



# **Request for Proposal (RFP)**

**Development, Implementation and Services of  
Meter Reading App, Management Dashboard & NRW  
Monitoring Tool at CWASA Chattogram**

**announced by JICA DXLab**

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## Request for Proposal (RFP)

### Development, Implementation and Services of Meter Reading App, Management Dashboard & NRW Monitoring Tool at CWASA

April 2024

Office for STI & DX, Governance and Peacebuilding Department  
Japan International Cooperation Agency (JICA)

Electronic submission must be received at [JICADXLab@bcg.com](mailto:JICADXLab@bcg.com) by the latest 11:00 PM Bangladesh Standard Time on April 25<sup>th</sup>, 2024. The email subject needs to be changed to "RFP-CWASA-PoC", followed by your organization name (for instance, RFP-CWASA-PoC-Name). An information session for Bidders will be hosted on April 16<sup>th</sup>, 2024 (2:00 PM BST) to clarify questions related to the PoC and the proposal submission. Bidders need to email at [JICADXLab@bcg.com](mailto:JICADXLab@bcg.com) with email subject "RFP-CWASA-PoC", followed by your organization name by April 15<sup>th</sup>, 2024 to receive the online link for the information session.

## 1 Background

### 1.1 Announcing bodies

Japan International Cooperation Agency (“**JICA**”), an implementing agency for Japan's Official Development Assistance (“**ODA**”), believes that cooperation with developing countries in the digital age needs to change fundamentally. As such, JICA has launched the **JICA DXLab**, an open innovation mechanism to facilitate co-creation with Digital Partners to transform ODA projects with digital technology and innovation.

Chattogram Water Supply and Sewerage Authority (“**CWASA**”) was first established in 1963 by Ordinance No.19 of the erstwhile government of East Pakistan to have overall responsibility for the operation and management of the water supply and sanitation services to the City of Chattogram (aka Chittagong) and its designated suburban areas. It was re-established in 1996 through the enactment of the WASA Act 1996 and gazetted as a water and sewerage Authority in 2008. The Authority is charged with the responsibility of not only providing water supply but also sewerage and drainage services to the city of Chattogram.

CWASA’s vision is to be Bangladesh's most efficient water supply and sewerage authority. Its mission is to provide quality water supply, sewerage and drainage services in the most cost-effective manner applying appropriate technologies that are environmentally friendly.

As a collaborative effort between JICA DXLab and CWASA, this request for proposal (“**RFP**”) looks for a player to serve as a technology solution provider (“**Digital Partner**”) in a Proof of Concept (“**PoC**”) for the development and implementation of three major initiatives:

- Meter Reading App
- Management Dashboard
- Non-Revenue Water (“NRW”) Monitoring Tool

The PoC is expected to be launched in May and upon successful completion of the PoC, CWASA may continue to work with the Digital Partner to improve solutions and provide managed services. The PoC will run for 6 months. Contracting authority will discuss the requirements of managed services for subsequent periods once the PoC implementation has been initiated.

## 1.2 Problem statement

CWASA is embarking on a transformative journey to enhance operational efficiency, improve customer service, and tackle the escalating water management challenges precipitated by rapid urbanization and population growth in Chattogram. This ambitious PoC stems from CWASA's commitment to innovation and sustainable development, aiming to modernize its existing infrastructure and operational practices to serve the city's growing needs better. Aligning with global digital transformation trends, CWASA's initiative positions it as a leader in innovative water management, supporting sustainable development by ensuring efficient water supply and sanitation services.

- Meter Reading App: Currently, CWASA relies on a traditional pen-and-paper based method for meter reading, data entry, and bill printing. This approach, while functional, offers limited visibility into field force operations and contributes to an extended meter-to-cash cycle of about 12 weeks and results in billing inaccuracies due to the manual nature of meter reading and recording. CWASA aims to streamline this cycle to 8 weeks or less by transitioning to digital processes. The digitization of the meter-to-cash process is expected to improve operational efficiency and enhance customer satisfaction and CWASA revenue by providing accurate, transparent billing and service delivery.
- Management Dashboard: A key component of this digital transformation, the dashboard will serve as a central platform for data-driven decision-making, enabling CWASA to monitor key performance indicators, analyze trends, and make informed strategic and operational decisions. Currently, a monthly MIS report and other daily / monthly reports are generated and circulated through hardcopies / PDFs. In addition, ad-hoc management reports are generated for specific meetings. However, these reports are sporadic and don't address the key day-to-day governance issues. The envisioned dashboard will facilitate better planning, resource allocation, and responsive actions to operational challenges, ultimately supporting CWASA's future growth and positioning it as a leader in innovative water management.
- NRW Monitoring Tool: NRW represents water that has been produced but not billed, due to various factors such as leaks or billing inaccuracies. A significant area of focus for CWASA is the reduction of NRW, which currently stands at approximately 31% (as of

Nov 2023). Good practice range for NRW seen globally is 5-10%, and CWASA intends to achieve this target by utilizing data from SCADA systems to identify areas with high leakage and solving for those through operational interventions. This initiative is crucial for optimizing resource utilization and enhancing the financial sustainability of CWASA's operations.

The success of these initiatives will lay the foundation for a comprehensive digital ecosystem, enhancing CWASA's ability to manage its resources effectively, respond to customer needs proactively, and navigate the challenges of water supply and sanitation in an urbanizing world. Together, these efforts will propel CWASA towards its goal of sustainable development and operational excellence, ensuring a reliable water supply for Chattogram's residents.

## **2 About CWASA**

Chattogram city is served by two rivers, namely Halda and Karnaphuli. Halda river is a tributary of the Karnaphuli River, and it merges with the Karnaphuli River. Water Treatment Plants are located along these two rivers that intake, treat and pump water to Chattogram city for distribution.

CWASA serves roughly 2.3 million consumers, with ~93,000 connections (of which ~87,000 are billable). The total length of the pipe network is 962 kilometers. Daily water production is approximately 500 million liters per day (MLD), which includes water sourced from deep tube wells (DTWs) (details in Attachment 2).

CWASA has recently completed the KWSP project, funded by JICA, which includes the development of Sheikh Hasina Phase 1 & 2 WTP (production capacity 286 MLD), conveyance, transmission and distribution pipelines and reservoirs/tanks. The KWSP project also developed 59 District Metered Areas (“DMAs”) within the Karnaphuli Service Area (marked by pink border in Figure 2). The WTP, Reservoirs, Boosting Stations and DMAs have digital flow meters and pressure sensors. The water production and distribution are monitored using SCADA systems at respective WTPs and the SCADA control room at Nasirabad. In addition to this, Sheikh Rasel WTP (production capacity 90 MLD) is also equipped with the SCADA system.

Based on the presence of DMAs, Chattogram city can be broadly segregated into two parts – KSA (Karnaphuli Service Area) and non-KSA.

- KSA has 59 DMAs within it. It is a densely populated region comprising the central part of the Chattogram. There are ~47,000 connection in KSA.
- Non-KSA is relatively less densely populated than KSA region of Chattogram with ~43,000 connections. There are no DMA in the non-KSA region.

There are 5 major water production sources – 4 Water Treatment Plants and DTWs.

S No	Production Unit
1	Sheikh Hasina Pani Shoddhonagar (Water Treatment Plant) Phase – 1 (143 MLD)
2	Sheikh Hasina Pani Shoddhonagar (Water Treatment Plant) Phase - 2 (143 MLD)
3	Sheikh Rasel Pani Shoddhonagar (Water Treatment Plant) (90 MLD)
4	Mohara Water Treatment Plant (90 MLD)
5	A total of 45 DTWs

The operations can be divided into 4 Maintenance, Operations & Distribution (MOD) divisions as per Attachment 4. Each MOD is responsible for maintenance and repair of existing pipe infrastructure and water distribution to end-consumers in their respective zones.

### 3 Objectives of the PoC

The objective of this PoC is to partner with a digital technology solution provider to develop and implement a PoC for CWASA that includes three key initiatives: a Meter Reading App, a Management Dashboard, and a Non-Revenue Water (NRW) Monitoring Tool. This collaboration aims to enhance operational efficiency, improve customer service, and address water management challenges in Chattogram by leveraging digital technology and innovation.

#### Meter Reading App:

- The Meter Reading App will digitize and streamline the entire meter-to-cash process, replacing the current manual and paper-based system.
- It will facilitate real-time meter reading data capture, improve billing accuracy, and shorten the billing cycle to enhance revenue collection.
- The app would also help in faster meter reading uploads, improved customer account management, geotagging for location verification, and support for on-the-spot billing with mobile printers.

#### Management Dashboard:

- The Management Dashboard aims to centralize data-driven decision-making and improve overall operational governance.
- It will serve as a one-stop platform for CWASA's leadership team to monitor, analyze, and visualize key performance indicators in real time.
- The dashboard will enhance strategic planning, enable efficient resource allocation, and provide actionable insights to respond swiftly to operational challenges.



### **NRW (Non-Revenue Water) Monitoring Tool:**

- This tool is designed to systematically identify, monitor, and manage areas of water loss throughout CWASA's distribution network.
- It will use data from SCADA systems and other sources to potentially localize leaks, unauthorized consumption, or inaccuracies in metering and billing.
- The tool will support the analysis of water accounting, conduct water audit trails, and integrate geospatial analytics to visualize NRW across different sectors and DMAs.

Each of these initiatives plays a crucial role in achieving CWASA's vision of transforming into a technologically advanced and efficient water utility service provider. The successful execution of the PoC, running tentatively from May 2024 to October 2024, may lead to further development, improvement of solutions, and provision of managed services by the selected Digital Partner in alignment with JICA DXLab and CWASA's goals for sustainable development and efficient water supply and sanitation services.

## **4 Eligibility Requirements**

Bidder must meet the eligibility requirements for their Technical Bid to be evaluated. In case of sub-contractors, the lead Bidder must individually meet all the requirements in the eligibility criteria. For consortium bids, a maximum of two companies can participate: one serving as the lead bidder and the other as a member of the consortium. (Detailed criteria in attachment 5)

## **5 Related Parties**

- **Primary Users:**
  - **Meter Reading App:** 40 CWASA Meter Inspectors (“MIs”) in 2024; 80-100 CWASA MIs 2025 onwards
  - **Meter Reading App Admin Portal:** CWASA Revenue team leadership, including the Commercial Manager, Chief Revenue Officer, Revenue Officers & Supervisors, and the ICT team.
  - **Management Dashboard:** CWASA leadership team (~50)
  - **NRW monitoring tool:** Chief Engineer, Superintending engineer (MOD), Superintending engineer (T&P), Executive Engineers of MOD, WTPs, Reservoir and Boosting Stations
- **Contractor:** The Digital Partner to be selected through this tender.
- **Orderer:** The Japanese contractor, engaged by JICA DXLab, facilitates the execution of the PoC, with the JICA DXLab contractor acting as the contracting counterparty.

## 6 JICA DXLab's Strategic Work at CWASA

Over the past 8 weeks, JICA DXLab has been intensely engaged in laying the foundational work for the PoC with CWASA by meticulously designing a detailed framework that aims to streamline and enhance the water utility's operational efficiency through digital transformation. This effort involved several key activities:

- **Stakeholder Consultations:** JICA DXLab conducted a series of consultations with various CWASA officials to understand the unique challenges and requirements of the water utility. These discussions provided invaluable insights into the existing processes and highlighted areas where digital interventions could significantly improve.
- **Requirement Gathering:** JICA DXLab gathered detailed requirements directly from the end-users and managers at CWASA through workshops and meetings. This step was crucial for ensuring that the solutions developed would be practical, user-friendly, and address the core needs of the authority.
- **Process Analysis:** JICA DXLab thoroughly analyzed CWASA's current meter reading, billing, and NRW management processes. This analysis helped identify inefficiencies, bottlenecks, and opportunities for process optimization through digital solutions.
- **Solution Design:** Leveraging the insights gained from stakeholder consultations and process analysis, JICA DXLab designed detailed digital solutions. This included conceptualizing a Meter Reading and Billing App (MRA), a Management Dashboard, and an NRW Monitoring Tool tailored to the operational context of CWASA.
- **Functional Requirement Specification (FRS) Documentation:** The outcomes of the solution design phase were meticulously documented in a Functional Requirement Specification (FRS). This document outlines the technical and functional specifications of the proposed digital solutions, serving as a comprehensive guide for the development phase.
- **Implementation Strategy:** JICA DXLab also developed a strategic implementation plan that outlines the phased rollout of the digital solutions, including timelines, key milestones, resource allocation, and risk management strategies.

The groundwork laid by JICA DXLab in these 8 weeks is to ensure that the selected Bidder has a clear and actionable blueprint to follow. It's designed to accelerate development by providing a well-defined starting point, reducing uncertainties, and aligning expectations. However, it is acknowledged that the dynamic nature of PoC execution will necessitate modifications or further detailing of the FRS to adapt to new insights, technological advancements, or changing needs of CWASA.

## 7 Scope of Work

To actualize CWASA's vision of digital transformation and operational excellence, we seek a Digital Partner with the expertise and innovative capacity to develop and implement three initiatives:

1. Meter Reading App to digitize the meter-to-cash process to streamline operations and enhance customer satisfaction.
2. Management Dashboard for strategic planning and data-driven decision-making.
3. Non-Revenue Water (NRW) Monitoring Tool to monitor water loss across the entire value chain from production to consumption by end-consumers.

The Digital Partner will play a crucial role in leveraging technology to optimize CWASA's water management practices. Contracting authority will discuss the requirements of managed services for subsequent periods once the PoC implementation has been initiated.

### 7.1 Design and delivery of Meter Reading App.

- PoC Design:
  - Current process: From manual meter reading to bill printing, highlights a traditional approach for billing and collection. While effective, it involves multiple manual steps that could be prone to errors and inefficiencies. Modernizing this process with digital tools and automated systems could significantly enhance accuracy, efficiency, and customer satisfaction. (detailed current process in attachment 6.1)
  - To-be process: The MIs use a new app for meter reading, authenticating themselves and inputting readings with photo proof and geotagging. If readings are anomalous or meters are faulty, escalation occurs for further action or approval. Bills are generated and can be printed on-site or paid online, with real-time synchronization for online payments. (detailed to-be process in attachment 6.2)
  - Features to be developed for the Meter reading app. (detailed features list in attachment 6.3):
    - **Login & Authentication:** Ability to authenticate MIs for logging into the app. Ability to request authentication every 1 hour on the MI's device.
    - **Roster:** Ability to manage and assign meter reading schedules to MI randomly. No MI should visit the same home in consecutive 12 billing cycles.
    - **Route Sequencing:** Ability to create optimized travel routes for MIs
    - **Meter Reading:** Ability to record meter reading input by the MI into the Meter Reading App

- **Data Field Verification:** Ability to validate input data in real-time to ensure against common data error (negative or very low values etc.)
- **Photo Upload:** Ability to upload photos of meters as proof of reading and for verification purposes.
- **Location Verification (Georeferencing):** Ability to validate location of meter readings (within 50m of the consumer's GPS coordinates)
- **Spot Printing:** Ability to provide on-the-spot bill printing services immediately after meter reading using a handheld portable printer. The printed bill to include QR code for payments.
- **QR code for Bill Payments:** ability to generate QR code for spot payments for bKash payment portal for CWASA
- **Real-time Meter Reading Data Upload:** Ability to upload meter reading data instantly to the online water billing system for real-time updating and processing
- **Bill generation & Online Bill Posting:** Ability for automated creation and distribution of bills via digital means
- **Average Billing Alerts:** Ability to notify CWASA officials when their customer's meters are not read for an extended period.
- **Offline Functionality:** Ability of the app functions seamlessly without an internet connection for field operations when internet is not available.
- **Language Selection:** Offer language support for English and Bengali
- **Device Management:** Ability to whitelisted apps function on the devices.
- **Arrear Alerts:** Ability to alert customers about outstanding balances or overdue bills to encourage timely payments through SMS and emails.
- **Automated Notifications:** Ability to send timely SMS and emails notifications to customers and field personnel for appointments, billings, and important updates
- **Bill Generation for Tubewell:** Ability to generate bills for tubewell license fees for consumers with registered tubewell.
- **Elicit Promise to Pay (P2P):** Ability to record of P2P date for customers with high arrears
- **Issue Escalation:** Ability to lodge issues by MI regarding faulty meters, consumer malpractices etc.
- **Bill Generation for Tubewell:** Ability to generate tubewell bill for registered consumers

- Features to be developed for admin portal of Meter reading app (detailed features list in attachment 6.4):
  - **User Management:** Ability to manage user roles and access securely and efficiently. Option to modify the time interval for authentication request on MI device.
  - **Approval for bill generation:** Ability to approve bills with amounts outside the defined range
  - **Billing and Payment Monitoring:** Ability to track and manage billing and payments.
  - **Customer Management:** ability to view detailed account management with the option to change key fields by admin privileges
  - **Device and App Management:** Ability to whitelist or blacklist apps that are allowed on devices of MI
  - **Notification Management:** Ability to define logic for triggering SMS and Emails to consumers
  - **Issue Tracking and Escalation:** Option for RO/RS/CRO to close issues raised by MIs
- Key integration requirements:

Sr No	System	Current State
1	Online Water Billing System	Currently, it is maintained by the ICT team and hosted on on-prem servers. Digital Partner to integrate with the same.
2	Authentication System	To be developed by the Digital Partner
3	Roster and Route Sequencing	To be developed by the Digital Partner. The algorithm will run on the backend and pushed to the Meter Reading App
4	Shape File	Shape File would be provided for location validation. Currently, it is located in the Infrastructure Information Management System
5	Photo Upload	To be developed by the Digital Partner
6	Notifications & Alerts	SMS Gateway is maintained by the ICT team. Digital Partner to integrate with SMS gateway for sending notifications & alerts
7	Security & Device Management	To be developed by the Digital Partner
8	Issue Creation & Tracking	To be developed by the Digital Partner

- The tentative count of screens shall be ~20 covering all features of the Meter Reading App and also the admin portal.
- Final go-live checklist can be found in attachment 6.5
- **PoC Implementation:** The implementation phase will focus on implementing the features. This phase will include the following tasks:
  - **Roll-out & Training:** The app will be deployed to MIs and relevant CWASA staff. This step includes organizing 5+ comprehensive training sessions to familiarize users with the app's functionality, interface, and operational procedures, ensuring they can leverage the solution effectively in their daily tasks. (also Refer to section 8)
  - **User testing:** The Digital Partner shall conduct user testing and usability studies across personas to validate the dashboards' effectiveness. The Digital Partner shall conduct user testing across various personas to assess the effectiveness of the Meter Reading App. Digital Partner to adopt a structured approach, working in 2-week sprints. Upon the conclusion of each sprint, the newly developed features to be validated with users from CWASA to ensure it meets users' needs and usability expectations.
  - **Adaptation:** Adapt and modify the solution based on the user requirements and the performance of the initial roll-out. Digital Partner should also incorporate feedback from CWASA after each sprint.
  - **Integration Testing:** Digital Partner to verify the seamless integration of the Meter Reading App with CWASA's existing billing and other systems to ensure that data flows smoothly between systems, enhancing efficiency and reducing the chances of errors in billing and customer data management.
  - **Field Trials:** Implement field trials by selecting a controlled group of MIs to use the app in real-world conditions. Identify any potential challenges that may arise during actual meter readings and incorporate the learnings, if any.
  - **Security Assessment:** Conduct a comprehensive security assessment to ensure the app's data handling, storage, and transmission processes comply with relevant data protection regulations and CWASA's security requirements.

