



# TERMS OF REFERENCE

For

## Electronic Home Loan System



Prepared By  
**Bangladesh House Building Finance Corporation**  
Head office, 22, Purana Paltan, Dhaka

Supported By  
Access to Information (a2i) Program, Prime Minister's office



**Table of Contents**

- 1 PROPOSAL BACKGROUND ..... 4**
  - 1.1 BACKGROUND OF BHBF ..... **ERROR! BOOKMARK NOT DEFINED.**
- 2 OVERVIEW OF EXISTING SYSTEM ..... 4**
  - 2.1 ABOUT THE ORGANIZATION ..... 4
  - 2.2 EXISTING SERVICES (AS-IS) ..... 4
  - 2.3 PROBLEMS AND CHALLENGES ..... 4
- 3 PROPOSED OBJECTIVE OF E-SERVICE & SCOPE OF WORK ..... 5**
  - 3.1 E-SERVICE OBJECTIVES ..... 5
    - 3.1.1 *Service recipient* ..... 5
    - 3.1.2 *e-Service operators (service provider)* ..... 5
    - 3.1.3 *e-Service observer (service performance monitoring authorities)* ..... 6
  - 3.2 E-SERVICE SCOPE OF WORK ..... 6
    - 3.2.1 *Service Recipient* ..... 7
    - 3.2.2 *e-Service Operators (Service Provider)* ..... 7
    - 3.2.3 *e-Service Observer (Service Performance Monitoring Authorities)* ..... 7
- 4 E-SERVICE TECHNICAL & FUNCTIONAL REQUIREMENTS ..... 7**
  - 4.1 SOLUTION ARCHITECTURE ..... 7
  - 4.2 E-SERVICE FUNCTIONS AND FEATURES ..... 8
    - 4.2.1 *Module 01: Information Service Management* ..... 8
    - 4.2.2 *Module 02: Online Loan Application* ..... 8
    - 4.2.3 *Module 3: Loan Approval Process Management* ..... 9
    - 4.2.4 *Module 4: Loan Disbursement System* ..... 10
    - 4.2.5 *Module 5: Loan Recovery Management with APP* ..... 11
    - 4.2.6 *Module 6: Borrower Accounts Management* ..... 12
    - 4.2.7 *Module 07: Deed & Documents Delivery* ..... 13
  - 4.3 USERS AND USER ROLES ..... 13
  - 4.4 SECURITY AND PRIVACY REQUIREMENTS ..... 15
  - 4.5 INTEGRATION REQUIREMENTS ..... 15
  - 4.6 HOSTING REQUIREMENTS ..... 16
- 5 E-SERVICE NON-FUNCTIONAL REQUIREMENTS ..... 17**
  - 5.1 APPLICATION COMPLIANCE REQUIREMENTS ..... 17
    - 5.1.1 *Web Application* ..... 17
    - 5.1.2 *Mobile Application Requirements* ..... 17
    - 5.1.3 *Sizing, Performance and Scalability Requirements* ..... 17
    - 5.1.4 *Business Continuity* ..... 18
    - 5.1.5 *Interoperability and Data Exchange* ..... 19
    - 5.1.6 *System Audit Trail* ..... 19
    - 5.1.7 *UI/UX* ..... 19
    - 5.1.8 *Language Support* ..... 20
    - 5.1.9 *Accessibility* ..... 20
    - 5.1.10 *Coding Conventions* ..... 20
    - 5.1.11 *Documentation* ..... 20
    - 5.1.12 *Tools and Technologies to be used* ..... 21
    - 5.1.13 *Quality Attributes and Assurance* ..... 21
    - 5.1.14 *Copyright* ..... 22
- 6 SCOPE OF SOFTWARE DEVELOPMENT ..... 22**
  - 6.1 DEVELOPMENT AND IMPLEMENTATION METHODOLOGY ..... 22
  - 6.2 SYSTEM REQUIREMENT ANALYSIS ..... 23
  - 6.3 SYSTEM DESIGN ..... 23
  - 6.4 DEVELOPMENT ..... 23
    - 6.4.1 *Integration* ..... 23
    - 6.4.2 *Testing* ..... 24
  - 6.5 HOSTING ..... 24
  - 6.6 USER ACCEPTANCE TEST (UAT) ..... 24
  - 6.7 MANAGEMENT AND MIGRATION OF LEGACY DATA ..... 24



