National Housing Authority (NHA)

82, Segunbagicha, Dhaka-1000, Bangladesh

Draft Terms of Reference (TOR)
for
"Smart NHA: Integrated e-Service Management System"

Prepared By

EoI, ToR & Estimate Committee for
Smart NHA: Integrated e-Service Management System
National Housing Authority
82 Segunbagicha, Dhaka-1000.

Table of Contents

1. Background

Bangladesh has made significant strides forward in the field of e-Government in the past decade, starting with somewhat scattered projects on infrastructure development and some applications for automation of internal process, but gradually moving towards e-service delivery and inter-connected governance. The Government of Bangladesh is eyeing towards achieving Smart Bangladesh by 2041, an initiative built on the foundation of the Digital Bangladesh. Smart Governance is a part of the goal Smart Bangladesh, to transform public service delivery of the citizen by the Government.

Everyday citizens are coming to National Housing Authority (NHA) for different services relating to Land/Plot/Flat/Housing and other services. The Government of Bangladesh has taken initiative for providing e-service behind all manual services.

To solve the acute housing problem of the urban & rural areas of the country including the capital city, National Housing Authority (NHA) wants to participate with the government's Smart Bangladesh vision journey to provide better& quality services to Citizen. An integrated e-Service Management for Land/Plot/Flat/Housing related services could achieve the desired goal.

Digitization and Automation, as well as the collaborative approach, is one of the most important tools for any institutional management in the age of Information & Communication Technology (ICT). Digital Bangladesh is ensuring an ICT based society where online based management will be more efficient, which will ensure more productivity, transparency, and accountability. One of the significant components of digital Bangladesh is to establish technology-based digital governance (e-Governance).

To resolve these issues and in line with Smart Bangladesh vision, the National Housing Authority (NHA) is going to introduce an Integrated e-Service Management System.

2. About National Housing Authority (NHA)

National Housing Authority is an autonomous organization under the Ministry of Housing & Public Works of the Government of the Peoples' Republic of Bangladesh. It was formed in 2001 by virtue of The National Housing Authority Act 2000. Formerly it was known as Housing & Settlement Directorate. National Housing Authority has the mandate to solve the acute housing problem of the urban & rural areas of the country including the capital city of Bangladesh. It's mission is to ensure safe, sustainable and affordable housing for all strata of people by proper planning on the land available at hand and also to safeguard the property of the Government from illegal possession. NHA's stakeholders are the people of Bangladesh, contractors & real estate developers, banks & financial institution. National Housing Authority operates all over the country with 10 executive Engineers Offices & 10 Administrative Officers Offices.

3. Existing Services (As-Is)

Current services of NHA are provided in a traditional and manual way. Citizens are paying installments for Plot/Flats by going to NHA offices and banks in person. No data is available for the service seekers to find without paying visit to the offices. Most of the services such as land/plot/flat/housing allotment, mutation, transfer permission, re-allotment, power of attorney permission, lease deed registration, possession award etc. are being provided in the traditional system. To avail these services, citizens need to visit NHA offices physically. Sometimes due to rush, they need to wait for hours, even days to avail themselves of their desired services. These, result in service delays and despair to the citizens. Information on collections of service fees are not recorded properly and financial reports are incomplete for the lack of information.

4. Problems and Challenges

Citizen's Perspective:

a) Citizens need to visit NHA office several times to get the services
b) The applicant doesn't have proper information about the service requirements
c) Final allotment selection process takes a long time.
d) Land/Plot/Flat/Housing handover process is not completed within defined time.
e) Citizens have to visit different offices to complete the service
f) Required documents or check list for the services are not always available.
g) There is no notification system to inform the applicant about the file work status.
h) For making payment, beneficiaries have to wait in long line at bank premises.

Service Providers' Perspective:

a) Application scrutiny and document verification takes too much time.
b) Service delivery time is very long
c) Lack of manpower-manpower shortage hinders smooth service to Citizens

5. Objectives

5.1 Service Recipient point of view

a) Reduce the Time Visit Cost (TVC) of the citizen.
b) Can easily be informed about service completion status.
c) Service Recipients need not to come to the service provider offices physically. They will be able to get the services online.
d) Service Recipients need not to go to any bank or financial organization to pay the fees for the received services. They will be able to complete the payment process through Online Banking/ Internet Banking/Mobile Banking.
e) Citizen does not need to know what to do, how to do, where to go or which service is necessary. Service will proactively reach citizen when necessary. Citizens will only realize that instead of knocking door to door, services are knocking at them.
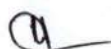
f) Citizens do not need to know service route, lifecycle or layers of engagement. Engagement will be only at the start and when output is generated.

g) Citizens will be notified at every step of the service processing & given alert or direction when necessary.

5.2 Service Provider Point of View

a) To ensure faster, systematic and seamless service delivery

b) To ensure much higher citizen satisfaction level by introducing a faster, secure and reliable automation solution

c) All the information related to land will be available in organized way in the database.

d) Services could be delivered from anywhere any time easily.

e) Transparency will be ensued and accountability will be increased.

f) Will move the governance trend from citizen centric to citizen driven.

g) Government makes decision based on statistics, unclear demand or based on research. This system will create opportunity government to access specific citizen demand or happiness parameters of the population from real time data.

h) For root level information, supreme authority depends on input from mid-level. The pain of citizens, what they want and what they face is not visible among leadership. This solution will make citizen satisfaction level visible to policy makers.

i) Will create political sustainability of the government - what needs to be done and what needs to be avoided. Technology with reduce challenges among layers of bureaucracy inside the governance and leadership structure.

j) To ensure scalable and robust solution in order to meet high concurrent accessibility.

5.3 Service Performance Monitoring Authorities

a) To monitor service delivery efficiency.

b) To monitor service delivery position of different sections of organization.

c) Dynamic reports can be generated at any time.

d) Ensure reliable scalability of solution for NHA's future requirement.

e) The solution should include a robust reporting engine, monitoring dashboard and block image/graphical representation to generate accurate and comprehensive reports on the performance of services, key metrics, trend and information. These features will enable informed decision-making and facilitate data driven improvements.

6.   Technological Requirement

Integrated e-Service Management System is a software-based service delivery platform for both the citizens and NHA. It will improve the quality of service and reduce service delay. The system will allow direct communication with organizations. This system endeavors to improve the performance of NHA by considering the holistic management process.

The integrated e-service management system will provide a web-based solution for the services of citizen. The services which are to be automated are categorized into below components/modules:

1. Module 1: Application for Plot/Flat with Lottery and Allotment.
2. Module 2: Online Installment Collection System for the Allottees of NHA.
3. Module 3: Digital Land Based Services:
    a) Transfer/Handover Permission
    b) Permission for Namjari/Mutation
    c) Installment Defaulter Payment Permission
    d) Impunity Exemption
    e) Demolishment & Reconstruction Permission
    f) Time Extension Permission
    g) Mortgage Permission
    h) Joint Construction Permission on Multiple Plot
    i) Piece Plot Allotment
    j) Plot Division/Consolidation Permission
    k) Power of Attorney Receive Permission
    l) Power of Attorney Appoint Permission
    m) Conversion Permission
    n) Alternative Plot Allotment
    o) Lease Deed Registration
    p) D-Type/Bed Sitter Flat Allotment
    q) Rehabilitation Plot Allotment
    r) Industrial/Commercial/Institutional Plot Allotment etc.
4. Module 4: Digital Document Archiving with Indexing
5. Module 5: Common Service Configuration

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

Apart from this, the interested Software firm/company should analyze the other scopes which are relevant to the areas covered above and should propose the best possible and comprehensive ICT solutions in their technical proposal. The ultimate module and features of the proposed system will be finalized at the requirement study and analysis phase of SDLC based on customer

requirement acceptance and Software Firm/Company's best proposal/solutions relevant to the above-mentioned area and scope.

The Software Firm/Company is recommended to choose the appropriate tools and technologies to be used (preferable TOGAF9.x or similar open source-based technologies) for the development and implementation of this ongoing service application to ensure enterprise level management. Has to consult with implementing organization and/or technical committee which has been selected by the organization to finalize the tools, technologies, framework and platform with the approval of same authorities' consent.

6.1 Web Application

    i. The systems mentioned, which is a web-based solution, should be hosted in a centralized web-server.

    ii. The application should be developed in micro service architecture following micro service design approach.

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

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

    v. The application should have the ability to seamless integration with future module / components / applications.

    vi. Application should be lightweight and rich client-side scripting.

    vii. UI should be developed based on the analysis of UX.

    viii. Any web interface of this application should be fully responsive.

    ix. Platform & device independent application.

    x. Need to use Open-source development platform & language.

    xi. User friendly and equitable.

6.2 Mobile Application

    i. The mobile application version of the system should be developed for both Android and iOS.

    ii. The mobile app should have the capability of displaying system notifications.

    iii. Functionality for registration options for service recipients.

    iv. App should enable compact view of services for service recipients.

    v. There should be an option to auto synchronize with the central database with apps local database on the availability of the internet connectivity.

7. Scope of work

7.1 Development and Implementation Methodology

Development methodology i.e. SDLC plays a very important role in clearing 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 Software Firm/Company 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.