## 7.2 Design and delivery of Management Dashboard

- **PoC Design.** The design phase will focus on furthering the understanding of the local requirements and developing a comprehensive plan for development of management dashboard by adjusting the proposed plan. The POC will only focus on Billing and Collections related KPIs. This phase will include the following tasks:

- **Wireframe design for Billing and collection dashboard:**
  - collaborate with in-house teams and stakeholders for feedback and iteration.
  - create design system or style guide to be used across all dashboard screens.
  - detailed annotations and documentation for the wireframes to guide development.
- **Features to be developed** (detailed features list in attachment 7.2)
  - Login & Authentication – Authenticate users for logging into the app
  - Three sections – KPI tracking, Analytics, and triggers & Report generation. (Proposed feature map in attachment 7.1)
  - Ability to create, view, modify, save trends and values of multiple KPIs through graphs and visualizations. (detailed KPIs list in attachment 7.3)
  - Ability to create, view, modify, save anomalies; generate and send triggers on breach of threshold values (detailed anomalies list in attachment 7.4)
  - Ability to create, view, save and send excel csv files (by email) of standard defined reports and generate new reports from available data sources (detailed reports list in attachment 7.5)
  - Ability to automatically send notifications to users via SMS and email about triggers
  - Offer multi-language support to cater to diverse customer preferences and enhance usability
  - Ability to give different access levels to different users for individual files or records, instead of just whole folders or databases.
  - Data ingestion: Data type and frequency of data ingestion vary across current and new sources of data in future. The partner is expected to implement solution to support the various scenarios.
  - Integrations required: Water Billing System, User authentication system, Notifications and Alerts system, Security and Device Management
- **PoC Implementation:** The implementation phase will focus on implementing the features. This phase will include the following tasks:
  - **Development in Sprints:** Development will proceed in two-week sprints, with each sprint concluding with a feature validation session involving CWASA users.
  - **Roll-out & Training:** Roll out the dashboard to users. The roll-out will include training sessions to ensure that the users are familiar with the solution and can use it effectively.

- **User testing:** The Digital Partner shall conduct user testing (detailed requirements in attachment 7.6) and usability studies across personas to validate the dashboards' effectiveness. The Digital Partner shall conduct user testing across various personas to assess the effectiveness of the Meter Reading App. Digital Partner to adopt a structured approach, working in 2-week sprints. Upon the conclusion of each sprint, the newly developed features to be validated with users from CWASA to ensure it meets users' needs and usability expectations.
- **Adaptation:** Adapt and modify solution based on the user requirements and the performance of the initial roll-out and the user feedback at the end of each sprint.
- **Integration Testing:** Digital Partner to verify the seamless integration of the dashboard with CWASA's existing billing and other systems to ensure that data flows smoothly between systems
- **Security Assessment:** Conduct a comprehensive security assessment to ensure the dashboard's data handling, and transmission processes comply with relevant data protection regulations and CWASA's security requirements.

### 7.3 Design and delivery of NRW monitoring tool

- **PoC Design.** The design phase will focus on furthering the understanding of requirements and developing a comprehensive plan for development of NRW Monitoring tool by adjusting the proposed plan. This phase will include the following tasks:
  - **Wireframe design:** develop wireframes and user interface designs for the dashboards
  - **Features to be developed** (detailed features list in attachment 8)
    - **Consumption Analytics:** Ability to track and forecast consumer water usage patterns, incorporating trends and seasonality, and identify significant deviations from expected consumption. Digital Partner will need to design and implement use cases to identify billing leakages / fraud / theft.
    - **Water Accounting:** Ability to calculate water inputs and consumption for sectors, DMAs, and reservoirs, using SCADA data and billing data to measure and manage Non-Revenue Water (NRW) and overall water losses. The water input / output / leakage for the different stages of the value chain will need to be calculated and showcased.
    - **Geospatial Analytics:** Ability to estimate revenue collection and outstanding arrears by area, leveraging billing data and locational insights to pinpoint areas with high deviations in water use. Digital Partner will need to design and implement use cases to identify billing leakages / fraud / theft.
    - **Pressure Analytics:** Ability to monitor and score water pressure quality across DMAs, identifying zones with consistently low pressure.



- **Supply Schedule Calculation:** Ability to use SCADA data to determine the total water supply time to DMAs, identifying areas with insufficient supply and ensuring equitable water availability.
- **Faulty Meter Detection:** Ability to detect malfunctioning meters and anomalous consumption patterns within DMAs or sectors using SCADA data.
- **Water Production Analytics:** Ability to assess performance and load factors of water treatment plants and boosting stations, offering insights into daily to yearly operations.
- **Water quality metrics tracking**
- **PoC Implementation:** The implementation phase will focus on implementing the features. This phase will include the following tasks:
  - **Roll-out & Testing:** Roll out the tool to users. The roll-out will include training sessions to ensure that the users are familiar with the solution and can use it effectively. (Also refer to section 8)
  - **User testing:** The Digital Partner shall conduct user testing and usability studies across personas to validate the tools' effectiveness. The Digital Partner shall conduct user testing across various personas to assess the effectiveness of the Dashboards. Digital Partner to adopt a structured approach, working in 2-week sprints. Upon the conclusion of each sprint, the newly developed features to be validated with users from CWASA to ensure it meets users' needs and usability expectations.
  - **Adaptation:** Adapt and modify the solution based on the CWASA requirements and the performance of the initial roll-out. Digital Partner should also incorporate feedback from CWASA after each sprint.
  - **Integration Verification:** Ensure the NRW Monitoring Tool integrates seamlessly with existing data sources, including SCADA systems, billing platforms, and other relevant operational technologies.
  - **Data Accuracy and Validation:** Validation and verification of data used and generated by the tool. This includes comparing tool outputs with historical data and conducting field validations to ensure the reliability and accuracy of NRW assessments.

## 7.4 Technology architecture

Catalogue of application and system currently used in CWASA in attachment 9. The following outlines the scope of capabilities expected to meet the 3 Application requirements:

- Meter Reading App
  - Mobile App (Android)

- MR Backend services
- Admin Portal
- Devices/Software to be procured:
  - Either:
    - Handheld printers (120) – (58mm or more, Bluetooth, Thermal Label Receipt Printer)
    - Handheld devices (120) – (Android 10 & above, 4 GB RAM or more, Camera with 5 MP resolution or more; Inbuilt storage of 128 GB or more, Bluetooth)
  - Or:
    - Handheld printers (120) – (56mm or more, Bluetooth, Thermal Label Receipt Printer), embedded with the phone (Android 10 & above, 2 GB RAM or more, Camera with 2 MP resolution or more; Inbuilt storage of 64GB or more, Bluetooth, GSM)
  - Mobile device management (if needed)
  - Printing Paper for Handheld printers (1200)
- Management Dashboard
  - Dashboards (can be custom built or vendor can leverage out of the box tools. However, please be advised to provide Licensing costs)
  - Devices/Software to be procured:
    - Handheld devices/ tablets (15) – (Android 13 & above, 8 GB RAM or more, Camera with 2 MP resolution or more; Inbuilt storage of 128 GB or more)
    - Data visualization software license (if needed)
- NRW Tool
  - Interactive Web app tool
- Simple Integration Layer
  - Simple SFTP (Secured with front end for users to upload files)
  - Simple API Management Gateway
- Data Platform Stage 1
  - Data Acquisition – able to execute simple data extract transfer and load
  - Data Storage (RDBMS, File Server, Blob storage)

- Data Consumption Layer – specialized data marts to be exposed to the Dashboards and App Tool
- Infrastructure Set-up
  - The System should be built on 2 Rack Servers – with the Digital Partner providing the specification of the server racks to purchase
  - Each rack will need to be leveraged physically as no virtualization is allowed for this build. The application should be virtualizable and portable.
  - Hardware to be procured – Bidder to specify detailed specs of server rack(s) with justification of the specification based on the solution and approach taken
- Data Localization
  - Data to be localized with local storage (Bangladesh) on the corresponding cloud services used.
  - Encryption of data in transit and at rest.
- Data backup and recovery
  - The Digital Partner needs to describe the data backup and recovery plans based on the RTO/RPO described in Nonfunctional Requirements
  - They also need to define the Response and recovery during a disaster - ideally hardware failure, network failure.
  - They also need to account for the associated costs while suggesting the specification of hardware to be procured.
- Data refresh frequency
  - This will be determined by the set-up of the solution by the Digital Partner.
  - Possible solutions: Data is pulled end of day to support activities

Please note:

- All software licenses to be procured should be "perpetual" licenses.
- All software and hardware procured must be available in Bangladesh. This will facilitate ease of procurement for CWASA should there be a need to acquire additional similar software/hardware in the future.
- All licenses for the procured software and hardware should be registered in the name of CWASA to ensure ownership and control over the deployed solutions.
- Vendor should be available for helping with relocation of physical servers in the next 3 years (post deployment).

## 7.5 Monitoring and Evaluation

- Monitor and evaluate the effectiveness of the solution through user testing
- Ongoing support and maintenance: Provide ongoing support and maintenance for the solutions during the implementation phase.
- All the provided solutions must meet the non-functional requirements as set out in attachment 10

## 7.6 Capacity Building and Implementation Support

The scope of work for Capacity Building and Implementation Support requirements encompasses strategic planning, stakeholder engagement, training, and support for the three key initiatives: the Meter Reading App, Management Dashboard, and Non-Revenue Water (NRW) Monitoring Tool. This detailed scope aims to ensure these initiatives are successfully adopted and utilized to their full potential by all relevant stakeholders.

- **Meter reading app**
  - **Stakeholder Identification and Engagement:** Identify and categorize stakeholders including meter readers, billing department staff, and IT support teams. Conduct workshops to understand their needs, concerns, and expectations.
  - **Technical Skills Enhancement:** Develop a continuous learning program to enhance the technical skills of the IT support team in managing and maintaining the app. This includes training on the latest mobile technologies, security protocols, and data management practices.
  - **Training and Support:** Design and deliver customized training programs for users, focusing on app navigation, data entry, and troubleshooting common issues. Admin training will cover the admin portal functionalities, user management, and data analysis. Establish a support desk for addressing queries and issues post-deployment.
  - **Adoption Monitoring:** Establish KPIs to monitor app usage and impact on decision-making processes. Use these metrics to encourage continuous engagement and identify additional training or support needs.
  - **Customization and Integration Training:** Train IT and operational teams to customize the app and integrate it with other existing IT systems.
- **Management Dashboard**
  - **Leadership Engagement:** Engage with senior management and decision-makers to align the dashboard functionalities with organizational goals and strategies.

- **Training and Support:** Organize training sessions for managers and analysts on interpreting dashboard metrics, generating reports, and leveraging data for strategic planning.
- **Adoption Monitoring:** Establish KPIs to monitor dashboard usage and impact on decision-making processes. Use these metrics to encourage continuous engagement and identify additional training or support needs.
- **Customization and Integration Training:** Train IT and operational teams to customize the dashboard and integrate it with other existing IT systems.
- **Non-Revenue Water (NRW) Monitoring Tool**
  - **Cross-Functional Team Formation:** Train a cross-functional team including technical experts, operational staff, and financial analysts to oversee the NRW tool's implementation and usage.
  - **Collaborative Workshops:** Conduct collaborative workshops with operations, maintenance, and engineering teams to align on objectives, share insights on water loss control, and integrate the NRW tool into daily operations.
  - **Technical Training:** Provide technical training on the use, maintenance, and troubleshooting of the NRW monitoring tool, including data interpretation and action planning based on insights.
  - **Training and Support:** Develop comprehensive training materials and operational guidelines for using the NRW tool, focusing on data interpretation, leak detection, and preventive maintenance planning.
  - **Adoption Monitoring:** Establish KPIs to monitor tool usage and impact on decision-making processes. Use these metrics to encourage continuous engagement and identify additional training or support needs.
  - **Customization and Integration Training:** Train IT and operational teams to customize the tool and integrate it with other existing IT systems.
- On the ground support from the Bidder during the 1-month stabilization phase to handhold the users

The Digital Partner can suggest additional activities for ensuring adoption of the PoCs by CWASA.

## 7.7 Reporting and others

- Generate interim and final reports on the PoC status and overall progress for the relevant stakeholders.
- Organize / participate in the following reporting sessions:
  - Weekly meetings with JICA and Orderer's working members

- An interim monthly review session with extended members of JICA and Orderer
- A final reporting session with extended members of JICA and the Orderer
- JICA DXLab seminars to be held both internally with JICA investment and evaluation teams, and externally with relevant stakeholders and potential clients interested in the Digital Partner’s solution.

## 8 Deliverables and timelines

The PoC's deliverables are categorized into software, hardware, documentation, and reporting segments, each with specific timelines based on the **date of issue of Letter of Intent (referred to as T0)**. These deliverables are essential for the successful implementation and operation of the PoC, ensuring that all components are developed, installed, and made operational within the stipulated timeframes. The contract is for 24 weeks starting from T0.

- T0: Issue of Letter of Intent (tentatively 3<sup>rd</sup> May 2024)
- Team Mobilization on ground: T0 + 1 week

S No	Category	Sub-category	Type	Tentative timeline
1	Software	Management dashboard	CUG launch	T0 + 12 Weeks
			All users Go live	T0 + 14 Weeks
			No P1 Issues pending	T0 + 18 Weeks
2	Software	NRW Tool	CUG launch	T0 + 14 Weeks
			All users Go live	T0 + 16 Weeks
			No P1 Issues pending	T0 + 20 Weeks
3	Software	Meter reading app	CUG launch	T0 + 18 Weeks
			All users Go live	T0 + 20 Weeks
			No P1 Issues pending	T0 + 24 Weeks
4	Hardware	Handheld devices (Android Mobiles and tablets)		T0 + 6 Weeks
		Servers – Installation and operationalization		T0 + 10 Weeks
		Handheld Devices, Portable Printers		T0 + 12 Weeks

*CUG = Controlled user group*

- Documentation deliverables
  - Training sessions:

**Table 8-1 Details of five training sessions to be conducted**

S No	Category	Content to be covered (non-exhaustive)	Audience	Tentative timeline
1	Management Dashboard	Overview of dashboard capabilities, custom report generation, data interpretation strategies, and decision-making insights.	~20 members including CWASA	T0 + 11 Weeks
			~60 members including CWASA	T0 + 13 Weeks
2	NRW Monitoring Tool	Training on the use of the NRW (Non-Revenue Water) tool, including data entry, analysis of water loss, and identification of areas for improvement.	~20 members including CWASA	T0 + 13 Weeks
			~60 members including CWASA	T0 + 16 Weeks
3	Meter Reading App	Operational training on app usage for field data collection, integration with central systems, and troubleshooting common issues	~20 members including CWASA	T0 + 17 Weeks
			~60 members, including MIs, Revenue Supervisor/ Officer from CWASA	T0 + 20 Weeks
4	Meter Reading Admin portal	Training for Revenue Supervisors/Officers, Chief Revenue Officers on usage of admin portal including approval for bills, identification of high arrears, bills outstanding by MI/Area etc.	~10 members including CWASA	T0 + 17 Weeks

			~20 members, including CWASA	T0 + 20 Weeks
5	Technology architecture	Detailed overview of the technical infrastructure, system architecture, security protocols, data flow, and maintenance procedures.	~10 members from IT staff and system administrators	T0 + 16 Weeks

The trainings need to be held in CWASA headquarters or in other suitable places in Chattogram. All trainings will be in-person trainings and the participants will be provided with detailed pre-read as well as training material. Trainings will be of ~3-4 hours (half working day) each and will be conducted in an interactive manner.

- User guide: Comprehensive user manuals for each software and hardware component, including:
  - Step-by-step instructions for setup, operation, and troubleshooting.
  - Best practices for users to maximize the efficiency and accuracy of their work.
  - Safety guidelines for handling devices and operating within different environments.
- Software documentation: Detailed technical documentation for all software deliverables, aimed at IT personnel and system administrators. This will cover:
  - Installation and configuration guides for servers, apps, and dashboards.
  - API documentation for integration with other systems or third-party services.
  - Security protocols, data handling practices, and compliance information.
- Capacity Building and Implementation Support:
  - Design of process/ governance model
  - Stakeholder engagement and communication plans
  - Detailed documentation of all training sessions' content
- Reporting deliverables (in English)
  - Monthly reports summarizing key activities, achievement, challenges faced in the month and plans for the following months
  - One final report that includes but not limited to
    - An outline of the result of the PoC.
    - Details of the PoC activities



- Technical, operational, and strategic recommendations
- Preliminary strategy proposal for the next phases.
- o Method of submission
  - Electronic data

Contracting authority will discuss the requirements of managed services for subsequent periods once the PoC implementation has been initiated.

## **8.1 Bidding and contractual process**

- Release of the Request for proposal: 10<sup>th</sup> April 2024, 9:00 AM BST
- Queries for the RFP to be submitted by 15<sup>th</sup> April 2024, 12:00 Noon BST. Format for the enquiries is provided in Attachment 15.
- Prebid conference & Response to potential Bidders' queries on 16<sup>th</sup> April 2024 2:00 PM BST
- Closing date and time for submission of Technical and password-protected Commercial proposal: 25<sup>th</sup> April 2024, 11:00 PM BST
- Eligible Bidders' presentations to be conducted on 29<sup>th</sup> April 2024 at CWASA headquarters WASA Bhaban, Dampara, Chattogram, Bangladesh. Potential Bidders are requested to make themselves available for the presentations. Meeting to be attended by teams from CWASA, JICA and Orderer.
- Sharing of Passwords for commercial bids by email 30<sup>th</sup> April 2024, 12:00 Noon BST
- Opening of commercial bids: 30<sup>th</sup> April 2024, 1:00 PM BST
- Bid evaluation result: 2<sup>nd</sup> May 2024
- Issue of Letter of Intent to Digital Partner (T0, tentative): 3<sup>rd</sup> May 2024
- Team Mobilization on ground: T0 + 1 week
- Contracting Authority: Orderer as appointed by JICA DXLab
- Orderer reserves its right to accept or reject any or all bids, abandon/cancel, modify the procurement process, and issue another RFP for the same or similar Services before the award of the contract. It would have no liability to the affected Bidder(s) or any obligation to inform them of the grounds for such action(s).
- Participation in only one bid: either as a lead or as a sub-contractor or any other form. Conditional offers, alternative offers, and multiple bids by a Bidder shall not be considered.