## Terms of Reference (TOR) for Electronic Home Loan Service



|          |   |           |
|----------|---|-----------|
| 6.8      | DEPLOYMENT AND IMPLEMENTATION.....            | 25        |
| 6.9      | TRAINING AND KNOWLEDGE TRANSFER .....         | 25        |
| 6.10     | MAINTENANCE AND SUPPORT SERVICE.....          | 25        |
| 6.11     | DURATION OF THE PROJECT AND WORK STATION..... | 26        |
| 6.12     | WORK DISTRIBUTION AND TEAM COMPOSITION.....   | 26        |
| 6.13     | EXPECTED DELIVERABLES .....                   | 27        |
| <b>7</b> | <b>CONCLUSION .....</b>                       | <b>28</b> |



## 1 Background

---

Digital Bangladesh is an integral part of the government's Vision 2021—which promises a prosperous and equitable middle-income Bangladesh by its golden jubilee of independence.

Bangladesh House Building Finance Corporation (BHBFC) is a specialized Government Organization, working for a standard housing infrastructure, has been trying to its services into digital system. To make the government's vision 2021 a success, the BHBFC has taken steps for

- a) Making home loan services simplified and minimize cost, time & visit.
- b) Converting conventional & manual services into modern e-service system.
- c) Making a society of swift service and freed from corruption.
- d) Making the country's economy increasing and developed one.
- e) To convert manual service into e-system effective training and patronization activities have been taken.
- f) Different facilities for making e-technology and instruments easy and reasonable are being provided.
- g) To make country wide electronic network for digital service system.

## 2 Overview of Existing System

---

### 2.1 About the Organization

House Building Finance Corporation was established in 1952 to provide financial assistance in residential housing sector. After independence, the corporation was reconstituted as Bangladesh House Building Finance Corporation (BHBFC) by the President's Order no 7 of 1973. BHBFC is providing loan to build house, renovating residential house and purchasing flat for the country's people to enhance the residential facilities.

### 2.2 Existing Services (As-Is)

BHBFC provides loan to construct a house or to purchase a flat to any Bangladeshi Citizen. BHBFC deals with clients from its nationwide 29 Zonal and Regional Offices. At present BHBFC is providing loan to eligible persons or group of persons in manual system. From receiving application to disbursement Loan process, every records is being maintaining in hard documents and conventional registers. BHBFC also has a Loan Management Software to maintain borrowers' loan accounts. At present BHBFC have about 34000 borrowers account. All are being maintained from BHBFC's field offices and 19 local servers installed with Loan management System (LMS). At present to sanction a loan, it takes up to 45 days in manual system.

### 2.3 Problems and Challenges

As BHBFC is running as manual system so there are many problems raised day by day. Among them, few major problems are listed below:

- Due to Manual System it takes too much time to process a complete Loan



- Loan Recovery system in manual way to too complex to maintain, calculating interest, change of Interest rate adjustment etc
- Inappropriate loan disburse rate is growing high which is serious issue for the Organization
- Due to manual system, activity of field level officer's dependency is high and No other alternative way to recovery it easily.
- Fault loan possibilities and recovery rate is high.
- Wrong/Invalid Document submission and does not have cross-match facility for the appropriate loan.
- BHBFC can't prepare any report (Monthly, bi-yearly and annually) easily and in time due to manual system.
- Bad debt loaner, transaction history is very much complex to find out.
- It's too difficult to find out few years back loan information due to paper based system.
- Lack of Transparency in current Loan management and recovery solutions
- Customer do not get faster loan and visit many times for various documents.
- Client is fully unaware about their Loan Application process and stages.

