

**Terms of Reference (ToR)**

**for**

**Selection of IT Firm for Providing Technical Assistance to Develop Information Management  
and Visualization System for Project Monitoring.**

**(Package no. RWSHP-SD-18)**

**Rural Water, Sanitation and Hygiene for Human Capital Development Project**

**Supported by:**

**The World Bank, Asian Infrastructure Investment  
Bank (AIIB) & Government of Bangladesh (GOB)**

**Implemented by: Department of Public Health Engineering (DPHE)**

**August, 2022**

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*Annex-1: List of working area and number of personnel for Training on digital MIS*

*Annexure 2: Work schedule and planning for deliverables*

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## 1. Project Introduction

Department of Public Health Engineering (DPHE) and Palli Karma-Sahayak Foundation (PKSF) jointly have been implementing a project entitled, Bangladesh Rural Water, Sanitation and Hygiene for Human Capital Development supported by the International Development Association (IDA) – a member of the World Bank Group and Asian Infrastructure Investment Bank (AIIB). The key components of DPHE part under the project includes:

### (a) Component 1: Investments in water supply

- (i) **Subcomponent 1.1-Large piped water schemes:** It will carry out investments in large piped water schemes to support safe water scarce communities through the build-operate (BO) model. This subcomponent will target 78 safe water scarce communities of 300–700 households (1,350–3,150 people) with willingness to pay.
- (ii) **Subcomponent 1.2- Small piped water schemes:** It will carry out investments in small piped water schemes to support safe water scarce communities through the design-build-operate (DBO) model. The subcomponent will target about 1,300–1,700 safe water scarce communities with willingness to pay. Around 3,000 small piped water schemes, 1–3 schemes per community, will be invested, each serving 30–40 households (135–180 people).
- (iii) **Subcomponent 1.5- Feasibility studies in high climate risk regions:** This subcomponent will carry out feasibility studies in high climate risk regions, which will identify sources for drinking water and examine technological options and their financial viability in southern Bangladesh.

### (b) Component 2: Investments in sanitation and hygiene

- (i) **Subcomponent 2.1- Investments in sanitation and hygiene:** This subcomponent will target 312 public toilet facilities in high pedestrian traffic locations, such as markets and bus stations. In addition, about 1,280 community clinics will receive support for renovation or new construction of their WASH facilities, both for patrons and medical purposes.
- (ii) **Subcomponent 2.3- Sanitation and hygiene facilities for households:** This subcomponent will finance 'safely managed' sanitation and hygiene facilities for households. This will prioritize twin-offset pit latrines, which facilitate the safe management of fecal sludge.

**2.2.b. Grants for the poorest households:** This will provide fully subsidized toilets to about 309,000 poorest households (around 10 percent of the total households in the project locations).

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(iii) **Subcomponent 2.4** will promote innovation to localize innovative WASH technologies, especially in FSM, to pilot and implement the Rural Fecal Sludge Management Framework through provision of innovation grants.

(iv) **Subcomponent 2.5-Behavioral change communication (BCC) campaign:** will support a behavioral change communication (BCC) campaign to raise WASH awareness, provide training for staff of community clinics and the Ministry of Health and Family Welfare (MoHFW).

The behavioral change strategy will be formulated by blending demand creation and awareness-raising activities and emphasizing health benefits through community health workers and MFI field staff. Different tools and techniques will be used, such as health worker visits to households, target group sessions, and mass and social media. This subcomponent will also include support for training staff from the MoHFW and community clinics and the identification and supervision of poorest household targeting.

(c) **Component 3: Institutional strengthening**

(i) **Subcomponent 3.1- Strengthening of policies and regulatory framework:** This subcomponent will provide technical assistance (TA) for the strengthening of policies necessary to support the implementation of the NSWSS.

(ii) **Subcomponent 3.2- Capacity building:** It will carry out capacity-building activities through trainings to central and local government officials working in the WASH and converging sectors who are responsible for implementation of the NSWSS and investments in information technology (IT) hardware and software to support the sector institutions.

(d) **Component 4: Project implementation and management**

(e) **Component 5: COVID-19 emergency response:** This component will provide quick, just-in-time WASH services where needed in the COVID-19 pandemic hotspots, to cope with the fast-changing COVID-19 situation, among others, through (i) setting up handwashing stations/devices (fixed and portable) with running water, proper drainage, and sanitation facilities; (ii) providing quality water access or delivery points, compact water treatment plants, and water kiosks; and (iii) providing emergency operational supplies, such as for personal

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protective equipment, and for water supply and sanitation service providers to ensure disaster preparedness and continuity of service delivery.

- (f) **Component 6: Contingent emergency response component (CERC).** This component will provide immediate response to an eligible crisis or emergency as needed.

## 2. Project Location

This project will be implemented in 78 selected Upazilas of four divisions (Mymensingh, Rangpur, Chattogram and Sylhet) where two World Bank (WB) projects are on-going; (i) the Bangladesh Health Sector Support Project (HSSP), which seeks to strengthen the health, nutrition and population (HNP) sector's core management systems and delivery of essential HNP services; and (ii) the Bangladesh Income Support Program for the Poorest Project (ISPPP), which seeks to provide income support to the poorest mothers in selected Upazilas while increasing the mothers' use of child nutrition and cognitive development services and enhancing local level government capacity to deliver safety nets.

In addition, this project also will be implemented in more 20 upazilas under, Khulna, Barisal, Rajshahi and Dhaka Division.