7.2 System Requirement Analysis

Requirements finalization will be a very important milestone of The Software Firm/Company's proposed development methodology. It is expected that, the selected Software Firm/Company will carry out detailed requirement study and analysis on each and every scope of Integrated e-Service that mentioned in the TOR. The firm/company having long time experience of requirement analysis of e- service development in Government sector will be given high preference. Under this scope of work, the selected Software Firm/Company has to analyze the detailed functions, processes, documents, actors, sites and infrastructure of the relevant prevailing system precisely of the concerned organization. At this phase, The Software Firm/Company's ultimate objective will be finalization of the integrated e-Service requirements in details under the scope of TOR and approval of NHA. The Software Firm/Company is encouraged to have multiple detail discussions and meetings with each service point of NHA for the implementation of this assignment. Here the Software Firm/Company 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.

7.3 System Design

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. 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, The Software Firm/Company may perform 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.
- 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& API connectivity flowchart.
- Finalizing tools, technologies and frameworks to be used etc.

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

7.4 Development

At this stage, the Software Firm/Company 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, The Software Firm/Company will prepare a comprehensive development plan for the e-Service application, which should include a schedule consisting of development item wise start date, test date, review date, completion date etc. At the development stage, the Software Firm/Company must follow agile development method, 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, the Software Firm/Company is requested to include a preliminary development plan (standard approach) in their technical proposal.

7.5 Integration

Considering integration requirements and scopes for this e-Service application, The Software Firm/Company must include a phase in their proposed development and implementation methodology. At this stage, the Software Firm/Company will perform all necessary tasks regarding integration to make the e-Service application interoperable. The firm having e-service integration experience with NID, traditional payment gateways in Bangladesh, Eksheba platform of Bangladesh Government (MyGov), Ekpay, National Web Portal (NWP) will be given high preference.

7.6 Testing

The Software Firm/Company must propose a testing plan for the combined e-Service management system starting from development to deployment. The Software Firm/Company must provide a web-based testing server & host the applications, so that NHA can test the system online. Testing server & hosting charges will be provided by the Software Firm/Company. The 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 firm having multiple Govt. e-services testing experience and successful testing certification from SQTC Center under BCC will be given high preference.

The Software Firm/Company should submit test approaches. Some are mentioned below as examples for reference:

a) Integration testing

b) Compatibility testing
c) Load Testing
d) Alpha testing
e) Beta testing
f) Usability testing
g) Accessibility testing
h) Security testing
i) Unit Testing
j) Regression testing
k) Acceptance testing

7.7 Hosting

The hosting of the server would be arranged at National Data center or 4 tier Data Center of Bangladesh Govt. The Hosting charge will be borne by NHA. The Software Firm/Company is requested to submit a "Hosting Architecture & Requirements" in their technical proposal for this e-Service application with specification of server and space requirements.

The Software Firm/Company will ensure that the hosting requirement given is enough to provide smooth and desired web service accepted by NHA. The Software Firm/Companys will advice NHA from time to time to upgrade the server requirement based on the growth of data.

However, the Software Firm/Company will have to provide the entire support of the hosting services like database administration, devOps and all related services for keeping the services up and running. The Software Firm/Company will submit hosting proposals by considering the issues mentioned below:

a. Hosting requirement /environment (hardware, servers, network, security, storage, traffic, firewall, bandwidth etc.)
b. Data Growth and Scalability.
c. User handling/load balancing.
d. Licensing issues (if required).
e. Scheduled backup & Restore Requirements.

7.8 User Acceptance Test (UAT)

User Acceptance Test (UAT) is a very vital and essential phase in this integrated e-Service Management System development lifecycle. At this phase all types of users must test the developed Automation System application by themselves and have to provide details feedback/test report based on the UAT report. The Software Firm/Company must update the application accordingly to ensure user satisfaction by making it more users friendly. Here it is expected that considering the type of users and their role in the System, the Software

Firm/Company must propose a comprehensive UAT plan in their technical proposal which may cover the Following:

- 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 test case, test results/deliverables
- detail user feedback/ test reports
- System update plan.
- System operating manual
- Report Management System(Report Dashboard)

7.9 Deployment and Implementation

After completed all kinds of development integration, testing and hosting, the Software Firm/Company will deploy the proposed systems in a live server. The Software Firm/Company will be responsible for the deployment of the developed systems in hosting services provided by NHA. The Software Firm/Company will handle any issue regarding deployment and will be responsible until easy web access is ensured. The pilot or full-scale implementation period starts formally in this stage only. The Software Firm/Company is requested to propose their deployment and implementation plan covering the major activities to be performed, the deliverables to be provided etc.

7.10 Training and Knowledge Transfer

The Software Firm/Company will provide all kinds of technical and capacity enhancement training to all parties involved (NHA Officials, Service Recipient, Bank Officials, IT Personnel) with the proposed services. To take a leap from traditional way to a fully automated approach, the NHA must be acquainted & trained in this system. The Software Firm/Company will ensure that the officials are successfully operating the system after training. The Software Firm/Company will provide training at NHA head office and as well as at branch offices which are located all over the country. The locations will be chosen by NHA. Training materials, training entertainment &training honorarium will be carried out by the Software Firm/Company. The Software Firm/Company must arrange a separate training for technical counterparts of NHA to solve issues within NHA's scope. For technical capacity enhancement, the Software Firm/Company may arrange local/oversees training sessions for all technical counterparts of NHA. For training & knowledge transfer, the Software Firm/Company will follow below directions:

a) The Software Firm/Company must propose a detail training plan for the users of the Integrated e-Service Management System.
b) The Software Firm/Company should include necessary training methodology, documentation and training materials support in their training plan

c) The training materials may include user manual, administration manual, quick start tutorial, online help, video tutorial, frequently asked questions.

d) The training plan should contain full course descriptions for all courses that to be carried out for respective users. The training plan must describe the sequencing, time, duration and resources involved in implementation of each of the consultant's proposed training activities.

e) The Software Firm/Company should develop multimedia training materials for all users. These materials shall be available for viewing and reviewing for all users through a web portal.

f) The Software Firm/Company instructions should support both English and Bengali language

g) The Software Firm/Company will record all the valuable suggestions in report format from the trainees and submit to the authority.

h) The Software Firm/Company also needs to propose their smooth, efficient and effective knowledge transfer idea and plan here in this technical proposal with the training plan.

i) The Software Firm/Company will also provide tutorials for general applicants (certificate recipients)

7.11 OAT (Operation Acceptance Testing) and Commissioning

After the training tasks are done by the Software Firm/Company and users are found to be comfortable operating the system without any hand-holding and operation is found to be as per need, NHA will arrange for formal commissioning of the system and issue a certificate to the Software Firm/Company to that effect. This would constitute the final milestone of the project before 'Going Live'.

This is the phase of SDLC, when the consent is being given to "Commissioning" of the developed system after completed all kinds of development, integration, testing and hosting.

7.12 Maintenance and Support Service

The selected Software Firm/Company has to provide a period of 05 (Five) years maintenance and support service. Maintenance period will start after 01 (One) year development period. Here it is expected that, the Software Firm/Company must provide a detailed maintenance and support service plan which may include the followings:

a) 24/7 support and maintenance.
b) Data/Database migration work.
c) Service desk functionalities.
d) Office Hour Call Center Service for citizens.
e) Configuration management.
f) Change management.
g) Service layers for support.
h) Communication management.

i) Release management.
j) Incident management.
k) Problem management.
l) Maintenance reporting.
m) Service Log Management.

Maintenance Services for the overall system:

a) During the maintenance period, the firm will be responsible for maintaining the overall system as required.
b) During the maintenance period, the firm will be responsible for implementing the necessary change request (i.e. develop/customize /upgrade etc.) in the software and mobile app.
c) Perform any troubleshooting within the overall system. Fix any software problems/bugs/issues/errors within 48 hours.
d) After every 3(three) months a checkup for regular maintenance is required.
e) Fix any security issues (including virus attacks and other security problems) within 24 hours. Handle any cyber attack incidence immediately and data recovery if needed.
f) Maintain back-up and recovery of data from any point of time within 12 hours.
g) Assist the client to maintain and enhance the system through transfer of knowledge as required.
h) Assist the service seekers to use the developed system and obtain desired service through a dedicated call center for this system 24/7 during maintenance & support period.
i) In addition to the above mentioned works/services, the IT firm will have to perform IT related services/work as required from time to time by NHA.

Apart from the above-mentioned issues, if the Software Firm/Company thinks any other issue to be included in their plan, it would be considered as added value addition. After successful completion of the Maintenance & Support Service Period, both party will decide to engage for managed services by following PPA 2006 & PPR 2008.

8. Proposed System Requirements

8.1 Module 1: Application for Plot/Flat with Lottery and Allotment

Existing Process:

At present, Service seekers apply to NHA for flat/plot allotment whenever a circular is published under a project. These applications are taken manually through selected banks. The aspirants have to visit bank in person to buy prospectus and application and the application are submitted at banks with security money payment. Those applications are sent to NHA. NHA then perform scrutiny of applications, sort the applications, create gradation list and lottery is performed at NHA offices in front of the applicants. The lottery winners are then awarded allotment by NHA.

Proposed System:

The Software Firm/Company is required to transform this service into an online system where aspirants can buy prospectus by paying fees, apply for desired plot/flat by filling out necessary information &NHA can perform scrutiny, can perform necessary processing (discard invalid applications, create gradation list under quotas), can perform online lottery and then award allotment paper from the system. The Software Firm/Company will perform detail requirement analysis and submit a proposal for automating this process from application to award of allotment.