### 3 Proposed e-Service (To- Be)

---

#### 3.1 e- Service Objectives

The main and focused point of the service is to facilitate the House Building loan receivers and the management of Bangladesh House Building Finance to smooth operation of Loan management system by the web based centralized system.

By ensuring the easy loan application management, faster loan approval, easy calculation, transferring way in file management, easy way to recovery Loan and the final goal to facilitate the citizen of Bangladesh and effective way to manage the full system of BHBFC.

##### 3.1.1 Service recipient

- Reduce TCV of service recipient
- Can easily be informed about the loan application status
- Can easily receive loan without any hassle
- Can easily be informed about account status through online
- Can easily get loan clearance certificate
- Loan Originating System
- Loan Recovery system
- Electronic Loan recovery system through Banking and others payment integration

##### 3.1.2 E-Service operators (service provider)

- To accelerate loan approval process
- To know loan recovery position of field office at any time
- To make loan distribution process more transparent and accountable



- *To manage borrowers loan account through a Term Loan Management System with data migrations from current 2 Loan Management Systems.*
- To know current status of loan disbursement of organization at any time
- To know current status of loan recovery
- Online report anytime for No. of Lone issues( period), Loan Disbursement Amount, Loan Recovery Amount (period), No. of Installment, Defaulter, No. of Default Loan, Bad Loan, Amount of bad Loan, Recovery status( Different graphical way), Loan officials and many others information on 24/7, 365 Days.
- Messaging system for Loan Application Document stages, Back for fault document, Loan Installment date, receive, due etc

### 3.1.3 **e- Service observer (service performance monitoring authorities)**

- Easy monitoring system for loan approval status at any time
- Easy monitoring for loan disbursement status
- Easy monitoring for loan recovery status
- Can monitor information service status.
- Can monitor objection & dispute migration status.
- Can monitor accounts management **and payment related reports.**
- Can monitor administrative proficiency status.

## 3.2 E-Service Scope

Main functional modules of the e-services

1. Information Service Management
2. Online Loan Application System
3. Loan Approval Process Management
4. Loan Disbursement System
5. Loan Recovery Management
6. Borrower's Account Management **with Existing Loan Management Systems Migration.**
7. Deed & Documents Delivery System
8. ***Dashboard & Reports Generation***

Some high level features of the proposed solutions

- Developing a online system for public to apply for Housing loan.
- Developing a online system for complete loan process, Loan Application to loan Approval
- Developing a system for current loan status for the borrower.
- A dashboard system for Head Office and zonal/regional offices' Administrators.
- **Developing a Mortgage/Term Loan Management System that complies with existing Loan Management Systems working on Oracle 11g.**
- Developing a system for loan closing and clearance issuing.
- Details Loan Application Management System including ( Fully Loan originating to Loan Close)



### 3.2.1 Service Recipient

- Can apply for services and receive loan approval through online
- Can pay fees and installments using online payment system
- Can easily be informed about the overdue amount through SMS notification
- Can easily be informed about the application status through SMS/*online*
- Can get loan clearance certificate etc.
- Can get payment through BEFTN.

### 3.2.2 E-Service Operators (Service Provider)

- Can easily verify applicant's Identity through NID
- Can accelerate loan approval process
- Can give decision concerning service recipients' demands
- Can transfer amount to service recipient's bank account
- Can provide service information.