- Timelines mentioned above are tentative and may undergo a change as per the requirements

## 9 Proposal formats

Electronic submission must be received at JICADXLab@bcg.com by the latest 11:00 PM Bangladesh Standard Time on April 25<sup>th</sup>, 2024. The email subject needs to be changed to "RFP-CWASA-PoC", followed by your organization name (for instance, RFP-CWASA-PoC-Name).

The submission shall consist of the three separate files, Overview of General Information, Technical Proposal Pitch Deck, and Commercial proposal (password protected) all in the form of PDF. Note that all submission materials need to be prepared in English. The size of all files should be less than 70 pages each (minimum 12 font size).

### 9.1 Overview of General Information (PDF format)

Provide all the following information by filling out the forms provided in the Attachment 1.1.

### 9.2 Technical Proposal Pitch Deck (PDF format)

Your company's description and business/technical qualifications should be presented concisely in this order to include the following information:

- **Company overview**
  - This may include but is not limited to the company's history, structure and management, number of employees, location, and management policy.
- **Organizational capacity**
  - Overview on capability/ skill set in terms of experts in Bangladesh and globally
  - An overview of relevant experience: Highlight experience in developing and implementing custom technological solutions like mobile apps and management dashboard/ Data Visualization and Reporting System, Core Applications, IT-OT, data engineering, Customer applications development, Managed services, Hardware Deployment
- **Technical Proposal**
  - Proposed Solution/technology overview
    - Detailed description of the solution's technology, software, and hardware components and how the technologies will be integrated to achieve the PoC objectives.

- Implementing team structure and operating model
  - Detailed breakdown of roles and responsibilities of the PoC team, including a project manager, data engineers, software developers, solution architects, and any other relevant personnel.
  - The proposal should also describe the qualifications and experience of each team member, highlighting their relevant experience and expertise in developing and implementing technology-based solutions.
  - Duration in which the team plans to spend on the field should be clearly defined in the timeline.
- **A detailed implementation plan**, including the timeline and the resources required for the PoC.

Provide all the information by filling out the forms provided in the Attachment 1.2 to 1.5

### **9.3 Commercial Proposal**

1. Provide a total expected cost (after including all payable duties and taxes) and a detailed breakdown of the costs associated with the PoC, including personnel, hardware, and implementation resources. (Details in Attachment 1 Form 1.6)

Bidders may make inquiries/information requests by email to JICADXLab@bcg.com. For any inquiry, the email subject must be changed to “Inquiry-CWASA-PoC”, followed by your organization name (e.g., “Inquiry-CWASA-PoC-Name”). The deadline for receipt of inquiry is April 15<sup>th</sup> Bangladesh Standard Time. Format for the enquiries is provided in Attachment 15.

### **10 Evaluation criteria**

The selection process will be four-folds: 1) Candidates to submit responses to the RFP in a form of the pitch deck; 2) Eligible candidates will be shortlisted 3) Shortlisted candidates to give an oral presentation/Q&A in English based on the submitted pitch deck with key team members as part of the Bidder team in that presentation room and; 4) JICA DXLab to select the Digital Partner based on the results of the submitted documents and pitch/Q&A.

The overall score is out of 100, with a 30% weightage given to commercial scores and a 70% weightage to technical scores. Technical scores are further broken down into, credentials in software development (35 points), Approach (30 points), Team (30 points), and Financial Strength (5 points).

The Bidder will be evaluated based on the following technical criteria (detailed criteria in attachment 11.1) and commercial criteria (detailed criteria in attachment 11.2):

## Technical Criteria

- **Financial stability**
  - Average annual turnover in past 2 years
- **Credentials in software development - Organizational Capacity**

Relevant project experience in the following areas:

- Core Applications, IT-OT, data engineering
- Customer applications development
- Management dashboard/ Data Visualization and Reporting System
- Analytics use cases
- Managed services
- Hardware Deployment - setup and configuration of hardware systems including Servers, networking equipment and end-user devices

Project experience to cover relevant sectors / geography:

- Water utilities sector
  - public sector including Gov Ministries / Divisions / Agencies / Utilities
  - in Bangladesh
  - outside Bangladesh
- **Approach - Proposed Solution/Technology**
    - Evaluation of suggested approach for setting up the data platform and quick wins implementation
    - Quality of proposed architecture for:
      - **Front-end - Channels - Overview of the user interface and interaction channels**
        - Detailed plans for user interface with clear interaction strategies
        - Complete design that exhaustively covers user interaction
      - **Back-end - System of Engagement - outlines interactions between the data platform and backend systems.**
        - Comprehensive backend system design, covering operational specifics to full examples of system interactions and operations.
      - **Integration & API - includes a general plan for API development and system integration.**

- Detailed in-depth strategy for integration and APIs, including performance, security details, and complete outlines of API structures.
- **Infrastructure** - includes proposed high-level designs for the underlying infrastructure systems that support the data platform.
  - Exhaustive plans for infrastructure setup and technology architecture, focusing on performance with comprehensive specifications
- **Implementation Approach** - outlines the general phases of the PoC, from initial setup to final deployment.
  - Detailed roadmap and PoC plan with milestones, phase wise deliverables. Details on number and content of parallel streams working on the PoC and sprint plans.
  - Specificity of roadmap, timelines, and team structure to drive the PoC.
  - Feasibility of the operating/delivery model (resource allocation/timeline) to complete the work defined in the Scope of Work
  - Resourcing plan for the PoC phases - when and what type of resources are required across the phases
  - Detailed approach for Capacity Building and Implementation Support– Proposed trainings, training content, support provided for queries, trainings towards building capabilities and handover.
  - Details on various steps to implement each quick-win (requirement gathering, Design, build, test, deploy), timelines and outputs/ deliverables of each step, inputs required
  - Details on how the quick wins tie together with the technology infrastructure set up
- **Capacity Building and Training Approach**  
Bidder needs to have a clear and detailed plan for capacity building of CWASA officials so that PoCs are effectively adopted by CWASA.
- Talent and capability

For a PoC of such a large scale and complexity, it is imperative that the Bidder should deploy best in class professionals to ensure successful execution of this PoC.

- **Manpower:** Credible talent (Digital and Industry specific) in Bangladesh and region to support the PoC
- The Digital Partner must provide named experts that will be core part of the team to be deployed. Minimum of 3 named experts have to be physically present in the

presentation and may be interviewed / assessed during the presentation. Roles of the core team to be deployed -

- Project Lead
- Solution architect
- Infrastructure expert
- Data engineer
- IT Security
- Lead business analyst

Technical Bids will be opened, evaluated, and assigned a technical score out of a maximum of 100 (One Hundred) marks. Only the Bidders with total technical marks of 70% or more will qualify for the commercial bid evaluation. Failing to secure minimum marks will lead to technical rejection of the Bid.

#### **Commercial Criteria**

1. The commercial price Bid would be evaluated based on - Total Cost of Ownership (TCO) basis.
2. Only those Bidders who qualify in technical evaluation would be shortlisted for commercial evaluation

Bidders to note 2 additional mandatory criteria in relation to the offered Commercial bid:

1. The minimum price set for the commercial offer is 100,000 USD.
2. Bidders bidding less than 50% of the arithmetic mean of all the bids (that have passed technical qualification of 70% marks) will be eliminated.

Commercial score for each shortlisted Bidder will be calculated as follows:

Commercial Score = (Minimum Total Cost of Ownership quoted/ Total Cost of Ownership by the Bidder) \*100

**Final scores for each Bidder** = 70% \* Technical score + 30% \* Commercial score

The Bidder achieving the highest composite score, reflecting a balanced mix of technical proficiency, organizational capability, strategic approach, and financial competitiveness, will be shortlisted for the issuance of the Letter of Intent (LoI) and subsequent initiation of contract for engagement on the work outlined in the RFP. Should the contracting process fail, the Orderer reserves the right to proceed to the next highest scoring Bidder and so on.

## **11 Terms of agreement**

The scope of work and deliverables set out in this RFP would be governed by the General Terms and Conditions set out in Attachment 14. The Digital Partner would be expected to fully accept and agree to comply with these terms and conditions. If there are any discrepancies between any requirements or conditions set out in this RFP and the General Terms and Conditions, the General Terms and Conditions would take precedence, unless explicitly agreed otherwise by the Order in the formal contract.

### **11.1 Reporting Requirements**

- Reports (in English)
  - Monthly reports summarizing key activities, achievements, challenges faced in the month and plans for the following months
  - One final report that includes but is not limited to
    - an outline of the result of the PoC.
    - details of the PoC activities
    - technical, operational, and strategic recommendations
    - A preliminary strategy proposal for the next phases.
- Method of submission
  - Electronic data

### **11.2 Payment Terms**

No advance payment will be made on awarding the contract. Considering the service performed by the selected Bidder under this Contract, JICA DXLab's contracted authority shall pay the selected Bidder for deliverables specified in section 8 and in such manner as detailed below. The acceptance criteria of these payment milestones will be approved by JICA DXLab's contracted authority. Payment to be disbursed within 90 days after invoice approval.

**T0: Issuance of LoI and will remain same during the execution of this deployment**

Sr. No	Deliverables	Milestone	Payment terms (% of implementation costs)
1	<b>HLD / LLD / Dev Environment set-up on new hardware</b>	<b>T0 + 8 weeks</b>	<b>10%</b>
2	<b>Management dashboard Go-Live</b> - Full launch to Target User Group. No Critical bugs open.	<b>T0 + 14 weeks</b>	<b>15%</b>
3	<b>NRW tool Go-Live</b> - Full launch to Target User Group. No Critical bugs open.	<b>T0 + 16 weeks</b>	<b>15%</b>
4	<b>Meter reading app Go-Live</b> - Full launch to Target User Group. No Critical bugs open.	<b>T0 + 20 weeks</b>	<b>25%</b>
5	<b>PoC Completion:</b> All known defects closed, all requirements in the RFP delivered and provision of post-deployment support documentation and training. All systems operational, handed over and accepted by the client.	<b>T0 + 24 weeks</b>	<b>35%</b>
<b>Total</b>			<b>100%</b>

**One Time Implementation costs - From Form 1.6 Commercial bid Table #1**

Sr.No	Deliverables	Milestone	Payment terms (% of hardware costs)
1	Server Hardware delivery and installation (Dev, SIT, UAT, Prod, Any Other Environment) at CWASA Premises <ul style="list-style-type: none"> <li>• Unboxing, mounting &amp; power-on of hardware</li> <li>• Reports confirming proper functioning of the hardware components</li> </ul>	<b>T0 + 10 weeks</b>	<b>15%</b>
2	Server Environment set-up and signed off by JICA DXLab's contracted authority (Dev, SIT, UAT, Prod, Any Other Environment). <ul style="list-style-type: none"> <li>• Network configurations done</li> <li>• Servers Configured</li> <li>• End-to-end security clearance</li> </ul>	<b>T0 + 12 weeks</b>	<b>30%</b>
3	Procurement and delivery of mobiles and tablets at CWASA premises	<b>T0 + 6 weeks</b>	<b>10%</b>
4	Mobile and Tablets set-up and signed off by JICA DXLab's contracted authority	<b>T0 + 8 weeks</b>	<b>20%</b>



	<ul style="list-style-type: none"> <li>• Unboxing, setup, and activation of mobiles and tablets</li> <li>• Installation of required software applications and security settings on mobiles and tablets</li> <li>• Testing and confirmation of mobiles and tablets' functionality, including connectivity, application performance, and security features</li> </ul>		
5	First go-live of any of the three quick-wins in scope	<b>T0 + 16 weeks</b>	<b>25%</b>
<b>Total</b>		<b>100%</b>	

## Hardware procurement costs - From Form 1.6 Commercial bid Table #2

### 11.2.1 Penalties

- **Time delay:** For any delay in delivering a certain milestone, there would be 4% penalty for each week of delay on the milestone date. The penalty amount will be applied on the value of the relevant milestone.
- **Quality issue:** Penalty of 5% (maximum 10%) on non-conformance of quality set by the Project Steering Committee at the start of each month (relevant to the milestones to be delivered in that month)

## 11.3 Governance Criteria

The governance criteria are as follows:

Meeting	Objective	Participants	Frequency
Daily Stand-up	<ul style="list-style-type: none"> <li>• Provide a regular forum for addressing daily operational issues and quick decision-making.</li> <li>• Support continuous communication and feedback for the timely progression of PoC activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Designated Operational Team Members from CWASA/JICA and the Digital Partner</li> </ul>	Daily
Weekly PoC Management Meeting	<ul style="list-style-type: none"> <li>• Coordinate PoC's progress, address issues, align on priorities, and plan for the upcoming week. They are more in-depth than daily standups, offering a space for problem-solving, resource allocation, and strategic planning.</li> </ul>	<ul style="list-style-type: none"> <li>• CWASA Senior Stakeholders</li> <li>• Representatives from the selected Digital Partner</li> </ul>	Weekly

Meeting	Objective	Participants	Frequency
Working team meeting Fortnightly Review Meeting	<ul style="list-style-type: none"> <li>Align on current progress, architecture, and implementation approach</li> <li>Address implementation challenges.</li> <li>Oversee the development and implementation by the selected vendor</li> <li>Foster technical collaboration</li> </ul>	<ul style="list-style-type: none"> <li>CWASA Senior Stakeholders</li> <li>Representatives from the selected Digital Partner</li> <li>JICA Stakeholders</li> </ul>	Fortnightly
Monthly Steering Committee	<ul style="list-style-type: none"> <li>Ensure strategic alignment and resolve PoC roadblocks</li> <li>Facilitate change management processes and oversee PoC milestones.</li> <li>Discuss and align on PoC priorities and adjustments needed for successful implementation.</li> </ul>	<ul style="list-style-type: none"> <li>CWASA Business &amp; Technical Leaders</li> <li>Digital Partner Senior Representatives</li> <li>JICA Stakeholders</li> </ul>	Monthly
Dispute Resolution Committee	<ul style="list-style-type: none"> <li>Resolve disputes or grievances related to the PoC's scope, SLA compliance, or contractual terms - Ensure PoC continuity and mitigate risks by addressing critical issues promptly.</li> </ul>	<ul style="list-style-type: none"> <li>CWASA PoC Management Leads</li> <li>Vendor Management Team</li> <li>JICA's Stakeholders</li> <li>Legal Representatives (if required)</li> </ul>	On-Demand

## **11.4 Resolution Mechanism**

In the event of any disputes, disagreements, or issues arising from the execution or interpretation of the contract terms, the following resolution mechanism shall be employed to ensure prompt and effective resolution:

- **Initial Consultation:** Upon identification of an issue, the parties agree to engage in good faith negotiations to resolve the matter amicably. This initial consultation phase must commence within 5 business days of the issue being raised by either party.
- **Escalation:** If the issue remains unresolved after initial consultation, the matter will be escalated to a designated representative from both the CWASA and the Digital Partner's senior management teams. This escalation must occur within 10 business days of the initial consultation.

## **11.5 Transition Mechanism**

### **11.5.1 Transfer of Assets**

- 1 month prior to expiry, the Digital Partner shall deliver to CWASA an Asset Register comprising:
  - list of all Assets eligible for transfer to CWASA; and

A list identifying all other Assets (including human resources, skillset requirement, and know-how) that are ineligible for transfer, but which are essential to the delivery of the Services. The purpose of each component and the reason for ineligibility for transfer shall be included in the list.

### **11.5.2 Transfer of Software Licenses**

- 1 month prior to expiry, the Digital Partner shall deliver to CWASA all licenses for Software used in the provision of Services which CWASA purchased.
- On notice of termination of this Agreement, the Digital Partner shall, within 2 (two) weeks of such notice, deliver to CWASA details of all licenses for Digital Partner's Software and Digital Partner's Third-Party Software used in the provision of the Services, including the terms of the software license agreements. To avoid doubt, CWASA shall be responsible for any costs incurred in the transfer of licenses from Digital Partner to CWASA, provided such costs are agreed upon in advance. Where transfer is not possible or not economically viable the Parties will discuss alternative licensing arrangements.
- Within 1 (one) month of receiving the software license information as described above, CWASA shall notify Digital Partner of the licenses it wishes to be transferred, and Digital Partner shall provide for the approval of CWASA a draft plan for license

transfer, covering novation of agreements with relevant software providers, as required. Where novation is not possible or not economically viable, the Parties will discuss alternative licensing arrangements.

#### **11.5.3 Transfer of Software**

- Wherein CWASA is the owner of the software, 1 month before expiry, the Digital Partner shall deliver, or otherwise certify in writing that it has delivered, to CWASA a full, accurate and up to date version of the Software including up to date versions and latest releases of the software.

#### **11.5.4 Transfer of Documentation**

- 1 month prior to expiry, the Digital Partner shall deliver to CWASA a full, accurate and up-to-date set of Documentation that relates to any element of the Services

#### **11.5.5 Transfer of Knowledge Base**

- 1 month prior to expiry, the Digital Partner shall deliver to CWASA a full, accurate and up-to-date cut of content from the knowledge base (or equivalent) used to troubleshoot issues arising with the Services but shall not be required to provide information or material which Digital Partner may not disclose as a matter of law.

#### **11.5.6 Transfer of Data**

- In the event of expiry or termination of this Agreement, the Digital Partner shall cease to use CWASA's Data and, at the request of CWASA, shall destroy all such copies of CWASA's Data then in its possession to the extent specified by CWASA.
- Except where, CWASA has instructed Service Provider to destroy such CWASA's Data as is held and controlled by the Digital Partner 1 (one) month prior to expiry, the Digital Partner shall deliver to CWASA:
  - An inventory of CWASA's Data held and controlled by the Digital Partner, plus any other data required to support the Services and/or
  - a draft plan for the transfer of CWASA's Data held and controlled by the Digital Partner and any other available data to be transferred.

#### **11.5.7 Transfer Support Activities**

- 1 month before expiry, the Digital Partner shall assist CWASA to develop a viable exit transition plan, which shall contain details of the tasks and responsibilities

required to enable the transition from the Services provided under this Agreement to or CWASA, as the case may be.

- The exit transition plan shall be in a format to be agreed with CWASA and shall include, but not be limited to:
  - A timetable of events;
  - Resources;
  - Assumptions;
  - Activities;
  - Responsibilities; and
  - Risks.
- Digital Partner shall supply to CWASA specific materials including but not limited to:
  - Change Request log;
  - Entire back-up history; and
  - Dump of database contents including the Asset Register, problem management system and operating procedures.
- Digital Partner shall provide for the approval of CWASA a draft plan to transfer or complete work- in-progress at the date of expiry or termination.

#### 11.5.8 Use of CWASA Premises

- Prior to expiry or on notice of termination of this Agreement, the Digital Partner shall provide for the approval of CWASA a draft plan specifying the necessary steps to be taken by both Digital Partner and CWASA to ensure that Digital Partner vacates CWASA's Premises.
- Unless otherwise agreed, the Digital Partner shall be responsible for all costs associated with the Service Provider's vacation of CWASA's Premises, removal of equipment and furnishings, redeployment of Digital Partner's Personnel, termination of arrangements with Subcontractors and service contractors and restoration of CWASA Premises to their original condition (subject to a reasonable allowance for wear and tear).