*The list of working areas is given in Annex 1.*

## 3. Project implementation and management

The Project Management Unit (PMU) of DPHE is responsible for implementing the project activities as per operational manual of the project. The TA firm will work in collaboration with PMU-DPHE to support in the implementation of relevant activities of the project as mentioned in the section-B.

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## SECTION B: TECHNICAL INFORMATION

### 1. Objective of the assignment

The main objective of the assignment is to develop an Information Management and Visualization (IMV) System which shall consist of a real time data collection, mobile app, web admin portal, dynamic and interactive dashboard system. The consultancy is crucial in creating dynamic linkages between field data forms, GIS/GPS data including captured photos of the project outputs and creation of a cloud-based M&E database. The IMV system will be established in all 98 upazilas under the project area and respective DPHE-Upazila team, DPHE Management and PMU will use this monitoring system. The system will aid the project with real time data collection, generate required data visualization reports and indicators progress as defined by the project and allow management for easier access to information with the help of the dashboard system, so that they can take informative managerial decisions to achieve the project goals. The system should be replicable for the future activities.

### 2. Duration of the Assignment

The assignment will be total fifty-seven (57) months among which nine (09) months for system development and 48 months for system maintenance and update after the system development.

### 3. Scope of work

The hired IT Firm will carry out the following activities under the guidance of PMU-DPHE and the World Bank.

#### 3.1 Database development

A complete database containing all the necessary data points of all the components of the project needs to be designed, developed and deployed to accommodate all the application modules and features that will be implemented in this phase. The user management, role management, access control is some of the components that will be designed in a generic style so that it can be used in other projects. The database must be made to be compatible with Power BI dashboard platform and data collection applications.

The following tasks need to be accomplished for the database development.

- a) Requirement analysis for the generic application modules
- b) Identify the necessary entities to support the generic modules
- c) Develop the data dictionary
- d) Design and implement the database schema
- e) Implement all the necessary relationship among the database entities
- f) Implement the data management screens in the web application

- g) Integration with the database of the components implemented by PKSF under this project.

## 3.2 Web Application Development

### 3.2.1 Web based admin module

The web-based admin module will have all the necessary parts of the application that will be used by the administrator of the application. Some part of the admin module will also be available for organization admins. The web application should be browser and operating system friendly and independent. It should be compatible for major web browsers of all resolutions as well as being responsive so that the design is not broken in mobile phones, tablets, or different browsers.

It should contain all necessary components to meet management requirements such as:

- Program, project result framework and actions define planning section
- MIS section
- Monitoring, evaluation & learning section
- Knowledge management section
- Budget and financial section
- Reporting and report generation section
- Data import/ export section
- Training / Capacity building section
- Feedback section
- Emergency response section

Users should be able to perform the following tasks through the web portal:

- a) Organization management: This module will manage basic organization information.
- b) Partner Organization Management: This module will manage basic information of the Partner Organization and their Branches.
- c) User management: This module will allow managing all the user information and their access controls. Organization admins will be able to manage their own users. Platform will also allow creating accounts for web, mobile so that they can start accessing the system instantly. Accounts might be disabled for all levels of users by the system administrator.
- d) Role management: The application will allow setting roles to the users. Each user will have its access in the application based on the permission assignment.
- e) API key management: The system will need to ensure secure API system for uploading beneficiary data by the partner organizations. There should be a proper way for generating and managing the API keys that will be used by other MIS applications to push the data.

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- f) Permission management: All the application modules and sub-modules with action items should be controlled by the role-based permission. The system should have an easy way to manage the permissions for each role.
- g) Program/Project Management: This module will allow the admin of the BD Rural WASH for HCD project after end of the project. This could be used for other projects of the same nature.
- h) Multilayer Activity: The activities of projects can be multilayer. There should be proper options for managing the hierarchy of the activities for all views and management.
- i) Web application: Web application should have authentication, multiuser support, reporting, data export capabilities.

### 3.2.2 Application Programming Interface (API) development

To ensure extended compatibility and linkage with database systems, the system will need to provide unified and secured APIs, which should allow XLS/CSV as a reporting material/content. System must handle XLS/CSV and keep a track of the files including data. The following different types of APIs need to be developed for this purpose. Following different types of APIs need to be developed for this purpose.

- a) API for User Data from union/upazila with role and permission setup
- b) API for Activity Data from union along with the location (GIS/GPS) data
- c) API for service delivery data from union/Upazila
- d) API for various reporting data that will be generated at MIS system.

### 3.2.3 Report generation module

The system will be able to generate reports (monthly, quarterly, half- yearly and yearly) based on the real time data and download to the user's system. Types of reports available for each user will depend on the user rights set by admin users. Admin users should also be able to create and design new reporting templates dynamically so that the dynamically is adaptable for all reporting needs.

### 3.2.4 Data migration module

There should be a module to easily import/export/retrieve data using easily readable formats (csv, xlsx, xml, etc.). The application will use this data for reporting and other purposes.

### 3.2.5 Dynamic survey module

To properly locate the project activities through GPS/GIS with identity and collecting the required information, for different activities there will be different types of online surveys. PMU will prepare the survey formats and the prescribed format will be available for field officers data entry. The application will use these different types of survey data for reporting and other purposes.

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## 2.6 Feedback module

The system will notify management / admin users for any real time feedback submitted by the field level users. For any problems or issues mentioned in the feedback, the management user can take necessary actions, and mark the feedback item as being resolved once the issue is taken care of.

