TERMS OF REFERENCE (ToR)
for

Hiring Consultancy Services for Development & Operations Services of Krishak Digital Financial Module (KDFM) (with KSC Apps for Android & iOS)

(Package No: SD/PARTNER-DAE/16**)**

Program on Agricultural and Rural Transformation for Nutrition, Entrepreneurship and Resilience in Bangladesh (PARTNER)
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Contents

1 Background

Agriculture sector as a whole has been playing an important role in the overall economic development of Bangladesh. Despite the significant growth in the service and manufacturing sector, the agriculture sector continues its importance in accelerating the growth of food production and is now a major source of rural employment.

This sector provides employment for around 50% of the total labor force and seems to have managed to feed around 180 million people of the country. During the last decade significant changes took place in the agriculture sector which includes, among others, new production structure, use of high yielding varieties supported by fertilizers, pesticides, mechanized cultivation, irrigation etc. All of these changes have contributed much to the increased production of food grains. The utmost development of the agriculture sector is very much urgent for poverty reduction, food security and sustainable development of our country. It is needless to say that, the farmers of Bangladesh are playing the most vital role by feeding the nation, yet they're not getting the privileged services and mostly deprived of various fast track services that they are worthy of.

To improve this situation, the Program on Agricultural and Rural Transformation for Nutrition, Entrepreneurship and Resilience in Bangladesh (PARTNER) project intends to develop a comprehensive Krishak Digital Financial Management (KDFM) system to streamline public financing in agricultural improvement including subsidies, grants, loans, incentives etc. to the farmers, dealers, agents and related personnel, monitoring, outcome/ impact evaluation and management of such services and introduction of a virtual digital smart card/ wallet (e-Krishak Smart Card/ wallet/ Wallet) to every farmer of the country to improve farmers' access to inputs, extensions and financial services.

The e-smart card/ wallet will bear the necessary information of a farmer containing digital credentials of the respective farmer after appropriate e-KYC and would be linked to all relevant digital services and available financial institutions. Using this card/ wallet, the farmer will get privileged services from different government channels that provide various agriculture related financial and commercial services (Farmer's Registration, Financial Transaction, Subsidy, e-Voucher, Loan/ Grant/ Incentive Management, Dealer/ Merchant/ Agent Management, Distribution/ Adjustment Management, Dispute/ Grievance Management etc.).

2 Proposed Krishak Digital Financial Management (KDFM)

2.1 Objectives

The prime objective of this assignment is to develop a comprehensive platform where every Farmer's digital profiling system, an e-wallet and a comprehensive Krishak Digital Financial Management (KDFM) System and, Krishak Smart Card (KSC) Mobile App (Android & IOS) with Management System. Details are mentioned below:

KDFM:

1. Develop Krishak Digital Financial Management System (KDFM) to provide farmers subsidy, incentive, loan, grant etc. according to specific requirement and standards.
2. Develop system administration, farmers and merchant profiling, financial distribution, impact evaluation and monitoring system to manage and review all sorts of relevant activities by the stakeholders.
3. All modules of the proposed system will be digitized in a uniform standard and incorporated in a centralized platform preferably in a micro-service architecture.

4. Integrate and manage profiling of Farmers' individual/family and Dealers/ Distributors/ Merchants Database with required e-KYC.
5. Integration and management of e-Voucher System and Services.
6. Develop and Implement mobile based farmers' live detection (preferably via biometric verification e.g. speech, face or any suitable means) for each time e-voucher redemption/ incentive/ loan/ grant collection from merchants/ dealers.
7. Mobile App based POS Terminal/ Soft POS for Agents/ Merchants/ Dealers for collecting payment and farmer's e-voucher redemption, with other services.
8. Provide openness for future loan/ grant collection from government through banking/ MFS/ wallets/ schemes or similar channels as well as means for loan repayments or adjustments.
9. Development and Implementation of e-Extension Services.
10. Integration with Banking/ MFS/ wallets/ schemes Services,
11. Integration with iBAS++ and Bangladesh Bank for establishing channel with government funds (GoB/ RPA/DPA).
12. Integration with mobile connectivity providers for device and SIM authentication/ integration with e-KYC.
13. Development and implementation of Dispute, Reconciliation and Settlement System.
14. Development and implementation of Grievance recording, processing and resolution System.
15. This Krishak Digital Financial Management (KDFM) system will provide full single sign on facility. i.e. the system will have provisions to provide access to every module to authorized users through a single one stop virtual access point in different platforms like Mobile apps or web.
16. All concerned officers will get access into the same platform and will use the customized application as per their authorization and authentication.
17. There will be a search engines to assist in getting quick service across multiple apps/ web addresses while using Krishak Digital Financial Management (KDFM).
18. The technologies and UI will be similar, consistent and maintaining same standard for all the applications and modules under the scope of the same integrated Krishak Digital Financial Management (KDFM) system.
19. Operational and technical management, administration and maintenance will be managed centrally, which will be easy (with minimum complexity), user friendly and having very natural flow.
20. The objective of saving multiplicative effort and cost need to be in view while digitizing modules for Krishak Digital Financial Management (KDFM).
21. Any integration with the external and internal systems needs to be simple and a one-go endeavor to be time and effort saving.
22. Send SMS, In-App Notifications and Email notifications or various events, alerts and user related services.

KSC:

1. Develop a Krishak Databank Management System to provide farmers digital identity according to specific requirement and standards.
2. Requirement Analysis, Design, Development and Implementation of Krishak Smart Card Mobile App both n Android and IOS Platform.
3. Develop Krishak Smart Card (KSC) Management and monitoring System to manage all sorts of activities of Krishak Smart Card (KSC)
4. Development of CAPI (Computer Assisted Personnel Information) System in Android and IOS App that will run on Mobile Device as well as an in TAB devices. Develop

Card Delivery Monitoring Solution to track card status instantly. Record and Archive Delivery information following government procedures, standards and security manner.

5. All modules of the proposed system will be digitized in a uniformed standard and incorporated in a centralized platform.
6. The internal officer will access every module through a single one stop virtual access point in different platforms like Mobile apps or web. There will be no hassle to search different addresses and multiple apps for Krishak Smart Card (KSC).
7. All concerned officers will get access into the same platform and will use the customized application as per their authorization and authentication.
8. This KSC system will provide full single sign on facility.
9. The technologies and UI will be similar, consistent and maintain same standard for all the applications and modules under the scope the same integrated KSC system.
10. Operational & technical management and maintenance will be managed centrally, which will be easier, less complex.
11. Huge effort & cost will be saved while digitizing modules for Krishak Smart Card (KSC).
12. Integration with the external and internal systems will be conducted only once which is easier and will save time and effort as well. The integration will be API driven only and must support both dedicated VPN and/or over the internet.
13. Send SMS, In-App Notifications and Email notifications or various events, alerts and user related services.

3 Scope of Work

3.1 Functions and Features

The entire scope of applications is divided into 3 components as follows:

Component 1: Requirement Analysis, Design, Development, Implementation and Maintenance of Krishak Digital Financial Management (KDFM) including e-Voucher and e-Krishak Smart Card (e-KSC) aggregation. Provide Bulk SMS and In-App Notifications Service.

Component 2: This component has two (2) parts one as CAPI (Computer Assisted Personnel Information) and KSC Mobile App both in Android & IOS. The activities included Requirement Analysis, Design, Development, Implementation and Maintenance of CAPI and KSC Mobile & Web Application. Provide Bulk SMS and In-App Notifications Service.

Component 3: 12 Months 16/7 Call Center/ Help Desk and 12 Month Cloud (DC-DR) Rental and Management Service for Krishak Digital Financial Management (KDFM) Applications and Databases at National Data Center (NDC) of Bangladesh Government.