Payment System:

The Software Firm/Company will have to develop a secure payment gateway for the payment of prospectus and security money. Major Cards Processors, Banks and Mobile Wallets/m-Banking must be available so that citizen can pay with their DEBIT/CREDIT/VISA card or proprietary card (like DBBL Nexus, qCash, etc.) and other way of online payments (as payment through POSs) through this channel. Provision of payment by Mobile wallet (like bKash, DBBL, Mobile, etc) must be present on the Online Payment Gateway. Incorporate bank to bank transfer as soon as the scope is available. NHA will complete all necessary contract agreement on its part with payment gateway vendors. Need transaction log and audit trails for the payment system, protect sensitive financial information, and ensure compliance with laws and regulations.

Dashboard:

The Software Firm/Company will develop interactive dashboard for service recipients as well as for the officials of NHA for this system. There can be different types of dashboard templates based on user layers and types and systems. From Admin/Officials dashboard NHA users will be able to view, manage & perform all necessary process like scrutiny of applications, perform lottery and issue allotment paper but not limited to these for the above-mentioned proposed system. Dashboard must be designed in such a way that it can be used to monitor performance, track progress, and make decisions.

Reporting System:

The Software Firm/Company will implement dynamic reporting system in the system so that NHA officials can generate all types of reports for this system. Necessary fields and format of the report will be approved by NHA. All reports must be in the downloadable and printable format. The reporting system must provide flexibility to the official user, so that they can choose fields for the format of the report from multiple dropdowns, checkboxes etc.

Mobile App Development:

The Software Firm/Company will develop mobile application for managing Application for Plot/Flat with Lottery and Allotment system which is deployable on both Android & iOS system.

Mobile app for only NHA users is needed where summary of the system will be displayed. NHA users will be able to view all the applications, status summary, searchable lottery results and allotment details. The mobile app data will be automatically synced with web system's data.

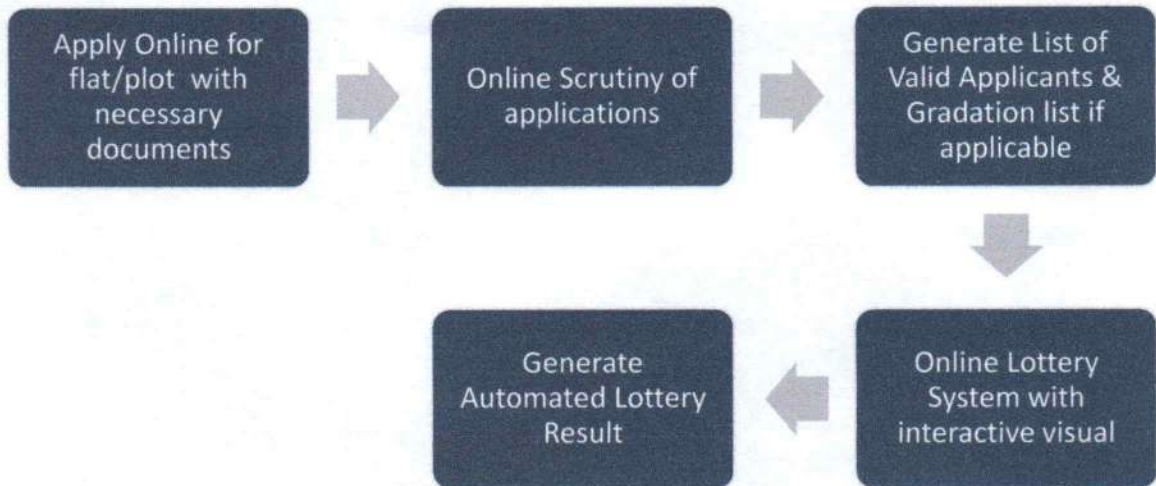The Software Firm/Company is encouraged to but not limited to follow below online process flow:

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┌──────────────┐     ┌──────────────┐     ┌──────────────┐
│ Apply Online │     │ Online       │     │ Generate List│
│ for flat/plot│ ──▶ │ Scrutiny of  │ ──▶ │ of Valid     │
│ with         │     │ applications │     │ Applicants & │
│ necessary    │     │              │     │ Gradation    │
│ documents    │     │              │     │ list if      │
│              │     │              │     │ applicable   │
└──────────────┘     └──────────────┘     └──────────────┘
                                                  │
                                                  ▼
┌──────────────┐     ┌──────────────┐
│ Generate     │     │ Online       │
│ Automated    │ ◀── │ Lottery      │
│ Lottery      │     │ System with  │
│ Result       │     │ interactive  │
│              │     │ visual       │
└──────────────┘     └──────────────┘
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Figure 1: Proposed Online Process flow overview for online application for Plot/Flat allotment

8.2 Module 2: Installment Collection System for Plot/Flat Allottee

NHA develops plot/flat scheme for the low and middle income group of Bangladesh and provide them with long-term installment facilities. The payment of installments are given in manual process by allottees and NHA wants to simplify the process for service recipients to ensure the collection of installments of NHA's projects. To automate this process The Software Firm/Company will develop an online payment system for the allottees of NHA by which alottees can pay installments online and NHA can ensure proper financial management of installment collection. The proposed system should include below facilities (but not limited to):

a) Create Allottee Database for plot and flat projects of NHA and provide necessary arrangement in the system to accommodate all necessary information of each allottee.

b) The software must be a scalable platform where projects can be added with their allottee information (All necessary fields for information must be stated in SRS document to be made by the Software Firm/Company in SRS preparation phase).

c) Develop a Web Based Installment Management System for the Allottees of NHA, which will facilitate the allottee to pay flat/plot's installments via online & offline..(Connecting with online Banking System)

d) Develop an automated ledger management system for each allottee with a standard balance sheet to be approved by NHA. The Ledger will contain allottee's all installment payment information with necessary payment status and details. (Payment status, payment method, payment date etc.). To store an already running project's installment collection information into the system, the consultant must complete the data entry work of already paid installments of each allottee.

e) This module must provide accurate calculation in terms of the installment amount. The system must automate the process of calculating any late fees and defaulter fees and add to the amount of installment. Calculation of added fees to the installment must be shown explicitly.

f) The system will be flexible enough to make any special arrangements of installment payment, advance payment, payment of multiple installments, remaining full installment payment etc.

g) Develop regular Alert & Notification (SMS & Email) system to inform allottes to pay their installment in time. The system will be able to send custom alert to the allottees who will be installment defaulter.

h) The system will block users from payment if they did not pay installments for certain amount of time following the rules & regulations of NHA. Create an approval system by which a defaulter allottee can apply for further payment. Unblock the defaulter if proper approval is given from the concerned authority.

Online Installment Payment System:

The Software Firm/Company will develop a secure online payment system so that the allottees can pay their installments in this system. The Software Firm/Company will have to follow below instructions but not limited to for the development of online payment system of installments:

a) For Online Payment, ensure integration of a secure payment gateway to pay installments. Online Payment Gateway must have Debit Card, Credit Card, Amex Card or proprietary card (like DBBL Nexus, qCash, etc.) and all kinds of mobile financial system (bKash, Nagad etc.). Incorporate bank to bank transfer as soon as the scope is available. NHA will provide all kinds of legal support in this aspect.

b) After payment of each installment, ensure secure entry to this system and generate a pay slip for the allottees to download and print.

c) Development of offline payment through creating an automated challan (format to be approved by NHA) in this system to pay in the banks. The Software Firm/Company must develop a system of incorporating offline payment entry into this online system. The Software Firm/Company must develop a portal for any number of banks, where offline payment collection information will be stored by Bank Officials.

d) Provide secured payment confirmation certificate with online verification.