## 3.3 Mobile app for data collection

- a) The mobile application app will allow the field data collectors to provide some basic information in a general structure for all the service delivery points along with the GPS/ GIS coordinates and pictures where applicable.
- b) The app will also be able to collect data related to all training /capacity building sessions along with the GPS/ GIS coordinates and pictures where applicable.
- c) Mobile app must work offline during data capturing and needs to store data locally. Once a data connection is available, data should be uploaded to the server in an ad-hoc fashion.
- d) The app will compress all pictures which exceed a file size or resolution limit. The app can resize the image and /or compress into JPEG format of no more than 75% quality so that the picture files are kept under the file size limit.
- e) The app will have another mode of functionality that will allow reviewers or monitors to see all the existing targeted program participants' location on the map as well as the detailed information of the household and local community.
- f) The mobile app will have a login facility. Based on the logged in user's permission, app components will be available to the user.
- g) The app will show a route to a desired point from the current location. The routing will be displayed in online mode.
- h) Map points should have suitable symbols for different type of items to have better visualization and understanding.
- i) The initial target for the mobile app is for Android, but there should be proper design for usage/development on iOS version and other mobile platforms also. The apps should be compatible with old and upgraded versions for both Android and IOS platform.
- j) The application should be made easy to use i.e. Convenient user interface/user friendly interface. Must adhere to platform specific UI standards provided by Apple and Google respectively.
- k) The application will have a feedback input system, where the user can enter any feedback in real time (i.e., problems with water flow, supervisory visit instructions) with supporting

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images as files. Any submitted feedback will remain in the app and show as submitted. The status will change to being resolved when the management has taken proper action to resolve the issue.

### 3.4 Dashboard system and Web map demographic visualization

The system shall consist of a web based dynamic dashboard system which will give a quick glance at the overall status of the reach, output level quantitative indicator progress, thematic reach, event calendar and others in graphs, chart and GIS Map form. Users should also be able to generate reports and download in a form of maps and charts.

Alongside, the dashboard should also have a component for program and project mapping, where the project indicators can map with the program indicators. The mapped different project level indicator progress should accumulate with the defined program level indicator. Those can be a further filter in terms of theme, project, outcome, geographic/ geological/ demographic so on.

The dashboard will be fully interactive so that the users can easily navigate through the system to see a detailed level if desired. Admin users can authorize users as to what information can be accessed by whom. The dashboard will need to have easy filtering system so that all information can be easily filtered by:

- Location (98 upazila)
- Component wise
- Progress status

The dashboard should consist of the following components:

- Program and Project Mapping
- Piped water scheme tender progress
- Piped water scheme construction progress
- Piped water scheme usage details (upon construction completion)
- Piped water scheme cluster information and GIS map
- Household level sanitation facilities information and GIS map
- Activity progress on BCC campaign and capacity building related information
- COVID areas development information and GIS map
- Pipeline area coverage (circular area)
- Water source with ID and water quality
- Piped water scheme billing and others
- Emergency response

- Individual piped water scheme running status
- Piped water scheme structure design from engineering design images

### 3.5 Information or data validation:

Develop the interface to validate the information and data entered into the system with certain cross and checks built into the system to eliminate the error. The data entry module should have an option of maker/checker where data entry by one staff member can be approved/ disapproved by assign senior staff member with live chat feature in the system for comments, suggestions.

### 3.6 Training on the use and operation

- a) Preparation of Training manual and user manual
- b) Capacity building of IT personnel to update and maintain the application
- c) Training to post, update and handling the application system.

### 3.7 Other services

- a) Technical Support for databases (update, backup, restoration and maintenance) will be up to the contract period, which will start from the date of final installation and delivery. System should have the provision for updating data in higher version of server with higher Environment.
- b) System should be developed in English language.
- c) Troubleshooting, tuning, data export-import, backup etc. for databases.
- d) Technical Support for installation, configuration, and deployment of application servers.
- e) Technical support for the Web Application (deployment of updates) will be up to the contract period, which will start from the date of final installation and delivery.
- f) IT Firm will provide SSL Certificate for secured protocol of the Web Application.
- g) IT Firm will create and set up a Google Play store and Apple Store account for DPHE for Android and IOS App Deployment.
- h) Technical support for mobile applications (deployment of updates) will be up to the contract period, which will start from the date of final installation and delivery.
- i) Bug fixing and upgrading of the Web Application and Mobile Application.
- j) IT Firm will provide Google Maps API usage up to the free limit according to Google's Policy. \*\*Google allows \$200 per month free usage for used services.
- k) Testing and validating by government authority.

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- l) Ownership: Once the web and mobile application has been completed, tested and validated as per Govt ICT policy, and accepted by the DPHE, the software and apps with source code, Database and architecture become property of DPHE.

### 3.8 Warranty

Warranty period will be 2 years after completion of the project.

## 4. Infrastructure Management

Vendor needs to arrange a proactive infrastructure team to handle all infrastructure related issues continuously for ensuring smooth service of this platform across the country as well as globally.

- Configure necessary Staging & Production server.
- Continues server monitoring sizing and tuning.
- Security: Protection & security of content, hosting environment, servers, network elements, access & network must be ensured.
- Ensure Instant Modular expandability option of cloud computing resources using cloud resource control & configuration panel.
- Ensure Instant Internet IP address & bandwidth increase & expansion ready arrangement to accommodate scalability, user growth & integration to other systems.
- Ensure System software back-up at DR site.
- Monitor user experience of IP & Suggest performance development requirements supported by analysis & findings of such monitoring.
- Online UPS for electric backup.
- Ensure CCTV IP camera coverage.
- All entry and exist point must have security door lock and facial recognition system.
- For data Centre, 02 Air-conditions should be installed.
- Mirror server setup at DPHE MIS unit and configuration should done according to government ICT standard.