### 3.2.3 E-Service Observer (Service Performance Monitoring Authorities)

- Can easily monitor loan approval scenario through dashboard at any time.
- Can monitor service process running rightly or not
- Can monitor overall business and administrative service process
- Can ensure due-time service detecting faults/delay and decision

## 4 E-Service Technical & 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. Electronic Home Loan 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 an 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 Electronic Home Loan 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**

- 1) Information Service Management
- 2) Online Loan Application System
- 3) Loan Approval Process Management
- 4) Loan Disbursement System
- 5) Loan Recovery Management
- 6) **Borrower’s Term Loan Account Management.**
- 7) Deed & Documents Delivery System
- 8) **Dashboard & Reports Generation**

**4.2.1 Module 01: Information Service Management**

| SI | System Features                             | Feature Description   | Actor     | Media                       |
|----|---|---|-----------|-----------------------------|
| 01 | Web based Information service for Home Loan | To Provide Information of loan eligibility, payment system, Types of loan, account status, reschedule procedure, transfer, loan segregation, Account Closing and Redemption, Processing Fees etc. | Applicant | Call Center, UDC, Apps, Web |

**4.2.2 Module 02: Online Loan Application**

|    | System Features         | Feature Description   | Actor               | Media   |
|----|-------------------------|---|---------------------|---------|
| 01 | User Registration       | User will open an account to online portal using NID, Date of Birth, Cell No & Email.   | Applicant           | Website |
| 02 | Online Application Form | NID verification with data collection. Applicant will fill up various fields such as: personal info, land info, structure info, Developers & others information with required attachments. After successful submission of application an unique application number will be generated automatically. | Applicant           | bsiteWe |
| 03 | e-Schedule              | Engineer will prepare site visit schedule (Pre-task) & applicant will select pre-scheduled date.  | Engineer, Applicant | Website |





## Terms of Reference (TOR) for Electronic Home Loan Service



|    |           |   |                     |         |
|----|-----------|---|---------------------|---------|
| 04 | e-Payment | Applicant will pay the cost of form through online or with electronic receipt over office counter/desk.<br><br>After successful payment, system will send Confirmation SMS, Email to Applicant, Office Head, Loan Officer, Engineer | Applicants , System | Website |
|----|-----------|---|---------------------|---------|

### 4.2.3 Module 3: Loan Approval Process Management

| Sl | System Features  | Feature Description  | Actor          | Media                  |
|----|--|--|----------------|------------------------|
| 01 | Applications Listing and assigning to Engineer by office Head. | Office Head will check each of the Applications that submitted successfully & will assign to Engineer.   | Office Head    |                        |
| 02 | List of assignments and print Report Template facility.        | Engineer will check that marked applications and will print applicant's Data Sheet for visit.  | Engineer       |                        |
| 03 | Visiting Report Entry by Engineer.                             | Engineer will physically visit the site in scheduled date with a printed Applicant's Data Sheet. Engineer will submit his Inspection Report and upload the printed sheet signed up by applicant. | Engineer       | Predefined format Doc. |
| 04 | Online Approval/Reject   | Office Head will approve or reject application(s) based on Engineer's report. System will notify decision (Reject/approved) to applicant by SMS, Email.  | Office Head    | System.                |
| 05 | Additional Document's Data Fill up                             | Loan officer will fill up additional data field including deed number and original document's number with attachment.  | Loan Officer   | Website                |
| 06 | Application Fee  | Application fee will be paid by applicant by e-Payment or offline over office-counter with e-Receipt.  | Applicant      | Offline Payment        |
| 07 | Document forwarding and verification                           | Document forwarding, verification and approval & Report Entry from different section of office through Government Nothi System (HO & Branch Office).   | Multiple Actor |                        |



|    |                              |   |                  |  |
|----|------------------------------|---|------------------|--|
| 08 | Final Approval               | Approval Authority (MD/GM) will approve/reject loan and will be notified to all concern department and applicant. | Management       |  |
| 09 | Sanction letter issuing.     | Zonal Office will prepare the sanction letter and will issue to applicant.  | Office Head      |  |
| 10 | Cheque Disbursement Schedule | Preparing cheque condition based on cheque disbursement schedule.   | Accounts Officer |  |