## 11.6 Change Request

### 11.6.1 What Constitutes Change Request?

Any internal stakeholder nominated by CWASA (Originator) can submit the following types of issues to the change control system:

- Requests for requirements changes (additions, deletions, modifications) to the Scope of work
- Requests for enhancements in functional requirements beyond the scope of this RFP and as defined during the business signoffs by the Bidder, e.g., additional process steps to be introduced in a currently defined process flow

This change control process applies to baseline work products including but not limited to:

- Software that has been released to production
- Requirements specifications for CWASA PoC
- User roles and technical documentation

Baseline work products are work products which have been formally reviewed and approved by CWASA and deviations/changes to the same can only be made via formal change control procedure. Interim or temporary work products created during the course of the PoC are not considered as baseline work products.

Change control procedure shall be applicable to changes being requested after the completion of the Go-Live of respective modules. The following categories of changes (indicative) shall not be considered as a change request and shall be exempted from the Change Control Procedure:

- Any work arising in order to fix root causes behind Critical Service Levels or KPI defaults, as mentioned in Service Level Agreements – any software or hardware related changes for these should be done as per normal troubleshooting
- Any software changes required due to problems/bugs in the developed software/application/ hardware will not be considered as part of change control and will have to be completed by the Bidder at no additional cost (even if it requires any enhancements/ customizations)
- Any changes undertaken by Bidder on its own to improve processes and applications (e.g., any changes undertaken for simplification of business processes under Bidder)
- Any request pertaining to data assistance, system access, server access, etc. by CWASA or any nominated authority on behalf of CWASA from Bidder, which doesn't require any modifications in the portal or back-end systems.

### 11.6.2 Institutional Framework for Change Management

Role	Description
<p><b>Change Request Management Committee (CRMC)</b></p>	<p>Members of Change Request Management Committee (CRMC) –</p> <ul style="list-style-type: none"> <li>• Chairperson of CRMC (Nominated by CWASA MD)</li> <li>• Nominee 1 (Member as nominated by CWASA MD - can be internal/ external stakeholder)</li> <li>• CWASA Nominee 1 (Member as nominated by CWASA MD)</li> <li>• CWASA Nominee 2 (Member as nominated by CWASA MD)</li> <li>• Bidder Representative</li> </ul> <p>CRMC to evaluate principal acceptance of —Change from Scope of work as per RFP along with demarcation whether it is —Revenue Generating Change Request or —Non-Revenue Generating Change Requestll, as defined below:</p> <p><b><u>Revenue generating change request:</u></b> Any change which results in incremental revenue for CWASA as well as Bidder from either the CWASA platform or new offerings / functionalities / features enabled for CWASA customers will be considered as a revenue generating change request. No payment would be made to Bidder for development and deployment of such requests.</p> <p><b><u>Non-revenue generating change request:</u></b> Any other change request, that does not qualify as a revenue generating change request, will be classified as a non-revenue generating change request.</p>
<p><b>Change request application</b></p>	<p>The Originator submits a valid issue or change requirement with all necessary information, referred to as Change Request Application.</p>
<p><b>Change request</b></p>	<p>Once the reviewer approves the change request application submitted by the originator on whether it should be implemented or not, it would be regarded as a change request.</p>
<p><b>Originator</b></p>	<p>Any nominated person from CWASA (basis role assigned) can be designated as originator by CWASA. Originator shall submit a change request application, whenever required. There can be multiple originators.</p>
<p><b>Reviewer</b></p>	<p>Any nominated person(s) from CWASA (basis role assigned) who is responsible for the approval of change request application submitted by</p>

	the originator on whether it should be implemented or not. There can be multiple reviewers.
<b>Modifier</b>	The person from the Bidder team who is assigned responsibility for making changes in a work product in response to an approved change request; Modifier shall deploy the change and update the status of the request over time
<b>Verifier</b>	The person from CWASA team who determines whether a change was made correctly. This can be an individual, group or a committee as required which will be nominated by the reviewer who approves the change request application. Upon successful verification of deployment of the change the status changes to —Verified. In case further modifications are required, the status changes to —Verified and resent for modification on the tool. In certain cases, the verifier may be the same as originator, in which case, originator shall inspect and verify the change deployed. In case of originator being separate from the verifier, approvals of originator and verifier would be required for confirmation of change request as verified.

## 11.7 Exit Criteria

To ensure a smooth and orderly transition upon the expiration or termination of the contract, the following exit mechanism will be implemented:

- **Notice Period:** The Digital Partner must provide Orderer with a minimum of 30 days’ notice before the termination or expiry of the contract to facilitate transition planning.
- **Transition Plan:** Within 15 days of the notice period, the Digital Partner shall submit a comprehensive transition plan outlining the steps necessary to transfer responsibilities, knowledge, and data back to Orderer or to a new vendor. This plan will include:
  - **Asset Transfer:** Detailing the transfer of any physical or intellectual property assets.
  - **Software and Data Handover:** This includes the transfer of all software licenses, source codes, and related documentation, as well as CWASA's data, in a usable format.
  - **Knowledge Transfer:** Ensuring that CWASA personnel are trained on operating and maintaining the developed solutions.
- **Final Reconciliation:** Prior to the completion of the transition period, a final reconciliation meeting will be held to ensure all contractual obligations have been fulfilled, and to resolve any outstanding issues.



- **Post-Exit Support:** The Digital Partner agrees to provide post-exit support for a period of 1 month, to address any issues that may arise after the transition period. The scope and terms of this support will be outlined in the contract.

This exit mechanism is designed to protect the interests of CWASA and ensure continuity of service for the utility's customers, while also respecting the rights and obligations of the Digital Partner.

## **11.8 Termination of Contract**

Orderer reserves the right to terminate the contract, either entirely or partially, at its convenience or due to the frustration of the contract, by issuing a written 'Notice for Determination of Contract' to the Digital Partner at any point during the contract's term. The notice will clearly state whether the termination is for Orderer's convenience or due to the contract's frustration. It will also detail the extent of the Digital Partner's performance under the contract being terminated and the effective date of such termination.

Following the issuance of this notice, the termination will not compromise or impact any rights and remedies that have accrued or will accrue to either party thereafter.

Unless directed otherwise by Orderer, the Digital Partner is expected to continue fulfilling the contract to the extent it has not been terminated.

In the event of contract termination, Orderer will only be obligated to make payments for services provided prior to the termination's effective date.

Should the scope of the Services be reduced, Orderer 's obligation to pay service charges or provide Orderer materials shall decrease in line with the reduction in services.

Orderer will not be liable for compensation under the termination provisions if the total amount, inclusive of any payments made or due, or becoming due to the Digital Partner under the contract, surpasses the total service charges agreed upon within the contract. The Digital Partner will not be entitled to compensation for the loss of potential profits.

Any obligations related to Defect Liability will remain in effect despite the termination of the contract.

Services and incidental goods/works that are capable of being delivered or executed within thirty days following the Digital Partner's receipt of the termination notice will be accepted by Orderer in accordance with the terms of the contract. For any remaining Services and incidental goods/works, Orderer may choose:

- To have any part of the remaining balance completed and delivered according to the original contract terms, conditions, and prices; and/or

- To cancel the remaining Services and incidental goods/works and compensate the Digital Partner by paying an agreed amount for the costs incurred by the Digital Partner towards the remaining Services and incidental goods/works.

This adjustment ensures the contract termination provisions are clearly understood and tailored to the specific context of Orderer 's RFP for the development of digital solutions, removing any reference to previous clauses for clarity and simplicity.

## 12 Secure Coding Standards

- Purpose. Unsafe coding practices result in costly vulnerabilities in computer software and/or web applications that lead to the theft and/or loss of sensitive and/or valuable data. The purpose of this document is to define common standards and guidelines for secure coding practices across CWASA.
- Scope. This document sets up common general principles and a compliance process which should be followed when developing and otherwise coding software solutions and/or web applications to avoid unsafe coding practice, notably in the context of (1) a custom software solution PoC or (2) a CWASA proprietary product launch.
- Target Audience. These requirements of this document apply to Digital Partner personnel and contractors responsible for (1) designing and developing software solutions and/or web applications, (the “Developers”), and/or (2) launching, managing, and marketing proprietary software solutions and other web applications (the “Product Owners”).
- Requirement. Developers and Product Owners coding must ensure that:

prescribed safe-coding practices are used (i) at each phase of any web application and/or software development life cycle (SDLC)

requirements for secure coding practices, data handling and data privacy, including security training and reviews, are incorporated into each phase of the software development life cycle (SDLC), and they use prescribed safe-coding practices regardless of the type of development or deployment platform.

- Secure Coding Practices. Secure coding practices must be incorporated into all stages of any web application or software development process. Developers and Product Owners are responsible for ensuring that:

Design and architectural documentation must include a brief statement declaring the determined risk exposure of the app being developed and either:

a general description of the sensitive data that is processed and the secure coding practices followed (including a test plan – see below)

or a brief explanation of why secure coding principles are not required for the application.

Compliance with this document is tested before deployment throughout the development lifecycle and that an escalation procedure with the business function is defined to deal with flaws that cannot be fixed in a reasonable timeframe or that are technically infeasible.

No sensitive data will be included in code or testing environments (de-identified data is acceptable if it is irreversibly de-identified). Ideally, both code scanning tools (static and dynamic) are employed, and code reviews are performed to check for compliance. Where code testing tools are unavailable or infeasible, code reviews conducted by experts or peers who understand secure coding principles are sufficient. The results of code scanning and code reviews must be recorded in the PoC development documentation. All medium or high-risk flaws must be identified, documented and either fixed (and re-tested) or documented by the Developer and/or Product Owner as a justified risk before deployment.

Dynamic analysis tools should be used with deployed code if available. For more information on Code Review processes see:

[https://owasp.org/www-project-code-review-guide/assets/OWASP\\_Code\\_Review\\_Guide\\_v2.pdf](https://owasp.org/www-project-code-review-guide/assets/OWASP_Code_Review_Guide_v2.pdf)

[https://docs.microsoft.com/en-us/previous-versions/msp-n-p/ff649315\(v=pandp.10\)](https://docs.microsoft.com/en-us/previous-versions/msp-n-p/ff649315(v=pandp.10))

Secure Coding Principles. The Open Web Application Security Project (OWASP) defines the following categories of secure coding principles:

- Input Validation
- Output Encoding
- Authentication and Password Management
- Session Management
- Access Control
- Cryptographic Practices
- Error Handling and Logging
- Data Protection
- Communication Security
- System Configuration
- Database Security
- File Management
- Memory Management
- General Coding Practices

While the details of OWASP (Open Web Application Security Project) primarily apply to web applications, the secure coding principles outlined can and should be applied to: web and non-web applications, modification to code for deployment, as well as code developed for managing deployed environments.

Data Privacy. There are additional principles to keep in mind when developing software solutions and/or web applications that handle personal data. Issues regarding handling data to ensure privacy of customers and users is an important aspect of developing software and related to “Secure Coding”. Writing secure code is one aspect of protecting data. Developers and Product Owners should be aware that data privacy requirements vary by jurisdiction and, in some cases, by type of data (e.g. health data regulations) and should become aware of relevant data requirements when coding and/or determining requirements for the software and/or web application/code that is being developed.

### **13 Minimum Security Requirements**

Digital Partner’s laptops, devices and computer systems (collectively, “Devices”) must meet the following minimum requirements below prior to hosting any CWASA or client data or intellectual property on such Devices:

Anti-virus protection is enabled with current definitions and configured to receive updates automatically.

Software firewall enabled and configured to deny all firewall connections except those necessary for providing service to CWASA

Current level of patches for the operating system and all installed applications, including, without limitation, Microsoft, Adobe, and Java products and applications.

Device does not allow any form of unauthenticated or unapproved access

Screensaver automatically enabled after 15 minutes of system inactivity

The hard drive is fully encrypted with power-on authentication. Hard drives will be encrypted using an AES-256-bit algorithm.

Below are a few examples of applications that meet these requirements:

Anti-virus: Sophos, Symantec Endpoint Protection, Microsoft Security Essentials (for PCs only), BitDefender, McAfee

Encryption: Sophos, Symantec, FileVault 2 for Macs (free), Bitlocker for Windows (free)

Firewall: Built-in firewalls are typically acceptable but should block nearly all inbound traffic.

Examples of prohibited peer-to-peer software are BitTorrent, uTorrent, etc.

Digital Partner will ensure data stored on mobile devices are encrypted and password protected using an AES-256 bit algorithm, and a password at least five characters in length.

Data storage in cloud environments, applications and platforms is prohibited except where CWASA approves data storage.

## Attachment 1 Proposal submission formats

### Table of Contents

Section	Description	Page No.
Executive Summary	Brief summary of the proposal	
<b>Form 1.1</b> Company Overview	Information about the bidding company	
<b>Form 1.2</b> Proposed Team Construct	Team structure and roles for PoC delivery	
<b>Form 1.3</b> Expertise & Experience for team members	Details on relevant design and development experience	
<b>Form 1.4</b> Workplan & Delivery Approach	Approach, methodology, and timeline for the PoC	
<b>Form 1.5</b> Commercial Proposal	Financial bid, structure, and rate cards	
<b>Form 1.6</b> Client Reference Format	Information about the past projects	
<b>Form 1.7</b> Services Agreement	Services Agreement	

### Form 1.1a Company Overview

S No	Particulars	Details
1	Name of the Bidder	
2	Corporate Identity No	
3	Place of Registration/Principal Business	
4	Complete Postal Address	
5	Pin code/ZIP code	
6	Telephone no's (with country/area codes)	
7	Contact persons/Designation	
8	Email IDs of the contact person	
9	Mobile Nos (with country/area codes)	
10	Number of employees (split by technical staff and non-technical staff)	Self-certified letter by CEO or Head of HR to be attached
11	Profits for FY 2023 (In USD)	
12	Profits for FY 2022 (In USD)	
13	Revenue for FY 2023 (In USD)	

S No	Particulars	Details
14	Revenue for FY 2022 (In USD)	
15	Year of incorporation	
16	Local Workforce (Number of employees in Bangladesh - split by technical staff and non-technical staff)	
17	Documents to be attached	<p>Audited copies of the P&amp;L statement OR the Chartered Accountant certificate for minimum of last 2 years.</p> <p>Copy of Certificate of incorporation / partnership/ any other government recognized certificate mentioning dates</p> <p>Self-certified letter from CEO/ authorized body for Number of employees, and Local workforce</p> <p>Signed and stamped No-deviation certificate (Format available in Attachment 13)</p>

### Form 1.1b Company Overview - Taxation

S No	Particular	Details
1	PAN/BIN number	
2	Type of Tax Registration as per the Act	
4	Registered/Certified Offices from where the Services would be supported and Place of Service Site for Tax	
5	Contact Names, Nos & email IDs for Tax matters (Please mention primary and secondary contacts)	

### Form 1.2 Proposed Team Construct

Sr No	Role	Number of People	Skillset	Years of Experience	Years of Experience with water utilities, if any
1	<b>Project Lead</b>		Expert in leading diverse teams for software development projects, skilled in Agile methodologies, and adept at		

Sr No	Role	Number of People	Skillset	Years of Experience	Years of Experience with water utilities, if any
			using JIRA and Trello for project management and execution. Should be 100% deployed in Chattogram Should be Bangla speaking		
2	<b>Solution Architect</b>		Strong understanding of areas related to Service Oriented Architecture, Integration Architecture and Design Patterns, API Management etc.		
3	<b>Infrastructure expert</b>		Extensive detailed working knowledge and acumen in the employment of enterprise architecture best practices, including, but not limited to, logical and physical data architectures, network communications, operating systems, applications, data base servers, application servers, web servers, server consolidation, server performance, middleware, etc.		
4	<b>Data Engineer</b>		Expertise in Database technologies, ETL processes, and database management. Fluent in Bangla, with strong programming skills, preferably located in Chattogram. Ability to design, build, and maintain scalable data infrastructure and understand the complexities and preempt data integration challenges 100% deployed		
5	<b>IT Security</b>		Possess extensive knowledge and experience in information technology security design, operations, encryption, information access. Strong knowledge of risk assessment procedures, policy formation, role-based authorization methodologies, authentication technologies and security attack pathologies		



Sr No	Role	Number of People	Skillset	Years of Experience	Years of Experience with water utilities, if any
6	<b>Lead Business Analyst</b>		Experience in areas such as UML, Project Management tools, Requirement Analysis and Documentation, Visio, Release Planning and Management, Budgeting, Process Mapping and Re-engineering, Six Sigma. Responsible for applying their knowledge of business process modelling methodologies to document processes and present new process designs Should be 100% deployed in Chattogram Should be Bangla speaking		

The list of roles is non-exhaustive

### **Form 1.3 Experience & Expertise**

For a PoC of such a large scale and complexity, it is imperative that the Bidder should deploy best of class professionals to ensure successful execution of this PoC. For each of the 6 roles mentioned in the table above, please fill the following form. The key people that shall participate in the project must be named and deployed from start of the project. They will have to be present physically and will be assessed during the presentation.

- Bidder must commit 100 (Hundred) per cent time availability of the named Experts since Day 1 (One) of the PoC.
- Attrition or replacement of any of the named Experts on or after the date of Technical Presentation should be honored within two weeks. Resources must be replaced with a resource of equal or higher competence. The replacement of the resource shall be interviewed by evaluation team prior to the final hiring.
- Minimum of 3 named experts (Project Lead, Solution Architect and Lead Business Analyst) will have to be physically present in the presentation and may be interviewed / assessed during the presentation. Named experts cannot be substituted without a penalty charged to the Bidder.

Key Expert Curriculum Vitae form

Particulars		Details
Name		
Surname		
Role in the PoC		
Educational Qualifications		
Total Years of experience		
Total Years of software development experience		
Tenure with the Bidder’s organization/entity		
Base location		
Opportunity to interview		
Certifications		
Language proficiency – Bangla, English		
Availability date		
List main relevant projects for the scope of this RFP, including project descriptions, starting/ending periods, designation & role played by the person in this project, client/industry and key impact to business/tech performance (maximum 500 words each)	Project 1	
	Project 2	
	Project 3	

**Form 1.4 Letter for Approach, methodology, and timeline for the PoC & general acceptance of the RFP**

(Maximum 30 pages)

(To be submitted as part of Technical Bid, along with supporting documents, if any) (on Bidder’s Letterhead)

RFP Title: Invitation For Request for Proposal (RFP) for Development, Implementation and Services of Meter Reading App, Management Dashboard & NRW Monitoring Tool at CWASA

Bidder’s Name

[Address and Contact Details]

Date.....

Form 1.4: Description of Approach and Methodology for performing the assignment, including a detailed description of the proposed methodology and staffing for training if the Terms of Reference specify training as a specific component of the assignment.