## 5. Technology Specification

The vendor will follow the TOGAF or any other industry accepted and widely used open source-based technologies, frameworks, platforms and guidelines. Following are some technical specifications which vendor should consider as reference but not as the ultimate method of implementing National Portal platform. Technology Specification may change in real-time based

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on the context of the project and future trend.

- Common data platform
- Open-Source PHP/any updated version Framework.
- eService bus (Enterprise Service Bus)
- Rule-based authorization support for SSO
- Bootstrap, jQuery and Ajax for best UX
- MySQL or any other open-source RDBMS
- Redis, Memcached, CDN or Varnish for caching and faster data delivery
- Must ensure load balancing for scalability and failover for high availability of service endpoints
- Code Version Controlling using GIT or Bitbucket in private mode
- Future technology change, iterative prototyping and agility in framework design are the generic expectation
- Kubernetes, for source version control and deployment management.
- Use government approved payment gateway if required.

## 6. Security

The vendor should follow any of the industry standard secure development methodology such as (but not limited to) Comprehensive Lightweight Application Security Process (CLASP) by OW ASP etc.

- The IT Firm will be expected to ensure the system is configured in such a way that data/information security and the security standards maintained according to industry standards.
- The vendor should consider (but not limited to) common vulnerabilities such as SQL Injection, Cross Site Scripting (XSS) etc.
- Vendor will undertake responsibility for Input Validation Controls, Authorization/Authentication Control and other security controls in place in both test and production environment of application.

The following vulnerabilities must be checked and ensured security from the beginning:

- Cross Site Request Forgery (CRSF)
- Cross Site Scripting (XSS)
- Session hi-jacking o Session Fixation
- SQL Injection
- Input Validation/Filtering
- Output Escaping
- Code Injection
- Secure File Access

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## 7. Maintenance of the Platform:

Major responsibilities under maintenance will be as follows:

- The selected vendor has to provide proactive maintenance and support services that will cover the followings (but not limited to) areas:
- Continuous monitoring of query execution in Database, tuning database and tuning codes & queries to minimize response time.
- Fixing all bugs in the system irrespective of its nature and complexities.
- Enhance and/or re-arrange existing feature of extended development of any supplementary feature within the existing technology framework complying with core SRS.
- Updating training manual adjusting the changes in the system.
- Adjust and update system in compliance with any security test, load test or IT audit conducted by the client.

### Multi-Layered Support from vendor:

Vendor will provide multi-layered user support which will cover the following activities (but not limited to):

#### **Layer 1 Support from Vendor:**

- Attain Phone Calls, checking emails
- List problems and initial troubleshooting
- Classify problems

#### **Layer 2 Support from Vendor:**

- Issues investigate
- Update Issue Tracking Tool (CRM)
- Escalate issues to 3rd Level

#### **Layer 3 Support from Vendor:**

- Bug Fixing: Source Code Modification, DB structure Change
- Transactional Data Fixing
- Wrong activities corrections
- Systems Monitoring
- 3rd level issues investigate and resolve and necessary Change Management.
- Regular System Maintenance

**Minimum SLA Terms to be complied:**

Vendor needs to comply the minimum SLA Terms & Conditions (subject to further discussion) during Maintenance Period which are given below:

- Deploying dedicated Support Engineers 9AM to 9PM (without Holiday) to address support issues.
- A service failure or severe degradation when users are unable to access any portal will be treated as **Critical Issue Level-1** and vendor should respond immediately that will not exceed 12 hours (subject to the discussion).
- A partial service failure or mild degradation when a bug is creating a significant impact to existing portal or application integration will be treated as **Critical Issue Level-2** and the vendor should respond immediately that will not exceed 24 hours (subject to the discussion).
- General Issues when users are able to access all portals will be treated as **Critical Issue Level-3** and vendor should respond immediately that will not exceed 24 hours (subject to the discussion).

**8. Guidelines for system development and design**

- a) The IT Firm shall adopt the design principles of Service Oriented Architecture (SOA) throughout the system.
- b) It should have web services-based Architecture to ensure flexibility and scalability.
- c) The system shall be designed in a simplified manner to avoid the need for specialized users and high maintenance overheads.
- d) The system should be robust to cope with errors during execution and cope with erroneous input.
- e) The proposed solution should be secured. The web applications will be hosted under the secure environment and could only be accessed through secured protocol.
- f) The system should be designed in such a way that it can be extended for larger dataset and map points without changing the core architecture and implementation.
- g) The web application and mobile app should have a unique yet consistent look and feel and align with DPHE's website. The use of font colors and layouts should be consistent throughout the site and should follow a common theme.

- h) The web application and mobile app should be easy to navigate, or in other words, to be able to find the expected data/information/section within the soonest possible time.

