



TERMS OF REFERENCE (TOR)

For
e-Veterinary Service



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1. Background

The benefits of digitalization are many fold where the basic philosophy is to make peoples life easier, hassle free, productive, people-centric governance and getting financial sufficiency by fostering growth and development by using computer based technologies. Four important elements are set by Government as “Digital Bangladesh” vision;

- i. Human Resource Development
- ii. People involvement
- iii. Civil services and
- iv. Use of information technology.

We have taken three initiatives from our department those are “**Livestock Diary**” (Mobile Apps), **Mobile SMS service for “Livestock, e-Reporting service” for field extension reports.**

To make easy our veterinary service for farmers to Collect Information, Online appointment, Outdoor management (Prescription Management), Inventory Management. We are planning to make this service to make our citizen’s quick and easier service.

2. Review of Existing Service

2.1 About the Organization

The role of livestock service is vital for the economic development of agro-based Bangladesh. The contribution of livestock to National Gross Domestic Product (GDP) is 2.79 percent and which is 17.15 percent in Agricultural share. About 44 percent of the animal protein comes from livestock sources. Moreover, 4.31 percent of the total export is from the export of leather and leather goods. Out major services are

1. Prevention, control and treatment of animal and poultry diseases.
2. Poultry-Management of poultry farm, grading and quality control.
3. Dairies-Management of cattle&poultry farm.
4. Animal nutrition.
5. Duckery-management of Duckery Farm, grading and quality control.
6. To develop strong genetic record of Artificial Insemination for breed up gradation.
7. Professions: development of veterinary practices.
8. Prediction of animal and poultry diseases by the help of epidemiological investigation.
9. Prevention of cruelty to animals.\
10. Ensure Food safety to Human and Animal

To make veterinary service easier to the farmer we planning to make the manual service to e-Service, so that the process will be automated and more farmers will be served.

2.2 Existing Service (As-Is)

The veterinary service mainly provides the diseases control and protection, diagnosis and treatment.

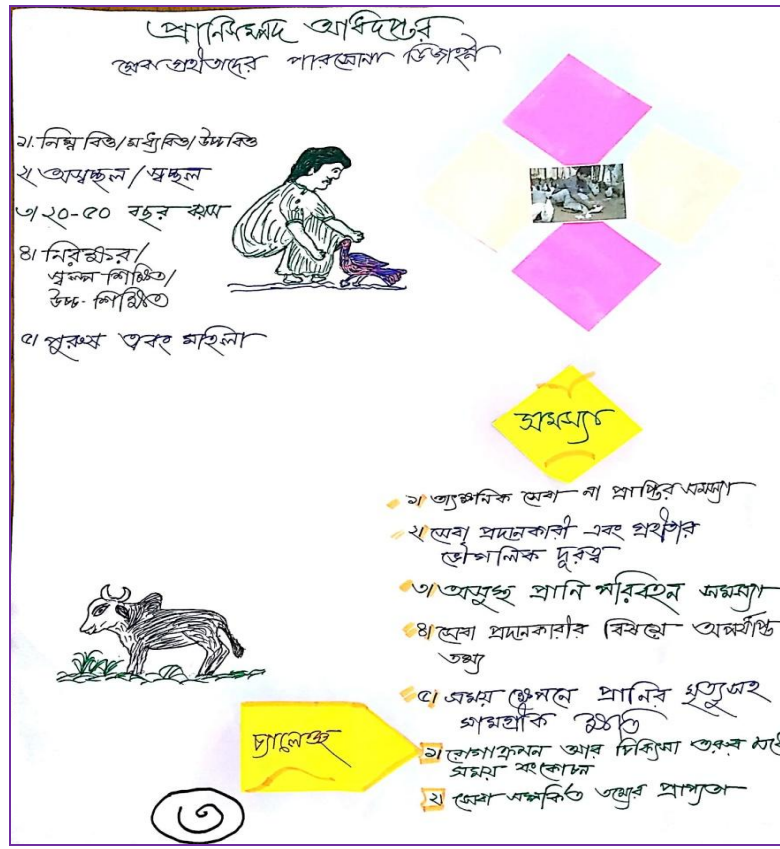
The actual beneficiaries of this service are livestock, poultry, pet animal owners and commercial farmers.

Upazila livestock office is the key point to provide the veterinary service where veterinary surgeon plays the major role.

This veterinary service serves about seven thousand service recipients per month from each Upazila office.

To take this service each service recipient may visit 3 to 4 times which took around 5 hours and cost around 1900 taka.

2.3 Problem and challenge



The major problems of these veterinary services are –

- Doctor is not available all the time in the hospital because only one doctor is providing service to entire Upazila citizens.
- Due to only one service point in Upazila to take service people have to travel a long distance to reach in Upazila center.
- To carry the sick animals from rural area is risky, costly and time consuming moreover causes fatal cases.



The major challenges of this veterinary service are –

- Providing information about the services to general farmers and pet owners.
- Provide ambulatory clinic for this service
- As a single veterinary surgeon is providing this service which really difficult to manage the whole schedules.

3. Proposed e-Service (To-Be)

3.1e-Service Objectives

By implementing this e-Service three types of stakeholder will be benefited such way:

1. **Service recipient (livestock, poultry, pet animal owners and commercial farmers)**

- Easy accessing to any kind of information at anytime from anywhere.
- No more 9am – 5pm and no more 5 days a week, 24/7 hours service by this e-Service.
- Service transparency will be enhanced.
- First aid videos and pictorial treatment materials will be available not only to the hospital but also in hands.
- Doctor will visit to the patient through online.

1. **e-Service operators (service provider)**

- Outdoor management will make more easy
- Digital prescription and suggestion will reduce the time.
- Hassle free inventory, medicine and chemical management.