Suggested structure of your Response:

1. Technical Approach and Methodology
2. Organization and Staffing

- **Technical Approach and Methodology**

{Please explain your understanding of the objectives of the assignment, the technical approach, required inputs from the CWASA team, the methodology you would adopt for implementing the tasks to deliver the expected output(s), and the degree of detail of such output. Please do not repeat/copy the TORs here. The section should detail the approach in 4 subsections – Front-end, back-end, Integrations /APIs and Infrastructure }

- **Organization and Staffing**

{Please describe the structure and composition of your team, including the list of the Key Experts, Non-Key Experts, and relevant technical and administrative support staff. The Organization and staffing should be consistent with Form 1.3: Key Expert Curriculum Vitae (CV).}

- **Timeline**

{Please describe the timeline for development, testing and rollout of each of the digital solutions.}

- **Training and Capacity Building**

{Please detail the composition and organizational structure of your team designated for training and capacity development, specifying the roles of Key Experts, Non-Key Experts, as well as any technical and administrative personnel involved. Include descriptions of each individual's expertise and their specific contributions to training and capacity-building efforts, illustrating how their collective capabilities will facilitate effective knowledge transfer and skill enhancement for the PoC.}

We have fully understood the terms and conditions outlined in the RFP Document and hereby accept and agree to comply with these terms and conditions without any reservations.

We also confirm the validity, truthfulness, and correctness of scanned copies of documents, affidavits, and undertakings uploaded during the shortlisting process and for this RFP, to the best of our knowledge and belief. We will bear responsibility for any disputes regarding the validity and truthfulness of such documents, affidavits, and undertakings, and commit to providing originals and self-certified copies of all such documents for scrutiny upon demand by CWASA.

We further confirm that should our bid be accepted, we agree to adhere to all such terms and conditions in the resultant contract. We undertake to treat this Bid/RFP and your written Letter of Award as a binding contract between us until a formal contract is signed or issued.

We hereby confirm that the information provided above is accurate and complete, with no concealment of facts, and commit to informing you of any future changes to these details. We understand that any misinterpretation or misrepresentation will be considered a violation of the Code of Integrity and may lead to legal actions against us.

We confirm that we are duly authorized to submit this Bid and to make commitments on behalf of the Digital Partner, recognizing that our digital or digitized signature is valid and legally binding, with supporting documents provided herewith.

Rights of JICA DXLab to Reject Bid(s):

We understand that JICA DXLab is not obligated to accept the lowest or any bid received in response to the aforementioned RFP Document.

.....  
(Signature with date)

.....  
(Name and designation)

Duly authorized to sign Bid for and on behalf of

.....  
[name, address, and seal of Bidder]

## Form 1.5 Client Reference Format

(To be submitted as part of Technical Bid)  
(Along with supporting documents, if any)  
(on Bidder's Letterhead)

Bidder's Name  
[Address and Contact Details]

Documentary evidence like Purchase Orders, Copies of the Service Contracts or Work Completion certificates from the client organization confirming the details of the solution services, to be submitted with following details:

The documentary evidence submitted should reflect the contract start date and end date.

Name of Client:

Details	Required Information
Name of the Client	
Contact person of the Client with Name, Designation, Tel. No., Fax No., Address, Email-id & Mobile no.	
Documentary evidence submitted	
Role of the Bidder	
Contract valid from	
Contract valid up to	
No. of years of tie up	
Title of project	
Scope of project	
Details of Hardware configurations & Software used at the Client end	
Duration of Project (& Number of man-months)	
Size of project (in USD)	
Location of the project	
Sector/ geography/ Clientele experience: (1. Water utilities sector	

Details	Required Information
2. public sector including Central Government/ State Government/ Public Sector Undertakings/ CWASA 3. in Bangladesh 4. outside Bangladesh)	
Demonstrated capabilities (1. Core Applications, IT-OT, data engineering 2. Customer applications development 3. Management dashboard/ Data Visualization and Reporting System 4. Analytics use cases 5. Managed services 6. Hardware Deployment - setup and configuration of hardware systems including Servers, networking equipment and end-user devices)	
Solution Details (including brief details about the Solution architecture, Data Flow, Workflow implemented and team)	

For and on behalf of: (Bidder) Authorized Signatory of the Bidder

Name:

Designation:

Office Seal or digital signature:

Place:

Date:

## Form 1.6 Commercial Bid

### COMMERCIAL BID TABLE

Sr. No	Description	Cost (USD) inclusive of all taxes
1	One Time Implementation (Table#1)	
2	Hardware Procurement Cost (Table#2)	
3	Change Request costs (Table#3)	
	<b>TOTAL COST OF IMPLEMENTATION (price to be taken into consideration for QCBS evaluation and subsequent payments)</b>	

Table #1 – One Time Implementation Cost

Sr. No	Application	Number of Man-days (X)	Blended Man-day rate (Y)	One Time Development Cost (Z) = (X) * (Y)	Taxes (A)	Total Cost (USD) inclusive of all taxes (B) = (Z) + (A)
1	Meter Reading App					
2	Management Dashboard					
3	NRW Monitoring Tool					
<b>Total</b> (to be transferred to Master Table under “One Time Implementation”)						

Table #2 - Hardware Procurement Cost

Sr. o	Application	Units	Unit Rate	Subtotal	Taxes	Total Cost (USD) inclusive of all taxes
1	Smartphone (Android 10 & above, 4 GB RAM or more, Camera with 5 MP resolution or more; Inbuilt storage of 128 GB or more, Bluetooth) and Handheld Portable Printer (58mm or more, Bluetooth, Thermal Label Receipt Printer) or	120				

Sr. o	Application	Units	Unit Rate	Subtotal	Taxes	Total Cost (USD) inclusive of all taxes
	Handheld printers – (56mm or more, Bluetooth, Thermal Label Receipt Printer), embedded with the phone (Android 10 & above, 2 GB RAM or more, Camera with 2 MP resolution or more; Inbuilt storage of 64GB or more, Bluetooth, GSM)					
2	Android Tablets (Android 13 & above, 8 GB RAM or more, Camera with 2 MP resolution or more; Inbuilt storage of 128 GB or more)	15				
3	Server	2				
4	Data Pack for Smartphones (10 GB/month or more) for 7 months (June to December 2024)	120				
5	SQL Database Server License Cost	2				
6	Mobile Device Management License Cost					
7	Windows Server License Cost	2				
8	Any other hardware or license cost					
<b>Total</b> (to be transferred to Master Table under “Hardware”)						

Table #3 – Change Request (optional, as per need)

The Bidder should provide a blended cost for the below mentioned resources that will be utilized when calculating change requests. This lumpsum amount of 100 man-days will be



included in the commercial bid calculation. However, Bidder shall note that this lumpsum amount will be an indicative amount i.e., contracting authority is not obligated to pay it to Digital Partner unless it is used.

The rate card mentioned in this table will stand confirmed for the entire duration of the PoC: Blended Cost for 100 man-days: \_\_\_\_\_

Sr. No	Professional Figure	Price/Month (USD) inclusive of all taxes
1	Technical Program Manager	
2	Business Analyst/PO	
3	Sr. App Developer	
4	Jr. App Developer	
5	DevOps Engineer	
6	UI Engineer	
7	Functional QA Engineer	
8	Solution architect	
9	Database experts	
10	Infrastructure experts	
11	IT Security	
12	Data engineer	
<b>Total</b> (to be transferred to Master Table under “Change requests costs”)		

### Form 1.7 Services Agreement

This Service Agreement (the “Agreement”) is entered as of MM DD, 2024 (“Effective Date”), by and between consulting partner appointed by JICA DXLab, having offices in Tokyo, Japan (hereinafter called the “Orderer” and NAME, having offices located at Address (hereinafter called the “Supplier”) (each a “Party” and together the “Parties”).

#### WHEREAS

- Orderer has requested Supplier to provide certain services as defined in this Agreement;
- Supplier, having represented to Orderer that it has the required professional skills, expertise and technical resources, has agreed to provide the Services on the terms and conditions set forth in this Agreement;

NOW THEREFORE the Parties hereto hereby agree as follows:

- The following documents attached hereto shall be deemed to form an integral part of this Agreement:
  - Terms and Conditions (included in Attachment 14)
- In the event of a conflict between the Terms and Conditions and the SOW, the provisions of the Terms and Conditions will prevail, unless otherwise expressly varied in this SOW.
- The mutual rights and obligations of Orderer and Supplier shall be as set forth in the Agreement, in particular:
  - Supplier shall carry out the Services in accordance with the provisions of the Agreement; and
  - Orderer shall make payments to Supplier in accordance with the provisions of the Agreement.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be signed in their respective names as of the day and year first above written.

For and on behalf of Orderer

Name:

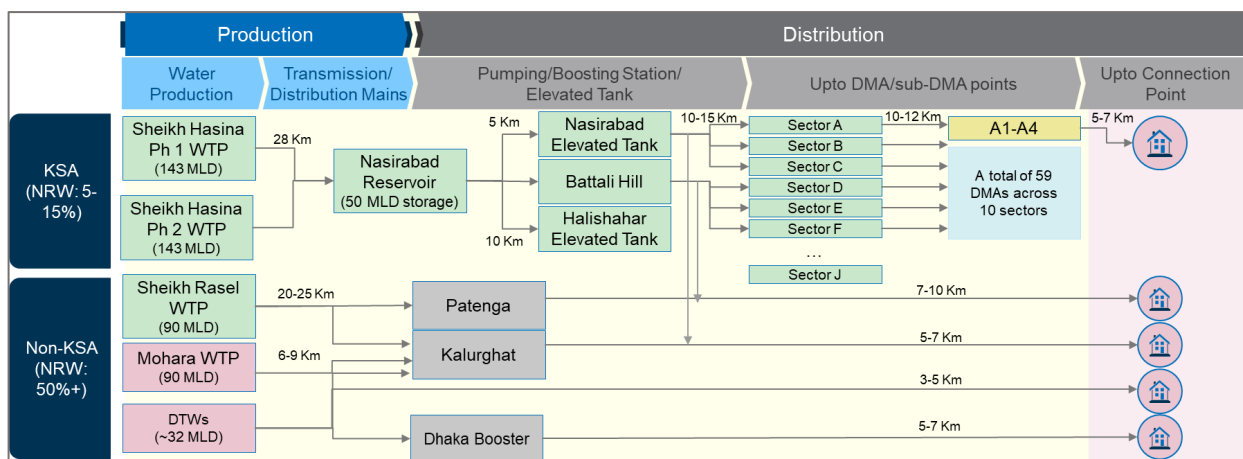
Title:

For and on behalf of NAME

Name:

Title:

## Attachment 2 Assets Landscape



There are 5 major water production sources – 4 Water Treatment Plants and DTWs.

S No	Production Unit
1	Sheikh Hasina Pani Shoddhonagar (Water Treatment Plant) Phase – 1 (143 MLD)
2	Sheikh Hasina Pani Shoddhonagar (Water Treatment Plant) Phase – 2 (143 MLD)
3	Sheikh Rasel Pani Shoddhonagar (Water Treatment Plant) (90 MLD)
4	Mohara Water Treatment Plant (90 MLD)
5	A total of 45 DTWs

In addition to this, there are 4 boosting stations:

S No	Boosting Station
1	Nasirabad Reservoir
2	Patenga Boosting Station
3	Kalurghat Iron Removal Plant & Boosting Station
4	Dhaka Boosting Station (Dhaka Grand Trunk Road)

The KSA also has 3 elevated tank/secondary reservoir situated in Nasirabad Elevated Tank, Battali Hill Reservoir and Hallishahar Elevated Tank. There are a total of 10 sectors with 4-8 DMAs within each sector with a total of 59 DMAs.

## **Attachment 3 Current IT Landscape**

There are a total of 27 IT systems currently in use by CWASA. Some of the most prominent systems from operational point of view:

1. **Online Payment Posting System:** A system to facilitate the posting of bills and payments made online by consumers.
2. **Data Push Pull System:** A system used to push data to, and pull data from, various MFS and Banks through API
3. **Water Works System:** collates information received from various WTPs, MODs and Boosting Station on water production.
4. **Daily Water Production System:** collates water production information from deep tube wells that contribute to water production.
5. **Meter Replacement System:** Keeps track of the meter replacement operations across the consumer base.
6. **Inventory Management System:** Manages inventory levels, orders, and stock for operational equipment and supplies. Operational at 2 out of 4 stores of CWASA.
7. **Tally:** A popular accounting software for financial statements and reporting.
8. **SCADA (X 6):** Supervisory Control and Data Acquisition systems used for real-time data collection and control at various points in the water distribution network.
9. **Customer Complaints Tracking:** A system for logging, tracking, and resolving consumer complaints.
10. **Billing Comparison Report:** A system for comparing billing data across different periods, area, ward and MI

Internal IT Systems in use by CWASA

Payroll; PF Mgmt. System; E-letter archive system; Employee Information System; E-GP (Government); E Nothi (Government)

These systems collectively form the IT infrastructure that supports CWASA's operations, from billing to maintenance and consumer relations.

## Attachment 4 Map view for CWASA

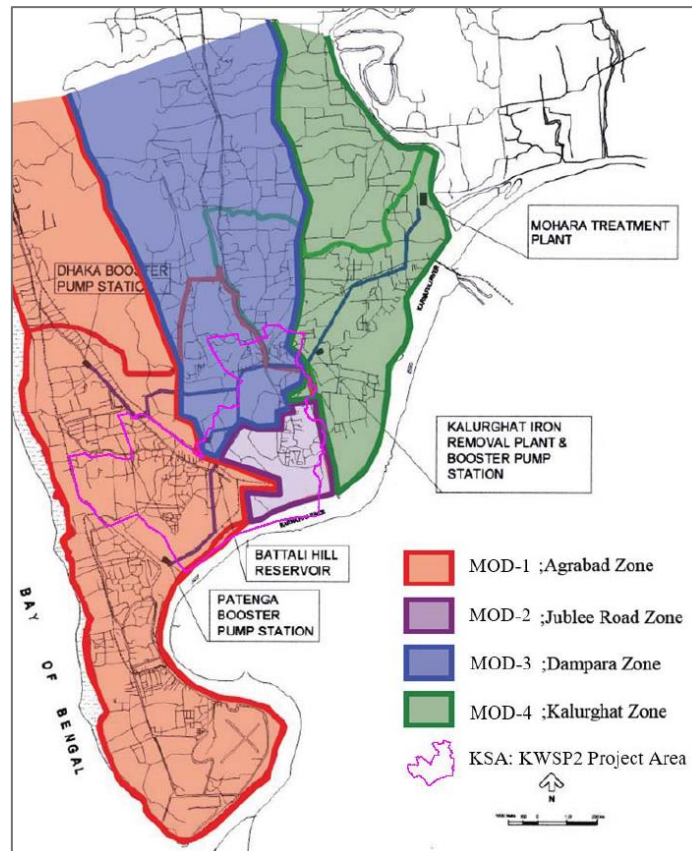
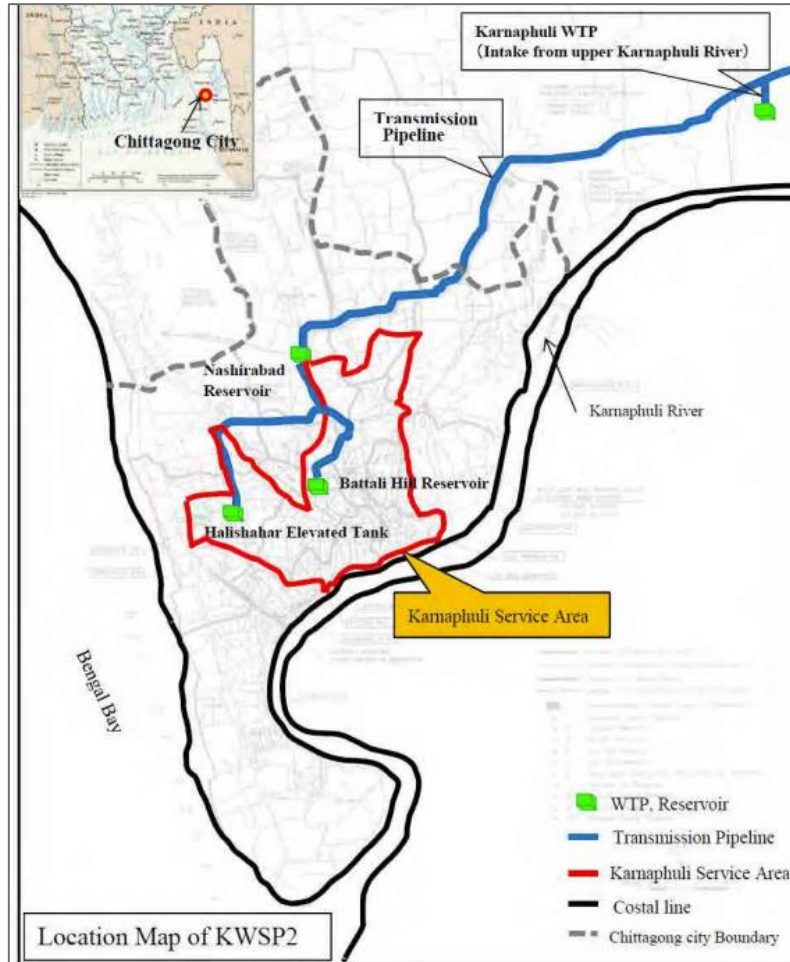


Figure 1: Maintenance zone wise map of CWASA



## Attachment 5 Detailed Eligibility criteria

Eligibility criteria mentioned below are necessary requirements that vendors must meet in order to be eligible to submit a proposal. They are a screening mechanism to ensure that only capable and qualified Bidders who can deliver the services or products required are considered. They include criteria related to financial stability, experience in similar projects, technical capabilities, and compliance with specific regulations. Failure to meet any of these requirements will lead to an automatic disqualification from the bidding process. For consortium bids, a maximum of two companies can participate: one serving as the lead bidder and the other as a member of the consortium. For consortium bids, the contract will be executed with the lead bidder.

Exchange rates to be considered [Financial year defined as July to June]–

- FY2020 – 1 USD = 84.6 BDT
- FY2021 – 1 USD = 84.2 BDT
- FY2022 – 1 USD = 94.4 BDT
- FY2023 – 1 USD = 108.5 BDT

For reference projects to be submitted as part of requirements for similar projects completed: Project can be built/delivered incrementally through a Single or Multiple Purchase Orders/Contracts/Amendments/Extensions within 1 year.