## 9. Deliverable and work schedule

Sl. No.	Activities	Deliverables
1	Preparation in Inception period	<p>Submission of <b><u>inception report</u></b> within 15 days that include:</p> <ul style="list-style-type: none"> <li>• Detail team mobilization</li> </ul> <p>Final detail action plan with timeline and specific milestone using Gantt Chart.</p>
2	Development of URS, SRS & User Interface Design	<p>Development of URS, SRS &amp; User Interface Design within 2<sup>nd</sup> month of signing the contract. IT Firm will develop and finalize in consultation with the concerned officers of DPHE:</p> <ul style="list-style-type: none"> <li>• User Requirement Specification (URS)</li> <li>• System Requirement Specification (SRS)</li> </ul> <p>Architectural Design document of the GIS/GPS based Monitoring and Evaluation Application System and other related documentation</p>
3	Development of Web and Mobile Application	<p>Development of Web and Mobile Application including full application, rolled out for field testing, piloting, data verification should be completed by 6<sup>th</sup> month. IT Firm will provide:</p> <ul style="list-style-type: none"> <li>• Database</li> <li>• Web Application</li> <li>• Mobile Application</li> </ul>
4	System Implementation and capacity building	<p>Completed System installment to user mobiles of all respective Offices, provide capacity building training and report generated based on the data provided by the users by 8<sup>th</sup> Month. The IT firm will ensure that the system has been tested and validated as per Govt ICT policy. Additionally, the IT Firm will provide:</p> <ul style="list-style-type: none"> <li>• Software (source code and installers)</li> <li>• System Manual</li> <li>• Installation Manual</li> <li>• User Manual</li> <li>• Training manual: High quality training manuals (user &amp; system) must be supplied. Besides, presentation slides and other</li> </ul>

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Sl. No.	Activities	Deliverables
		<p>audiovisual methods implied in the training will be available to user.</p> <ul style="list-style-type: none"> <li>Capacity building training for 300 Personnel of Upazila, district and central level.</li> </ul> <p>Reports must be provided after completion of training.</p>
5	Final report on assignment completion	<ul style="list-style-type: none"> <li>At the end of the assignment IT Firm will submit a completion report.</li> </ul> <p>IT Firm will submit the letter of copyright on the <b>Information Management and Visualization System for BD Rural WASH Project of DPHE.</b></p>
6	System maintenance and update	IT Firm will be responsible for System maintenance and update for next 04 (four) years.

*Target number of training participants is given in Annexure-1*

*Work schedule and planning for deliverables is given Aneexure-2*

## 10. Coordination

Monitoring Consultant of the project will provide necessary support to the IT Firm related with project information, relevant documents and assist to maintain linkage with PKSF. On the other hand, an assigned project manager needs to be made available by the IT Firm to present information and coordinate with DPHE. A reasonable number of meetings need to be organized to present the design and develop the solution by incorporating data and information.

## 11. Proposal and costs

The technical and financial proposal will include all relevant expenditures related to the IT services (including Tax, VAT and others as per Government rule). The cost will be expressed in Bangladeshi currency (BDT) and all payments will be made locally in the same currency. Tax, VAT and others (if any) will be deducted at source as per govt. rule.

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## 12. Mode of Payment

Payments will be made based on the following percentages and milestones:

- a) 1st Payment (10% of total contract value): The 1<sup>st</sup> payment will be made upon the submission and acceptance of a detailed work plan with specific milestones for accomplishment of all tasks in inception report within 15 days of signing the contract.
- b) 2<sup>nd</sup> Payment (20% of total contract value): The 2<sup>nd</sup> payment will be made upon submission and acceptance of the Development of URS, SRS & User Interface Design within the 2<sup>nd</sup> month of signing the contract.
- c) Third Payment (30% of total contract value): The 3<sup>rd</sup> payment will be made upon acceptance of the Development of Web and Mobile Application within the 6<sup>th</sup> month of signing the contract.
- d) Fourth Payment (20% of total contract value): The 4<sup>th</sup> payment will be made upon acceptance of the full application by the DPHE and successful completion of system implementation and capacity building within the 8<sup>th</sup> month of signing the contract.
- e) After completion of system development for operation & maintenance the remaining of the contract amount will be paid at yearly equal installments.

## 13. Qualification of IT Firm

- a) The firm must have experience of developing the digital service platform for the Government of Bangladesh/corporate sector.
- b) The firm must have the experience to implement and roll-out large-scale IT Projects in different areas (District, Upazila, Union etc.) across the country.
- c) The IT Firm must have minimum 07 years of experience in ICT business as a registered company/entity in Bangladesh.
- d) The IT firm must have proven experience/knowledge for handling large users database and data visualization platform at government/corporate sector.
- e) The IT Firm should have successful track record in developing and deploying decoupled applications and secured APIs that are interoperable and have integration facilities with multiple systems. A list of projects (minimum two) must be provided as a proof with work orders and completion certificates.
- f) The IT Firm should have a proven record of deploying at least one (01) large scale online monitoring and evaluation application integrated with a mobile app in government

organization or any internationally reputed organization that takes field level input with data from various workers and deposits the data to central server.

- g) Must have valid and up-to-date Trade license/Register of joint stock & companies (RJSC) registration, VAT, TIN certificate, Audit Report for last 3 years.

## 14. Team composition, qualification and responsibilities of key experts of the IT Firm

### 14.1 Team composition

The expert team for this assignment will be formed consisting of the following members:

- **One (01) Team Leader:** At least 10 years of experience with project related GIS Based M&E Application development.
- **One (01) Solution Architect:** At least 07 years of profound experience in the field of Software architecture design and analysis.
- **One (01) Security Expert:** At least 07 years of profound experience in the field of Software Security for ICT based application.
- **One (01) Database Administrator:** At least 07 years of experience in the field of database design, database management and administration.
- **Four (04) Software Developers:** At least 03 years of experience with project related to M&E Application development as software developer.
- **Two (02) Mobile App Developer (android developer):** At least 02 years of experience with project related to M&E Application development as android developer.
- **One (01) Graphics Designer:** At least 03 years of profound experience in the field of user interface design
- **One (01) UX Expert:** At least 03 years of profound experience in the field of user experience design.
- **One (01) QA Expert:** At least 03 years of profound experience in the field of software Quality assurance in application.
- **One (01) Technical Documentation Expert:** At least 02 years of profound experience in field of technical documentation.