#### 4.2.4 Module 4: Loan Disbursement System

| SL | System Features   | Description Feature   | Actor                       | Media              |
|----|---|---|-----------------------------|--------------------|
| 01 | Cheque Request  | Applicant will request for cheque after completing specified construction.  | Applicant                   | System, Website    |
| 02 | Inspection Fee and Mortgage Deed's Cost Payment                     | Applicant(s) will pay through online or with electronic receipt over office counter/desk.   | Applicant, Accounts Officer | e-Payment          |
| 03 | Integration with LMS  | API connected LMS will synchronies a newly created account.   | Integration with LMS        |                    |
| 04 | Site Reporting , Mortgage Deed Registration and Cheque Disbursement | Office Head will forward the file to Engineer for Site Inspection. Engineer will entry inspection report and forward to Office Head. Office head will forward to Accounts for cheque issue and accounts will forward the cheque to law officer. Mortgage deed registration will be performed and law officer will hand over the cheque. | Multiple Actor              | Govt. Nothi System |
| 05 | Encumbrance Certificate Issue                                       | Law Officer wills entry mortgage deed information and Issue Encumbrance Certificate to appropriate authority.   | Law Officer                 | e-document         |
| 06 | Law Cover   | Law Officer will prepare law cover and preserve the law cover after audit.  | Law Officer                 | e-document         |
| 07 | Advice Issue  | Accounts will issue a Loan Advice and send it to Borrower and forward file to Recovery.   | Accounts Officer            |                    |



|    |                                |   |  |  |
|----|--------------------------------|---|--|--|
| 08 | Following Cheques Disbursement | Office Head will forward the file to Engineer for Site Inspection. Engineer will entry inspection report and forward to Office Head. Office head will forward to Accounts for cheque issue and accounts will forward the cheque to law officer. |  |  |
|----|--------------------------------|---|--|--|

4.2.5 Module 5: Loan Recovery Management with Mobile APP

| SL | System Features                                | Feature Description  | Actor            | Media      |
|----|--|--|------------------|------------|
| 01 | Installment Reminder Notification              | System will notify borrower for Payable, Paid installment, default amount & month-end balance.   | System           | SMS, Email |
| 02 | Reminder/Legal Letter/                         | Recovery & Law officer will able to prepare any reminder/legal letter based on default installments with proper permission from Office head via Government Nothi System. |                  |            |
| 03 | Reschedule/ Segregation/ Re-fixation /Transfer | Borrower can apply for Reschedule/ Segregation / Refixation / Transfer after payment (if needed) is made over the counter.   | Borrower         | System     |
|    | Verification/Auditing/Site Reporting           | Office Head will forward the file to Recovery officer, Engineer, Account & Audit officer for further verification & reporting.   | Recovery Officer | System     |
| 04 | Approval Permission                            | Office Head will send for approval request to Head Office for Management approval. An advice letter and notification will be issued after completion.                    | Office Head      | System     |
| 06 | Successors' Data Management                    | Recovery officer will input successors' data to system,  |                  |            |



4.2.6 *Module 6: Borrower Term Loan Accounts Management*

| SL | System Features   | Feature Description   | Actor            | Media                          |
|----|---|---|------------------|--------------------------------|
| 01 | <p>Standard Term Loan Accounting System</p> <p>[Current data should be migrated from existing 2 Loan Management systems, where data is stored in multiple offline and one online schema(s). Database is Oracle 11g.</p> <p><i>Our running applications are built on 2 loan calculation concepts, 1) Amortization Method (EMI) 2) Reducing Balance Method (Deferred interest).</i></p> <p>In newly developed module, database should be designed in maximum of 2 schemas with migration of old all schema's data.</p> <p>This module will be run on IBM AIX.</p> | <p><i>At present we have 6 types of loan with 3 categories. These should be flexible to add new types and category.</i></p> <p><i>While first time disbursement a new loan will be originated to this feature. A standard term loan account system will maintain borrower's daily/monthly/yearly accounting with various rules and conditions as per BHBFC.</i></p> | LMS              | System                         |
| 02 | Accounts dashboard  | Loan account statement details will be visible to officers and borrowers with user rule.  | Multiple Actor   | Web                            |
| 03 | <i>Reschedule/Recast/Transfer/Segregation Effect</i>  | Accounts officer will update the system with reschedule/recast effect to LMS Feature. New loan account may be opened.   | Multiple Actor   | Web                            |
| 04 | Voucher Adjustment  | Voucher for Legal & Miscellaneous Cost may entry to LMS via API.  | Accounts         | Web                            |
| 05 | Loan Accounts closing   | Borrower will apply for loan account closing or other request by system. Office Head will forward for Audit, accounts & Law officers.   | Borrower         | Loan Management System         |
| 2  | Over Payment Refund   | Accounts officer will issue overpayment cheque (if any) and entry voucher. And forward the file to Law Officer  | Accounts Officer | Loan Management System , eFile |