Sr no	Metrics segment	Metric	Value in case of single bidders	Value in case of consortium bidders	Documentation requirements
1	<b>Financial Stability Metrics</b>	Minimum Annual Revenue	Minimum 1 million USD in each of the last 2 fiscal years.	Total revenue of the lead bidder should be minimum 1 million USD in each of the last 2 fiscal years.  Each consortium member should have minimum 300,000 USD in each of the last 2 fiscal years	Audited copies of the P&L statement OR the Chartered Accountant certificate. For consortium bids, each member must provide the required documents individually.
2		Profitability	Profitable in each of the last 2 fiscal years	Each consortium member should be profitable in each of the last 2 fiscal years	Audited copies of the P&L statement OR the Chartered Accountant certificate  For consortium bids, each

Sr no	Metrics segment	Metric	Value in case of single bidders	Value in case of consortium bidders	Documentation requirements
					member must provide the required documents individually.
3	<b>Experience and Track Record Metrics</b>	Years of Operation	Minimum of 5 years operating in the technology development (custom app/ software development)	Lead bidder of the consortium should have minimum experience of 5 years operating in the technology development (custom app/ software development)  Each member of the consortium should have minimum experience of 2 years operating in the technology development (custom app/ software development)	Copy of Certificate of incorporation / partnership/ any other government recognized certificate  For consortium bids, each member must provide the required documents individually.
4		Similar Projects Completed	At least 3 projects similar to the scope of this RFP successfully completed in the past 5 years, with each project value > 50,000 USD.  To be considered, the projects need to have demonstrated any three of the following six capabilities: 1. Core Applications, IT-OT, data engineering 2. Customer applications development	Lead bidder and consortium members should collectively meet this requirement.	Citation – Project title, client name, scope, duration, completion date, deliverables, project value, completion certification from client (or proof of successful completion)  Format for citation – Attachment 1 Form 1.5



Sr no	Metrics segment	Metric	Value in case of single bidders	Value in case of consortium bidders	Documentation requirements
			3. Management dashboard/ Data Visualization and Reporting System 4. Analytics use cases 5. Managed services 6. Hardware Deployment - setup and configuration of hardware systems including Servers, networking equipment and end-user devices		
5		Number of employees	Minimum 50 FTE (i.e., excluding support functions like HR, finance) in Bangladesh; with overall 100 FTEs globally (i.e., excluding support functions like HR, finance)	Lead bidder should have minimum 50 FTE (i.e., excluding support functions like HR, finance) in Bangladesh; with overall 100 FTEs globally (i.e., excluding support functions like HR, finance)  All member of consortium should have minimum 25 FTE (i.e., excluding support functions like HR, finance) globally	Self-certification from CEO/ Authorized signatory.  For consortium bids, each member must provide the required documents individually.
6	<b>Local Content Requirement Metrics</b>	Local Workforce	At least 40% of the project team consists of residents/co-locate to Bangladesh	At least 40% of the project team consists of residents/co-locate to Bangladesh  At least 75% of the co-located and overall resources are from the lead bidder.	Self-certification from CEO/ Authorized signatory.  For consortium bids, each member must provide the required documents individually.

Sr no	Metrics segment	Metric	Value in case of single bidders	Value in case of consortium bidders	Documentation requirements
7	<b>Legal entity in Bangladesh</b>		Legal entity in Bangladesh (firm/company/partnership/ proprietorship firm registered under the Bangladesh Companies Act, 1994) in past 2 years	Any member of the consortium should meet this requirement.	Copy of Certificate of incorporation / partnership/ any other government recognized certificate For consortium bids, member meeting this particular criterion must provide the required documents
8	<b>Legal history</b>		Digital Partner's management and proposed team members do not include members who have a history of corruption, arrest records, or involvement with criminal organizations	All members of the consortium should meet this requirement individually.	Self-certification from CEO/Authorized signatory.  For consortium bids, each member must provide the required documents individually.

### **Attachment 5.1 Continued Eligibility**

- The shortlisted Bidder must continue to meet the eligibility criteria prescribed in the RFQ document (based inter-alia on which they were shortlisted) and should continue to meet these till the award of the contract. Bidders must provide evidence of their continued eligibility to JICA DXLab if requested.
- Furthermore, it is the Bidder's responsibility to ensure that its Experts, service providers, suppliers and/or their employees similarly continue to meet such eligibility criteria.

### **Attachment 5.2 Change in Structure or Associations**

- **Changes in Structure:** Any change in the structure, formation, eligibility, or qualifications of a shortlisted Bidder after being shortlisted/invited to bid before submitting Bids shall be subject to the written approval of JICA DXLab.

### **Attachment 5.3 Participation in only one Bid**

The shortlisted Bidder shall not participate in more than one Bid in this RFP Process. Participation in any capacity by a Bidder in more than one Bid shall result in the disqualification of all Bids in which he is a party.

### **Attachment 5.4 Sub-contracting**

- Subject to the conditions listed in this RFP and herewith, the Bidder may propose to use subcontractor(s) to make a complete offer to perform all services.
- Any prospective subcontractor that is not a wholly owned subsidiary of the Bidder will be subject to conditions specified in this clause. The conditions for proposing to use subcontractors include, but are not limited to, the following:
- Prior to any communication or distribution of CWASA confidential information to the potential subcontractor, the Bidder must provide CWASA with the name of the potential subcontractor in advance and in writing. The Bidder will also provide contact information for the potential subcontractor. Bidder must obtain prior written approval of CWASA before providing any confidential information of CWASA to a potential subcontractor or another entity.
- If selected, the selected Bidder will be the prime Bidder for services provided to CWASA by approved subcontractors. The Bidder and all the subcontractors shall be jointly and severally responsible for performance of the solution.
- The Bidder will be ultimately responsible for the provision/deficiency of all services, including subcontractor's compliance with the service levels and all other obligations and conditions enumerated in this RFP and the awarded Contract, if any.
- Subcontractor's cost will be included within the Bidder's pricing and invoicing and CWASA shall in any way not be obligated or liable to pay to the approved subcontractors any remuneration or monetary compensation of any kind.
- No subcontract under the contract shall relieve the Bidder of the responsibility for ensuring that the requested services are provided, and the provisions of the Non-Disclosure Agreement are adhered to. Bidders planning to subcontract all or a portion of the work to be performed must identify the proposed sub-contractors sufficiently in advance to ensure timely delivery of services.
- The Bidder may only submit one bid as a prime Bidder. If the Bidder submits more than one bid, CWASA may reject one or more of the submissions. This requirement does not limit a subcontractor's ability to collaborate with one or more Bidders submitting bids.

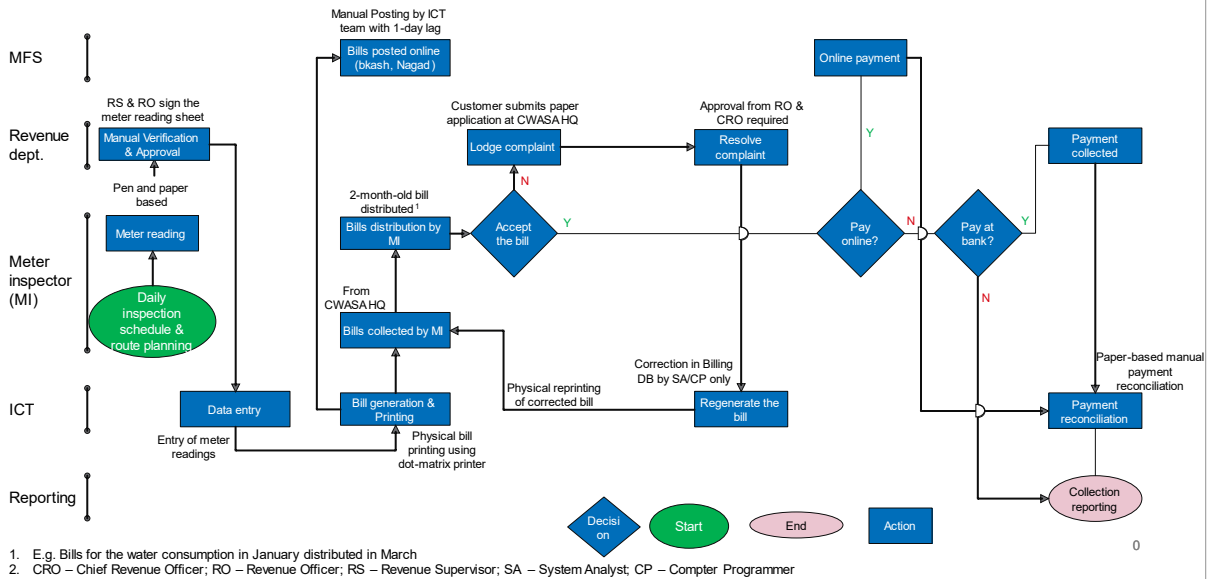
## **Attachment 5.5 Consortium Bidders**

- JV/ consortium bids are allowed for this RFP. The list of Consortium Partners needs to be declared in the bid. Any change in the Consortium during the bidding process will lead to disqualification of the Consortium.
- For consortium bids, a maximum of two companies can participate: one serving as the lead bidder and the other as a member of the consortium. For consortium bids, the contract will be executed with the lead bidder.
- In case of a Consortium bid, the "Lead Bidder" will be responsible for meeting all obligations of the Consortium and the delivery of goods and services mentioned in this RFP, including but not limited to:
  - The management of Consortium Partner who is also a part of the bid and for the delivery of all products and services in accordance with the Agreement
  - The supply, delivery and installation, commissioning of all products and providing all services as submitted in their bid
  - Ensuring the successful execution of integrated solution including meeting the SLAs
- Internal arrangement between the Consortium Partners is left to the bidders. It is the responsibility of the Lead Bidder to ensure that the other Consortium Partners in the bid are compliant to all the clauses as mentioned in the bid, failing which bid can be disqualified. If, during the bidding process, the Consortium as proposed in the bid is dissolved or the Consortium Partners change, then the Bid is liable to be disqualified
- Bidders will need to submit following documents for consortium bids:
  - Citation of Memorandum of articles OR
  - certificate from Chartered Accountant stating the relationship between the JV / Consortium partners OR
  - any similar documentary evidence

## **Attachment 6 Meter Reading app**

### **Attachment 6.1 Meter Reading app: Current process**

## Meter Reading app process flow chart - Current



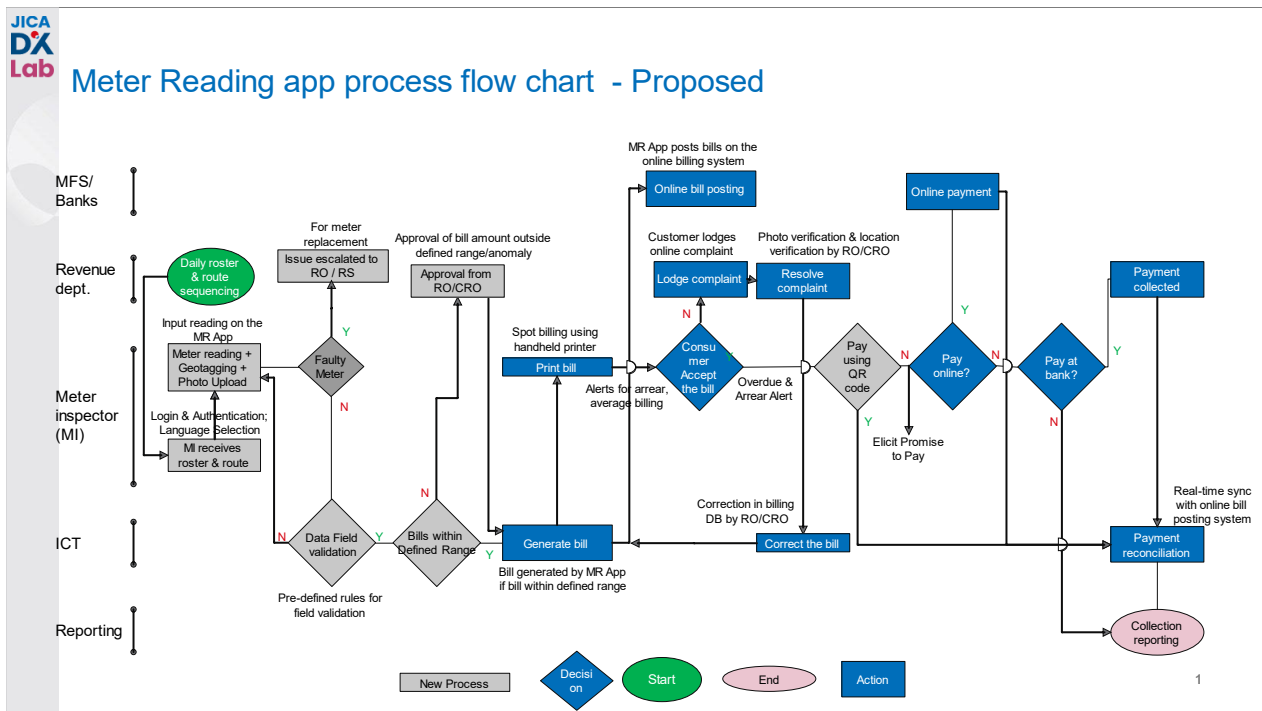
The process flow chart describes the current workflow for meter reading and billing in a water utility context, as follows:

1. Meter Reading:
  - a. The MIs conduct meter readings as per the daily inspection schedule and route planning. MI has a sheet of paper with customer accounts number listed
  - b. The MI records the current meter reading in front of the account numbers. The readings are recorded using pen and paper.

The meter reading process is time consuming and prone to human error.
2. Verification and Approval:
  - a. The Revenue Supervisor (RS) and Revenue Officer (RO) sign off on the meter reading sheet after manual verification and approval
3. Data Entry:
  - a. The recorded meter readings are manually entered into the system by the ICT (Information and Communication Technology) team.
4. Bill Generation and Printing:
  - a. Bills are generated at the CWASA (Chattogram Water Supply and Sewerage Authority) headquarters.
  - b. The physical bills are printed using a dot-matrix printer.
5. Bill Distribution:
  - a. MIs collect the bills from CWASA HQ and distribute them to customers.
  - b. The bills, which are two months old according, are distributed by MIs. For e.g., MI on 1<sup>st</sup> March will take the meter reading for the month of February and distribute the bill for the month of January.
6. Complaint Resolution:

- a. If a customer lodges a complaint, the issue is resolved with approval from the RO and Chief Revenue Officer (CRO).
- 7. Bill Correction:
  - a. If there is a need for correction, the billing database is corrected by a System Analyst (SA) or Computer Programmer (CP).
  - b. The bill is then physically reprinted.
- 8. Payment Process:
  - a. Customers have the option to pay online or at the bank.
  - b. If the customer chooses to pay online, and the payment is successful, it is collected, and the process ends.
  - c. If the customer opts to pay at a bank and the payment is successful, it is collected.
  - d. If the customer doesn't pay, no payment is recorded and the same is counted as dues / arrears in the next billing cycle.
- 9. Payment Reconciliation:
  - a. Payments are manually reconciled using payment records shared by banks & MFS and the payment confirmation received from banks & MFS
  - b. Payment reconciliation and collection reporting are done as part of the final steps in the process.

## Attachment 6.2 Meter Reading app: Proposed process



The process flow chart outlines the proposed operations for meter reading and billing after the implementation of a new meter reading app for a water utility. The process description for some of the crucial process is as follows:

1. Meter Inspector Login & Authentication: The MI logs in to the Meter Reading App, authenticates themselves, and receives their daily roster and route.
2. Meter Reading: The MI inputs readings on the Meter Reading App, geotagging the location and uploading a photo of the meter as proof of reading.
3. Data Field Validation: The Meter Reading App performs data field validation to ensure the accuracy of the readings based on pre-defined rules. If the reading is within the defined range, it proceeds; if not, it requires further action.
4. Photo Upload: MI uploads meter photo for future verification and
5. Georeferencing: location verification by the app
6. Faulty Meter or Bill Amount Outside Defined Range: If the meter is faulty, the issue is escalated to the Revenue Officer (RO) or Revenue Supervisor (RS) for replacement. If the bill amount is outside the defined range or if there's an anomaly, approval is needed from the RO/CRO (Chief Revenue Officer) before bill generation
7. Bill Generation: If the bill is within the defined range, the Meter Reading App generates the bill.
8. Spot Billing: The MI can print the bill using a handheld printer for on-site spot billing.

9. **Online Bill Posting and Payment:** The Meter Reading App posts bills on the online billing system, and customers can make online payments or pay at a bank. There is real-time synchronization with the online bill posting system for any payments made online.



## Attachment 6.3 Meter Reading app: Functional Requirement Specification

### Must Have Features

Application Use Cases	Objective of this use case	Indicative list of Features and their description	Front-end & Back-end
<b>Login &amp; Authentication</b>	Authenticate MIs (MI) for logging into the app	<ul style="list-style-type: none"> <li>• First time login</li> <li>• Option for Mobile/Email OTP-based login.</li> <li>• Option to reset/change password.</li> <li>• Ability to setup security questions for forgot passwords.</li> <li>• Ability to send WhatsApp messages for notification</li> <li>• Ability to manage role-based access control</li> <li>• Ability to request authentication from MIs every 1 hour</li> </ul>	Login, OTP based login – frontend Authentication, OTP sending, OTP validation – backend Biometric validation – backend
<b>Roster</b>	Manage and assign meter reading schedules to MI randomly. No MI should visit the same home in consecutive billing cycles	<ul style="list-style-type: none"> <li>• Ability to take input from the Revenue Officer on available MI</li> <li>• Ability to allocate wards/geographic areas to MIs based on availability and CWASA's logic (e.g., service priority, coverage efficiency).</li> <li>• Ability to generate a meter-reading plan for the day/week/fortnight.</li> <li>• Ability to share Daily To-Do List with MIs via the app, detailing their specific assignments</li> </ul>	Back-end

Application Use Cases	Objective of this use case	Indicative list of Features and their description	Front-end & Back-end
<b>Route Sequencing</b>	Optimize travel routes for MIs to enhance productivity, increase percentage of houses covered.	<ul style="list-style-type: none"> <li>• Ability to gather information from the roster scheduling for each MI.</li> <li>• Ability to generate a multi-point route map comprising all visits planned according to the daily roster plan, optimizing the route sequence over at least three billing cycles for efficiency.</li> <li>• Ability to provide MIs with daily routes in the app, including the best order to visit meter reading locations.</li> <li>• Ability to use GPS to track the real-time location of MIs, recording all visited places with both time and geographical coordinates.</li> </ul>	Frontend
<b>Meter Reading</b>	capture water usage data from meters for billing and analysis	<ul style="list-style-type: none"> <li>• Ability to retrieve previous meter readings and other relevant customer details (ward no, connection type, area, name, contact, address) as per the roster schedule.</li> <li>• Ability to support manual entry of current meter readings by MIs.</li> <li>• Option to select Meter Sizes from a dropdown menu (0.75", 1", 2", 3", 4", 6", 8")</li> </ul>	Frontend
<b>Data Field Verification</b>	Validate input data in real-time to ensure accuracy and consistency of meter readings	<ul style="list-style-type: none"> <li>• Ability to validate negative numbers, meter readings lower than previous month's readings</li> <li>• Ability to automatically validate entered readings against historical consumption data for discrepancies (high deviation from historical consumption)</li> <li>• Ability to require approval for readings outside specified ranges:</li> </ul>	Frontend (on-device)