2. **e-Service observer (service performance monitoring authorities)**

- Observer can check any kind of report at a glance.
- Disease surveillance will easier for higher authority to allocate of veterinary vaccine in the next year.



3.2 e-Service Scope

1. **Service recipient**
 - Web Application/ Apps for registration as service recipients
 - Check doctor's availability and make online appointment.
 - Manage livestock, poultry, pet animal profile and service history
 - Receive Veterinary Telemedicine service
 - Submit/View Complaint
2. **e-Service operators**
 - Outdoor service management.
 - Prepare digital prescription and suggestions.
 - View and confirm appointment and own schedule management
 - Provide Veterinary Telemedicine service
 - Complain view and reply
 - Store/Inventory Management
 - Reports & Dashboards
3. **e-Service observer**
 - Real time dashboard for overall service status
 - Different types of reports
 - Complain view and reply



4. e-Service Functional Requirements

4.1 Solution Architecture

Solution architecture is expected to define and describe an architecture of the proposed e-Service Solution in the context of the mentioned prevailing service delivery process i.e. **e-Veterinary Service**. The solution architecture should assist in the translation of the service to e-Service transformation requirements into a solution vision, high-level operations and/or ICT application specifications and a portfolio of implementation scope. The expected architecture of a solution, where the solution is a e-Service system that should offers a coherent set of functionalities to its environment. As such, it should concerns those properties of a solution that are necessary and should be sufficient to meet its essential requirements. The vendor shall propose comprehensive solution architecture on **e-Veterinary Service** which may cover the following items in their descriptive and diagrammatic presentation

- Goals/Results
- Service Recipients
- e-Service Operators/User (Service providers)
- e-Service Observers (Service administration and performance monitor)
- Database application components:
- Entity application component:
- Utility component
- System federation (Systems to be integrated)
- Process application component
- Interaction application component
- Application
- Accessible Points
- Networks
- Types or Layers of Service Delivery Points
- Hosting Site



4.2 e-Service Functions and Features

To reach the ultimate objective of this e-Service development and implementation the system may have the following features and functionalities. However, the selected vendor must perform a detailed requirement study and system analysis and prepare the necessary deliverable documents. Taking approval from Department of Livestock Services (DLS) on this submitted documents the system design phase should be start.

Module 1: Service Recipient Registration and Online Account

No.	System Features	Actor	Media	Description
1.	Online Registration	Farmers / Animal Owners	Web, Apps, UDC	Any livestock / poultry / other animal owners can register to this system as service recipient using this features. By registering they will get an online account. Mobile No. or NID can be used for service recipient Unique/Login ID. Necessary notifications also send in SMS/Email/System.
2.	Online Account	Service Recipients (SR)	Web, Apps, UDC	By completing the registration process the service recipient will get and access his/her personal online account from where they will avail the services provided by Upazila Livestock Services Office and view previous taken services history.
3.	Service History	SR	Web, Apps, UDC	Previous taken services can be searched and viewed here with service full history.
4.	Patient Profile Management	SR	Web, Apps,	Using this system features the SR will create patient profile with few basic information which can be used for maintain the patient's history for future use. A unique patient ID should be generate here for future tracking.
5.	Dashboard	SR	Web, Apps, UDC	Describe in Dashboard Module
6.	Report	SR, Upazila Livestock Officer (ULO)	Web, Apps, UDC	Describe in Report Module

**Module 2: Online Appointment Management**

No	System Features	Actor	Media	Description
1.	Schedule Management	Veterinary Surgeon(VS)/SR	Web, Apps, UDC	VS can create his/her own visit / appointment schedule using this feature. A calendar view will be available to view the schedule in a user friendly manner. The SR can also view the VS schedule and can send Appointment Request using this feature. Necessary notifications also send in SMS/Email/System.
2.	Appointment Request	SR	Web, Apps, UDC	The SR can view the VS schedule and can send Appointment Request using this feature. Necessary notifications can be send here.
3.	Appointment Reschedule	SR	Web, Apps, UDC	Using this feature any SR can cancel his/her appointment and asked for a new schedule if required. Notifications will be send accordingly
4.	Appointment Confirmation	VS	Web, App	From this system feature the VS can view the request and confirm. Necessary notifications will be send accordingly
5.	Report	ULO, VS, Departmental Higher Authority (DHA), Ministerial Higher Authority (MHA)	Web	Describe in Dashboard Module
6.	Dashboard	ULO, VS, DHA, MHA, SR	Web, Apps, UDC	Describe in Dashboard Module

**Module 3: Veterinary Telemedicine**

No	System Features	Actor	Media	Description
1.	Patient Profile Management	SR	Web, Apps,	Using this system features the SR will create patient profile with few basic information which can be used for maintain the patient's history for future use. A unique patient ID should be generate here for future tracking.
2.	Submit & View Request	RS	Web, App	This will be a very useful feature for rural area for the Veterinary First Aid services. Using this feature the SR can submit a request by creating the patient profile and selecting few basic options with one or few patient's picture. SR can also view the suggested prescription/suggestions against the request.
3.	Manage Receive Request	VS	Web, App	Using the feature the VS can view the submitted request and can reply for further query if necessary or can prescribe using the Inspection&Prescription Management feature
4.	Report	ULO, VS,DHA, MHA	Web	Describe in Dashboard Module
5.	Dashboard	ULO, VS, DHA MHA, SR	Web, Apps, UDC	Describe in Dashboard Module