4.2.7 Module 07: Deed & Documents Delivery

| SL | System Features   | Feature Description  | Actor       | Media   |
|----|-------------------|--|-------------|---------|
| 01 | NOC & Doc Service | Law Department can generate NOC to borrower after account closed. After closing requested account auditing, an Electronically Signed NOC will be send to borrower. |             |         |
| 02 | Verify            | Law Officer will Verify redemption supporting documents and person(s) and notify borrower  | Law Officer | System  |
| 03 | Delivery          | Law officer will deliver deeds and documents collected from strong room to borrower and deed receiving copy will be scanned to system.                             | Law Officer | System. |

4.2.8 Dashboard & Report Generation

| SL | System Features   | Feature Description   | Actor | Media |
|----|-------------------|---|-------|-------|
| 01 | Dashboard         | All types of borrowers' account and business related information should be shown in this module for multi level administrator and user. |       |       |
| 02 | Report Generation | Multiple reports should be generated for BHBFC, CIB & Ministry use. Reports should be generated specially from Loan Management System.  |       |       |
|    |                   |   |       |       |

4.3 Users and User Roles

Vendor should 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



## Terms of Reference (TOR) for Electronic Home Loan Service



| Types of user         | User Titles   | Possible number of user | Desk office  | User Role   |
|-----------------------|---|-------------------------|--|---|
| e-Service operator    | Office Assistant,<br>Computer operator ,<br>Supervisor,<br>officer,<br>Sub-assistant Engineer,<br>Assistant Engineer,<br>Law officer,<br>Sr. officer,<br>Principal officer,<br>Executive Engineer, Sr.<br>Principal Officer,<br>Asst. General manager,<br>Deputy General Manager,<br>General Manager,<br>Managing Director. | 400                     | Zonal office,<br><br>Regional office,<br><br>Head office | Receive application<br>Verification<br>E-filling<br>Loan Approval<br>Loan Recovery<br>Rescheduling<br>Re-fixation<br>Segregation<br>Account closing |
| e-Service observer    | Regional Manager, Zonal Manager, AGM, DGM, GM, MD.  | 100                     | Zonal office,<br>Regional office,<br>Head office         | Monitoring loan sanction status<br>Monitoring loan recovery position<br>Observing field office activity   |
| e-Service beneficiary | Citizen   | 40000 (approx)          | Zonal office,<br>Regional office,<br>Head office         | Application Submission<br>Tracking application status<br>Receive Loan Sanction Letter<br>Receive Cheque   |
| e-Service admin       | System Admin  | 7                       | Head office  | User account management<br>Leave substitute management  |



**Special note: Who has the e-Filing integration option:**

If the proposed e-Service application needs to integrate and interoperable with government prescribed e-Filing system (a2i e-Filing) then vendor should have design the seamless, smooth and user friendly single login system.