The following are the key features of this System:

Component 1: Krishak Digital Financial Management (KDFM)

a. Farmer e-KSC Registration with e-KYC:

i. **Biometric Verification:** At the time of registration farmer biometric data will be validated with the biometric data stored in the Election Commission through the App. The farmer can do a self-registration through the e-KSC App, or the registration can be done through 3rd party/ field workers through the Mobile App.

b. e- KSC wallet Management Module

i. e-KSC wallet Generation and Fund Transmission Service
ii. e-KSC wallet Auditing and Reconciliation Service
iii. e-KSC wallet Monitoring and Administration Service

iv. e-KSC wallet Dispute/ Grievance Management Service

c. Subsidy/Loan/ Grant/ Incentive/ Scheme Management

i. Subsidy/ Loan/ Grant/ Incentive/ Scheme initiation and criteria management Service
ii. Subsidy/ Loan/ Grant/ Incentive/ Scheme registration and approval Service
iii. Related Administration and Control Service
iv. Related Fund Transmission Service
v. Related fund Auditing and Reconciliation Service
vi. Related Monitoring and Reviewing Service
vii. Related Reporting, Dashboarding and Support Management Service

d. Dealer/ Distributor/ Merchant Management System

i. Dealer/ Distributor/ Merchant Registration and e-KYC Service
ii. Dealer/ Distributor/ Merchant Administration and Control Service
iii. Dealer/ Distributor/ Merchant wallet Generation, Receive Payment (with provision of mPOS) and Fund Transmission Service
iv. Dealer/ Distributor/ Merchant fund Auditing and Reconciliation Service
v. Dealer/ Distributor/ Merchant Monitoring and Reviewing Service
vi. Dealer/ Distributor/ Merchant Reporting, Dashboarding and Support Management Service

e. Data Analytics/ Business Intelligence Reporting

i. Custom Analytics as per SRS
ii. Dynamic Reporting (beyond SRS)

f. Awareness / Training/ Event Management

i. Awareness / Training/ Event initiation and criteria management Service
ii. Participant and actor registration and approval Service
iii. Related Operation, Administration and Control Service
iv. Related Monitoring and Reviewing Service
v. Related Reporting, Dashboarding and Support Management Service

i. Call Center/ Help Desk Management

i. Call registration and escalation management Service
ii. Related mode of operation (audio-video inbound call/ chat/ in app notification/ SMS/ email), Chatbot, Administration and Control Service
iii. Related Monitoring and Reviewing/ Quality Assurance (QA) Service
iv. Related Reporting, Dashboarding and Support Management Service

j. Web/ App Content/ Notification Management

i. Content/ notification generation and criteria management Service
ii. Related mode of operation (audio-video outbound call/ chat/ blog/ content (text, image, audio, video, multi-media)/ in app notification/ SMS/ email), Chatbot, Administration and Control Service
iii. Related Monitoring and Reviewing/ Quality Assurance (QA) Service
iv. Related Reporting, Dashboarding and Support Management Service

k. Notifications and Alert Services

i. Notifications Setup - Configure the core notification framework, define system parameters and user preferences, and document setup for scalability.
ii. Notifications Category / Sub-Category / Type - Establish a structured taxonomy of notifications, defining categories, sub-categories, and types with consistent metadata standards.
iii. Notifications Schedule - Develop scheduling options for real-time, batch, and recurring notifications, aligned with performance needs and user preferences.

iv. Integrate with Notifications Gateway Services - Integrate with SMS, email, and push gateways, ensuring secure protocols, compliance, and validated end-to-end delivery.
v. Send Notifications (SMS / In-App / Email) - Enable multi-channel delivery with proper formatting, monitoring, and analytics to ensure effective communication and user engagement.
vi. Various Reports on Notifications - Develop and deliver periodic reports on notification activities, including setup status, category distribution, scheduling efficiency, gateway integration performance, and delivery outcomes across SMS, in-app, and email channels, ensuring clarity, accuracy, and actionable insights for administrators and stakeholders.

l. Central Security and Administration

vii. Administrative user sign-up and access control Service
viii. Access Monitoring and Auditing Service
ix. Master Data Management (location, office, scheme, FIs, criteria, menu etc.)
x. Related Reporting, Dashboarding and Support Management Service

m. External System/ API Management

i. Integration with Bank/ Financial Institutes (FI), MFS, Wallets
ii. Integration with iBAS++
iii. Integration with NID and e-TIN Database for Registration, e-KYC etc. features,
iv. Integration with related government systems (DAM Market and Commodity Price Database, Ministry of Land for farmer land records and verification, digital signature/ certificate systems, BBS GISP System, Land, Training Scheduling etc.)
v. Integration with crop, input or agriculture related systems e.g. QIS, AIS, Khamari, Krishi Batayon, Crop Production Data, FRG, etc. for crop/ input/ good agriculture practice (GAP) selection, traceability, linkages and certifications.
vi. Integration with any other 3rd party system(s)
vii. Integrate with SMS/Notification Gateway Service to send SMS, In-App and Email notifications for various events and alert services.

Component 2 (A): CAPI Mobile and Web Apps

The CAPI Application will be used by enumerator, supervisor and administrator to collect Farmer Household Data using Door to Door visit and enter the data for farmer e-KYC and Profile Database. The CAPI Mobile Apps will be developed to operate from both Mobile Devices and TAB devices, and which will be available both in Android and IOS Platform. It will also be developed as a Web based Application to Manage Data Collect through the Mobile App.

Following are the key features of this module:

- **Farmer Household Data Collection using CAPI**
  - A CAPI (Computer Assisted Personnel Information) Mobile Apps will be developed to collect the data on farmer household. The data collection will be done using the Enumerator as an user of the App.
  - This Application will be available both in Android and IOS platform.
  - This Application interface will be compatible for both Mobile and TAB based devices.
  - The application will be compatible for integrating security features like keeping data protected and separate. It did so by adopting proprietary means to run and

store security-sensitive apps and data inside a protected execution environment on the devices. The application must also support the standard BYOD protocol, and its security features must ensure the compatibility and requirements for BYOD to operate the Application.

- End to End Encryption for App
- **e-KYC for Farmer**
  - **e-KYC for Farmer** (Large, Medium, Small, Marginal & Landless | Tenant, Rental, Lease Holder)
    - Farmer Registration
    - NID Verification (Mandatory)
    - Mobile Number Verification using OTP (Mandatory)
    - Email ID Verification (Optional)
    - Other Farming Data Collection
  - **e-KYC for Enumerator (end user)**
    - enumerator Registration by Admin user.
    - NID Verification
    - Mobile Number Verification using OTP (Mandatory)
    - Email ID Verification (Mandatory)
    - BYOD Verification (Mandatory)
  - **e-KYC for Other Stakeholder (Supply & Value Chain Actors)**
    - Registration
    - NID Verification
    - Mobile Number Verification using OTP.
    - Email ID Verification (Optional)
    - Other Data Collection
  - **e-KYC for Management & Administrative Personnel**
    - User Registration by Super Admin
    - NID Verification
    - Mobile Number Verification using OTP
    - Email ID Verification (Mandatory)
    - BYOD Verification (for mobile devices)

- **Editing/updating Farmer's Data**
  - SAAO will edit/update the data using the Mobile Apps or similar functionality Web Application using their official Computer.
- **Farmer's Data Validation**
  - AEO, AAO, USO will validate the data using Web Application in Computer.
- **Farmer's Data Approval**
  - UAO will approve the data using Web Application in Computer
- **Farmer's Data Monitoring/Supervision and Data Display Dashboard**
  - District, Region, DAE-HQ, MoA Web based dashboard facility will be available to monitor the progress and time to time intervention with the field operation