Application Use Cases	Objective of this use case	Indicative list of Features and their description	Front-end & Back-end
		<ul style="list-style-type: none"> <li>○ 0.5-0.75X or 1.25-1.5X needing Revenue Officer approval</li> <li>○ below 0.5X or above 1.5X requiring Chief Revenue Officer approval for bill generation.</li> </ul> <p>X being the last month's consumption.</p> <ul style="list-style-type: none"> <li>● Ability to generate alerts for identified discrepancies in meter readings, allowing MIs to re-enter the reading.</li> <li>● Ability to record and report multiple data field violations for the same customer, generating reports for the Revenue Officer accessible via the admin portal under "Data Field Violations".</li> </ul>	
<b>Photo Upload</b>	Enable meter readers to upload photos of meters as proof of reading and for verification purposes.	<ul style="list-style-type: none"> <li>● Ability to prompt MIs to mandatorily upload the photo of the meter reading after the reading has been input. <ul style="list-style-type: none"> <li>○ Meter Reading should not be completed if no photo is attached, or no issue is raised regarding meter errors</li> </ul> </li> <li>● Ability to attach uploaded photos to the meter reading entry for evidence and documentation.</li> <li>● Ability to enable the Revenue Team through the admin portal to review photo attachments and meter readings.</li> </ul>	Frontend

Application Use Cases	Objective of this use case	Indicative list of Features and their description	Front-end & Back-end
<b>Location Verification (Georeferencing)</b>	Confirm the geographical location of water meters to ensure readings are taken from the correct site	<ul style="list-style-type: none"> <li>• Ability to capture and record GPS coordinates during the input of meter reading.</li> <li>• Ability to attach GPS coordinates to the meter reading entry.</li> <li>• Ability to perform location verification of customer accounts for which GPS coordinates exist.</li> <li>• Ability to generate an alert and prevent recording of the meter reading if the MI is beyond 50 meters of the consumer's GPS coordinates.</li> </ul> <p>In case GPS coordinates of the consumer doesn't exist</p> <ul style="list-style-type: none"> <li>• Ability to validate the GPS coordinates within the boundaries of ward of the consumer (ward no for each consumer and ward boundaries is available)</li> <li>• Ability to record GPS coordinates for future location reference while taking meter reading</li> <li>• Ability to fix GPS coordinates for the consumer if 3 consecutive month's meter reading has GPS coordinates in very close proximity (&lt;20 m)</li> </ul>	Frontend
<b>Spot Printing</b>	Provide on-the-spot bill printing services immediately after meter reading.	<ul style="list-style-type: none"> <li>• Ability to present an option for spot printing of the bill within the app after calculating it based on the latest meter reading for immediate delivery to the customer via SMS/Email</li> <li>• Ability to enable MIs to print the bill on-site or for immediate delivery to the customer through handheld printer</li> <li>• Ability to record the bill generation and printing for audit and customer service purposes</li> <li>• Physical bill to include QR code with payment link</li> </ul>	Frontend

Application Use Cases	Objective of this use case	Indicative list of Features and their description	Front-end & Back-end
<b>QR code for Bill Payments</b>	Simplify bill payment, reducing collection time by generating QR code for spot payments	<ul style="list-style-type: none"> <li>• Ability to include a unique QR code in each generated bill that customers can scan to initiate payment. (QR code to contain the payment link to bKash payment portal for CWASA)</li> <li>• Ability to direct customers to the payment portal upon scanning the QR code, facilitating online bill payments.</li> <li>• Ability to update the customer's account ledger with payment confirmation upon completion of payment.</li> </ul>	Backend (this feature would work when the device is connected to internet)
<b>Real-time Meter Reading Data Upload</b>	Upload meter reading data instantly to the system for real-time updating and processing	<ul style="list-style-type: none"> <li>• Ability to upload meter reading data to the online water billing system in real-time upon completion of a meter reading (post data validation, photo upload and successful georeferencing)</li> <li>• Ability to include a timestamp with each data upload.</li> </ul>	Front-end
<b>Bill generation &amp; Online Bill Posting</b>	Automate the creation and distribution of bills, allowing customers to view and pay their bills online.	<ul style="list-style-type: none"> <li>• Ability to calculate bills based on the latest meter reading after data validation</li> <li>• Ability to generate bills in offline mode, independent of the online billing system data generation.</li> <li>• Ability to post generated bills to the Online Billing System for customer access and processing.</li> <li>• Ability to store meter readings and generated bills offline, ensuring the bill can be posted to online water billing system once the device connects to the internet</li> <li>• For customers with arrears greater than predefined amount, the generated bill shall have a red color/ visual shape. Initial predefined amount is</li> </ul>	Frontend

Application Use Cases	Objective of this use case	Indicative list of Features and their description	Front-end & Back-end
		BDT 50k. This predefined amount can be modified in the admin portal.	
<b>Average Billing Alerts</b>	Notify CWASA officials when their customers meters are not read for extended period of time	<ul style="list-style-type: none"> <li>Ability to review meter reading schedules and identify meters not read according to CWASA criteria (e.g. meters not read for 3+ months): <ul style="list-style-type: none"> <li>Triggering alerts for MIs on the app</li> <li>Notifications to Revenue Officer/Chief Revenue Officer regarding overdue readings on the admin portal and email</li> </ul> </li> <li>Ability to notify consumers via SMS of upcoming meter readings</li> </ul>	Triggered by Backend Received at frontend
<b>Arrear Alerts</b>	Alert customers to outstanding balances or overdue bills to encourage timely payments	<ul style="list-style-type: none"> <li>Ability to send a notice directly to consumers detailing the amount due and final payment deadline through SMS or email.</li> <li>The warning should include instructions for payment and contact information for customer service in case of disputes or questions.</li> <li>Ability to define the logic for sending digital notices (by amount, by month outstanding, by non-payment months)</li> </ul>	Backend
<b>Offline Functionality</b>	Ensure the app functions seamlessly without an internet connection for field operations in remote areas.	<ul style="list-style-type: none"> <li>Option for offline functionality of meter readings and billing options.</li> <li>Meter Reading data (current monthly reading, timestamp, meter photo, GPS coordinates, and account number) should be stored locally on the app when an internet connection is unavailable.</li> </ul>	Frontend

Application Use Cases	Objective of this use case	Indicative list of Features and their description	Front-end & Back-end
		<ul style="list-style-type: none"> <li>• Ability to sync stored data with the Online Billing System Database once an internet connection is restored.</li> </ul>	
<b>Automated Notifications</b>	Send timely notifications to both customers and field personnel for appointments, billings, and important updates.	<ul style="list-style-type: none"> <li>• Ability to send automated notifications to customers regarding upcoming meter readings, newly generated bills, and payment confirmations <ul style="list-style-type: none"> <li>○ Relevant details such as the date for the meter reading, bill amount, due date, and payment confirmation should be included</li> </ul> </li> </ul>	Backend
<b>Language Selection</b>	Offer multi-language support to cater to diverse customer preferences and enhance usability	<ul style="list-style-type: none"> <li>• Ability to offer language selection during the initial app setup, allowing users to choose their preferred language: <ul style="list-style-type: none"> <li>○ App interface, notifications, and reports adapt to the selected language.</li> </ul> </li> <li>• Ability to change language preference at any time via app settings.</li> </ul>	Front-end

Application Use Cases	Objective of this use case	Indicative list of Features and their description	Front-end & Back-end
<b>Device Management</b>	Ensuring only whitelisted app function on the devices	<ul style="list-style-type: none"> <li>• Ability to manage a whitelist of apps that are allowed to run on the devices used by MIs <ul style="list-style-type: none"> <li>○ Blocking or flagging any attempts to open or install non-whitelisted apps.</li> <li>○ Only admin can change the whitelisted apps.</li> </ul> </li> <li>• Ability to remotely manage the whitelist of apps, including the ability to add, update, or remove applications without physical access to the devices.</li> <li>• Ability to require authentication for administrative access to prevent unauthorized changes and log all administrative actions for audit and compliance purposes.</li> <li>• Ability to ensure seamless integration with essential apps like Google Maps and the Meter Reading app.</li> </ul>	Triggered by Backend Reflected on frontend
<b>Bill Generation for Tubewell</b>	Ability to generate bill for collection of tubewell license fee	<ul style="list-style-type: none"> <li>• Ability to retrieve tubewell account details, including licensee information, tubewell location, and license number.</li> <li>• Ability to calculate the billing amount based on the annual license fee and any prorated adjustments. <ul style="list-style-type: none"> <li>○ Option to include standard billing details such as the period of coverage, due date, and applicable taxes or surcharges.</li> </ul> </li> <li>• Ability to require electronic approval from RO/CRO for any bills exceeding a predefined threshold similar to Meter Reading bill generation</li> </ul>	Front-end



Application Use Cases	Objective of this use case	Indicative list of Features and their description	Front-end & Back-end
<b>Elicit Promise to Pay (P2P)</b>	For customers with high arrears, elicit promise to pay and record	<ul style="list-style-type: none"> <li>• Ability to record the date promised by the customer for making the payment.</li> <li>• Ability to send reminder SMS to the customer on the Promise to Pay (P2P) date.</li> </ul>	Frontend  SMS sending – backend
<b>Issue Escalation</b>	Facilitating lodging of issues and sending to concerned officials	<ul style="list-style-type: none"> <li>• Ability to report issues encountered during meter readings, such as faulty meters or leaks by MI <ul style="list-style-type: none"> <li>○ Option of drop down of issue categories (e.g. faulty meter, leaks etc.)</li> <li>○ Option to include detailed descriptions, photos, or documents</li> </ul> </li> <li>• Ability to view issue reported by MI through admin portal by Revenue Supervisor / Officer or Chief Revenue Officer <ul style="list-style-type: none"> <li>○ Option to close an issue by RS/RO/CRO once the issue has been resolved</li> </ul> </li> </ul>	Frontend

## Attachment 6.4 Meter reading app: Functional Requirements for Admin Portal

Application Use Cases	Objective	Indicative list of Features and their description
User Management	To manage user roles and access securely and efficiently.	Ability to create, modify, and manage user accounts for MIs and other staff, including role-based access control.
Features management	To manage the feature rollout	Ability to select which features are online. Eg Roster, Route Sequencing etc. can be activated when required by CWASA
Approval for bill generation	To approve bills with amounts outside the defined range	Ability to generate bills after approval based on bill amounts: <ol style="list-style-type: none"> <li>1. RO (Revenue Officer) if the current month bill is 0.5-0.75X or 1.25-1.5X than previous month's bill</li> <li>2. CRO if the current month's bill &lt;0.5X or &gt;1.5X the previous month's bill</li> </ol> <p>X being the last month's bill</p>
Billing and Payment Monitoring	To streamline the tracking and management of billing and payments.	Ability to Facilitate the tracking of bill generation, delivery, and payment statuses, including arrear alerts and average billing notifications.
Customer Management	To improve customer service through detailed account management.	<ul style="list-style-type: none"> <li>• Ability to manage customer accounts in detail, encompassing the history of meter readings, billing, payments, and any service-related issues.</li> <li>• Option for the Revenue department to correct or rectify bills as necessary.</li> </ul>
Issue Tracking and Escalation	To ensure timely resolution of issues reported by MIs.	<ul style="list-style-type: none"> <li>• Ability to log, track, and escalate issues related to meter functionality, such as faults or the need for replacements, as well as reports of malpractice</li> <li>• Ability to close issues once completed; Option to upload photos or other documents for verification while closing the issue</li> </ul>
Device and App Management	To maintain secure and efficient	Ability for CRO to whitelist applications, manage software updates, and monitor device health

<b>Application Use Cases</b>	<b>Objective</b>	<b>Indicative list of Features and their description</b>
	operation of MI devices.	
Notification Management	To enhance communication with automated notifications.	Ability to configure and dispatch automated notifications to customers and MI regarding meter readings, billing, and other updates.
Reporting and Audit Trails	To facilitate compliance and decision-making through detailed reporting.	Ability to generate detailed reports covering various facets of the meter reading and billing processes, supporting compliance and audit requirements
Language and Localization Settings	To cater to regional preferences and enhance usability.	Ability to customize the user interface language and settings of the portal according to language preferences and regulatory mandates
Security and Compliance	To ensure application security and regulatory compliance.	Ability to ensure compliance with data protection and privacy laws, employing encryption, maintaining audit logs, and implementing strict access controls

## Attachment 6.5 Meter reading app: Go-Live checklist

Checklist Item	Criteria	Acceptable Range
<b>Pre-Go-Live Preparation</b>		
System Integration Testing	All system components integrated and functional	100% integration success
Training Completion	MIIs and Revenue Officers trained	100% of targeted users trained
Data Validation Checks	Accuracy of data validation and verification	98% accuracy in meter reading data validation
<b>Operational Readiness</b>		
Offline Functionality Verification	App operates effectively without internet connection	Successful operation & 100% data sync after reconnecting
Device and App Whitelisting	Only authorized apps function on MI devices	100% adherence to device policy
GPS and Georeferencing Accuracy	Precise location tracking for meter readings	Accuracy within 50 meters
Photo Upload and Verification	Seamless photo upload as proof of meter reading	99%+ success rate for photo uploads
Bill Generation and Printing	Quick and accurate bill generation post-meter reading	Bills generated within 5 seconds after data validation & photo upload is completed
Notifications and Alerts System	Effective delivery of all programmed notifications and alerts	99%+ delivery rate for notifications and alerts
QR Code for Bill Payments	QR code generation for easy bill payments	99%+ accuracy in QR code generation
Real-time Meter Reading Data Upload	Instantaneous data upload to system for updating and processing	Data uploaded within 1 minute after data validation when device is connected to the internet
Online Bill Posting	Automated and offline bill creation and posting	Bills posted within 2 hours of generation
Arrear Alerts	Automated alerts for customers with outstanding balances	100% delivery rate of arrear alerts
Automated Notifications	Timely notifications to customers and MIIs	100% accuracy and timeliness
Language Selection Functionality	Multi-language support functioning as expected	All supported languages fully operational
Issue Escalation Mechanism	Efficient lodging and escalation of issues	Issues reported to Revenue Officer / Supervisor within 5 minutes of issue escalation

<b>Checklist Item</b>	<b>Criteria</b>	<b>Acceptable Range</b>
AMR Capability Integration	Exclusion of consumers with AMR for billing	100% exclusion of AMR meters from MI routes
Login and Authentication Processes	Secure and efficient login/authentication mechanisms	100% success rate for OTP, biometric validations
Roster Management	Effective management and assignment of meter reading schedules	100% accuracy in roster assignments (no MI is allotted)
Location Verification (Georeferencing)	Confirmation of meter locations	100% success in location verification within 50 m range
Spot Printing Capability	On-the-spot bill printing services operational	100% functionality for in-field bill printing
<b>Post-Deployment Monitoring</b>		
Monitoring and Alerting System	Operational status of monitoring system	Continuous monitoring with <1 hour issue detection
Data Backup and Recovery	Operational status of backup and recovery systems	Daily backups, <4 hours Recovery Time Objective
<b>Compliance and Documentation</b>		
Compliance Checks	Compliance with regulations and data protection laws	100% compliance
Documentation Delivery	Availability of user manuals and operational documentation	Documentation provided to all stakeholders
<b>Final Checks</b>		
Final Review Meeting	Confirmation of system readiness	All checklist items reviewed and confirmed

## **Attachment 7 Management Dashboard**

### **Attachment 7.1 Management Dashboard: Current Process**

Currently CWASA have a mix of hardcopy reports, such as the Monthly MIS Report and the Monthly Revenue & Expense Report, along with soft copy reports like the ICT Billing Report and the Monthly Production Report. Additionally, SCADA system is limited to six installed sites.

However, CWASA is facing certain challenges due to the current reporting methods:

1. **Lack of Real-Time Data:** Hard copies can't provide up-to-the-minute information, crucial for timely decision-making.
2. **Data Silos:** Information stored in physical format can create isolated data pools, hindering integrated analysis.
3. **Limited Accessibility:** Access to physical documents is restricted by location, making it difficult for remote or traveling team members to stay informed.
4. **Time-Consuming:** Gathering, compiling, and analyzing data from physical documents is a slow process, delaying insights and actions.
5. **Difficulty in Sharing:** Distributing physical reports across departments or to external stakeholders is cumbersome and slow.
6. **Increased Risk of Errors:** Manual entry and handling of hard copies can lead to inaccuracies and data inconsistencies.

### **Attachment 7.2 Management Dashboard: Proposed Process**

CWASA has decided to build an integrated management dashboard for KPI tracking, report generation and anomaly detection (issues monitoring).

Management dashboard will be primarily used by MD, DMDs, and other heads of the departments to monitor performance, streamline operations, and achieve strategic objectives. They will utilize these dashboards to access real-time data insights to identify possible areas for intervention, enabling them to make data-driven decisions swiftly and efficiently. Kindly refer to Appendix 1 for org chart.

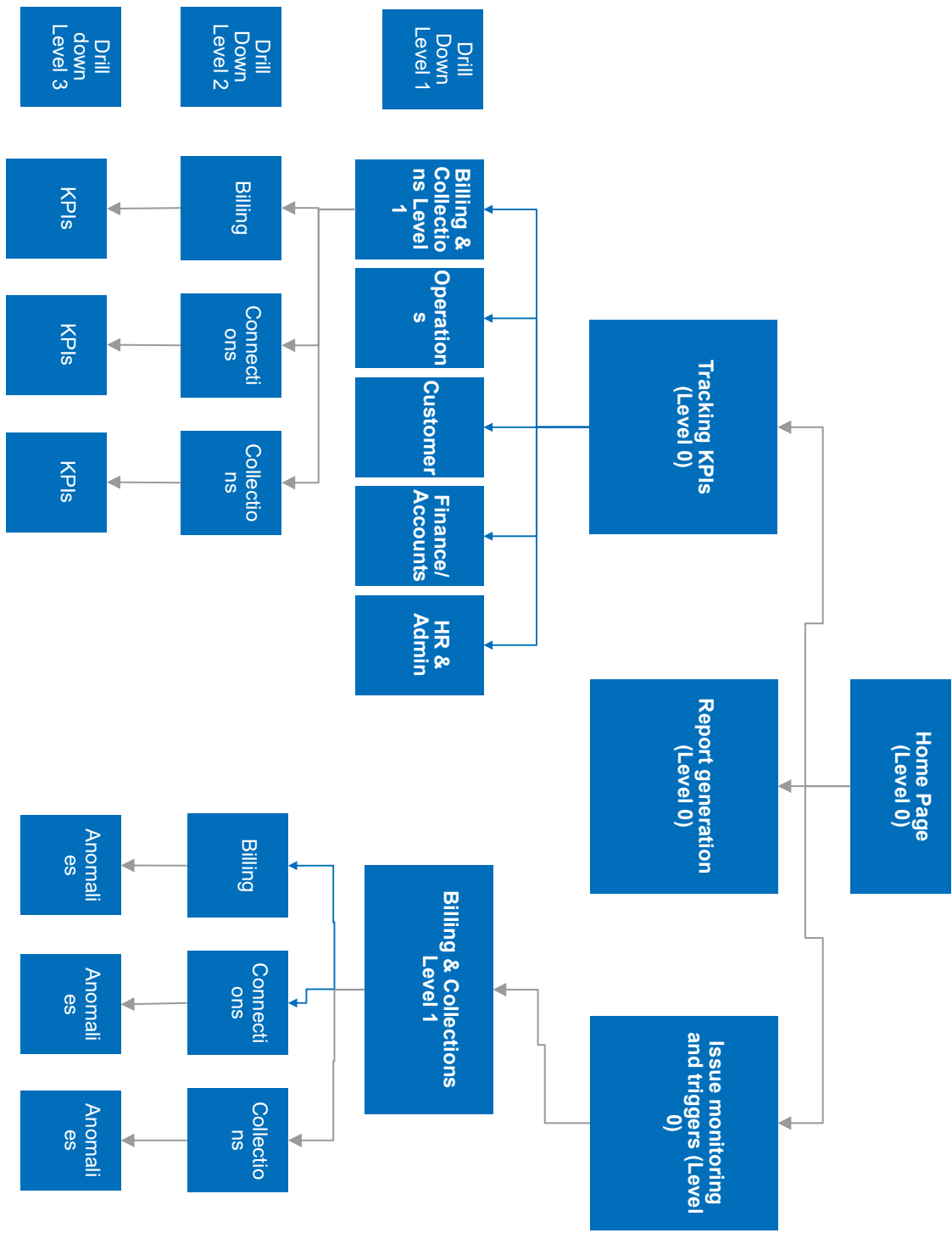
By integrating data from various sources, the dashboard will provide a holistic view of CWASA's operations, facilitating cross-departmental collaboration and alignment with organizational goals. Automated alerts for performance anomalies and deviations from set thresholds will enable proactive issue resolution, minimizing potential disruptions. Additionally, the dashboard will support trend analysis over time, helping identify opportunities for improvement. The inclusion of data visualization tools, such as graphs and heat maps, will make complex data more accessible and understandable, enhancing the decision-making process. This digital transformation aims to improve operational efficiency, promote transparency, and drive sustainable growth.