**Module 4: Outdoors Management**

No	System Features	Actor	Media	Description
1.	Patient Profile Management	Veterinary Field Assistant(VFA), Dresser, VS	Web, Apps,	Using this system features the system user will search or create new patient profile with few basic information' which can be used for maintain the patient's history for future use. A unique patient ID should be generated here for future tracking.
2.	Clinical History Management	VFA, Dresser, VS	Web, App	Using this feature the system user will add the Clinical History of the patient when first came.
3.	Inspection&Prescription Management	VS	Web, Apps	After inspecting the patient, the VS will add the inspection report and write the prescription, advice, refers etc. using this feature. These features will be very user-friendly and smart enough to provide auto fill/suggestion of medicine, test etc. by just selecting and less typing. The system will automatically show the prescribed medicine availability in office dispensary and availability of test facility of the office lab. After complete the prescription the printed version can be provided to SR and also SR can view it in his/her online account.
4.	Report	ULO, VS, DHA, MHA	Web	Describe in Dashboard Module
5.	Dashboard	ULO, VS, DHA, MHA, SR	Web, Apps, UDC	Describe in Dashboard Module

**Module 5: Dispensary Management**

No	System Features	Actor	Media	Description
1.	Medicine, Vaccine, Semen and AI Delivery Management	Compounder, VFA, Field Artificial Inseminator (FAI)	Web, Apps,	Using this system features when a SR will come to receive prescribed medicine/ Vaccine/ Semen, the system user will search the prescription by prescription ID and can confirm the delivery. The stock will be automatically deduct accordingly.
2.	Report	ULO, VS, VFA, FAI, Compounder, DHA, MHA, Compounder	Web	Describe in Dashboard Module
3.	Dashboard	ULO, VS, VFA, FAI, Compounder, DHA, MHA	Web, Apps,	Describe in Dashboard Module

Module 6: Lab Test Management

No	System Features	Actor	Media	Description
1.	Lab Test Formula Setting	Super Admin/Scientific Office of Central Lab	Web	Using this system features the system user will create/set different types of lab test formula i.e. Test Name, required Chemical Reagent and One time usable items and Test Report Template. Depending on the formula the system will automatically deduct store items when a Test Processing will start.
2.	Fee & Sample Collection Management	Lab Technician (LT), Scientific Officer (SO)	Web, App	This feature will allow the Lab system users to collect the applicable fees for tests and confirm and tag the collected samples by unique test ID. This feature will also integrate with Payment Gateway to collect the fees.



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3.	Test Processing Management	LT, SO, VS	Web, App	Using the feature, the LT/SO/VS can initiate test processing. The system will automatically deduct items from store based on test formula. If any test required to rejected/cancel/re collection he/she can manage it from this feature. Necessary notifications will be sent to relevant users accordingly.
4.	Lab Test Report Management	LT, SO, VS	Web	After completing the test process the system user will able to open the test report template providing the unique Test ID and fill-up the necessary fields can generate the report and print it. The Soft copy this report can be viewed from the SR online account in service history. Necessary notification will send when the report will be ready to delivery.
5.	Test Report Delivery	LT, SO	Web, Apps	This feature will allow the system user to confirm the printed test report delivery to SR from a very easy and user-friendly interface.
6.	Report	LT, SO, ULO, VS, VFA, FAI, Compounder, DHA, MHA, Compounder	Web	Describe in Dashboard Module
7.	Dashboard	LT, SO, ULO, VS, VFA, FAI, Compounder, DHA, MHA	Web, Apps,	Describe in Dashboard Module

**Module 7: Inventory Management**

No	System Features	Actor	Media	Description
1.	Item Management	Head Office Admin	Web	Using this system features the system user can able to add Item Type/Category, Name, Description, Unit etc. the Filed Offices Store user will pick items in store management from this list.
2.	Stock Management	Compounder, VFA, Field Artificial Inseminator (FAI)	Web, App	This system feature will allow the users to entry the opening stock of the stores. When the office received new supply he/she can receive the goods using this feature and the stock will automatically update. The user can also manage the stock out from here.
3.	Report	LT, SO, ULO, VS, VFA, FAI, Compounder, DHA, MHA, Compounder	Web	Describe in Dashboard Module
4.	Dashboard	LT, SO, ULO, VS, VFA, FAI, Compounder, DHA, MHA	Web, Apps,	Describe in Dashboard Module



Module 8: Complain Management

No	System Features	Actor	Media	Description
1.	Submit Complain	SR	Web, Apps, UDC	Using this features SR can submit/initiate a complaint related for a service.
2.	Complain View and Action	ULO, SR, DHA, MHA	Web, App	This system feature will allow the ULO to view the complaint submitted by SR and can reply. The SR can also view the reply and can also reply further. All the conversions related to the particular complaint will be managed in a thread view. DHA can also view the office wise submitted complaint, their status, unattended issues and can reply if necessary.
3.	Report	LT, SO, ULO, VS, VFA, FAI, Compounder, DHA, MHA, Compounder	Web	Describe in Dashboard Module
4.	Dashboard	LT, SO, ULO, VS, VFA, FAI, Compounder, DHA, MHA	Web, Apps,	Describe in Dashboard Module

Module 9: Dashboard

Dashboard is a very interactive and important feature of a system in which the user can view his/her daily activities & performance at a glance as well as the top management can view overall performance and activity in real time. The dashboard will contain statistical data of different features of the system in different interactive format like indicator based graphical chart, table with figure/summary data etc., which are easy to understand at a glance and also easy to take quick prompt decision. The dashboard orientation & information will be different for different level and Type of users like User/SR own dashboard, Office/Zila/Division head dashboard, dashboard for DLS higher authority and Govt. higher authority etc.

Module 10: Report

Reports are very important and vital feature of any automated system. The system user as well as top management of the organization can view the current, periodical, time based status, details/summary information which allow the concern person and organization management to take important and vital decision for the organization. Each component/module/feature will have some basic report relevant to that feature in a predefined format. Beside this an advance report generator will be available in the system, which will act as a BI to take smart, effective and prompt decision by the top authority of the DLS. The authorized admin user can create report format and logic for this advance report generation in a very easy and user friendly way and can save as template for further use.