**4.4 Security and Privacy Requirements**

The vendor should submit an extensive and complete security and privacy plan for these proposed solutions, e-Service and other 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 these, the vendor should keep in account the following considerations also as well as checklist based on system and hosting and security plan (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 should come up with an integration plan in their technical proposal considering and understanding the scope of the e-Service application as per this TOR. The possible integration scopes of this e-Service application are mentioned below as reference for the vendor

| Name of the system     | Purpose of Integration   | Dependent Organization               |
|------------------------|--|--------------------------------------|
| NID System             | Beneficiary identity verification  | Election Commission                  |
| TIN                    | Applicant’s Income Level Justification   | NBR                                  |
| TELCO                  | For notification (SMS, USSD)   | Tele talk and other mobile operators |
| <i>Payment Gateway</i> | <i>For electronic payment submission through Bank Deposit/NPS/BEFTN/MFS/NPS/ Card.</i> | <i>Banks &amp; a2i</i>               |
| CRVS                   | <i>A scope should be designed for Outgoing Data of some basic</i>                      | a2i                                  |



|  |  |  |
|--|--|--|
|  | <i>fields and actions (transactional and non-transactional). Data will be sent to CRVS which will be implemented in a near future.</i> |  |
|--|--|--|

#### 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) and Bangladesh House Building Finance Corporation 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 of BHDFC and NDC, at BCC
- 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.)
- 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 with graphical dashboard
- 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 database 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 500000 service recipients 29 Offices and around 34350 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 at least 150 concurrent users at run time.
- The vendor must conduct an extensive load testing task taking above factors into consideration and submit a load testing results.
- The system should be available to access 24x7x365 days a year without any unapproved downtime.



- The system should be developed with narrow bandwidth concept (Considering the network infrastructure challenges in Bangladesh ) where page loading 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.
- For mobile application the system should support very low bandwidth even in 2G, 3G and 4G network.
- 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-up) 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 to propose 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 interoperability, integration and data exchange with other systems. It is expected that the system will be based on open architecture and will be fully interoperable with the current and future systems.

The following are the key expectations on interoperability requirements:

- The system should be designed for interoperability using industry standard protocols.
- System must expose data by Advanced Message Queuing Protocol and REST via TLS
- All imported data must undergo data validation to ensure full integrity.
- Data exchange within the system at different levels via the internet shall be encrypted.
- The system should have functionality to exchange data with other own systems or external institute systems.
- The system shall have functionality to export/import files based on the standard template defined through web services and/or API

Full API documentation must be provided so that third party integrators can integrate the proposed system easily.

#### **5.5 System 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

- 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
- Unauthorized access details
- Full accessibility audit trail
- 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 light and lucrative UI/ UX design 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 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 should shows highest-level of professionalism for delivering the standard documentation approach at each phase of e-Service development and implementation project. Vendor should 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 Bangladesh House Building Finance Corporation 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 Software Quality Assurance (SQA) plan with measurable attributes for each phases of this e-Services development life cycle in their technical proposal.

### **5.13 Copyright**

Bangladesh House Building Finance Corporation 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 (BRD, SRS, HLD, LLD, DA, Architectural Design, Testing, Integration ) 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 Bangladesh House Building Finance Corporation, the vendor shall assist in securing such property rights and transferring them in compliance with the requirement of the applicable law. After the completion the vendor will be handed over to the Bangladesh House Building Finance Corporation of entire system development and implementation life cycle according to TOR.

The vendor cannot claim any royalty or authority of any sort in case of replicating the source code or database or any other deliverables as per TOR to anywhere except Bangladesh House Building Finance Corporation.

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 Bangladesh House Building Finance Corporation

## **6 Scope of Software Development**

---

### **6.1 Development and Implementation Methodology**

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

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. The Ultimate objective of the vendor will be finalization of the e-Service requirements in details as per TOR and approval from the concern authority. However, vendor is requested to propose and submit a system requirement analysis plan which should cover the full 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

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 following designing related task and will produce various standards System Designing Documents (SDD):

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

The Selected 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 BRD, SRS and SDD, vendor will prepare a comprehensive development plan for the e-Service including inception report of the proposed 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 aligned with Architecture which may include standard test approaches.

**6.7 Hosting**

Vendor should submit primary hosting requirements for this application related to hardware, servers, network, security, storage, traffic, firewall, bandwidth etc .Based on their submitted requirements, regarding hosting Bangladesh House Building Finance Corporation 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 users friendly. However, 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**

Here, it is expected that, the vendor will propose their detail 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.