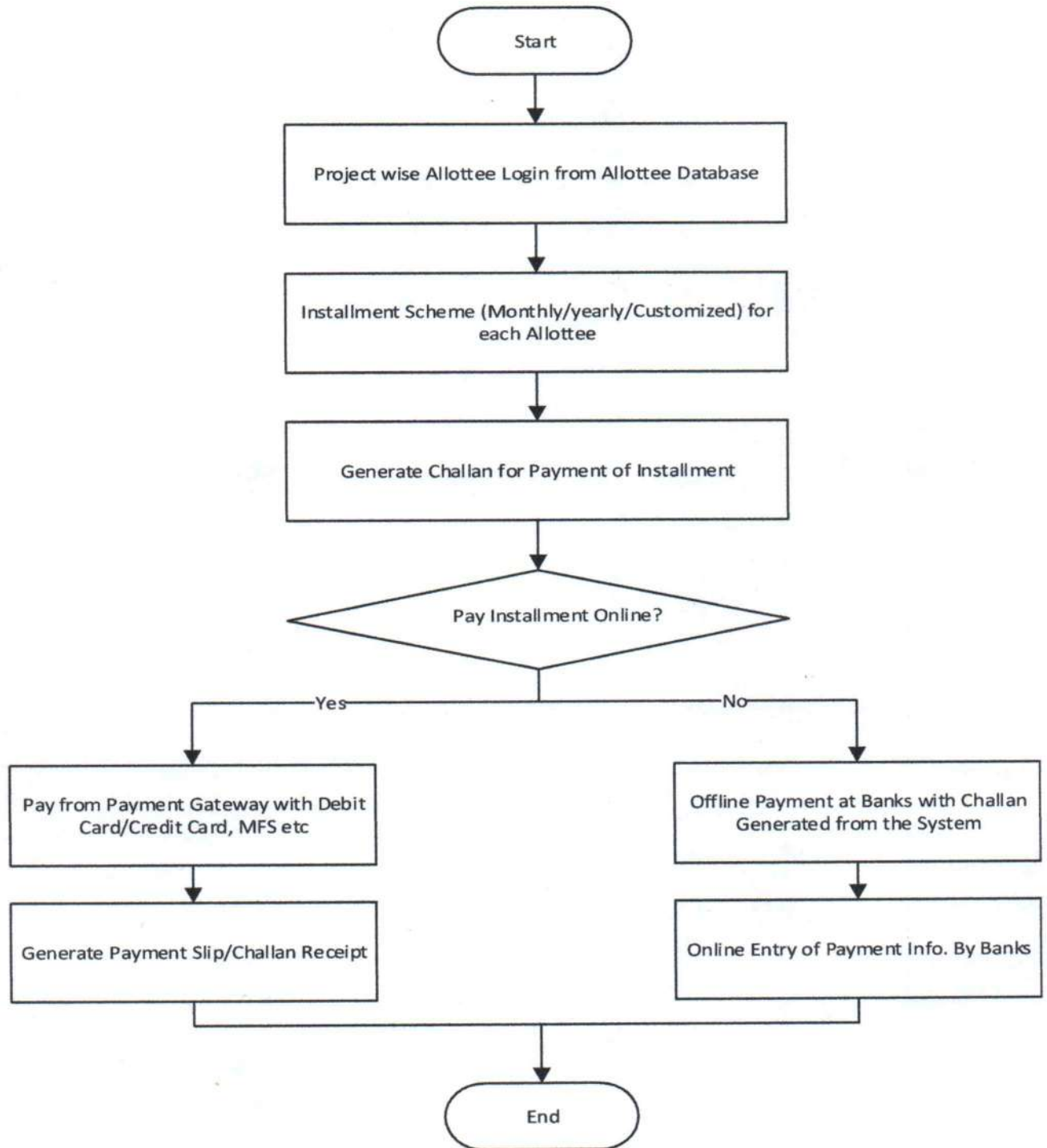e) Need transaction log and audit trails

Figure 1: Proposed System for Installment Collection of Plot/Flat Allottee

Dashboard:

The Software Firm/Company will develop interactive and fully responsive dashboard for NHA user, Bank user, Allottee user. A central dashboard is needed for higher officials of NHA for

viewing collection information of each project with necessary graphs and charts. Content access for Dashboard must be separate according to the role of NHA officials. There can be different types of dashboard templates based on user layers and types and systems. Management officials for this system must be given different access for managing the system.

Reporting System:
Develop Report Generation System for NHA users for Office Use. NHA users must be given utmost flexibility of generating any report i.e payment history report, financial report etc. from the system. Develop customizable report system where users will be able to choose heads from multiple dropdowns. Must include daily, weekly, monthly, yearly installment collection report with ease.

Mobile App Development:
The Software Firm/Company will develop mobile application for managing Installment Collection System for Plot/Flat Allottee which is deployable on both Android & iOS system. The mobile app will be only used for viewing all the information of the system. The allottees and the NHA users will both use the mobile app for viewing purpose. NHA users will be able to view installment collection status, summary of collection, payment history etc through the mobile app whereas the allottees can view only their payment information of installments.

8.3 Module 3: Smart Land Services

The Software Firm/Company must implement an online system from where Citizen can easily apply online for various services provided by NHA. Each application for services has necessary fields to be filled by a service seeker. These services include but not limited to:
a) Transfer/Handover Permission
b) Permission for Namjari/Mutation
c) Demolishment & Reconstruction Permission
d) Time Extension Permission
e) Mortgage Permission
f) Joint Construction Permission on Multiple Plot
g) Piece Plot Allotment
h) Plot Division/Consolidation Permission
i) Power of Attorney Receive Permission
j) Power of Attorney Appoint Permission
k) Conversion Permission
l) Alternative Plot Allotment
m) Lease Deed Registration
n) Rehabilitation Plot Allotment
o) Industrial/Commercial/Institutional Plot Allotment etc

Below are some features that must be included in digital land services module:

Online Attachment/Upload:

While applying for services, Citizens have to attach necessary documents. The consultant must develop facility for uploading supporting documents in each application stated above. Document size & type will be decided at SRS phase.

e-Verification:

Applicant will fill up various fields such as: personal info, land info, others information with required attachments. The Software Firm/Company must achieve the facility of instant verifying of NID& other documents (TIN, Birth Registration, Trade license etc) if possible. Details are given in Integration Requirements section.

e-Beneficiary account management:

Manage citizens profile (create service recipient user id, generate password, recovery password, user session, user validity, user dashboard with submitted application's current status etc)

8.3.1 Land Service Application Processing:

After submitting application, some steps are followed to resolve an application or award permission. The online system must replicate the manual process. The Software Firm/Company must do detail software requirement analysis in this section to produce a standard Software Requirement Specification. Below steps are needed in this online application system to resolve an application:

a) Receive online Application in NHA's respective department. (Receipt document provided to applicant)

b) Develop system for forwarding submitted application to designated assistant. (Include Full Office Setup of NHA officials with necessary credentials)

c) Develop File Noting & Approval System.

d) After Approval, Issue Letter/Permission,

e) Checking/Verifying of required documents in the system. Documents will be available after being archived. For Archiving see section8.3 Document Archiving with Indexing.

f) Provide Application status with necessary details.

g) **e-Scheduling:** Develop provision within the system to Ensure attendant of service recipient and arrange hearing with concerned NHA official within define date and time by notifying the user from the system.

h) **Service Fee Payment:** Online Payment Gateway integration solution with major Cards Processors, Banks and Mobile Wallets/m-Banking so that citizen can pay service charge with their DEBIT/CREDIT/VISA card or proprietary card (like DBBL Nexus, qCash, etc.) and other way of online payments (as payment through POSs) through this channel. Provision of payment by Mobile wallet (like bKash, DBBL,

Mobile, etc) must be present on the Online Payment Gateway. Incorporate bank to bank transfer as soon as the scope is available. The business process flow overview of

i) the proposed system of online application for land services is given below and the Software Firm/Company is requested to follow below steps (but not limited to) in designing the proposed system.
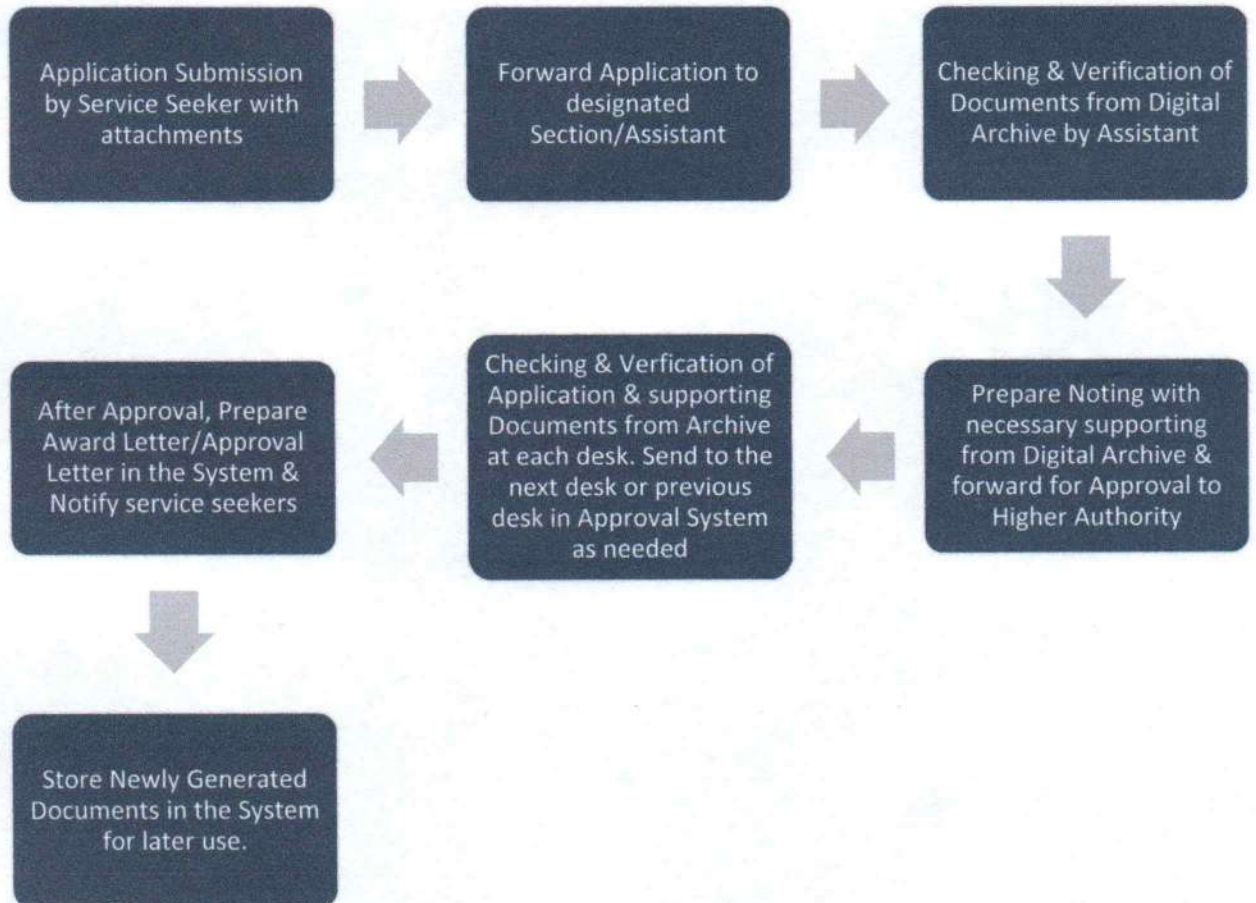
Figure 2: Possible overview of the proposed system for online application for land services.