- **One (01) Training Expert:** At least 03 years of profound experience in the field of user training of web-based application or Software.

#### 14.2 Man-month inputs of the key experts

Sl #	Staff	Duration	Month											
			1	2	3	4	5	6	7	8	9			
1	Team Leader	9	■	■	■	■	■	■	■	■	■	■	■	■
2	Solution Architect	1	■											
3	Security Expert	3	■	■	■									
4	Database Administrator	2	■	■										
5	Software Developer (4 persons)	9	■	■	■	■	■	■	■	■	■	■	■	■
6	Mobile Apps Developer (2 persons)	4	■	■	■	■								
7	Graphics Designer	2	■	■										
8	UX Expert	2	■	■										
9	QA Expert	6				■	■	■	■	■	■			
10	Technical Documentation Expert	2										■	■	
11	Training Expert	2											■	■

#### 14.3 Qualification and responsibilities of the key experts

Sl. No.	Positions	Person and month	Educational qualification and experience	Responsibilities
1	Team leader	1 person for 9 months	<ul style="list-style-type: none"> <li>• Master's degree in software engineering, computer science, or similar field.</li> <li>• Bachelor's degree in software engineering, computer science, or similar field.</li> <li>• Minimum 5 years of experience as IT team leader/ project manager.</li> <li>• Relevant experience on taking projects related to M&amp;E Application development.</li> <li>• Demonstrated capacity in reports writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Overall management of the project related with role assignment, system analysis, planning, interface design, user manual design, training module design and report preparation.</li> <li>• TL is responsible for all deliverables under the contract in a timely manner with acceptable standards.</li> <li>• Ensure close cooperation with DPHE-PMU when needed.</li> <li>• Carryout all other tasks and activities needed for successful implementation of the project.</li> </ul>

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Sl. No.	Positions	Person and month	Educational qualification and experience	Responsibilities
2	Solution Architect	1 person for first 1 month	<ul style="list-style-type: none"> <li>• Master's degree in software engineering, computer science, or similar field.</li> <li>• Bachelor's degree in software engineering, computer science, or similar field.</li> <li>• Minimum 3 years of experience as solution architect.</li> <li>• Relevant experience on taking projects related to M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct an architectural system evaluation.</li> <li>• Analyzing the technology environment.</li> <li>• Analyzing and documenting requirements.</li> <li>• Setting the collaboration framework.</li> <li>• Define a procedure and process to ensure solution delivery.</li> <li>• Creating a solution prototype.</li> <li>• Participating in technology selection.</li> <li>• Controlling solution development.</li> <li>• Supporting project management.</li> </ul>
3	Security Expert	1 person for first 3 months	<ul style="list-style-type: none"> <li>• Master's degree in software engineering, computer science, or similar field.</li> <li>• Bachelor's degree in software engineering, computer science, or similar field.</li> <li>• Minimum 3 years of experience as security expert.</li> <li>• Vendor Certification e.g. ISSP/CEH/ISO/CISA/CISM is expected.</li> <li>• Relevant experience on taking projects related to M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze IT specifications to assess security risks.</li> <li>• Design and implement safety measures and data recovery plans.</li> <li>• Secure networks through firewalls, password protection and other systems.</li> <li>• Inspect hardware for vulnerable points of access.</li> <li>• Draft policies and guidelines.</li> <li>• Ensure system security requirements are achieved.</li> </ul>
4	Database administrator	1 person for first 2 months	<ul style="list-style-type: none"> <li>• Master's degree in software engineering, computer science, or similar field.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing, developing, and maintaining the database.</li> <li>• Perform performance monitoring and necessary database tuning.</li> </ul>

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Sl. No.	Positions	Person and month	Educational qualification and experience	Responsibilities
			<ul style="list-style-type: none"> <li>• Bachelor's degree in software engineering, computer science, or similar field.</li> <li>• Minimum 3 years of experience as database administrator.</li> <li>• Relevant experience on taking projects related to M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Perform required troubleshooting.</li> <li>• Ensure database security.</li> <li>• Perform database backup and recovery.</li> <li>• Prepare technical documentation for the database system.</li> </ul>
5	Software developers	4 persons for 9 months	<ul style="list-style-type: none"> <li>• Bachelor's degree in software engineering, computer science, or similar field.</li> <li>• Minimum 3 years of experience as software developer.</li> <li>• Relevant experience on taking projects related to GIS based M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Developing the web portal including all required features.</li> <li>• Design, Develop &amp; Deploy required API systems.</li> <li>• Ensure system security and compatibility.</li> <li>• Prepare technical documentation for the web portal system.</li> <li>• Aid team leader in preparing user manual for the web portal system.</li> </ul>
6	Mobile App developer	2 persons for first four months	<ul style="list-style-type: none"> <li>• Bachelor's degree in software engineering, computer science, or similar field.</li> <li>• Minimum 2 years of experience as android app developer.</li> <li>• Relevant experience on taking projects related to GIS based M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Developing the android application including all required features.</li> <li>• Ensure proper offline and online usage functionality.</li> <li>• Ensure proper design for future iOS application development.</li> <li>• Prepare technical documentation for the android application.</li> <li>• Aid team leader in preparing user manual for the android application.</li> </ul>