The vendor should include any other redevelopment requirement during preparation of the SRS

4.3 Users and User roles

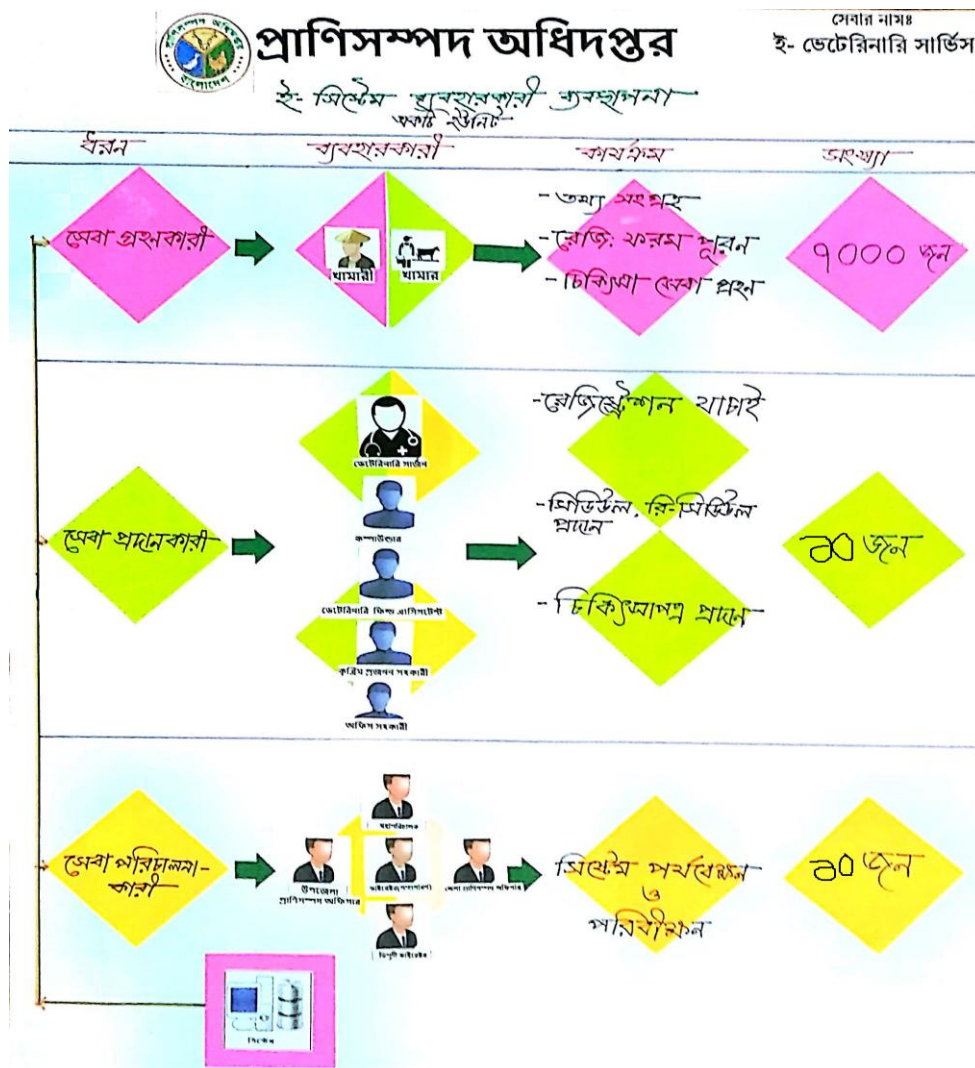


Figure 1: User details



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Vendor should have submit a comprehensive plan and approach covering different types of users and their roles providing accessibility, privacy, confidentiality and transparency based on the given statics. Also have to mention the user friendliness login system.

Type of Users	Title	No. of Users	location	User Role
e-Service Operator	Upazila Livestock Officer	6000	64 District, 490 Upazila	<ul style="list-style-type: none"> Complain View and Action Report Dashboard
	Veterinary Surgeon			<ul style="list-style-type: none"> Schedule Management Appointment Confirmation Patient Profile Management Clinical History Management Inspection and Prescription Management Test Processing management Manage/Receive Request Report Dashboard
	Scientific Officer			<ul style="list-style-type: none"> Fee and Sample Collection management Test Processing Management Lab Test Report Management Test Report Delivery Report Dashboard
	Veterinary Field Assistant			<ul style="list-style-type: none"> Patient Profile Management Clinical History Management Vaccine Management Dashboard Report
	Field Assistant (AI)			<ul style="list-style-type: none"> AI Delivery Management Dashboard Report
	Dresser			<ul style="list-style-type: none"> Clinical History Management Sample Collection
	Veterinary Compounder			<ul style="list-style-type: none"> Patient Profile Management Clinical History Management Medicine Management Dashboard Report



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	Laboratory Technician				<ul style="list-style-type: none"> • Fee and Sample Collection management • Test Processing Management • Lab Test Report Management • Test Report Delivery • Report • Dashboard
e-Service Administrator	Principal Scientific Officer	550	64 District, 490 Upazila	<ul style="list-style-type: none"> • Test Processing Management • Lab Test Report Management • Report • Dashboard 	
	District Livestock Officer			<ul style="list-style-type: none"> • Complain View and Action • Report • Dashboard 	
	Upazila Livestock Officer			<ul style="list-style-type: none"> • Complain View and Action • Report • Dashboard 	
e-Service Observer	Principal Scientific Officer	650	Headquarter (DLS) and Ministry of Fisheries and Livestock	<ul style="list-style-type: none"> • Complain View and Action • Report • Dashboard 	
	District Livestock Officer			<ul style="list-style-type: none"> • Complain View and Action • Report • Dashboard 	
	Deputy Director			<ul style="list-style-type: none"> • Complain View and Action • Report • Dashboard 	
	Director			<ul style="list-style-type: none"> • Complain View and Action • Report • Dashboard 	
	Director General (DLS)			<ul style="list-style-type: none"> • Complain View and Action • Report • Dashboard 	
	Secretary (MoFL)			<ul style="list-style-type: none"> • Complain View and Action • Report • Dashboard. 	