8.3.2 Real-time Service Tracking:

The online applications must have unique service tracking ID by which any user can track the current status of an application. The Software Company/Firm will develop tracking system to monitor performance, track progress, and make decisions. view the application details and status. The tracking ID will be available to the service recipient to track current status of their application

8.3.3 Online Application Monitoring Dashboard

The Software Firm/Company needs to provide a central Accelerated dashboard through which, officials of the NHA would be able to view and manage online applications. Dashboard requirements are:

a) Design and develop a user friendly and user-specific dashboard segregated by the user role and user group for all the systems so that they can view online applications submitted to them and take necessary actions. There can be different types of dashboard templates based on user layers and types and systems.
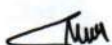
b) Include necessary charts, graphs based data in dashboards for viewing application submission and resolve status in daily, weekly, monthly and yearly basis. Provide smooth navigation from dashboard to any application's detail view.

c) Must include service fee Collection information in dashboard.

d) Must include all types of reports of the data available at hand in standard format approved by NHA

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

Mobile App Development:

The Software Firm/Company will develop mobile application for managing Digital Land services which is deployable on both Android & iOS system. The mobile app will be only used for viewing all the information of the system. The allottees and the NHA users will both use the mobile app for tracking and monitoring progress of the services. NHA users will be able to view summary of this system, progress of the applications, disposal percentage of applications etc. whereas service recipient will be able to view and track their applications and make payments of service fee if needed.

8.4 Module 4: Digital Document Archiving with Indexing

National Housing Authority manages plot/flat of all kinds across the country under its jurisdiction. Many of these files may have documents dated back to 1960 or more. Documents and files of this kind are in vulnerable situation. we have one (01) Record Room of approx. 30,000 (Thirty Thousand) files and each file have 200 (Three Hundred) significant pages on average. These land related files need to be scanned, indexed & documented so that these digitally archived files can be successfully used for online application for land services (section 9.2) software. The firm will develop a scalable software system for digital document archiving to store the archived files and maps. The firm will archive the manual documents and maps and input those the system. The system will be designed in a way, such that NHA users can archive documents by themselves. The system will be scalable enough to accommodate increasing

volume of documents. After successful archiving, these digitally archived documents will be used as input to the online application for land services (section 9.2) system. The Software Firm/Company will design suitable solution to integrate the system with section 9.2 & provide easy and faster access of data. These archived files must be available with concerned application of services to verify the authenticity of an application from a service seeker. These digitally archived documents will be present in the system so that it can be easily searched with associated information and viewed by NHA users.NHA users will add documents to the system The firm will propose roadmap for archiving these files with timeline. The Software Firm/Company may propose to complete this section in phases. The firm having previous experience on digital document archiving for any Bangladesh government office will be given preference. They may archive the files starting with newly established project & then move back towards past. In this case, NHA will decide priority of the project. For better understanding, below integration requirement overview is given in figure:

Access Data, Files, Information for Verification

Archived Data, Files, Maps

Store Copy of Generated Documents in Archive Database

Online Application for Land Services

Digital Document Archiving System
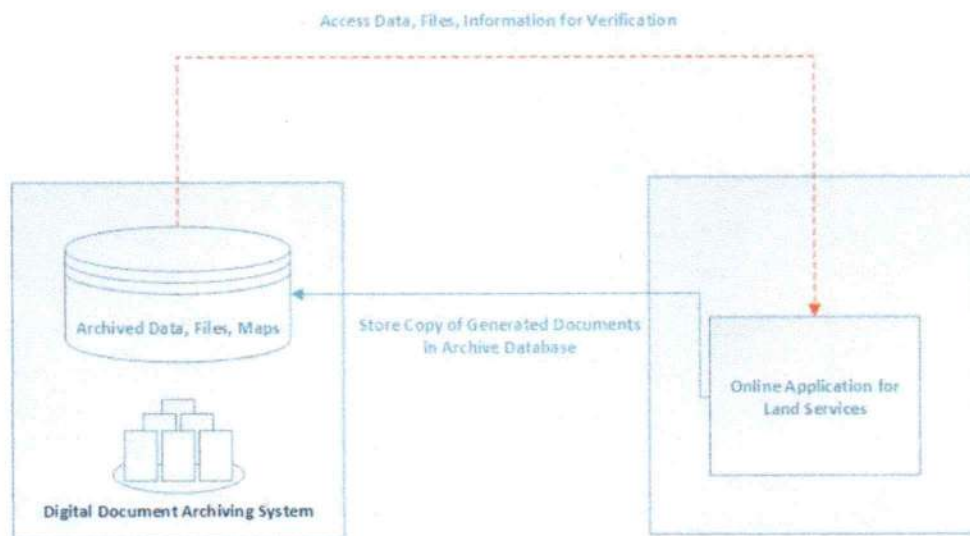
Figure 3: Integration Requirement Overview of Archiving & Online Service

The Software Firm/Company needs to accomplish below tasks under Digital Document Archiving with Indexing:

8.4.1 Collect Data and Information

Considering the above context, the following activities need to be performed by the consultant (but not limited to):

a) Develop data and information collection methods and forms for Digital File Archiving & Documentation. Software Firm/Company will sit with record room keeper/attendant to collect the number of files to be archived and present report to the authority for approval.

b) Visit respective regional offices.

c) Visit Record Rooms and setup necessary utilities to scan the files & documents according to the approved method.

d) Maintain strict quality control during the file & document scanning.

e) Each piece of paper holds confidential information of the authority and it's service seekers. Maintain document's integrity & confidentiality throughout the whole assignment and for any loss of document during the process the Software Firm/Company will be held responsible.

8.4.2 Information & Data Entry and Documents Scan & Upload

Considering the record room of head office & regional offices, the number of files might be a rough estimated 40,000 with 300 significant pages need to be digitized at this stage. Considering the above context, the following activities need to be performed by the consultant (but not limited to):

a) It is Software Firm/Company's responsibility to perform total estimate of no. of files & pages need to be scanned& uploaded into the system. Consultant will provide detail proposal of carrying out the work of scanning & uploading with calculated timeline & phasing.

b) The Software Firm/Company will upload scanned Documents into the developed Online Application & File Workflow System with indexing and tagging. Number of index or fields that needs to be associated with each file/page will be agreed upon by Software Firm/Company and NHS. The fields must be mapped to the documents appropriately so that they can be easily searched and accessed for any purpose.

c) The Software Firm/Company will be responsible for the successful scanning and uploading and the client will verify if the system has appropriately digitized and archived each file. The system must have the facilities to size/resize documents and adjust resolution to provide better viewing of the users.

d) The Software Firm/Company will provide daily report on number of files/pages uploaded into the system from the start of this module.

e) For document storage and application hosting NHA will provide server with the amount of storage required by the consultant.

f) It is to be noted that online application for land services (section 9.2) system is solely dependent on the successful archiving and digitization of the land related files. If unable to scan & upload and verify documents from the system, it will be regarded as unsuccessful completion of the assignment.

g) Type of documents that need to be scanned are land related files (note sheets, letters), layout, maps, attachments etc. Documents need to be saved into the system as suited for the Online Application & File Workflow System but will have to have provision to be downloaded.

8.5 Common Services Configuration

Common services configuration refers to the setup and configuration of services that are commonly used in an organization or network. They are often designed to be reusable, modular, and easily configurable, allowing them to be easily integrated into different systems and applications. By using common services, organizations can reduce the costs and complexity associated with developing and maintaining separate, standalone services for each application or system.

The selected firm/company needs to migrate legacy data to the newly developed system. Also, the vendor may need to migrate data from National Housing Authority (NHA) sub offices to the newly developed system. This migration/process will be a part of whole development.

8.5.1 Sub-Module 01: User Management

User management is the process of creating, modifying, and maintaining user accounts for an organization's system, software, or website. This includes tasks such as creating new accounts, assigning roles and permissions, resetting passwords, and deactivating or deleting accounts. User management is an important aspect of ensuring the security and access control of an organization's systems and data.

User Account Management

User account management should have the following options:

- Insert, update, block, delete users -Users can register in the system.
- System admin can assign users to their designations with designated roles.
- System admin can assign users to their designations with designated roles.
- System admin can release user from his/her designation.

User Role Management

Insert, update user roles. Assign different types of roles to different kinds of users.

User Account Verification

There will have option to verify users based on email and/or SMS.

User Account Recovery

Easy implementation of a "Forgot your password?" feature in this Platform can choose between three methods: using email or using a secret question or using SMS based secret code.

Change Password

Any user can change his/her password any time to address security challenges.

Profile Management

System will have provision to add and update user account information such as the password, email, phone number, photo, signature etc.

8.5.2 Sub-Module 02: Access Control Management

Access control management is the process of controlling access to resources or systems within an organization. This includes identifying and authenticating users, granting or denying access to specific resources, and monitoring and logging access attempts. Access control management helps to ensure the security and integrity of an organization's systems and data by preventing unauthorized access or changes.