Component 2 (B): Krishak Smart Card (KSC) Mobile App (Android & IOS)

The following are the key Modules and features:

KSC	Farmer self e-KYC and Registration
	Farmer Household Data
	Krishi Smart Card Management
	Farmer Self-service Mobile Apps (e-Voucher, Input Subsidy and e-Extension)
	Claim Management
	Awareness Program Management
	Call Center Management
	Digital Content Management
	Baseline Data
	Training, Video and Certification
	Video Broadcasting
	Notification and Alert Services
	System Configuration

1. **Farmer Household Data Profile**
   - **a. Farmer self e-KYC and Registration**
     - **i** Farmer Registration
     - **ii** NID Verification (Mandatory)
     - **iii** Mobile Number Verification (Mandatory)
     - **iv** Email ID Verification (Optional)
     - **v** Other Farming Data Collection
   - **b. Farmer Information Management**
     - **vi** Farmer Information
     - **vii** Farmer Information Verification
     - **viii** Farmer Information Register
     - **ix** Farmer Digital Profile
     - **x** Krishi Smart Card Print Request
2. **Krishi Smart Card Management**
   - a. **Smart Card Generation Management**
     - **i** Smart Card Print Request Receive
     - **ii** Smart Card Print Request Approval
     - **iii** Smart Card Print
     - **iv** Smart Card Data Correction
   - b. **Smart Card Service Management**
     - **i** Card Activation
     - **ii** Card Deactivation
     - **iii** Card Renewal
     - **iv** Card Re-printing
   - **c. Smart Card Distribution Management**
     - **i** Smart Card Distribution
     - **ii** Smart Card Delivery
3. **Farmer Self-Service Mobile Apps**
   - a. Self eKYC and Registration

b. Virtual Card Management by Farmers
c. Farmer Self profile management
d. Subsidy Information
e. e-Extension Service
f. Loan Management
g. Insurance Management
h. Training, Video and Certification
i. Video Broadcasting
j. Notification and Alert Services
k. End to End Encryption for App
l. Financial Management
ii. Account Creation Request
iii. Balance Inquiry
v. Make Payment
vi. Pay Bill Request
vii. Mobile Recharge
viii. Transaction History

4. Claim Management
a. Claim types: [smart card, subsidy, grant, incentive, dealer, stock]
b. New Claim entry
c. Claim register
d. Claim action register
e. Claim result entry
f. Claim settlement

5. Awareness Program Management
a. Training & Event Management
i Seminar/Workshop
ii Trainer
iii Venue
iv Participants

6. Call Center Management
a. **Operations Management**
i Agent Performance Tracking
ii Shift Scheduling
b. **Farmer Interaction**
i Inbound Calls
ii Chat & Email Support
c. **Quality Assurance**
i Call Monitoring
ii Call Recording

7. Help Desk Management System
8. Digital Content Management
a. News Management
b. Notice Management
c. Video Content Management
d. Blog and Article Management

9. Notifications and Alert Services
a. Integrate with Notifications & Alert Services Module in KDFM.

b. Receive Push Notifications
c. Notifications List and view
d. Send Notification on Service Request to Support Center.

10. System Configuration

a. Office Management
b. Officer Management
c. Crop Management
d. Feature Management
e. Access Management
f. Master Data Management

4 Working Phases

The vendor will be required to complete the development and deployment of a Krishak Digital Financial Management (KDFM) as an application following the standard agile SDLC methodology and perform the relevant activities accordingly within a proposed stipulated time. This Krishak Digital Financial Management (KDFM) system's implementation project can be divided into 5 major phases, for effective, communicative and timely development of this system and achieving early release as a tangible result, which are described hereunder.

4.1 Phase-I: Requirement Analysis, User friendliness analysis, UI wire-framing and High Level Design

This is the starting phase, in this phase inception, project planning, requirement fixation and high-level design (HLD) will be completed for the entire project. The entire functional scope will be finalized in this "System Requirement Analysis & Design" phase. The system may contain several sub-modules and features based on the implementation priority, dependency, and integration complexity. The entire system must be designed and developed following micro-service architecture so that inter-dependencies and integration functions among the sub modules and features of different modules will be smooth and highly organized.

4.1.1 Project Inception:

The SDLC process will be initiated with a kick-off meeting between vendor, implementing agency and relevant stakeholders. At this phase, the entire project scope mentioned in TOR will be briefed and discussed extensively, the part boundaries will be defined, preliminary project implementation timeline, project management plan format and content structure will be discussed. To devise the comprehensive work plan, the vendor is analyze relevant activities extensively across all subsequent phases to be performed, required timeline, specific deliverables to be produced, determine dependencies with critical paths to consider and resources to be used.

At the end of this phase, vendor will submit a comprehensive and detailed project management plan and inception report for client's approval with a PowerPoint presentation followed by submission of hardcopy documents.

This may be noted that, only on receipt of approval of the project management on the phase wise deliverables, any phase will move to the **Next Phase**.

Deliverables:

(1) Approved Project Management Plan and

(2) Approved Inception Report.

4.1.2 System Requirement Analysis:

In this phase, the vendor will make requirement finalization for the entire project scope from functional aspect.

Proposed Krishak Digital Financial Management (KDFM) requirement study, analysis and finalization is a very important phase in the entire SDLC. It is expected that, the selected vendor will carry out detailed requirement study and analysis on every scope of Krishak Digital Financial Management (KDFM) that is mentioned in the TOR. Under this scope of work, the selected vendor has to analyze the detailed functions, processes, documents, reports, channels, actors, service delivery sites and infrastructure of the relevant services precisely covering concerned stakeholders. At this phase, vendor's ultimate objective will be finalization of the Krishak Digital Financial Management (KDFM) requirements in details under the scope of TOR and receiving approval of the concerned organizational authority.

Deliverables:

(3) Approved Software Requirement Specification (SRS) with business activity diagrams, use cases, entity list and data flow diagrams,

4.1.3 User friendliness plan:

In both of the platform of web and mobile applications, the service recipient who are not even tech literate should be able to find an easy, simple, fast and interactive way to make them easily oriented for the digital service they would like to receive from application. Both the platform (Web and mobile) with few clicks should have easy content read & multimedia/ animated/video which is easy to view and understand receiving process, guideline and examples. The content can be focused on service receiving eligibility, requirements and systematic service receiving process for each and every service. The vendor should plan properly during content designing and development so that it will be easier for non-technical & non-tech savvy users.

Deliverables:

(4) Approved User friendliness plan and methods

4.1.4 UI/ UX design prototype/ mock screen/ wireframing.

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

1. The system interfaces should be highly user friendly, easy to navigate and ensure fast loading.
2. The UI shall be designed by using well-established, supported and lightweight UI framework so that it follows widely used industry flow patterns.
3. UI shall be easily configurable if any changes are needed.
4. Menu, content and navigation shall be based on the user entitlements, roles and permissions.
5. Vendor is requested to propose sample UIs for each platform i.e. mobile, web considering important features. The UIs should be designed professionally maintaining quality standard.

Deliverables:

(5) Approved user interface (UI)/ user experience (UX) Plan and methodology (6) Approved UI prototypes/ Mock screens/ wireframes.

4.1.5 High-level System Design (HLD):

The scope of the high-level design phase will be based on the entire project's approved SRS. However, the HLD document can be updated from time to time, if required, based on the changes of SRS i.e. version changed of SRS on received change requests (CR).

The architecture diagram will provide an overview of an entire system, identifying the main components that would be developed for the Krishak Digital Financial Management (KDFM) and their interfaces.