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Sl. No.	Positions	Person and month	Educational qualification and experience	Responsibilities
7	Graphics Designer	1 person for first 2 months	<ul style="list-style-type: none"> <li>• Bachelor's degree in any relevant subject.</li> <li>• Minimum 3 years of experience as database administrator.</li> <li>• Relevant experience on taking projects related to M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Study design briefs and determine requirements.</li> <li>• Conceptualize visuals based on requirements.</li> <li>• Develop illustrations, logos and other designs using software or by hand.</li> <li>• Use the appropriate colors and layouts for each graphic.</li> <li>• Work with copywriters and creative director to produce final design.</li> <li>• Ensure final graphics and layouts are visually appealing and on-brand.</li> </ul>
8	UX Expert	1 person for first 2 months	<ul style="list-style-type: none"> <li>• Bachelor's degree in software engineering, computer science, or similar field.</li> <li>• Minimum 3 years of experience as UX expert.</li> <li>• Relevant experience on taking projects related to M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand product specifications.</li> <li>• Facilitate the client's product vision and conduct concept and usability testing.</li> <li>• Find creative ways to solve UX problems (e.g. usability, findability).</li> <li>• Work with UI designers to implement attractive designs.</li> <li>• Communicate design ideas and prototypes to developers.</li> </ul>
9	QA Expert	1 person for last 6 months	<ul style="list-style-type: none"> <li>• Bachelor's degree in software engineering, computer science, or similar field.</li> <li>• Minimum 3 years of experience as QA expert.</li> <li>• Relevant experience on taking projects related to M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensuring product quality and release readiness.</li> <li>• Create test plans and perform manual and automated testing to identify, isolate, and track bugs throughout testing.</li> <li>• Perform and document risk analysis to identify any potential problems that users might encounter.</li> <li>• Record test progress and results and document the test cases.</li> </ul>

Sl. No.	Positions	Person and month	Educational qualification and experience	Responsibilities
10	Technical Documentation Expert	1 person for last 2 months	<ul style="list-style-type: none"> <li>• Bachelor's degree in software engineering, computer science, or similar field.</li> <li>• Minimum 2 years of experience as technical documentation expert.</li> <li>• Relevant experience on taking projects related to M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Collaborate and confer with stakeholders to document subject material and technical specifications.</li> <li>• Develop, gather, and disseminate technical information.</li> </ul>
11	Training Expert	1 person for last 2 months	<ul style="list-style-type: none"> <li>• Bachelor's degree in any relevant subject.</li> <li>• Minimum 3 years of experience as training expert.</li> <li>• Relevant experience on taking projects related to M&amp;E Application development.</li> <li>• Competence in relevant report writing in English.</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare training materials.</li> <li>• Organize and facilitate training sessions.</li> <li>• Prepare report on conducted training sessions.</li> </ul>

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Annex-1: List of working area and target number of personnel of Training on digital MIS

Sl. No.	Division	District	Upazila	Number of District level participants	Number of Upazila level participants	Total number of participants	Number of training batches	
1	Mymensingh	Jamalpur	Jamalpur Sadar	3	2	35	2	
2			Madarganj		2			
3			Melanda		2			
4			Sarishabari		2			
5		Mymensingh		Bhaluka	3			2
6				Fulpur				2
7				Haluaghat				2
8				Gouripur				2
9				Muktagacha				2
10				Trishal				2
11				Sherpur				Nalitabari
12		SherpurSadar						2
13		Sreebardi						2
<b>Total: Mymensingh</b>		<b>3</b>	<b>13</b>	<b>9</b>	<b>26</b>			
14	Rangpur	Gaibandha	Gaibandha Sadar	3	2	46	2	
15			Gobindaganj		2			
16			Palashbari		2			
17			Sagatha		2			
18			Sadullapur		2			
19			Fulchari		2			
20		Kurigram		Kurigram Sadar	3			2
21				Chilmari				2
22				Roumari				2
23				Char Rajibpur				2
24				Fulbari				2
25				Ulipur				2
26				Bhurangamari				2
27				Nageswari				2
28		Rajarhat		2				
29		Lalmonirhat		Hatibandha	3			2
30	Nilphamari			Jaldhaka	3	2		
<b>Total: Rangpur</b>		<b>4</b>	<b>17</b>	<b>12</b>	<b>34</b>			

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Sl. No.	Division	District	Upazila	Number of District level participants	Number of Upazila level participants	Total number of participants	Number of training batches	
31	Chattogram	Brahmanbaria	Akhaura	3	2			
32			Bancharampur		2			
33			Nabinagar		2			
34			Brahmanbaria Sadar		2			
35		Chandpur	Chandpur	Chandpur Sadar	3			2
36				Haimchar				2
37				Matlab Dakshin				2
38				Matlab Uttar				2
39				Faridganj				2
40				Kachua				2
41				Hajigonj				2
42				Shahrasti				2
43		Chattogram	Chattogram	Boalkhali	3			2
44				Mirersarai				2
45				Patiya				2
46				Sandwip				2
47				Chandanaish				2
48				Sitakunda				2
49				Bashkhali				2
50				Cumilla	Cumilla			Sadarsouth
51		Daudkandi						2
52		Titas						2
53		Homna						2
54		Laksam						2
55		Monoharganj						2
56		Lalmai						2
57		Nagolkot						2
58		Feni	Feni	Feni Sadar	3			2
59				Chagalnaiga				2
60				Dagonbhuya				2
61		Laksmipur	Laksmipur	Laksmipur Sadar	3			2
62				Raipur				2