4.4 Security and Privacy Requirements

The vendor should submit an extensive and complete security and privacy plan for this e-Service application considering the following issues

- Project technical scope
- Functional and nonfunctional requirements and Ultimate objectives
- Concerned service provider organization’s operational environments and capacity
- User roles - Accessibility, Authorization and Accountability
- Importance of data management
- Technologies to be used for development & run
- Hosting
- Client and service side
- Overall standard application security requirements.

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

4.5 Integration Requirements

As a government system or e-Service application, integration with the required and other prescribed national system is very important and essential. Only by proper integration making interoperable , an e-Service application can drive the ultimate citizen benefits with the optimum use of technology from service to e-Service transformation. Here vendor is expected to come up with an integration plan in their technical proposal considering and understanding the scope of the e-Service application as per this TOR. Necessary MoU or procurement for the dependent organizations/System Owner Organization will be done by the Department of Livestock Services (DLS). The possible integration scopes of this e-Service application are mentioned below as reference for the vendor

No	Name of the System	Integration Purpose	Owner Organization
1.	SMS Gateway	Send and Receive SMS	Telecom Operators
2.	NID	Verify Service Recipients Identity	Election Commission
3.	UDC	Service Delivery from UDC	Local Govt.
4.	Payment Gateway	Pay Fees& Collect Fees	Govt. P2G / Payment Gateway Provider



4.6 Hosting Requirements

Bangladesh Government is providing an extensive and standard hosting facility for all types of government organization applications and software that is named as National Data Center under Bangladesh computer council (BCC). It may be mentioned here that the vendor developed application will be hosted in government provided data center i.e. National data center (NDC) or **Department of Livestock Services** own data center. Therefore, at this stage, vendor is requested to submit a preliminary hosting plan for this e-Service application considering the issues mentioned below-

- Hosting requirement /environment (hardware, servers, network, security, storage, traffic, firewall, bandwidth etc)
- Hosting architecture
- Data Growth and Scalability plan
- User handling/load balancing mechanism
- Licensing issues
- Scheduled backup & Restore Requirements
- Disaster recovery requirements
- Monitoring tools requirements

5. e-Service Non-Functional Requirements

5.1 Application Compliance Requirements

5.1.1 Web Application

- The application which is a web based solution , has to be hosted in a centralized Web-server
- The application should be developed following Service Oriented Architecture (SOA)
- Application should support MVC framework.
- Considering the operating/client environment at different level of this application, it should be developed in such a way so that it requires low bandwidth to run.
- The web-based application should support cross browser platforms (popular web-browsers such Mozilla Firefox, Opera, Chrome, Internet Explorer, Safari etc.)



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- Should have ability to seamless integration with future module/components/applications
- Application should be lightweight and rich client-side scripting
- UI should be developed based on the analysis of UX.
- Any web interface of this application should be fully responsive

5.1.2 Mobile Application Requirements

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

5.2 Sizing, Performance and Scalability Requirements

- The system shall be capable of handling online functionalities for a database of at least One crore /Year service recipients and in terms of service provide 650 Offices and 20,000 System Users.
- The system processing shall be scalable to support the volume estimates for a period of 10 years at a 20% annual growth rate.
- The system shall be designed to handle estimated 2,000 simultaneous connection (online users) when it is ultimately rolled out.
- The vendor must conduct an extensive load testing task taking above factors into consideration and submit a load testing results.
- The database architecture should be such that the system is available to user 24 x 7 x 365 days a year without any unapproved down-time.
- Page load time, login response-time, on-click" load time for the web application should be less than 3 seconds while this is accessed over the intranet.
- Average transaction response time, on-submit response-time, or any other database access/ search time should be less than 5 seconds when the system solution is accessed over the intranet.
- Considering the network infrastructure challenges in Bangladesh, the solution



must support low bandwidth conditions for the services defined in the functional requirements.

- IN case of mobile application also, this should support very low bandwidth even in 2G network provided internet bandwidth.
- The proposed solution should be highly scalable to accommodate current and future requirements within the scope of the scope mentioned in the TOR
- Analyze the requirements whether both horizontal scaling (scale out) and vertical scaling (scale up) will be required for this e-Service application or not?
- The e-Service application should be provided with appropriate caching mechanism to handle very high-traffic scalability
- The vendor may propose here other relevant measures for the e-Service application scalability.

5.3 Business Continuity

Business Continuity plan will play a very important role by creating the systems of prevention and recovery to deal with potential threats and risk of the e-Service operation. Vendor is requested purpose a Business Continuity Plan for this e-Service application. Regarding business continuity you may take in account the followings issues if applicable or suitable for this e-Service Application

- All standard backup facilities should be supported by the system which can be started with disk based backup facility, gradually moving to Storage Area Network (SAN) based backup system.
- Data and the Operating system core component will be separated. A ghost image of the Operating system will always be available in case of rebuilding the server. All data can be restored in the data drive once the Operating System is restored.
- System can also have an automated Backup mechanism by which users can schedule the backups and the system will take the backups without manual intervention.
- System must check for the media and generate a report on backup with date time and details of backup.
- If a restoration fails for any reason, the system should prompt with proper error messages and suggest what has to be done to rectify the situation via on-screen, logs, email and text messages.
- System should maintain an automated recovery system and all versions of backup will be maintained. At any given point in time, the versions and incremental backup details can be retrieved from the system.
- The system may be hosted in virtual servers or containers. A restore of a virtual server/container is much easier and faster compared to a single host server.