The HLD is to add the necessary details to the current project description to represent a standard model for coding. This document includes a high-level architecture diagram depicting the structure of the system, such as the entity relationship diagrams (ERD) and database architecture, application architecture/ layers, application flow (UML, architecture diagrams, or flowcharts etc.), security architecture, technology stack (frameworks, languages, and tools) and integration blueprint (APIs, events, data pipelines)..

Deliverables:

(7) Approved High Level Design (HLD) Document.

(8) Approved Security Architecture

4.2 Phase-II: Development, Security Enhancement and Release:

The Krishak Digital Financial Management (KDFM) modules and features will be developed with enhanced security and released in predefined steps passing: Low Level Design (LLD), Development, Integration and Testing. After successful completion of this development as per predefined standard and result, the development will be tested and released as Alpha and Beta version.

4.2.1 Low-Level System Design:

Low-level design (LLD) is a component-level design process in which the actual software components, modules and functional requirements are designed. This process can be used for designing data structures, required software architecture, source code and necessary performance algorithms. Vendor will have to submit a report on LLD based on which development can be started.

Deliverables:

(9) Approved Low-Level Design (LLD) Document.

4.2.2 Development:

At the development stage based on the LLD, a development team will be mobilized who will start the coding process following the standard code convention, code level documentations, header of each file, algorithms, interfaces, code compression and APIs should be supplied with proper description within the given schedule as per the plan. The team will strictly follow the standard procedure of version control of codebase, database and related files using stable online version control tools and preferably the test driven development (TDD) approach to minimize testing and development time on each release.

The vendor will use standard project management tools to manage and track issues as well as monitor development progress. The nominated representative from the project management need to have access and control to the version control system and in project management tools to review and monitor the development process.

The main components of the software will be web-based applications. It should be run in Windows/ Linux/ Mac operating system at user's end and should be compatible with all major browsers.

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

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

The Krishak Digital Financial Management (KDFM) solution will preferably be developed in following technologies, if not otherwise agreed upon:

- **Frontend:**
  - React JS
  - Tailwind CSS
  - HTML 5
  - Typescript
- **State Management:**
  - Redux

- **UI Component Library:**
  - Shadcn UI
- **Backend:**
  - **Language**
    - Java
    - C/C#
    - Python
  - **Framework**
    - Spring Boot MVC
    - Spring Web
    - Spring Data
    - Spring Security
    - Spring Cloud
  - **Build Tool**
    - Gradle
  - **API Gateway:**
    - NGINX
  - **Configuration Management**
    - Spring Cloud Config
    - Authentication & Authorization
    - JWT
- **Mobile:**
  - **Flutter 3.20 or Native for Android and IOS in complaint with the Payment System**
  - **Push Notification Service:**
    - Firebase Cloud Messaging
    - MFA 2 factor Authentication for In-App OTP.
- **Databases:**
  - **RDBS**
  - **In-Memory**
  - **NoSQL**
  - **SQLite for offline data collection**
- **Monitoring & Reporting:**
  - **Monitoring**
    - Prometheus
    - Grafana
    - Logging
    - ELK Stack (Elastic search, Logstash, Kibana)
  - **Reporting**
    - BIRT: Business Intelligence Reporting Tool
- **Message Queue and Cache Server:**
  - **Cache Server**
    - Redis Cache Server
    - Message Queue
    - Kafka Event Streams
- **Deployment**
  - CI-CD based deployment with Development Server, Staging Server and Production Server.

The Web Application should comprise the following features:

1. The application which is a web-based solution, should be hosted in a centralized Webserver

2. The application should be developed in microservice Architecture
3. Application should support MVC framework.
4. 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.
5. The web-based application should support cross browser platforms (popular web browsers such Mozilla Firefox, Opera, Chrome, Edge, Internet Explorer, Safari etc.)
6. The application should have the ability to seamless integration with future module / components / applications
7. Application should be lightweight and rich on client-side scripting
8. UI should be developed based on the analysis of UX.
9. Any web interface of this application should be fully responsive.

The Mobile App should comprise the following features:

1. The mobile application version of the system should be developed for both Android and iOS.
2. The mobile app should have the capability of displaying system notifications
3. Functionality for registration options should be in app for service recipients
4. App should enable compact view of services for service recipients.
5. Agent Apps should have online & offline options.
6. There should be an option for auto synchronization of app data with the central database from the local database on the availability of the Internet connectivity.

Deliverables:

(10) Approved Tools and Technology plan and Methodology
(11) Developed bi-lingual (English and Bangla) features/ modules/ components/ applications,
(12) Code documentation, algorithm and interface related documents,
(13) Approved development and versioning report/ release note on each sprint,

4.2.3 Integration

Considering the Integration requirements and scopes defined in the SRS, HLD & LLD for this Krishak Digital Financial Management (KDFM) application, the vendor must perform the planned integration activities. At this stage, the vendor will perform integration to make the e-Service application interoperable.

Deliverables:

(14) Approved Integration activity report

4.2.4 System Security and Audit Trail

The vendor should keep in account the following considerations as well as vendor should provide a checklist based on system and hosting security plan (i.e. fraud, hacking, money laundering etc.) and methodology following that checklist.

1. The vendor should follow any of the industry standard secured development methodology such as (but not limited to) Comprehensive Lightweight Application Security Process (CLASP) by OWASP etc.
2. The vendor should consider (but not limited to) common vulnerabilities such as SQL Injection, Cross Site Scripting (XSS) etc.
3. Vendor will undertake responsibility for Input Validation Controls, Authorization/Authentication Control and other security controls in place in both testing and production environment of application.
4. The following vulnerabilities must be checked and ensured security from the beginning:
    a. Cross Site Request Forgery (CRSF)
    b. Cross Site Scripting (XSS)
    c. Session hi-jacking

d. Session Fixation
e. SQL Injection and Code Injection
f. Input Validation/Filtering
g. Output Escaping
h. Secure File Access

5. The vendor shall minimally provide Access control, Authentication and accountability security mechanisms for backend operations of the System.
6. The proposed security solution shall be scalable and should not affect the performance by creating a bottleneck or single point of failure to the overall system.
7. The system should provide tamper-proof audit trails and logs for administrator or auditor to check for the actions committed by users. The audit trails shall consist of following details but not limited to:
    a. Login and logout
    b. Attempts to access unauthorized resources
    c. User profile changes
    d. Past audit events.
    e. Track all actions performed on documents attached/uploaded.
    f. The system should have provision to assign the access rights of other resources on need basis to authorized users.
    g. Information in the System that is deemed sensitive shall be encrypted and protected from accidental and/or unauthorized modification.
    h. The System shall provide automatic session disconnection for inactive user after session time [Proposed best practice session time] is over.
    i. The system shall protect the audit trails from being modified by unauthorized personnel or privileged users.

Deliverables:

(15) Approved Checklist and Methodology for ensuring Security and Forensic Auditing.

4.2.5 Testing/ Quality Assurance

Software testing is to evaluate each and every functionality of the proposed software application whether meeting the specified requirements or not.

The vendor should prepare an extensive testing document so that any functional failure can be detected and corrected timely and properly. The scope of the software testing should include the review/ examination of the code as well as the execution of the code in various environments/ conditions as well as examining the aspects of the code; checking whether it does what is required, covering: (a) test plan (b) scripting, (c) testing tools, (d) testing process, (e) test report formats i.e. expected test deliverables, (f) test cases, (g) test log and (h) test results.

The vendor should submit testing document, which may include standard test approaches covering but not limited to the following tests.