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Sl. No.	Division	District	Upazila	Number of District level participants	Number of Upazila level participants	Total number of participants	Number of training batches	
63		Noakhali	Ramganj		2	93	4	
64			Companyganj	3	2			
65			Subarnachar		2			
66			Kabirhat		2			
<b>Total: Chattogram</b>		<b>7</b>	<b>36</b>	<b>21</b>	<b>72</b>			
67	Sylhet	Sylhet	Golapganj	3	2	36	2	
68			Zakiganj		2			
69			Kanaighat		2			
70		Habiganj	Madhabpur	3	2			
71			Chunarughat		2			
72			Baniachog		2			
73		Sunamganj	Southsunamganj	3	2			
74			Dharmapasha		2			
75			Tahirpur		2			
76			Jagannathpur		2			
77		Moulvibazar	Moulavibazar	3	2			
78			Sadar		2			
<b>Total: Sylhet</b>		<b>4</b>	<b>12</b>	<b>12</b>	<b>24</b>			
79	Khulna	Khulna	Paikgacha	3	2	24	1	
80			Magura	Shalikka	3			2
81			Bagerhat	Morelganj	3			2
82				Mollah Hat				2
83			Jhenaidah	Moheshpur	3			2
84				Hornakunda				2
<b>Total: Khulna</b>		<b>4</b>	<b>6</b>	<b>12</b>	<b>12</b>			
85	Barisal	Barisal	Agoljara	3	2	19	1	
86			Hizla		2			
87			Pirojpur	Indurkani	3			2
88			Patuakhali	Rangbali	3			2
89				Kalapara				2
<b>Total: Barisal</b>		<b>3</b>	<b>5</b>	<b>9</b>	<b>10</b>			
90	Rajshahi	Pabna	Pabna Sadar	3	2			

Sl. No.	Division	District	Upazila	Number of District level participants	Number of Upazila level participants	Total number of participants	Number of training batches
91			Ishwardi		2		
92		Bogura	Sariakandi	3	2		
93		Chapai N'ganj	Nachol	3	2		
94			Gomostapur		2		
<b>Total: Rajshahi</b>		<b>3</b>	<b>5</b>	<b>9</b>	<b>10</b>	<b>19</b>	<b>1</b>
95	Dhaka	Rajbari	Pangsa	3	2		
96			Kalukhali		2		
97		Manikganj	Sibalaya	3	2		
98			Harirumpur		2		
<b>Total: Dhaka</b>		<b>2</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>14</b>	<b>1</b>
<b>Total participants: District &amp; Upazila level</b>						<b>286</b>	<b>14</b>
<b>Central Team including MIS-GIS Unit</b>						<b>14</b>	<b>1</b>
<b>Grand Total</b>		<b>30</b>	<b>98</b>	<b>90</b>	<b>196</b>	<b>300</b>	<b>15</b>

Annexure 2: Work schedule and planning for deliverables

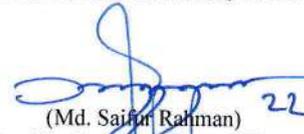
Sl. No.	Deliverables	Months								
		1	2	3	4	5	6	7	8	9
1	<b>Deliverable-1: Inception report</b>									
	a) Delivery of inception report									
	• Project data collection									
	• Team mobilization									
	• Revised action plan with timeline using Gantt Chart.									
	• Draft inception report									
	• Incorporating comments and finalization of inception report									
2	<b>Deliverable-2: Development of URS, SRS &amp; User Interface Design</b>									
	a) Presentation of first demo of Web and Mobile Application									
	• User Requirement Specification (URS)									
	• System Requirement Specification (SRS)									
	• Architectural Design document of the GPS based Monitoring and Evaluation Application System and other related documentation									
3	<b>Deliverable-3: Development of Web and Mobile Application</b>									
	a) Database design and development									
	b) Web Application Development									
	• Web based admin module design and development									
	• Data review and authorization system development									
	• Web portal and dashboard development									

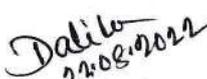
Sl. No.	Deliverables	Months								
		1	2	3	4	5	6	7	8	9
	• Web based GIS/GPS map platform development									
	• API development									
	• Data import (from excel files) system development									
	• Dynamic survey module development									
	• Data migration module development									
	c) Mobile Application Development									
	• User interface design and development									
	• Data capture (including GPS location) module development									
	• Data monitoring and reviewing module development									
	• Map features development									
	• Report display module development									
4	<b>Deliverable-4: System Implementation and capacity building</b>									
	a) System Manual									
	b) Installation Manual									
	c) User Manual									
	d) Training manual									
	e) Capacity building training 10 personnel of DPHE Central Team in 1 batch									
	f) Capacity building training for 286 personnel of district & upazila level in 14 batches									
	g) Report generation based on the data provided by the Upazila team									

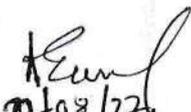
Sl. No.	Deliverables	Months									
		1	2	3	4	5	6	7	8	9	
5	Final report on assignment completion										
6	System maintenance and update for 4 years										Next 04 years

  
 22/06/22  
 (Sharmistha Debnath)  
 Executive Engineer,  
 Survey Investigation & Research Division,  
 Department of Public Health Engineering, Dhaka  
 &  
 Member Secretary, ToR Committee, DPHE

  
 22/08/22  
 (Mohammad Fayazul Islam Soman)  
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 &  
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