5.4 Interoperability and Data Exchange

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

The following are the key expectations on interoperability requirements:

1. The system should be designed for interoperability using industry standard protocols.
2. System must expose data by Advanced Message Queuing Protocol and REST via TLS
3. All imported data must undergo data validation to ensure full integrity.
4. Data exchange within the system at different levels via the internet shall be encrypted.
5. The system should have functionality to exchange data with other own systems or external institute systems.
6. 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.



5.5 System Audit

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

- Log the users who are accessing the system
- Log the parts of the application that are being accessed
- Log the fields that are being modified
- Log the results of these modifications
- Log attempted breaches of access
- Log attempted breaches of modification rights
- Timestamp.

Ensure an audit trail is kept for all transactions and all audit transactions logged are kept on the trail file or trail database from where system can generate different audit reports as and when required.

5.6 UI/UX.

The vendor must propose a UI/ UX plan containing UI designing method and tools, prototype or Mockup design (if applicable) , UI review method , process for study and analyze UX , collaboration of basic web and mobile UX issues and expected result and outcome of UX, finalizing the UI/UX design. Apart from this, the vendor should consider the following issues as requirement at the time of UI/UX plan.

- The system interfaces should be highly user friendly, easy to navigate and ensure fast loading.
- The UI shall design by using well-established, supported and lightweight UI framework so that it follows widely used industry flow patterns
- UI shall be easily configurable if any changes are needed
- Menu, content and navigation shall be based on the user entitlements, roles and permissions.



5.7 Language Support

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

5.8 Accessibility

Vendor must develop this e-Service application ensuring access for the citizen (Service Recipients) with disabilities in different standard accessible formats. e-Service application should be developed in “universal design” and “assistive technologies”. Accepting and facilitating the use of sign languages, augmentative and alternative inputs and all other accessible means, modes and formats for inputs and outputs as per their choice by “Service Recipients” with disabilities; All e-service features (Web application or Mobile Application) should be usable with the help of screen reading software by the service recipients with disability

5.9 Coding Conventions

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

5.10 Documentation

Detail and proper documentation of such ICT based project like e-service Application development and implementation for Government is very vital and essential. Documentation is required for any such project as reference, knowledge transfer, analysis of development and implementation history, baseline information for any modification or change, guidance etc. In this issue, Vender is expected the highest-level professionalism for delivering the standard documentation approach at each phase of e-Service development and implementation project. Vendor is requested here to include an extensive documentation plan of this project in their technical proposal which may cover the followings

- Documents titles phase or activity wise
- Purpose of document
- About the format of documents (if possible only index or fields)
- Type of expert and skilled resource will be used for documentation
- Document priority and dependency
- Time requirement for preparation (If applicable)



5.11 Tools and Technologies to be used

Vendor is recommended to choose the appropriate tools and technologies to be used for the development and implementation of the e-Service application. The selected vendor has to consult with A2I and DLS to finalize the tools, technologies, framework and platform with the approval of same authorities consent.

The main components of the software will be web based application. It should be run in Windows/Linux/OSx operating system at user end and should be compatible to all major browsers such as – Internet Explorer, Firefox, Google Chrome, Opera etc.

The System UI should be compatible with Tab & Smart Phone browsers and in case of Mobile Apps should be support both Android and IOS

Understanding the details scope of this project, vendor is requested to submit a comprehensive plan in their technical proposal following the table format mentioned below

Issues/Phases/Purpose	Used Technology/Tools	Justification for use	Alternative Tool/Technology
Project Management			
Version Control			
System Requirement Analysis			
System Design			
Development (Client end)			
Development (Server end)			
API/Web services			
Apps			
Testing			
Integration			
Hosting & Deployment			
Documentation			
QA			
Helpdesk/Support			
Reporting			
Communication			



5.12 Quality Attributes and Assurance

The Quality attributes and Assurance plan will describe the standards, processes and procedures in this e-Service Application development life cycle which will be used to support the consistent delivery of high-quality, professional standard e-Service application and services provided in the support of an automated environment. The quality assurance process will be concerned with establishing the authority of the QA function, quality assurance standards, procedures, policies, and monitoring, and evaluation processes to determine quality in relation to established standards. Quality assurance activities will concentrate on the prevention of problems through the continuous improvement of processes.

In order to provide high quality products and services, each support team will adhere to processes, procedures and standards. Quality Assurance (QA) is a process used to monitor and evaluate the adherence to processes, procedures, and standards to determine potential product and service quality. It will involve reviewing and auditing the products and activities to verify that they comply with the applicable procedures and standards, and will assure the appropriate visibility for the results of the reviews and audits.

The vendor is requested to provide an extensive Quality Assurance plan with measurable attributes for each phases of this e-Services development life cycle in their technical proposal.

5.13 Copyright

Department of Livestock Services shall be entitled to all proprietary rights including but not limited to patents, copyrights and trademarks, with regard to many Vendor.

All kinds of source code including code documentation and other approved documents (all versions trail, products , developed applications, documents and all kinds of deliverables which bear a direct relation to or is made in consequence of the services provided by the vendor under this scope of this TOR.

At the request of the **Department of Livestock Services** the vendor shall assist in securing such property rights and transferring them in compliance with the requirement of the applicable law. After the completion of the project such rights will be handed over to the **Department of Livestock Services** that will be produced at the time of entire system development and implementation life cycle under the scope of this TOR will be owned by **Department of Livestock Services**.