1. Unit Testing
2. Smoke and sanity testing
3. Usability testing
4. Functional testing
5. Integration/ interoperability testing
6. Limit/ boundary testing
7. Performance/ load/ stress testing
8. Security and vulnerability testing

The integration/ interoperability test:

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

The following are the key expectations on interoperability requirements:

1. The system should be designed for interoperability using industry standard protocols.
2. System must expose data by Advanced Message Queuing Protocol and REST via TLS.
3. All imported data must undergo data validation to ensure full integrity.
4. Data exchange within the system at different levels via the internet shall be encrypted.
5. The system should have functionality to exchange data with other own systems or external institute systems.
6. The system shall have functionality to export/import files based on the standard template defined through web services and/or API
7. The vendor must ensure standard interoperability facility for the system so that necessary data can be shared with the other concerned public & private sector software or mobile apps based on the approval of the ministry authority simply exposing API for data sharing/exchanging.
8. Full API documentation must be provided so that third party integrators can integrate their system with this system.

The Performance/ load/ stress testing should consider the following considerations:

1. The system processing shall be scalable to support the volume estimates for a period of 10 years at a 10% annual growth rate.
2. The system shall be designed to handle estimated 500,000 (Five Lac) simultaneous connection (online users) when it is ultimately rolled out.
3. The vendor must conduct an extensive load-testing task taking above factors into consideration and submit a load testing result.
4. The database architecture should be such that the system is available to user 24x7x365 days a year without any unapproved downtime.
5. Page load time, login response-time, on-click load time for the web application should be less than 3 seconds while this is accessed over the internet.
6. 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.
7. Considering the network infrastructure challenges in Bangladesh, the solution must support low bandwidth conditions for the services defined in the functional requirements.
8. In case of mobile application also, this should support very low bandwidth even in 2G network provided internet bandwidth.
9. The proposed solution should be highly scalable to accommodate current and future requirements within the scope of the scope mentioned in the TOR.
10. Analyze the requirements whether both horizontal scaling (scale-up) and vertical scaling (scale-up) will be required for this e-Service application or not?
11. The Krishak Digital Financial Management (KDFM) application should be provided with appropriate caching mechanism to handle very high-traffic scalability.
12. The vendor may propose here other relevant measures for the Krishak Digital Financial Management (KDFM) application scalability.

Deliverables:

(16-23) Approved Test Documentation on above 8 types of Tests. (page 27)

Note: Based on the above Test results and obtained bug lists the LLD document and the developed application may be revised and improved accordingly.

4.2.6 Release:

After successful completion of above quality assurance/ testing tasks, the developed application will be released as a Beta version considered to be a deliverable of each iteration. In case of unsatisfactory testing reports, the iteration will be continued accordingly without any release.

Deliverables:

(24) Approved Release Note and Released application with versioning.

4.3 Phase-III: User Acceptance Test (UAT) and Deployment:

After releasing the final developed and tested application as the Beta Version, UAT certification and Deployment phase will be initiated. In this phase, the actual user feedback and review will be taken and finally the application will be accepted by the User Authority after passing a complete and exhaustive end-to-end UAT. After UAT certification the deployment will be done successfully to make this application GO LIVE.

4.3.1 User Acceptance Test (UAT):

Just after the release of developed system as BETA version, developed application will enter into this UAT Process. At this step, the users of different levels extensively to receive their precise feedback and review will test the system on mobile (iOS, Android and web). Based on the received feedback and review, the process may lead to the previous state again with defined Change Requests (CR) to adjust. Finally, when user's valuable feedback and review will be addressed, this application will be ready for User Acceptance. This step will end with the user acceptance for the BETA version and full source code to move forward.

Deliverable:

(25) Approved UAT Plan and Documentation
(26) UAT Report/ Certification
(27) Accepted application (With version): Mobile (Android and iOS) and Web
(28) Accepted Full Source Code

4.3.2 Deployment

Deployment is a very important step in the SDLC for going LIVE where different types of necessary and standardized activities should to be performed as per predefined plan. The deployment plan should be prepared in a comprehensive manner choosing the appropriate deployment method and a deployment checklist including data migration tasks and with application and database hosting specification for NDC.

The inauguration of the application may take place when it enters into this stage after successful UAT, deployment and data migration. As inauguration is the formal session to expose or open the application to the end users/citizens, therefore proper consent of the concerned implementation Organization/Agency is required before going LIVE.

Deliverables:

(29) Approved Deployment Checklist with Hosting Specification and Plan,
(30) Approved Deployment and Installation Manual
(31) Approved Business Continuity Plan
(32) Approved Data Migration Plan and Method

(33) Successful Data Migration
(34) Final Deployment

4.3.3 Smartly guided Digital features:

In both the platform mobile apps and web in case of receiving the digital services in each interface of digital feature, the service recipient will find a default "guide/ help link" by clicking on this meaning. Instant guide service can be availed like systematic pictorial action flow or video/ multimedia content to use any feature and other relevant smart or interactive contents to receive instant support.

For all types of usage, vendor must prepare easily accessible and focused user manual, which will also be available in mobile apps and web application. The user manual should be smart enough so that the target users can receive the training by himself or herself without a trainer intervention also. The content should not be prepared only based on text but also the info graphic, pictures, animation, diagrammatic presentation, multimedia should be used smartly:.

1. This digital guide has to be implemented for each and every service of this system for each platform i.e. web, mobile.
2. All the digital content guidelines must be interactive so user can navigate the system by hearing, listening & reading.
3. Content creation methodology, activity and standard should be included in the plan.

Deliverables:

(35) Approved Digital User Manual Plan and Methodology
(36) Approved Smartly Guided Digital Operational and Administration Manual for Web and Mobile app/ services.

4.4 Phase-IV: Training and Piloting:

4.4.1 User Training:

There will be a Training Need Analysis (TNA), Training Plan and subsequent Training of Trainers (ToT), and several User Training sessions as per the TNA for different user levels. Therefore, a Training Plan followed by Training Sessions are to be arranged by the vendor, where the necessary arrangement will be provided by Project Management excepting the Trainer fee and Training Materials are to be borne by the vendor.

User training has to be very extensive and detailed so that users of each level will receive this training and will be capable to operate and run this system without any major technical dependencies.

Deliverables:

(37) Approved TNA and Training Plan
(38) Accepted Training Report and Feedbacks after successful Completion of ToT and User Training sessions.

4.4.2 Piloting:

After the successful completion of training, the Application will be rolled out for Pilot Testing in limited scale (say in selected 15 Upazilas). Based on the feedback and outcome of Pilot Testing the system may go through several iterations for fixation, enhancement and upgrading.

Deliverables:

(39) Approved Pilot Rollout Plan,
(40) Accepted Report on Pilot Rollout with User Feedback

4.5 Phase-V: Warranty, Help Desk / Call Center Operation and Maintenance Support Service

After final deployment and going live, a one-year Warranty and Maintenance Support phase will be started. This phase is very important because the vendor will start the actual maintenance support service and the rollout of this software will occur following successful piloting.

The vendor needs to provide this warranty and maintenance support service as per the approved plan and method. At this phase, the main objective will be ensuring this Krishak Digital Financial Management (KDFM) application is running smoothly, uninterruptedly and without any hassle or complexity. Some factors mentioned below are very important at the time of maintenance support service by the vendor.

1. The developed and deployed Krishak Digital Financial Management (KDFM) application should run smoothly and bug free.
2. In case of any technical problem or support requirement, vendor's response and appropriate solution have to be very prompt based on the type of technical complexity and support requirement, i.e. within the stipulated time covered by the signed Service Level Agreement (SLA).
3. Vendor must consider contingency plan to manage and solve sudden complexity, technical problems arise and attend support request.
4. The call center/ help desk remote support should be comprehensive, strong, standard and adequate adhering to SLA.
5. Improving user engagement, user training and receiving user review & feedback should be considered in the maintenance support plan.
6. Communication, software performance evaluation, continuous improvement for user satisfaction and right time reporting to the concern authority should be planned and executed timely as in SLA.
7. Based on the analysis of the impact of previous phases and adjusting the plan, implementation rolling out has to be done. In this case, the vendor will provide proper guidelines and different kinds of planning support to the organization so that the implementing organization can complete the rolling out successfully.