Multi-Layer Access Control Mechanism

The system will have system access control panel. Every system user will be assigned to one or multiple roles. Every role should be assigned to a set of actions or activities. The system admin will have provision to assign roles to users and to assign set of actions/activities to roles. There should have provision to assign layer, section, department, office-based access management system

SSO (Web & Mobile Application)

This should provide options to users to access all of his/her assigned systems with single user and password. No multiple access credentials needed to access multiple systems. Service recipients will use one single credential to access all the mentioned system and NHA officials will also use one single credential to use all the mentioned system. Credential details and login type will be decided later by NHA. Mobile apps developed in this assignment will also follow single-sign-on for both service recipients and NHA users.

8.5.3 Sub-Module 03: API Manager

An API (Application Programming Interface) Manager is a software or platform that helps manage and secure the use of APIs. It typically includes tools for creating and managing API endpoints, controlling access to APIs, monitoring usage and performance, and enforcing security policies

Secure API Manager

The process of designing, publishing, documenting and analyzing APIs in a secure environment. Through an API management solution, an organization can

- Guarantee that both the public and internal APIs they create are consumable and secure
- The API manager will have access control to APIs for internal and external systems:
- The API Manager should have API management dashboard.

So, need to develop an API Manager to ensure and establish secured channel of API communication. The mobile applications developed in this assignment must have secure API connection for login/authentication and on-app navigations. Integrations with other systems will also follow above regulations. The Software firm/company will take all necessary security measures for the API connections established in this system.

8.5.4 Sub-Module 04: Document Management

Document management refers to the process of organizing, storing, and tracking electronic or physical documents. It typically involves the use of software or systems to capture, store, manage, and distribute documents, as well as to track and control access to them.

Document store and management

User will upload documents; system will categorize, index and store those. System user will have provision to add, update and delete documents.

Document optimization

The system will have mechanism to automatically optimize raw documents special image or video files uploaded from different devices. Usually, the sizes of files are excessive than system really needs to process services. So, an automated and configured optimization mechanism is needed to optimize and make the system efficient.

Document processor and Management

The system will need to have generate special types of documents like certificates, approval letters, testimonials etc. The system should have option to store, share, circulate and use the document as reference to another system.

Document Template Management

The system will have templates to generate documents & maintain defined formats.

Document Verification Management

There will be an option to verify a document once delivered from the system.

Document Meta Data Management

There needs to have options to store meta data associated with the documents for better searching, sorting, indexing and archiving.

Document Upload and Download

There should be options to upload and download documents. There will be access control to document download options depending on the sensitivity and security of the documents.

8.5.5   Sub-Module 05: Notification Management

Notification management refers to the process of controlling the display and behavior of notifications on a device or application. This can include setting rules for when and how notifications are displayed, creating custom notification sounds, and grouping or prioritizing certain types of notifications. It can also include the ability to turn off notifications altogether or for specific apps, as well as the ability to clear or archive notifications that have already been received.

Notification Settings Management

There should have provision to create, configure and manage notification rules for different service delivery process.

Notification Medium

There are two mediums of notifications- SMS, e- Email, SMS: Sending SMS to service consumer and provider's mobile phone in real time is an important concern to process and deliver services efficiently. Email: Proper and timely notification is a vital concern at required point of

each service's life cycle. Email notification is very usual among 3 types of notifications like Email, SMS and System notification. There should have template with specific format for these notifications. The systems can access Queue manager and Enterprise Bus for these notifications.

Notification Types

System generated notification is another important concern and should be ensured along with Email/SMS notification in service life cycle Notification can be 3 types configurable, call to action, alert und medium can be via e-Mail, SMS and application systems.

8.6 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 and making the system interoperable, an e-Service application can drive the ultimate citizen benefits with the optimum use of technology from service to e-Service transformation. Here the Software Firm/Company 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 Software Firm/Company. The Firm/Service Provider will integrate the following External System but not limited to:

SL	External System	Integration Scope
1.	NID	Integration with NID server of Election Commission of Bangladesh/concerned authority. Necessary agreement is already signed between NHA & Election Commission for API. The firm having experience of NID integration will be given high preference. Maintain High security systems for NID integration. Concerned laws and regulations will be applied to the software company/firm for any incidence of breach from their part.
2.	Payment gateway	Payment Gateway integration with all kinds of cards, MFS, bank to bank transfer facilities for payment of installments, service fee. The Software Firm/Company must take approval on the Payment Gateway Service Provider. NHA will complete agreement with the Payment Gateway Service Provider. The firm having multiple e-service integration experience with Govt. payment gateway (EkPay) will be given high preference.
3.	D-Nothi / E-Nothi	Integration with D-Nothi / E-Nothi for official approval process and others applicable stages. The firm having multiple e-service integration experience with D-Nothi / E-

SL	External System	Integration Scope
		Nothi will be given preference.
4.	National Web Portal	Integration with National Web Portal (NWP) for instantly publishing the letters, notices and other related documents automatically in notice board and/or newsfeed of NWP. The firm/company having experience in National Web Portal (NWP) management will be given preference.

9. Functional Requirements

9.1 Security and Privacy Requirements

The authentication and authorization of the system need to be robust enough to ensure highest level of security. The system prevents all standard web vulnerabilities and provides industry standard security measurements. With a very strong Enterprise system's regular security audit and careful implementation of various measures least but not limited to the following must be taken to prevent any kind of security breach.

9.1.1 Application Security

a) The system should be completely secure and foolproof with incorporation of industry standard proven data encryption techniques and methodologies. Those encryption techniques should be audited in timely manner to detect loopholes and updated with the latest patches, in order to ensure that the mechanisms are fitted with the latest security features.

b) User sessions and cookies should be uniquely re-generated and stored securely each time they are logged in.

c) URL restriction should be tight. The system should recognize a logged-in user with proper rights and only present the part of the system that falls within his/her authorization scope. Furthermore, trying to access a URL by guessing should also be prohibited. URL encryption is extremely necessary for software systems.

d) The URLs for internal users should be relatively unique and separate from the well-known portal URLs. The communication between the user's device and interfaces should be SSL encrypted to prevent data hijacking through network protocols.

e) Configuration and other sensitive system-level artifacts should be securely stored.

f) The access control security function shall provide a facility for the system administrator to suspend an existing user's access rights for a specified period of time or indefinitely.

9.1.2 User Interface Security

a) Facilities can be provided to lock a user and unlock as and when required
b) No invalidated input should be accepted in any web forms – all incoming data should be validated, checked and purified before acting on that
c) In case of any system failure or error condition, no sensitive information (e.g. database credential) should be displayed on the site. All kinds of errors should be suppressed, logged, gracefully handled and should only be accessible by the administrators with proper rights
d) SQL/XML/Code injection, Session hijacking/fixation, Output Escaping, Cross-Site Request Forgery, Cross-Site Scripting, Enforced Same Origin Policy, Parameter Tampering, Directory Traversal, Denial of Service etc. should be prevented, logged, and reported.

9.1.3 Data Security

a) No personally identifiable information may be exposed within and outside the system without proper authorization as privacy of the user data must be dealt with utmost priority.
b) Any attempt to breach the security will be recorded with all the relevant data
c) If the system is accessed in the time not defined by the administrator, all options will be locked and the user will not be able to use the system.
d) Reports can be retrieved for all audit logs.
e) Source code should be provided by the system developers to the authority when it is necessary.

10. Non-Functional Requirements

10.1 Application Compliance Requirements

10.1.1 Web Application

a) The application which is a web based solution, has to be hosted in a centralized or clustered web-server
b) The application should be developed following Service Oriented Architecture (SOA)
c) The web-based application should support cross browser platforms (popular web-browsers such Mozilla Firefox, Opera, Chrome, Internet Explorer, Safari etc.)
d) Should have ability to seamless integration with future module / components / applications
e) Application should be lightweight and rich client-side scripting.
f) UI should be developed based on the analysis of UX.

g) Any web interface of this application should be fully responsive

h) User friendly and equity.

10.1.2 Mobile Application Requirements

a) The mobile application version of the system should be developed for both Android and iOS.

b) The mobile application should have capability of displaying system notifications

c) Functionality for registration options for service recipients

d) App should enable compact view of services for service recipients.

e) There should be an option to auto synchronization with the central database with apps local database on the availability of the Internet connectivity.

10.2 Sizing, Performance & Scalability, and Business Continuity and Interoperability

10.2.1 Sizing, Performance and Scalability Requirement

a) The system shall be capable of handling online functionalities for a database of at least 2,00,000 (approx.) service recipients and in terms of NHA, 8 (eight) Regional Offices. The number of service recipients will grow from time to time.

b) The system shall be designed to handle estimated 8,000/10,000 simultaneous connection (online users) when it is ultimately rolled out.

c) The Software Firm/Company must conduct an extensive load testing task taking above factors into consideration and submit a load testing result.

d) The database architecture should be such that the system is available to user 24 * 7 * 365 days a year without any unapproved down-time.

e) Application load time, login response-time, load time for the application should be less than 3 seconds while this is accessed over the internet.

f) 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 internet.

g) Consider the network infrastructure challenges in Bangladesh, the solution must support low bandwidth conditions for the services.

h) The overall proposed solution must be operable at very low bandwidth even in 2G network provided internet bandwidth.

i) The proposed solution should be highly scalable to accommodate current and future requirements within the scope mentioned in the TOR.

j) The overall proposed solution System should be provided with appropriate caching mechanism to handle very high-traffic scalability.

k) The Software Firm/Company may propose here other relevant measures for the overall proposed solution System scalability.

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

m) Analyze the requirements whether both horizontal scaling (scale-up) and vertical scaling (scale-up) will be required for this e-Service application or not?