The vendor should properly deliver all the entire approved source codes and other deliverables to the **Department of Livestock Services**. The vendor cannot claim any royalty or authority of any sort in case of replicating the source code or database or any other deliverables under this TOR for any future use that **Department of Livestock Services** and the Government of Bangladesh may see fit.



Any studies, documents, reports, graphics or other material prepared by the vendor for this project under this TOR shall belong to and remain the property of **Department of Livestock Services**.

6. Scope of Work

6.1 Development and Implementation Methodology

Development methodology i.e. SDLC plays a very important role to clear the ultimate project objectives precisely, to stable the project requirements, to monitor the progress with measurable deliverables and managing the entire project efficiently. Here the vendor is requested to propose and submit a best possible suited SDLC approach for this project considering the project scopes, requirements of e-Service, objectives, organizational environmental factors and behavior, project timeline, ultimate deliverables and various resources to be used.

6.2 System Requirement Analysis

Requirements finalization will be a very important milestone of vendor's proposed development methodology. It is expected that, the selected vendor will carry out detailed requirement study and analysis on the each and every scope of e-Service that mentioned in the TOR. Under this scope of work, the selected vendor has to analyze the detail functions, processes, documents, actors, sites and infrastructure of the relevant prevailing system precisely of the concerned organization. At this phase, vendor's ultimate objective will be finalization of the e-Service requirements in details under the scope of TOR and approval of the concern organizational authority . Here vendor is requested to propose and submit a system requirement analysis plan which should cover the scope of work at this phase, relevant activities to be performed, timeline, deliverables to be produced, dependencies and resources to be used.

6.3 System Design

Basically at this phase the detail functional scope defining and designing as per the standard of software engineering approach for the proposed e-Service system tasks are being performed. This is very vital and important phase of any SDLC. Considering the ultimate development and implementation scope, the proposed system design should be robust, scalable, user friendly and interoperable enough.

At this system designing phase vendor may perform different following designing related task and will produce various standard System designing Documents (SDD)

- Identifying module, components, tasks, I/O and functional features.
- Specifying technical and functional requirements.



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- User Interface design.
- Description of UI and requirements.
- Preparing the use cases.
- Defining Integration and interoperability scope.
- Designing system architecture.
- Determine process and data flow.
- Database design.
- API Design.
- Finalizing tools, technologies and frameworks to be used etc.

Here vendor is requested to cover details system designing plan in their technical proposal which may include relevant activities, approaches, methods, documentations and deliverables.

6.4 Development

At this stage vendor must take prior acceptance or approval from the concerned authority on tools, technologies and framework that will be used for the development of the e-Service Application. Based on approved SRS and SDD vendor will prepare a comprehensive development plan for the e-Service Application which should include a schedule consisting development item wise start date, test date, review date, completion date etc. At the development stage, vendor must follow the standard code convention, code level documentations, header of each file, algorithms, interfaces, code compression and APIs should be supplied with proper description and documentations. All kinds of standard testing tasks that are required to be performed at the development phase, should be mentioned in the plan. Considering the scope mentioned in the TOR for this e-Service application, vendor is requested to include a preliminary development plan (standard approach) in their technical proposal.

6.5 Integration

Considering the above mentioned Integration requirements and scopes for this e-Service application, vendor must include a phase in their proposed Development and implementation methodology approach. At this stage, the vendor will perform all necessary tasks regarding integration to make the e-Service application interoperable.

6.6 Testing

The vendor must propose a testing plan for this e-Service application starting from development to deployment. This testing plan should cover all the standard suitable testing approaches for this e-Service application which may include phase wise testing activities like



test scripting, test cases, testing tools, testing process, test log, result and report formats i.e. expected test deliverables based on the application development requirements. The vendor should submit testing plan which may include standard test approaches. Some are mentioned below as examples for reference

- Unit Test
- Functional Test
- Installation testing
- Compatibility testing
- Smoke and sanity testing
- Regression testing
- Stress Testing
- Acceptance testing
- Alpha testing
- Beta testing
- Functional vs non-functional testing
- Continuous testing
- Destructive testing
- Software performance testing
- Usability testing
- Accessibility testing
- Security testing

6.7 Hosting

Vendor should submit primary hosting requirements for this application related to hardware, servers, network, security, storage, traffic, firewall, bandwidth etc. i.e. complete hosting infrastructure that will be requires for their developed application hosting considering the implementation scope. Based on their submitted requirements, regarding hosting **Department of Livestock Services** will provide detail hosting infrastructure, facility and environment.

6.8 User Acceptance Test (UAT)

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 have to provide a details feedback/ test report . Based on the UAT report, vendor has to 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 vendor must propose a comprehensive UAT plan in their technical proposal which may cover the followings:

- UAT activities to be perform (planning, designing test cases, selection of 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

6.9 Management and Migration of Legacy Data

Under the process of service to e-Service transformation, during e-Service activation or deployment, there is **NO** legacy data upon prevailing services.

6.10 Deployment and Implementation

This is the phase of SDLC, when the consent is being given to “GO LIVE” of the developed system after completed all kinds of development integration , testing and hosting. This is very crucial and sensitive stage for a Government application because at this stage the system becomes public and expose to access towards all levels of users. The Pilot or full scale implementation period starts formally in this stage only. Vendor is requested to propose their Deployment and Implementation plan covering the major activities to be performed , the deliverables to be provided etc.

6.11 Training and Knowledge Transfer

- The vendor must propose a detail training plan for the users of the e-service application.
- The vendor should include necessary training methodology , documentation and training materials support in their training plan
- The training materials may include user manual ,administration manual, quick start tutorial, online help, frequently asked questions
- The training plan must describe the sequencing, time, duration and resources involved in implementation of each of the consultant’s proposed training activities.
- The training plan should contain full course descriptions for all courses that to be carried out for respective users.
- The vendor should develop multimedia training materials for all users. These materials shall be available for viewing and reviewing for all users through a web portal.