Deliverables:

(41) Approved Call Center/ Help Desk Establishment Plan
(42) Approved Support and Maintenance Plan,
(43) Signed Service Level Agreement (SLA),
(44) Issue and Support Log

4.6 Phase-VI: Annual Maintenance Contract with Help Desk / Call Center Operation

After one-year Warranty and Maintenance Support phase, annual maintenance contract (AMC) can be made per year basis, with the same cost to be followed first five years, if extended. The vendor needs to provide this maintenance support service as per the AMC. Same factors and conditions are to be followed as made during first year warranty and maintenance service by the vendor.

Deliverables:

(45) Signed Annual Maintenance Contract (AMC) along with same Service Level Agreement (SLA),
(46) Issue and Support Log

5 Technical Proposal

The following are the requirements to be ensured while submitting the **Technical Proposal** by the vendor, which will be the part of agreement for the successful vendor, is not otherwise updated in the Contract Agreement for the Service.

5.1.1 Coding Conventions

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

Note: A comprehensive **"List of Standards"** based on the latest technology to be complied for web and mobile platform regarding this Krishak Digital Financial Management (KDFM) solution development and operation will be preferred in the vendor's technical proposal.

5.2 Integration Requirements

The vendor should come up with an integration plan in their technical proposal considering and understanding the scope of the Krishak Digital Financial Management (KDFM) application as per this TOR. The vendor will require integrating the software successfully with all existing internal and external software and mobile apps ensuring the interoperability among the e-government/e-Services of Bangladesh, based on the assessment, which will be conducted in requirement analysis phase. The possible integration scopes of this Krishak Digital Financial Management (KDFM) application are mentioned below as a reference for the vendor.

The proposed Krishak Digital Financial Management (KDFM) solution must comply with all national e-Government standards those are prescribed by the BNDA (Bangladesh National Digital Architecture) guidelines, published e-government/ ICT policies and acts and international standards/conventions for minimizing system's operational dependencies and strengthening sustainability.

The vendor can follow standard integration mechanism such as exposing standard Restful APIs for the service process in different modules so that any modules or features can exchange data and related resources whenever it is required by satisfying the Govt. Agency's business purposes. Therefore, the vendor will develop a standard API manager following international standard so that the data sharing can happen efficiently and standard securities will be maintained smoothly.

The vendor is requested to submit an **"Integration Plan"** in their technical proposal for this Krishak Digital Financial Management (KDFM) solution covering the functional, technological, business, strategic, implementation, dependencies and activity related aspects.

5.3 Hosting Requirements

The vendor is to submit a **"Hosting Architecture & Requirements"** in their technical proposal for this Krishak Digital Financial Management (KDFM) application to be hosted in government provided data center i.e. National data center (NDC) and operating cost of one year is to be included in the Financial Proposal.

Note: If the implementing organization decides to host this Krishak Digital Financial Management (KDFM) solution in their own or any nominated data center, understanding the strength and capacity of this data center and hosting requirements, vendor must guide implementing organization well ahead of the time of system design phase. Therefore, implementing organization can take necessary measures to ensure hosting facilities, which will be required at the time of hosting the developed system.

5.4 Security and Privacy Requirements

The vendor should submit an extensive **"Security and Privacy Plan"** including comprehensive security architectures in their technical proposal for this proposed Krishak Digital Financial Management (KDFM) application considering the following issues:

1. Project technical scopes
2. Functional and nonfunctional requirements and ultimate objectives
3. Concerned service provider organization's operational environments and capacity
4. User roles - Accessibility, Authentication, Authorization and Accountability
5. Importance of data management & data privacy
6. Strength of technologies to be used for development, operate & maintenance
7. Deployment & hosting
8. Service recipients and providers security, confidentiality and privacy
9. A checklist of security measures to be taken for this solution
10. Overall security standards, which should be applicable for Krishak Digital Financial Management (KDFM) system.

6 Project Management

6.1 SDLC Methodology:

The vendor is requested to plan for following the standard "**Agile SDLC Methodology**" for this project in details in their technical proposal covering the following:

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

6.2 Implementation Timeline

Vendor must complete the project within a stipulated timeline based on the proposed SDLC methodology. The project timeline can be divided in four below phases.

"Project Implementation Timeline/Schedule"

The project is divided into 6 phases. The entire assignment is divided into following phases which may be partially overlapping on need basis:

Phase	Duration
PHASE-I: Requirement Analysis and Design	2 Months
PHASE-II: Development and Release	6 Months
PHASE-III: UAT and System Deployment	2 Months
PHASE-IV: Training & Piloting	2 Months
PHASE-V: Warranty, Maintenance & Support Service	12 Months
PHASE-VI: AMC Period	12 Months
Total	**36 Months**

6.3 Implementation Requirements

The selected vendor has to conduct implementation of the Krishak Digital Financial Management (KDFM) software solution. Vendor will submit the detailed **"Implementation Plan"** in the technical proposal in which the following may be considered to incorporate:

1. Vendor will be required to provide on-site support in phase to ensure smooth operation.
2. Vendor must provide extensive, premium and time-bound support at the implementation phase. The detailed support modality, methods, standard and relevant activities should be mentioned in the proposed plan.
3. Vendor will submit a performance assessment report covering result/ output, impact/ outcome, scalability, stability and sustainability.
4. The criteria/ key factors based on which the evaluation will be conducted should be mentioned in the proposed plan.

6.4 Documentation

Detailed and proper documentation of such ICT based project like Krishak Digital Financial Management (KDFM) application development and implementation for Government is very vital and essential. Documentation is required for any such project as reference, knowledge transfer, analysis of development and implementation history, baseline information for any modification or change, guidance etc. In this issue, Vender should show highest-level of professionalism for delivering the standardized documentation approach of Krishak Digital Financial Management (KDFM) development and implementation. Vendor should include an extensive **"Documentation Plan"** of this project in their technical proposal.

6.5 Work Distribution and Team Composition

The vendor is expected to provide work distribution and team composition plan based on the project scope, their proposed SDLC methodology and work and project implementation plan. The interested applicant (Vendor) should provide a **"Work Distribution & Team Composition Plan"** in their technical proposal describing the different teams with required HR positions that will be allocated at various phases or steps of proposed SDLC and project implementation. In the case of running multiple phases or steps or activities, the team allocation plan mentioning the number of human resource (HR) positions should be planned and described precisely. In the team allocation plan, each HR position should also be described with the roles, amount of involvement (man-day/man-month), expected deliverables and required skill and expertise. However, for proper execution of the project i.e. Krishak Digital Financial Management (KDFM) application development, the vendor shall include at least the following HR positions with respective CVs as minimum project team requirements:

Sl.	Position	Minimum Experience in ICT Position	No. of Person	CV submitted (Y/N)	Page #
1.	Project Manager	10 years	1		
2.	Deputy Project Manager	5 years	1		
3.	System Analyst	5 years	2		
4.	Business Analyst/ Domain Expert (Fintech)	5 years	1		
5.	Business Analyst/ Domain Expert (Agricultural Services)	5 years	1		
6.	Solution Architect	10 years	1		
7.	Database Engineer	5 years	2		
8.	Data Warehousing Expert	7 years	1		
9.	Dev-ops Engineer	5 years	2		
10.	Senior Software Engineer	5 years	4		
11.	Software Engineer	2 years	12		

