception Report including Work plan	1st Month
2	System requirement specification (SRS), Gap Analysis Report	System Requirements Specification (SRS) with System design, UI Design, Physical Design, Logical Design, Database Design, Architecture Design etc.), Context diagram of the proposed system, Sequence Diagram, Use Case Diagram, Class Diagram, CRC, Process Flow Diagram, Gap Analysis Report	2 <sup>nd</sup> – 3 <sup>th</sup> Month
3	Prototype / UI design, demo and Development	<ul style="list-style-type: none"> <li>➤ Use case</li> <li>➤ Test case</li> <li>➤ Prototype</li> <li>➤ UI design</li> <li>➤ Demo</li> <li>➤ Data Flow Diagram</li> <li>➤ Entity Relationship Diagram</li> <li>➤ Development</li> </ul>	4 <sup>th</sup> - 9 <sup>th</sup> month
4	UAT (Application and Mobile Apps)	<ul style="list-style-type: none"> <li>➤ Unit Test Case</li> <li>➤ UAT Test Case</li> <li>➤ QA Certification</li> <li>➤ Release Note</li> <li>➤ Test log</li> <li>➤ System release notes</li> <li>➤ Deployment Report</li> </ul>	10 <sup>th</sup> Month
5	Data migration from current system to new systems	<ul style="list-style-type: none"> <li>➤ Data Migration Plan</li> <li>➤ Data Verification and validation</li> <li>➤ Data Migration Acceptance</li> </ul>	10 <sup>th</sup> Month
6	UAT Feedback incorporation	<ul style="list-style-type: none"> <li>➤ Feedback incorporation</li> <li>➤ SQTc feedback incorporation</li> <li>➤ Mobiles Apps UAT feedback incorporation</li> <li>➤ SQA certification</li> <li>➤ Release Note</li> <li>➤</li> </ul>	10 <sup>th</sup> – 11 <sup>th</sup> Month
8	Final Deployment, OAT and Go live	<ul style="list-style-type: none"> <li>➤ Final SQA Certification</li> <li>➤ Unit Test Report</li> <li>➤ Final release note</li> <li>➤ Deployment report</li> <li>➤ Application and database server architecture</li> <li>➤ Network architecture</li> <li>➤ Final acceptance report from Project for Go live of the newly upgraded system</li> <li>➤ Final report (User Manual both end user and operational user, API documentation etc.)</li> </ul>	12 <sup>th</sup> Months



Sl.	Deliverable Type	Deliverables	Time in Month (Starting date will Contact date)
		<ul style="list-style-type: none"> <li>➤ Functional Traceability Matrix</li> <li>➤ Integration (All integrated Application through LSG) Traceability Matrix</li> <li>➤ Deployed and Handover Source codes (Hashing /Unencrypted/) including any external package / library / APIs with definition / commenting</li> <li>➤ Deployed Database with definitions of all schemas</li> <li>➤ VAPT (Vulnerability Assessment and Penetration Testing) Certification from SQTC must be obtained and submitted prior to Go Live.</li> </ul>	
9	Support of up gradation system	Categorize report on support monthly basis.	13 <sup>th</sup> to 25 <sup>th</sup> Month
10	Handover of source code and all other supporting documents to the Project Office	System architecture Use case, Sequence and Class diagram Source codes (Hashing /Unencrypted/) including any external package / library / APIs with definition / commenting Database with definitions of all schemas	End of project with final version of codes



## **Deliverables During operational and maintenance phase:**

The periodical report during Operation & maintenance should contain the following format:

- Executive summary
- Statistics of the Land Cases
- Release notes of the bug fixation or up gradation as operation & maintenance work
- Statistics on the infrastructure and server related data
- Statistics on support related activities
- Statistics on API related services with Land Cases
- Report on the notification of data to stakeholders
- Report on the resolution of the decisions taken in meeting organized by Project Office
- Report on training activities and outcome with photo of the events
- Report on documentation done – update in user manual / portal / social media etc.
- Pending issues to be resolved
- The following items will be required for the project under deliverables apart from service components in software development / maintenance and Training & awareness development:

## **29. Duration of the assignment**

**Total Duration of the assignment is 24 Months:**

- Analysis, HLD, LLD, Design and Development: **8.5 Months** (2.5 Months Inception, Gap Analysis, SRS and 6 months for Development)
  - ✓ Inception
  - ✓ Gap Analysis
  - ✓ SRS, HLD, LLD,
  - ✓ Software Development, App Development including Data Migration
- UAT and TOT Training: **01 Month**
- UAT Feedback incorporation: **1.5 Months**
- OAT and Bug Fixing as per needed: **01 Month**



- **Support & Maintenance:** New version Support & Maintenance after completely installation and live: **12 Months**

### **30. Conclusion**

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The Ministry of Land (MoL) has the mission of ensuring the best Government Online Digital Services to make the life of citizens comfortable. Planned digitalization implies the broad use of computers and embodies the modern philosophy of effective and useful use of Information & Communication Technology in terms of implementing the promises in education, health, and poverty reduction. This will include all classes of people and does not discriminate against people in terms of technology.

In view of the above, Vendor has to design, develop, implement, maintain a Single Sign-on web & mobile Apps based solution for Digital Services for Ministry of Land (MoL). Obviously, the proposed technical proposal has to reflect the visualization, deep level understanding of the processes, system requirement/sizing, development platform, Quality Assurance (QA) plan including capability of adopting future technologies.