10.2.2 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. The Software Firm/Company is requested to propose a Business Continuity Plan for this e-Service application. Regarding business continuity you may take into account the followings issues if applicable or suitable for this e-Service application

a) 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 or contemporary better storage solution.

b) 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.

c) 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

d) System must check for the media and generate a report on backup with date time and details of backup

e) 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

f) 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

g) 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

10.2.3 Interoperability and Data Exchange

The selected The Software Firm/Company must develop integrated e-Service Management System following all the standards and protocols of interoperability, 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:

a) The system should be designed for interoperability using industry standard protocols.

b) System must expose data by Advanced Message Queuing Protocol and REST via TLS.

c) All imported data must undergo data validation to ensure full integrity.

d) Data exchange within the system at different levels via the internet shall be encrypted.

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

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

g) Full API documentation must be provided so that third party integrators can integrate their system with this system.

10.3 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

a) Log the users who are accessing the system
b) Log the parts of the application that are being accessed
c) Log the fields that are being modified
d) Log the results of these modifications
e) Log attempted breaches of access
f) Log attempted breaches of modification rights
g) 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.

10.4 UI/UX

The Software Firm/Company 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 Software Firm/Company should consider the following issues as requirement at the time of UI/UX plan.

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

10.5 Language Support

The e-Service system should support multilingual option i.e. Bangla and English for both the Web version. All the user interfaces will be able to display and input controls can take input both in Bangla and English. System 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.

10.6 Accessibility

The Software Firm/Company 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
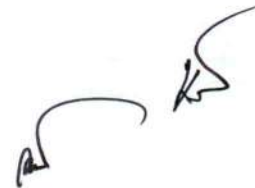
10.7 Coding Conventions

The Software Firm/Company 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 Software Firm/Company should submit a standard coding convention approach, which may include different conventions like commenting, indent style, naming etc. following the best coding practices.

10.8 Documentation & User Manuals

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. The Software Firm/Company will be responsible for providing a full technical documentation of the assignment with necessary visual diagrams and indicators. The technical documentation should be self-explanatory to solve any technical issues. The Software Firm/Company will provide all source code documentations with code comments. Separate source code documentation is encouraged in this assignment. The firm should include an extensive documentation plan of this project in their technical proposal, which may cover the followings

a) Documents titles phase or activity wise .
b) Purpose of document.
c) About the format of documents (if possible only index or fields)
d) Expert and skilled resourcewill be used for documentation.
e) Document priority and dependency.
f) Time requirement for preparation (If applicable)

User Manual: The Software Firm/Company will provide full user manual of the proposed systems after development. The user manuals must be prepared with pictorial representations of using the system for citizens, for NHA User & Bank User. Separate user manuals are required for all kinds of users in the system. All user manuals will be incorporated in the system according to user role. User manuals for citizens will be available on the landing page for use. Any update of the system, the system manual will also be updated. All user manuals are to be approved by NHA.

Video Manual/Tutorial: The Software Firm/Company will provide interactive videos as manuals for using the system. Multiple videos are required for performing different tasks in the system .A promotional video will be made by the Software Firm/Company for branding and promoting digital services of NHA. NHA will obtain the copyright and ownership of these videos. The videos will be approved by NHA and must be available in the system according to user's requirements.

10.9 Tools and Technologies to be used

The Software Firm/Company is recommended to choose the appropriate and modern tools and technologies (Open Source is preferable) to be used for the development and implementation. Ongoing Software Industry trends are to be followed along with integrating 4th Industrial Revolution Technologies (Big Data, Blockchain, VR/AR, AI, Machine Learning etc.). The Software Firm/Company has to consult with implementing organization (client) to finalize the tools, technologies, framework and platform with the approval of same authorities' consent. The Software Firm/Company having working experience with one/more above mentioned technologies will be given preference.

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

Understanding the details scope of this project, the Software Firm/Company is requested to submit a detail "Tools & Technology" plan in their technical proposal following the table format mentioned below

Issues/Phases/Purpose	Used Technology/ Tools	Justification for use
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		

10.10 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 Software Firm/Company is requested to provide an extensive Quality Assurance Plan with measurable attributes for each phase of this e-Services development life cycle in their technical proposal.

11. Expected Outputs/Deliverables

Considering the scope of works the consultant is requested to deliver as part of this service / assignment mentioned below, (deliverables proof will be fixup as per client's requirement):

Deliverable No.	Deliverables
D1.	Inception report with service/assignment management plan (including finalized methodology, detail work plan, Gantt Chart etc).
D2.	Need assessment report with requirement gathering documentations.
D3.	Detailed System Requirement Specification (SRS) in standard format consisting External Interface Requirements, System Features, Nonfunctional Requirements and Other Requirements (if any) based on assignment objectives, scope of works & proper documented customers' requirements for all the systems stated in this ToR.

Deliverable No.	Deliverables
D4.	Detail Proposal of Digital File Archiving & Indexing with time estimate and proper roadmap.
D5.	Detail System Design Documents (HLD and LLD as Software Design Descriptions [SDD] IEEE standards).
D6.	Development & Delivery of a web based solution for Module 1: Application for Plot/Flat with Lottery and Allotment& mobile app as per requirement stated in ToR and agreed on SRS. • Release of fully functional Beta version of the software (Tested by the Software Firm/Company) • Release of Final version
D7.	Development & Delivery of a web based solution for Module 2: Installment Collection System for Plot/Flat Allottee & mobile app as per requirement stated in ToR and agreed on SRS. • Release of fully functional Beta version of the software (Tested by the Software Firm/Company) • Release of Final version
D8.	Development & Delivery of an integrated web based system of Module 3: Digital Land Services and mobile app for this system as per requirement stated in ToR and agreed on SRS. • Release of fully functional Beta version of the software (Tested by the Software Firm/Company) • Release of Final version
D9.	Development & Delivery of Software for Module 4: Digital Document Archiving with Indexing with ability to provide user-defined indexes for easy search and retrieval of files.
D10.	Development & Delivery of Module 5: Common Services Configuration for the overall system.
D11.	Complete Data Collection, Data Scanning, Uploading & Data Entry work for Approx. 30,000 files into Digital File Archiving & Indexing system according to the approved method and data format. (Detail Requirement stated in Section 8.3). Integrate Uploaded files or complete API integration so that Online Application for Land Services system can access them for verification within the system. Submit report of archived documents.

Deliverable No.	Deliverables
D12.	Development & Delivery of Software for Module 5: Common Service Configuration: • Release of fully functional Beta version of the software (Tested by the Software Firm/Company) • Release of Final version
D13.	Test plan with its testing acceptance (consultant, user and third-party organization nominated by client like Bangladesh Computer Council or others) report based on the detailed required documents. Fix any issues or bugs in this section.
D14.	Complete System Installation & Deployment on Live Server.
D15.	Capacity Enhancement and Knowledge transfer through meeting/ workshop/ with manual (Text and/or Video) as per requirement stated in section 7.10.
D16.	Final version of the software & system along with the properly documented source code, database & other required credentials, user manual (text and/or video).
D17.	Data migration with its full report.
D18.	System security, support & maintenance SLA with reports in-person from the date of the final installation. Support & Maintenance will cover fixing all bugs and system errors as and when identified by the system users.
D19.	Training and Technology Transfer with Source code and training manual
D20.	Service/Assignment completion report with upcoming challenges

12. Project Management

12.1 Project Development Timeline

The total duration of the assignment is 72 months (06 years). Software development, Digital File Archiving, Testing, Implementation, Deployment and training will have to be completed in 12 (Twelve) months (01 year). Maintenance & Support period will be 60 (Sixty) months (05 years) after the final handover of the system and being accepted by the National Housing Authority (NHA). The Software Firm/Company will have to complete Digital File Archiving & Indexing

work within 01 year development time and they can perform this task by taking one project after another.

12.2 Project Implementation Timeline/Schedule

The Software Firm/Company will submit project implementation timeline/schedule in below format to NHA.

SL	Activity	Duration	Total Weeks
Development Phase (12 Months)			
1	Inception Report		
2	System Requirement Specification		
3	System Design		
4	Software Development, Beta Version Release, Testing& Final version of Software Release		
5	UAT and Training		
6	OAT and Commissioning		

12.3 Key Personnel Requirements

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

SL	Position	No of Personnel	Minimum Qualification
1.	Project Manager	1	• B.Sc. and M.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 10 (Ten) Years of experience in the field of Project Management. • Minimum 07 (Seven) IT/ITES software project management (Design, development and implementation) experience in Govt. Sector. • PMP/Prince2 certification will be given preference.
2.	Team Leader	1	• B.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 7 (Seven) Years of experience in the field of Project Management. • Minimum 05 (Five) IT/ITES software project management (Design, development and implementation) experience in Govt. Sector • PMP/Prince2 certification will be given preference.