Sl.	Position	Minimum Experience in ICT Position	No. of Person	CV submitted (Y/N)	Page #
12.	Mobile Application Engineer	2 years	4		
13.	UX Expert	3 years	1		
14.	UI Expert	1 year	2		
15.	Quality Assurance Manager	5 years	1		
16.	Quality Assurance Engineer	2 years	4		
17.	Cyber Security Expert	3 years	1		
18.	System Administrator	2 years	2		
19.	Network Administrator	2 years	2		
20.	Technical Document Writer	2 years	3		
21.	Software Trainer	2 years	4		
22.	Implementation/ Roll out Engineer	2 years	4		
23.	Support Manager	4 years	2		
24.	Support Engineer	1 year	4		
25.	Call Center/ Help Desk Operator	1 year	4		
26.	Compliance Expert	3 years	1		
	Total		67		

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

6.6 Quality Attributes and Assurance

The Quality attributes and Assurance plan will describe the standards, processes and procedures in this Krishak Digital Financial Management (KDFM) application development life cycle, which will be used to support the consistent delivery of high-quality professional standard application with the help of an automated supportive environment. The quality assurance process will establish the QA functions, quality assurance standards, procedures, policies, monitoring, and evaluation processes to determine quality and test requirements in this document.

In order to provide high quality products and services, each support team will adhere to processes, procedures and standards. Please note that this application will be tested in the Software Quality Testing and Certification (SQTC) center of the ICT Division and VAPT Testing from e-Government Computer Incident Response Team (BGD e-GOV CIRT) to further ensure the quality attributes of this software. The vendor will be responsible to complete the mention process and must submit the certification before go-live.

The vendor is requested to provide an extensive "**Quality Assurance Plan**" with measurable attributes for each phase of this Krishak Digital Financial Management (KDFM) development life cycle in their technical proposal.

6.7 Data Management and Migration of Legacy Data

Under the process of service to e-Service transformation, during Krishak Digital Financial Management (KDFM) activation or deployment, it might be necessary to move the legacy data of prevailing services. In that case, the vendor may require performing different relevant activities that may include data collection, softcopy conversion, data filter, data cleansing, data verification, data processing, data migration and overall data management. Here, it is expected that, the vendor will propose their detailed **"Data Management and Data Migration Plan"** for this Krishak Digital Financial Management (KDFM) application considering the estimation of legacy data mentioned below which will be required to migrate into the developed application.

Data About	Description	Current Status	Amount of Data	Dependency
Farmer's Data	Consist of Farmers Details Data Regarding Demographic Data including, Land, Crops, Agri Input, etc.	Database Stored	Approx. 10 m Data	Need to Process and Migrate to New System

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

6.8 Security Audit

This Krishak Digital Financial Management (KDFM) 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:

1. Log the users who are accessing the system
2. Log the parts of the application that are being accessed
3. Log the fields that are being modified
4. Log the results of these modifications
5. Log the attempted breaches of access
6. Log the attempted breaches of modification rights
7. Timestamp.

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

Vendor is requested to submit their proposed "**Security Audit Plan**" including strategy & standard measures in their technical proposal.

6.9 Training Plan

In case of Krishak Digital Financial Management (KDFM) successful implementation, user training plays one of the most vital roles in the entire implementation cycle. Vendor must consider government culture, convenience of government officials & staff and ICT literacy &

expertise at the time of designing user-training plan for the Krishak Digital Financial Management (KDFM) implementation. Based on the requirements, target prospective participants and implementation scope, vendor may plan for user training in 3 different modalities as following:

1. User Training,
2. TOT and
3. System Admin Training.

The vendor is requested here to submit a detailed **"Training Plan"** in their technical proposal considering the following:

Training Name	Persons	Duration
User Training	600 Officials (50 Officials per batch)	1 Day per batch
TOT Training	20 Officials	2 Days
System Admin Training	10 Officials	2 Days

Please note that, the training infrastructure like venue will be provided by the implementation organization. The vendor will provide training Materials, Lunch & Refreshment Cost.

6.10 End User Engagement

End user engagement is very important for Krishak Digital Financial Management (KDFM) implementation. Vendor should measure involvement of end users during development and the constant incorporation of feedback to provide high-quality end-user experience satisfying usability test. Based on different types end-user group, vendor may require to consider the following at the time of preparing **"End-User Engagement Plan"** which is required to be submitted with the technical proposal,

1. Purpose of end-user engagement.
2. For ensuring end-user behavior, proposed method & activity.
3. Define indicators & factors of the outcome for end-user engagement.
4. Determining area & boundary of end user's Engagement & the degree of involvement.
5. Mentioning vendors & implementing organization's roles in engaging end-users for large-scale implementation.

6.11 Risk Management

Software development is an activity that uses a variety of technological advancements and requires high levels of knowledge because every software development project contains elements of uncertainty. This is known as project risk. The success of a software development project depends quite heavily on the amount of risk that corresponds to each project activity. As a project manager, it is not enough to merely be aware of the risks. To achieve a successful outcome, they must identify, assess, prioritize, and manage all of the major risks. A standard risk management process includes the following steps:

1. **Identify** risks and their triggers
2. **Classify** and prioritize all risks
3. Craft a **plan** that links each risk to a mitigation
4. **Monitor** for risk triggered during the project
5. Implement the **mitigating action** if any risk materializes
6. **Communicate** risk status throughout project

The vendor should submit a **"Risk Management Plan"** addressing all types of risks including above-mentioned steps following standard risk management principles and their mitigation plan.

6.12 Expected Deliverables

Considering the scope of services and work of this project and based on the proposed project development & implementation methodology (SDLC), the vendor is requested to submit a comprehensive **"Project Deliverables Plan"** in their technical proposal describing the SDLC phase/steps/action wise timeline-based deliverables mentioning different formats and types. For better clarifications, some of the deliverable examples are mentioned below but not limited to:

Phase	Deliverables
Phase - I: System Analysis & Design	1. Approved Project Management Plan 2. Approved Inception Report
	3. Approved Software Requirement Specification (SRS), 4. Approved User friendliness plan and methods 5. Approved UI/ UX Plan and methodology. 6. Approved UI prototypes/ Mock screens/ wireframes
	7. Approved High-Level Design (HLD) Document. 8. Approved Security Architecture
Phase - II: Development & Release	1. Approved Low-Level Design (LLD) Document. 2. Approved Tools and Technology plan and Methodology 3. Developed English and Bangla features/ modules/ components/ applications, 4. Code documentation, algorithm and interface related documents, 9. Approved development and versioning report/ release note on each sprint,
	5. Approved Integration activity report 6. Approved Checklist and Methodology for ensuring Security and Forensic Auditing.
	7. Approved Test Documentation on Unit Test. 8. Approved Test Documentation on Smoke and sanity Test. 9. Approved Test Documentation on Usability Test. 10. Approved Test Documentation on Functional Test. 11. Approved Test Documentation on Integration/ interoperability Test. 12. Approved Test Documentation on Limit/ boundary Test. 13. Approved Test Documentation on Performance/ load/ stress Test. 14. Approved Test Documentation on Security and vulnerability Test.
	15. Approved Release Note and Released application with versioning
Phase - III: UAT and System Deployment	1. Approved UAT Plan and Document, 2. UAT Report/ Certification 3. Accepted application (With version): Mobile (Android and iOS) and Web and full Source Code
	4. Approved Deployment Checklist with Hosting Specification and Plan, 5. Approved Deployment and Installation Manual 6. Approved Business Continuity Plan 7. Approved Data Migration Plan and Method 8. Approved Data Migration Plan and Method 9. Successful Data Migration