**Table:** Estimation of Legacy Data to be migrated/data entry

| Data About          | Description          | number of pages/fields | current status | amount of data | dependency |
|---------------------|----------------------|------------------------|----------------|----------------|------------|
| Existing Borrower's | Data entry should be | 1 page,20 fields       | Hard copy      | 34000          | No         |





|                 |                         |  |  |  |  |
|-----------------|-------------------------|--|--|--|--|
| account profile | required from hard copy |  |  |  |  |
|-----------------|-------------------------|--|--|--|--|

The plan may cover amount of data to be migrated, activities to be performed, amount 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.

**6.10 Deployment and Implementation**

When the consent is being given to “GO LIVE” of the developed system after completed all kinds of development integration, testing, training 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 will trained the following BHBFC users.

1) Users’ Training (Approx. 300 persons),

Type of training:

Training for the Trainers (ToT)/ Master trainers-20

End user trainers-280

- 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 **02 (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 **02 (Two)** years. 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 within **09(Nine) Months** excluding the maintenance and support service period. Vendor will propose the Deployment, warranty, post support and maintenance with detail time line and milestone.

In 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 for smooth operation
- 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. Vendor will sizing the project, human resources involvement at their best approach to successfully develop and implement the solutions accordingly.

| <i>SL</i> | <i>Position</i>   | <i>Number of Person</i> |
|-----------|---|-------------------------|
| 1         | Project Manager   | 1                       |
| 2         | Team Lead   | 1                       |
| 3         | Business Analyst  | 1                       |
| 4         | System Analyst  | 1                       |
| 5         | Technical Document Writer                               | 1                       |
| 6         | Software Architect                                      | 1                       |
| 7         | Database Designer/ Administrator                        | 1                       |
| 8         | Database Programmer                                     | 1                       |
| 9         | Sr. Software Engineer                                   | 2                       |
| 10        | Software Engineer                                       | 3                       |
| 11        | Network System Administrator/ <b>Integration Expert</b> | 1                       |
| 12        | Mobile Application Developer/ Engineer-Android          | 1                       |
| 13        | Mobile Application Developer/Engineer-iOS               | 1                       |
| 14        | Trainers  | 2                       |
| 15        | Tester/ QA Engineer for Software                        | 1                       |
| 16        | Tester/ QA Engineer for Mobile Application              | 1                       |
| 17        | UI Designer   | 1                       |
| 18        | UX Expert   | 1                       |
| 19        | Technical Document Writer                               | 2                       |
| 20        | Surveyor  | 1                       |
| 21        | Network Engineer  | 1                       |
| 22        | Payment gateway Expert                                  | 1                       |
| 23        | Implementation, Support and maintenance Engineer        | 2                       |

### 6.15 Expected Deliverables

Considering the scope of work of this project and based on the proposed project development & implementation methodology, the vendor has to submit here a complete list of all types of deliverables will be produced throughout the entire project timeline like 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

---

The ultimate expectation of BHBFC is to automate existing Home loan Management system by facilitating transparent and reliable services to its clients through online. A comprehensive technical solution is required to automate the business process of existing system in a faster and robust way and make operational, reliable and seamless. The vendor has to ensure that all technical difficulties should address in a professional and effective manner. BHBFC expect to decrease time cost and value of an applicant that applicant can get a real time support through online and he can get service in a click.

BHBFC intends to develop a web based customized module with the modules mentioned in the schedule. BHBFC has 2 computerized web based Loan Management System running on Oracle RDBMS (Oracle 11g) and Oracle Developer Suite 10g. BHBFC has also database in Oracle RDBMS (Oracle 11g). Now BHBFC intends to migrate these Legacy Databases and convert the existing system of the mentioned modules to the proposed web based integrated customized software in the same interface.

This Web based customized module should be designed in such a way that it will run as Central Web based module to be installed in central server as well as standalone (local) server.