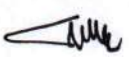| SL	Position	No of Personnel	Minimum Qualification
3.	System Analyst/ System Administrator	2	• B.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 07 (Seven) years of experience in the field of system analysis and designing. • At least 04 (Four) enterprise / e-Government IT/ITES software project solution experience in the field of system analysis and design. • Experience on Govt. e-service integration with NID, DNothi/ENothi , MyGov, and Ekpay platform will be given high preference.
4.	Domain Expert/ Business Analyst	1	• B.Sc. and M.Sc. in any subject. • Minimum 08 (Eight) years of land related working experience in Govt. Sector. • Publication of books or research work on land related matters will be given preference.
5.	Database Administrator (DBA)	2	• B.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 3 (Three) years of profound experience in the field of database design, data normalization, data analysis, database management and administration for IT/ICT Software project. • Hands on experience in SQL and PHP database frameworks. • Must have DBA certification of oracle or equivalent.
6.	Security Expert	1	• B.Sc. in CS/CE/CSE/IT or equivalent. • Must have security qualification certificate(ISSP/CEH/ISO/CISA/CISM). • Minimum 05 (Five) years of experience in security of web-based application from medium to large scale system.
7.	Sr. Developer / Sr. Programmer	2	• B.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 06 (Six) years of profound experience in the field of web-based software development. • Minimum 05 (Five) IT/ITES software project experience in the field of programming/scripting as a core development team.
8.	SQA / QC Expert	2	• B.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 05 (Five) years of experience in the field of software quality assurance and testing.

SL	Position	No of Personnel	Minimum Qualification
			• Minimum 03 (Three) IT / ITES software project experience in the field of software quality assurance and testing. • Experience on at least one Govt. e-services testing from SQTC Center under BCC will be given high preference.
9.	Interoperability Expert	1	• B.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 05 (Five) years of experience in the field of integration software function and establish interoperability.
10.	Developer / Programmer	12	• B.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 04 (Four) years of profound experience in the field of web-based software development. • Minimum 03 (Three) IT/ITES software project experience in the field of programming/scripting as a core development team.
11.	Senior Mobile App. Developer (Cross-Platform)	2	• B.Sc. in CS/CE/CSE/IT or equivalent. • Must have minimum 05 (Five) years of profound experience in the field of cross-platform mobile app design and development.
12.	Mobile App. Developer (Cross-Platform)	4	• B.Sc. in CS/CE/CSE/IT or equivalent. • Must have minimum 03 (Three) years of profound experience in the field of cross-platform mobile app design and development.
13.	Senior UI / UX Designer	1	• Bachelor degree in any discipline. • Minimum 05 (Five) years' experience in the field of UI/UX designing. • Minimum 03 (Three) IT/ITES software project experience in the field of interface design. • Experience in working with Adobe Creative Studio, Figma etc. will get preference.
14.	UI / UX Designer	3	• Bachelor degree in any discipline. • Minimum 03 (Three) years' experience in the field of UI/UX designing. • Minimum 02 (Two) IT/ITES software project experience in the field of interface design. • Experience in working with Adobe Creative

SL	Position	No of Personnel	Minimum Qualification
			Studio, Figma etc. will get preference.
15.	Technical Document Expert	1	• B.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 03 (Three) years of profound experience in the field of technical documentation. • Minimum 03 (Three) IT/ITES software project experience in technical documentation.
16.	Network Engineer	1	• B.Sc. in CS/CE/CSE/IT or equivalent. • Must have at least CCNA certification. • Minimum 3 (Three) years of experience in network management of large scale web-based applications i.e. server side and client side network management of web and mobile applications.
17.	Support Engineer	2	• Bachelor degree in any discipline. • Minimum 3 (Three) years of experience in IT-related fields, with clear understanding about web-based applications development and hands-on-experience in solving end-user problems.
18.	Data Entry Control Supervisor	1	• Minimum graduate in any disciplines. • Minimum 4 (Four) years' experience in the field of data entry.
Total:		**40**	

The minimum required qualification and experience of the Key professional staff for maintenance and support services are as follows:

Maintenance & Support Service Personnel Requirement			
SL	Position	No of Personnel	Minimum Qualification
1.	Software Maintenance & Support Engineer	2	• B.Sc in CS/CE/CSE/IT or equivalent. • Minimum 03 (Three) Years of experience in the field of Software Maintenance/Support Service.

2.	Software Engineer/Developer (on Demand)	2	• B.Sc in CS/CE/CSE/IT or equivalent. • Minimum 03 (Three) Years of experience as Software Engineer/Developer. •
3.	Mobile App. Developer Developer (on Demand)	1	• B.Sc in CS/CE/CSE/IT or equivalent. • Minimum 03 (Three) Years of experience as Mobile App Developer (Cross-Platform)
4.	DevOps/ Operation Engineer	1	• B.Sc. in CS/CE/CSE/IT or equivalent. • Minimum 03 (Three) Years of experience as Software/Operation Engineer. • Experience in Server Side Operation/Network Management will be given high preference.
5.	Help Desk/Call Center Support Assistant	3	• B.Sc. in any discipline or equivalent. • Minimum 03 (Three) years of experience in IT/ICT/ITES helpdesk support of large scale web based and mobile application.
Total		**07**	

13. Eligibility Criteria of the Firm/Company

The Firm/Company must prove that they have solid technical background and operational strength to undertake the type of assignments mentioned in the ToR and take this work forward without any hindrances. Firm must also have adequate technical ability, resources and processes. As such, following are defined as minimum eligibility criteria:

1. The Firm/Company must have a minimum of 10 (Ten) years' experience in Software development/IT/ITES business in Bangladesh.
2. Must have valid and up-to-date Trade license, VAT (BIN) Registration Certificate, TIN certificate and Certificate of Incorporation, latest bank solvency certificate.
3. Must be registered with RJSC (applicable for joint stock company or firm).
4. Must have ISO 9001 & ISO 27001 certificate.
5. Must have experience of completing at least 02 (Two) large scale/ nationwide software development, implementation and maintenance service with the Government/ Semi-Government/ Autonomous

Organization of Bangladesh either combined or separately, where designing, developing and implementing Web based Application/ Mobile Application/ Desktop based Application is included. Must submit the work completion certificate in this regard.

6. Experience of at least 01(one) large scale/ nationwide software development service having value minimum of BDT 300.00 Lac successfully carried out within last 5 years counted back from the date of publication of REOI either combined or separately. Must submit the work completion certificate in this regard.

7. The Firm/Company must have experience of successfully completing at least 01 (One) project where digital document archiving and indexing related work is included.

8. The Firm/Company must have an average annual turnover of TK 500.00 Lac or above for best 03(three) years in the last 05 (Five) financial years. Must Submit last 3 (three) years financial audit report showing annual turnover.

9. Firm/Company must have update BASIS membership.

10. Must submit the management and logistic capacity of the firm/company (Website link/brochures and other documents describing company's expertise, strength and experience, core functions, products and services, similar assignments or project experience, availability of relevant professional staff and experience among applicant's staff/resources, well-equipped office space with necessary facilities) to carry out this assignment.

11. The firm having e-service integration experience with NID, traditional payment gateways, National Web Portal (NWP), e-nothi/D-nothi, MyGov, Ekpay will be given high preference.

12. The firm must have multiple Govt. e-services testing experience and successful testing certification from STQC Center under BCC. Must submit certificates in this regard.

13. The firm/company must have a minimum of 40 persons IT/ITES related people. Detailed name, designation and job description need to be submitted.

14. The total duration of the contract is 01 (One) year development and 05 (Five) years support and maintenance period.

14. Copyright & Ownership

National Housing Authority (NHA) shall be entitled to all proprietary rights including but not limited to patents, copyrights and trademarks.

NHA will hold the copyright claim and be the owner of 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 Software Firm/Company under this scope of this TOR.

At the request of the NHA, the Software Firm/Company 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 NHA 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 NHA.

The Software Firm/Company should properly deliver all the entire approved source codes with proper documentation and code comments and other deliverables to the NHA. The Software Firm/Company 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 NHA and the Government of Bangladesh may see fit.
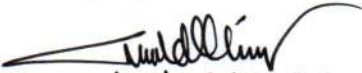
Any studies, documents, reports, graphics or other material prepared by the Software Firm/Company for this project under this TOR shall belong to and remain the property of NHA.

15. Jvca or Sub-Consultant Engagement

JVCA or sub-consultant can be engaged as per PPR, 2008.

16. Conclusion

National Housing Authority (NHA) expect that the Software Firm/Company will complete this project in time and help to serve the citizen's services and the ultimate expectation is to automate business functions for Plot/Flat related service facilitating improved services to its clients through online. A web based system with citizen's services has to be designed, developed and implemented for this purpose. The Software Firm/Company has to ensure that all technical difficulties should address in professional and effective manner. NHA is trying to ensure faster, systematic and much higher consumer service delivery by introducing a faster, robust, secure, tamper-proof and efficient online services.

14/03/2024

(Golam Mezbah Uddin)

Assistant Programmer &

Member (EoI, ToR & Estimate Committee)

National Housing Authority

Segunbagicha, Dhaka

14.03.24

(SOHEL MIA)

Programmer &

Member Secretary

(EoI, ToR & Estimate Committee)

National Housing Authority
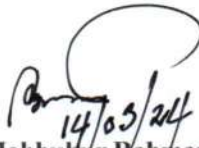
Segunbagicha, Dhaka.

14.3.24

(Md Mushfiqul Islam)

Deputy Director (Admin & Training) & Member

(EoI, ToR & Estimate Committee)

National Housing Authority

Segunbagicha, Dhaka.

14/03/24

(Md. Mahbubur Rahman)

Deputy Secretary (Budget Branch-4)

Ministry of Housing & Public Works & Member

(EoI, ToR & Estimate Committee)

National Housing Authority

Segunbagicha, Dhaka.

14.03.24

(Ahsan Habib)

Director (Land & Asset Management)

& Chairperson

(EoI, ToR & Estimate Committee)

National Housing Authority

Segunbagicha, Dhaka.