- The training instructions should support both English and Bengali language.
- The training activities should cover the training feedback, evaluation and report also.
- The vendor also needs to propose their smooth, efficient and effective knowledge transfer idea and plan here in this technical proposal with the training plan.

6.12 Maintenance and Support Service

The selected Vendor has to provide a period of **two years** maintenance and support service. After the development and deployment phase when the implementation period starts the vendor has to provide maintenance and support service for **the one year**. Here it is expected that, the vendor must provide detail maintenance and support service plan in the technical proposal which may include the followings-

- Support service types and mode of services
- Service desk functionalities
- Configuration management
- Change management
- Service layers for support
- Tools will be used for Support service management
- Communication management and modality
- Release management
- Incident management
- Problem management
- SLA (Service Level Agreement)
- Maintenance and support service related reporting
- Support service types
- Service Log Management

Apart from the above mentioned issues, if vendor thinks any other issue to be included in their plan, it would be considered as added value addition.



6.13 Duration of the Project and Work Station

The selected vendor will need to work for the above-mentioned scope as per approved project management schedule. The selected vendor must complete e-Service application development and deployment i.e. development life cycle as per their proposed development methodology within **Six months** excluding the maintenance and support service period. .

Now here in their technical proposal vendor is requested to propose detailed timeframe plan which may include -

- Total duration of the e-Service application development i.e. e-Service development
- Total duration of the Maintenance and support service at implementation phase
- Proposed SDLC Phase wise and deliverable wise time distribution and duration
- The schedule may cover Activity, Deliverables, Time in Days, Dependencies etc.
- Can be present as table or Gantt chart

6.14 Work Distribution and Team Composition

The vendor is expected to provide work distribution and team composition plan as deemed suited based on this project requirements and milestones and as per their proposed development and implementation methodology approach. The interested applicant (Vendor) should provide a team composition plan in their proposal describing the position, roles, tasks to be assigned, expected man-days of involvement, expected deliverables and required skill and expertise.

However, for proper execution of the project i.e. e-Service application the vendor may include at least the following personnel as minimum requirement

S L	Phase	Position / Title	Number of Person	Man Day	Year of experience	Special Skills and Expertise
1	System Requirement Study					
		Project Manager	1			
		Business Analyst	1			
		System Analyst	1			
		Technical Document Writer	1			



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		Surveyor	1			
		Technical Assistant	1			
		Sub-Total				
2	System Analysis & Design					
		Deputy Project Manager	1			
		Business Analyst	1			
		System Analyst	1			
		SoftwareArchitect	1			
		Database Designer	1			
		Technical Document Writer	1			
		UI Designer	1			
		UX Expert	1			
		Technical Assistant	1			
		Sub-Total				
3	System Development					
		Project Manager	1			
		Sr. Developer	1			
		Developer	4			
		System Analyst	1			
		Mobile Apps Developer	1			
		SoftwareArchitect/ Sr. Software Engineer	1			
		Database Designer/Program	1			



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		mer				
		Technical Document Writer	1			
		UI Designer	1			
		UX Expert	1			
		QA Expert	1			
		Technical Assistant	1			
	Sub-Total					
4	Integration (3 System)					
		Deputy Project Manager	1			
		Sr. Developer	1			
		Developer	1			
		System Analyst	1			
		Database Programmer	1			
		Technical Document Writer	1			
		Interoperability Expert	1			
		QA Expert	1			
		Technical Assistant	1			
	Sub-Total					
5	Hosting					
		Deputy Project Manager	1			
		Sr. Developer	1			
		System Analyst	1			
		System Administrator	1			



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		Technical Document Writer	1			
		QA Expert	1			
		Technical Assistant	1			
	Sub-Total					
6	Testing					
		Deputy Project Manager	1			
		Sr. Developer	2			
		Developer	1			
		System Analyst	1			
		System Administrator	1			
		Technical Document Writer	1			
		QA Expert	1			
		Technical Assistant	1			
	Sub-Total					
7	User Training & Deployment					
		Deputy Project Manager	1			
		Technical Document Writer	1			
		Trainer	2			
		Technical Assistant	1			

6.15 Expected Deliverables

Considering the scope of service and scope of work of this project and based on the proposed project development & implementation methodology, the vendor has to submit here



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a complete list of all types of deliverables will be produced throughout the entire project timeline whether those are materials, services, applications, source codes, documents, plans, reports etc in a table format mentioning the stages, activities and timelines.

Some examples of the deliverables are mentioned here under for your reference.

- Project inception and management report
- System requirement specification (SRS)
- System design document (SDD)
- Complete source code
- Detail source code documentation
- Test plan with test scripts and testing reports
- Technical documentation (system architecture, module integration points, workflow engine, data dictionary, user manual etc)
- Training plan and reports
- Training materials and user manuals
- Integration plan and reports
- Audit log
- Mobile Application
- Web application
- UAT Report
- Maintenance , agreement & SLA
- Maintenance and support log
- Hosting requirement specification , plan and report
- Implementation plan and report
- HR activity plan and report
- Progress and review reports



7. Conclusion

Ensuring easy, affordable, reliable, innovating and citizen-centric quality public service is of an essence now. Empowering civil servants with tools, expertise, and knowledge, resources to undertake present and future challenges are to be considered with no delay. One stop instant service rendering technologies are to be adopted exhaustively. Incorporation and encouragement of Department of Livestock Services actors with every cross section of citizens to owned the Govt. Vision in this regard is of no concession issue.