	10. Final Deployment
Phase - IV: **Training and Piloting**	**1.** Approved Digital User Manual Plan and Methodology **2.** Approved Smartly Guided Digital Operational and Administration Manual.
	3. Approved TNA and Training Plan **4.** Accepted Training Report and Feedbacks,
	5. Approved Pilot Rollout Plan, **6.** Accepted Report on Pilot Rollout with User Feedback Pilot Feedback,
Phase - V: **Warranty, Help Desk / Call Center Operation and Maintenance Support Service**	**1.** Approved Call Center/ Help Desk Establishment Plan **2.** Approved Support and Maintenance Plan, **3.** Signed Service Level Agreement (SLA), **4.** Issue and Support Log
Phase-VI: **Annual Maintenance Contract with Help Desk / Call Center Operation**	**1.** Signed Annual Maintenance Contract (AMC) along with same Service Level Agreement (SLA), **2.** Issue and Support Log

6.13 Maintenance and Support Service

The selected vendor will require providing maintenance and supporting service for this developed, deployed Krishak Digital Financial Management (KDFM) application. After the development and deployment phase as soon as the application goes Live, having consent and acceptance from the implementing organization. Vendor will require to provide maintenance and support services plan for next **1 (One) year**. Here it is expected that, the vendor must provide a detailed **"Maintenance and Support Service Plan"** including proposed SLA in the technical proposal.

Support & maintenance plan should be comprehensive and well elaborated to ensure proper support to the end users. Apart from above mentioned issues, if vendor thinks any other issue/method should be included in their plan which assures proper standard support & maintenance of this Krishak Digital Financial Management (KDFM) application which is suitable for implementing organization, it would be considered as added value addition.

Out of these one year of maintenance period; after six months, vendor will require to submit a comprehensive managed service plan to implementing organization exploring each & every scope of switching operational modality from AMC to Managed service for ensuring easy manageable, hassle-free service delivery & minimized operational cost in operation. The proposed managed service plan will not only be cost effective & efficient in operation for quality service delivery for the implementing organization, should be also viable for the vendor i.e. more sustainable & win-win for both parties. The managed service plan will be a guideline & support for the implementing organization for important & crucial decision-making regarding switching modality to AMC to Managed Service just after the expiration of six months maintenance & support period. For effective collaboration & proper decision making. In this case the organization will require to take measures by maintaining the necessary legal formalities before the expiration of one year maintenance period for smooth switching towards managed service modality with proper knowledge transfer.

Note: Please note that submitting the "The Managed Service" plan by the vendor will be one of the major deliverables of the maintenance plan before the expiration to the organization including extensive feasibility study. Here vendor is requested to add this as a deliverable in

the **"Project Deliverables Plan"** Plan that is going to be submitted by the vendor with the technical proposal.

6.14 Performance Review

As per the predefined performance review plan of different stages of SDLC, the vendor will take necessary actions so that it will be possible to evaluate the performance at different levels of their activities and the deliverables based on indicators/factors precisely. Those indicators, standards and factors for performance evaluation have to be defined earlier at the time of project management plan. Here vendor is requested to submit a proposed **"Performance Review Plan"** for the entire design, development, and implementation cycle mentioning the indicators, measuring strategy and expected review scopes.

6.15 Training/ Knowledge Transfer

The Knowledge Transfer Plan should provide a comprehensive approach to transfer responsibility for maintenance and operations from the vendor to implementing organization or their nominated agency. While designing a smooth, efficient and effective **"Training/ Knowledge Transfer Plan"** vendor should consider the following:

- Strategies, methods, milestones, schedules & their duration of accomplishing target.
- Vendor will propose required technical capacity, number of resources mentioning their roles & responsibilities from implementing agency to carry forward this plan.
- Vendor will need to identify the risks, craft a mitigation & contingency plan.
- Vendor needs to propose a method of evaluating & verifying of the standard of knowledge transfer plan.

7 Experience, Resources and Delivery Capacity required

The consultancy firm must meet the following eligibility criteria:

a. The firm must be a registered company/entity with a minimum of 10 (Ten) years of experience of Software Design, Development, Implementation and Post Implementation Support Services. (Please provide work completion certificate/proper document in favor of your claim)
b. Must have updated Trade License, Tax Identification Number, Business Identification Number, Tax (IT and VAT) Clearance Certificate, Register of Join Stock & Companies (RJSC) Registration, JV Agreement (if applicable)
c. Must have BASIS membership for the last 5 years (Please submit initial & updated membership certificate).
d. The firm must have ISO 27001:2022 and/or 9001:2015 Certified. CMMI certification and/or having adequate experience in PCI-DSS will be an added advantage.
e. The firm must have a minimum of 3 projects' experience of developing web-based enterprise solution and Mobile Application with similar technology of Web, Android & iOS within last 5 (Five) years. Minimum 2 Web Application and 1 Mobile Apps having features related to Financial Technology should active and under usage. Project PDS and Completion certificate must be submitted.
f. Must have experience of developing Software Solution for Government of Bangladesh or any of its agencies.
g. Minimum average annual turnover must be BDT 5 (Five) Crore in the last 3 (Three) years prior to deadline date for EOI submission (please submit the necessary document in this regard. For example, audited financial documents).
h. Must demonstrate access to or availability of financial resources in the form of liquid assets/ lines of credit to meet the cash-flow requirement of BDT 5 Crore.
i. Must submit the CVs which have enough capacity to deal with technical, managerial, administrative and financial issues, not less than the experts as stated in this document.
j. The firm must not have any data breach in the last Five (5) years, declaration must be submitted.
k. Must submit a checklist whether documents/ certificates are submitted as discussed along with the Technical Proposal (not limited to following):

Sl.	Item Name	Submitted (Y/N)	Page #
1.	List of Standards		
2.	Integration Plan		
3.	Hosting Architecture & Requirements		
4.	Security and Privacy Plan		
5.	Agile SDLC Methodology		
6.	Project Implementation Timeline/Schedule		
7.	Implementation Plan		
8.	Documentation Plan		
9.	Work Distribution & Team Composition Plan		

10.	Quality Assurance Plan		
11.	Data Management and Data Migration Plan		
12.	Security Audit Plan		
13.	Training Plan		
14.	End-User Engagement Plan		
15.	Risk Management Plan		
16.	Project Deliverables Plan		
17.	Maintenance and Support Service Plan		
18.	Performance Review Plan		
19.	Training/ Knowledge Transfer Plan		
20.	Trade License: initial & updated		
21.	Tax Identification Number Certificate		
22.	Business Identification Number Certificate		
23.	Income Tax and VAT Clearance Certificate: Latest		
24.	Registration of RJSC for Limited Companies		
25.	JV agreement if applicable		
26.	BASIS membership certificate: initial & updated		
27.	ISO 9001:2015 & 27001:2022 Certificates		
28.	PDS and Work Completion Certificates on similar Software and Mobile app Design, Development, and Post Implementation Services (minimum 3)		
29.	PDS and Work Completion Certificates on similar Software/ Mobile app majoring Financial Technology currently used by Mass Citizen (minimum 1)		
30.	PDS and Work Completion Certificates on similar Software and Mobile app for Government of Bangladesh or any of its agencies (minimum 1)		
31.	Audited financial documents/ similar proof of Turnover o last 3 years		
32.	Proof of availability of financial resources in the form of liquid assets/ lines of credit for this Project		
33.	CVs with enough capacity to deal with technical, managerial, administrative and financial issues of this Project		

8 Selection Method

Selection of the consultancy firm will be under Quality Cost Based Selection (QCBS) method following the Public Procurement Rules-2025.

Dr. Md. Raquibuzzaman Khan
DPD, PARTNER & Member-Secretary
ToR and Cost Estimate Preparation Committee

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