The management dashboard will have 3 sections:

1. KPI tracking

2. Report generation
3. Issues and anomaly tracking

Please find the proposed sitemap for the dashboard in figure below. Kindly note that this sitemap is for reference and vendors are encouraged to suggest better possible UI/UX for the project.



**Attachment 7.3 Management Dashboard: Features list**



Application Use Cases	Objective	Indicative list of Features and their description	Front-end & Back-end
Login & Authentication	Authenticate users for logging into the app	1. First time login – create account only based on company email-ID	Login, SSO, OTP based login – frontend
		3. Option for Mobile/Email OTP-based login -> OTP To validate user is logging in via their own device	Biometric validation – backend
		4. Option to reset/change password.	
		5. Set up security questions for forgot passwords.	
		6. Option to Opt-in for WhatsApp notifications	
		7. Role-based access control – Defines roles within the system and assigns permissions based on those roles to limit access to sensitive information and functionalities. Superuser/Administrator role: Able to view/change/update/ remove all data and sources- > assigned to CRO, Computer Programmers Developer Role: Able to view/change/ update/ remove all definition of reports, KPIs, analytics, triggers etc. -> assigned to IT Team members User Role -> Able to view/change/ update/ remove definition of reports, KPIs, analytics, triggers etc. for specific sets of data (e.g. revenue officer of MOD 1 able to access only MOD 1 data) -> assigned to business users Viewer Role: Able to view reports, KPIs, analytics, triggers etc. for specific sets of data (e.g. SRO of MOD 1 able to access only MOD 1 data) -> assigned to business users	
Home Page	Display the Three sections of the management dashboard for the users to select	All users have the ability to select b/w three options of KPI tracking, Analytics and triggers & Report generation. 1. KPI Tracking: This section allows users to monitor key performance indicators (KPIs) relevant to their objectives. Users can set and track specific metrics to evaluate the performance and efficiency of their operations or strategies over time. This feature enables the identification of trends, accomplishments, and areas needing improvement by providing real-time data and historical analysis. 2. Analytics and Triggers: This part offers users the tools to analyze data deeply and set triggers based on specific conditions or thresholds. The triggers' function allows for automated notifications when data reaches predefined parameters, facilitating proactive management and decision-making. 3. Report Generation: In this section, users can compile and generate detailed reports based on the data and analyses conducted within the system. It supports the creation of customizable reports that can include KPIs, analytical findings, and triggered event logs.	Frontend

Application Use Cases	Objective	Indicative list of Features and their description	Front-end & Back-end
Home Page-> KPI Tracking	Display the Five sections of the KPI tracking for the users to select	Ability to view five sections of KPI tracking -> (All the KPIs for the org are divided into 5 sections based on the most relevant departments). On the home page, the user shall be able to view upto 5 main KPIs for any particular section. For the POC – the focus is on billing & collections KPIs	Frontend
		Production & Maintenance: This section focuses on the KPIs related to the operational efficiency and maintenance activities of the water utility organization. It includes metrics on water production volumes, NRW, system uptime, maintenance reports.  The KPIs in this section will not be developed as part of this RFP. However, a placeholder tab needs to be created for future developments.	Frontend
		Billing & Collections KPIs: This area tracks the performance of billing and collections processes. It encompasses indicators such as billing accuracy, revenue collected versus billed, the efficiency of collections processes, and customer payment behaviors..	Frontend
		Customers KPIs: This segment is dedicated to metrics that measure customer satisfaction, engagement, and service delivery. It includes data on response times to customer inquiries, resolution of complaints, customer satisfaction scores, and overall service quality. This information is crucial for understanding and improving the customer experience. The KPIs in this section will not be developed as part of this RFP. However, a placeholder tab needs to be created for future developments.	Frontend
		Finance & Accounts KPIs: This section provides a detailed view of the financial health and performance of the organization through various financial KPIs. It covers aspects like profitability analysis, accounts receivables, operating ratio etc., offering insights into the organization's financial stability and efficiency. The KPIs in this section will not be developed as part of this RFP. However, a placeholder tab needs to be created for future developments.	Frontend
		HR & Admin KPIs: Focusing on the human resources and administrative aspects of the organization, this section includes KPIs related to number of employees, open positions, revenue per FTE etc. The KPIs in this section will not be developed as part of this RFP. However, a placeholder tab needs to be created for future developments.	Frontend
		Ability to view select KPIs in each section (details of KPIs and their sources available below)	Frontend

Application Use Cases	Objective	Indicative list of Features and their description	Front-end & Back-end
		Management users should be able to view and adjust KPIs between "date ranges". Standard options to be provided (e.g. This week, last week, this month, prev month, YTD, last year, custom range)	Frontend
		Ability to filter on the dashboard basis customer type, MOD, Area, MI, Connection status (detailed filter values provided below)	Frontend
		Ability to select Billing and collections for deep dive into billing and collections KPIs. Here they will be able to deep dive and select KPIs, apply filters (ex – MOD, Area, connection type etc.).	Frontend
		Ability to customize the KPIs views and access basis roles (e.g.- MD should be able to view all areas, revenue officers should be able to only view KPI of their area)	Frontend
		Ability to view help and guidelines for KPI -> calculation methodology, how to use, significance	Frontend
Home Page-> KPI Tracking -> Billing and collections	Display the three sections of the Billing and collections KPIs for the users to select	Ability to view the KPIs in three sections for Billing and collections: <ul style="list-style-type: none"> <li>• Connections</li> <li>• Billing</li> <li>• collections</li> </ul>	Frontend
		Ability to view and select KPIs in each section (details of KPIs and their sources available below)	Frontend
		Ability to modify the time duration of KPIs	Frontend
		Ability to filter on the dashboard basis customer type, MOD, Area, MI, Connection status (detailed filter values provided below)	Frontend
		Ability to select Billing and collections for deep dive into the specific KPIs related to the section	Frontend
		Ability to customize the KPIs values and access basis roles (e.g.- MD should be able to view all areas, revenue officers should be able to only view KPI of their area)	Frontend
		Ability to view trends and thresholds for each KPI through graphs/ visualizations	Frontend
		Ability to export the data in excel csv for offline views	Frontend
		Ability to download/save the visualizations as images	Frontend
		Ability to create new KPIs: User should be able to view the different available data sources and create new KPIs for their use	Frontend
		Ability to Modify KPIs: User should be able to view the different available data sources and KPIs and modify KPIs for their use. KPIs will be only modified for the current user and not for all users	Frontend
		Ability to view help and guidelines for KPI -> calculation methodology, how to use, significance (e.g. Bill sent out ratio = number of bills generated/	Frontend

Application Use Cases	Objective	Indicative list of Features and their description	Front-end & Back-end
		total number of connections, used to calculate billing efficiency, higher is better)	
Home page -> Analytics and triggers	Select between triggers management and analytics dashboard	ability to choose between two subsections – triggers management and analytics dashboard (Currently analytics dashboard shall be a placeholder, with room for future development)	Frontend
Home page -> Analytics and triggers -> Triggers management	Generate triggers for breach in KPIs/ operational metrics	Ability to view specific anomalies/ KPIs trends in 3 sections (detailed list and calculation methodology provided below) <ul style="list-style-type: none"> <li>• Connections</li> <li>• Billing</li> <li>• collections</li> </ul>	Frontend
		Ability to generate and send triggers on detection of anomalies	Frontend
		Ability to modify triggers: User should be able to view the different available data sources, threshold ranges and KPIs and modify triggers for their use. Triggers will be only modified for the current user and not for all users	Frontend
		Ability to view help and guidelines for triggers -> calculation methodology, how to use, significance	Frontend
		Ability to modify the time duration of triggers	Frontend
		Ability to filter on the dashboard basis customer type, MOD, Area, MI, Connection status (detailed filter values provided below)	Frontend
		Ability to customize the triggers values and access basis roles (e.g.- MD should be able to view all areas, revenue officers should be able to only view KPI of their area)	Frontend
		Ability to view trends and thresholds for each trigger through graphs/ visualizations	Frontend
		Ability to export the data in excel for offline views	Frontend
		Ability to download/save the visualizations as images	Frontend
		Ability to create triggers: User should be able to view the different available data sources, threshold ranges and KPIs and create triggers for their use. Triggers will be only created for the current user and not for all users	Frontend
		Ability to switch between triggers management and analytics dashboard	Frontend
		Ability to view all generated triggers in selected time duration	Frontend
		Ability to view all generated triggers by specific roles under the current user	Frontend
Home page -> Report generation	View and download	ability to view, save and send excel csv files (by email) of standard defined reports (list of reports, data fields and data sources provided below)	Frontend

Application Use Cases	Objective	Indicative list of Features and their description	Front-end & Back-end
	standard defined reports		
		ability to select fields to be viewed in a particular report -> user should get an option to select which fields they want to remove from view,	Frontend
		ability to move fields in the view in a particular report -> user should get an option to select and move fields from view,	Frontend
		ability to sort and filter reports basis data fields type -> ascending/descending for text type, smallest/largest for numerical,	Frontend
		ability to select the time duration of the report to be generated with both standard options (current month, last month, YTD, last year etc.) and custom dates.	
	Search reports	Ability for users to search for reports by name	Frontend
		Ability for users to search for texts within reports	Frontend
	Create new reports	ability to Create, view, save and send new reports based on available data sources (list of data sources provided below)	Frontend
		Newly created reports will be available only to the creating user, not for all users	Frontend
		Ability to send created reports to other users for their dashboards	Frontend
	Modify existing reports	ability to modify existing reports to be able to choose the data fields	Frontend
		Modified reports will be available only to the creating user, not for all users	Frontend
Automated Notifications	Send timely notifications to users for triggers	<ol style="list-style-type: none"> <li>1. Ability to automatically send notifications to users via SMS and email about triggers</li> <li>2. Notifications include relevant details such as trigger type, details of trigger, link to relevant trigger on dashboard</li> <li>3. Ability to customize which notifications to be received, and frequency</li> </ol>	Backend
Language Selection	Offer multi-language support to cater to diverse customer preferences and enhance usability	<ol style="list-style-type: none"> <li>1. During the initial account setup, the user selects a preferred language (Bengali or English).</li> <li>2. Dashboard interface, notifications, and reports adapt to the selected language.</li> <li>3. ability for users can change their language preference at any time via dashboard settings.</li> </ol>	Front-end
Audit Trails and Monitoring	Activity Logging:	Ability to capture detailed logs of user actions, system changes, and data access, which can be used for auditing and monitoring purposes. Logs of the following activity to be maintained- Log in and logout dates and times; Section accessed dates and times; Reports downloaded dates and times;	Backend

Application Use Cases	Objective	Indicative list of Features and their description	Front-end & Back-end
Ease of navigation	Ease of use	Easy Navigation Paths, straightforward menus and navigation options, allowing users to move between features without confusion. Home button on all screens top banner to move to home user profile, settings, preferences as drop down in all screens top banner	Front-end
	Section access	Quick Access to all sections -> all sections and subsection to be available as drop down on the top banner	Front-end
	Breadcrumb Trails	visual cues or breadcrumb trails for users to understand their location within the application hierarchy in the top banner	Front-end
	Quick Access	Quick Access to Frequently Used Features-> Ensures high-usage functions are easily accessible through a drop down on the top banner	Front-end
	Adaptive Design	Interface should adjust gracefully to different screen sizes and orientations.	Front-end
	Help and documentation	Offer easy-to-access guides, tooltips, and FAQs within the application. User should be able to view guides upon hovering at a field	Front-end

## Attachment 7.4 Management Dashboard: Detailed list of KPIs

Section	KPI
<b>Production &amp; Maintenance KPIs:</b>	Water Production
	Planned Maintenance %
	Non-Revenue Water (NRW)
	Water Quality sample
	Leakage occurrence
	Leakages per km
	Mean Time Between Failures (MTBF) – Equipment
	Breakdown works per month
<b>Customers KPIs:</b>	Overall Sentiment (KSA, Non-KSA, Others)
	Connection Applications
	Other Applications
	Customer Complaints
	Complaints Acted On
	High Arrear Customers
	Customer Sentiment
<b>Finance &amp; Accounts KPIs:</b>	Revenue
	Expenses
	Net Income
	Operating Ratio
	Stock & Stores
	Long-Term Loans
	Accounts Receivable (A/R) Collection Period
<b>HR &amp; Admin KPIs:</b>	Number of Employees (Permanent/Contract)
	Average Salary
	Full-Time Equivalent (FTE) per 1000 Connections
	Percentage Overtime to Basic Salary
	Number of Trainings
	Open Positions
	Retirement Eligibility
	Revenue per FTE
<b>Connections</b>	Count of total connections
	Count of new connections
	Count of inactive connections

Section	KPI
	Count of serviced new connection requests
	Billable connections
<b>Billing</b>	Functioning meter rate
	Bill sent out ratio
	Billed Value of total connections
	Billed Value of new connections
	Billed Value of inactive connections
	Billed value for metered and provisional readings
	Number of corrective actions & incentives earned by MIs
<b>Collections &amp; Arrears</b>	Collections Value of total connections
	Collections Value of new connections
	Collections Value of inactive connections
	Collections value for metered and provisional readings
	Total Arrears with start date of arrears & payment records
	Count of Actions taken for collections



## Attachment 7.5 Management Dashboard: Detailed list of anomalies and business logic

Section	Anomaly/ Trigger	Business Logic	
<b>Connections</b>	Sudden Increase in New Connections	Flag if the monthly increase in new connections exceeds the 6-month rolling average by more than 20%.	
	Inactive Connections with water usage	Flag any inactive connection that records water usage.	
	New connections are pending commencement of Billing	Flag if new connections, but no bill generated	
	Ghost Consumers -> Customers that have not paid for >6 months and on Provisional Billing	Flag if Customers that have not paid for >=6 months and on Provisional Billing	
	High Disconnection Rates in any area/ DMA	Flag if the monthly disconnection rate is more than 1.5 times the 6-month average.	
	Multiple Connections at a Single Property	Flag properties with connections exceeding expected norms based on property type and size.	
	Sudden Drop in Active Connections	Flag a more than 10% month-over-month decrease in active connections.	
	Changes of connection type from Commercial to Domestic, but with same/more consumption trend	Flag if connection type changed in <=3 months & no change in consumption pattern (+- 20% of avg consumption)	
	Anomalies in Geographical distribution of connections	Flag areas with connection rates significantly higher or lower ( $\pm 20\%$ ) than similar demographic regions.	
	Same MI being assigned to customer regularly	Flag if any MI tagged to same customer for more than 2 cycles	
	Identify cases with commercial usage of water but being billed as domestic	Flag if consumption pattern is significantly higher (+- 100% of avg consumption in similar area)	
	<b>Billing</b>	Sudden increase/ decrease in Billing Amounts	Flag any bill that is $\pm 30\%$ different from the customer's average bill over the past 12 months.
Unusually High or Low Average Consumption per Connection		Flag if average consumption per connection deviates more than 25% from the same period last year.	
Excessive Bill Adjustments and Corrections		Flag any account with adjustments or corrections exceeding 20% of the original billed amount more than once in a 6-month period.	
High Number of Bills Based on Estimates Rather Than Actual Readings		Flag if a customer receives estimated bills for more than two consecutive billing cycles.	
Outliers – Connections with significantly more consumption than average		Flag any Customer that is $\pm 30\%$ higher from the similar profile customer's average bill over the past 12 months.	

Section	Anomaly/ Trigger	Business Logic
	Outliers – Connections with significantly less consumption than average	Flag any Customer that is $\pm 30\%$ lower from the similar profile customer's average bill over the past 12 months.
	Hotspots for Nil consumption and minimum billing	Flag any ward that is x% minimum billing
	Ageing of nonfunctional meters, cutoff >6 months	Flag if meter nonfunctional for $\geq 3$ months
	Hotspots for defective meters: Ward wise / neighborhood of 500m wise	Flag any ward that is x% defective meters
	Regular Delays in Bill Generation	Flag any bill not generated within 10 days of the scheduled billing cycle.
	Mismatch Between Meter Readings and Bills	Flag any bill where the billed amount does not correspond to the meter reading for the same period within a 10% variance.
	Unusual Spike in Customer Complaints Regarding Bills	Flag if complaints about billing accuracy exceed 5% of the total bills issued in a month.
	Large Variations in Seasonal Billing Without Corresponding Usage Change	Flag if the variance in billing between seasons exceeds expected ranges based on historical averages by more than 20%.
	Discrepancies in Non-Revenue Water (NRW) Trends	Flag if NRW exceeds 25% of total water produced in a month.
<b>Collections and arrears</b>	Sharp Increase in Overdue Payments	Flag accounts with payments overdue by buckets of days (0-10, 10-30, 30-60, 60-90, >90) and bucket of amounts (0-10k BDT, 10k-20k BDT, 20-50k BDT, >50k BDT)
	Rise in Disputed Bills and Payment Queries	Flag if the number of disputed bills increases by more than 20% compared to the average of the previous 3 months.
	Variations in Write-offs	Flag if the amount or number of write-offs in a month exceeds the 6-month average by more than 25%.
	Inconsistent Cash Flow from Collections	Flag if monthly collections deviate more than 20% from the monthly average of the past year.
	Decrease in Collection Rate Efficiency	Flag if the collection rate drops below 80% for two consecutive months.
	Changes in Average Time to Collect Payments	Flag if the average time to collect payments exceeds 60 days or increases by more than 10 days compared to the 6-month average.
	Early detection of arrears – Prioritize new nonpaying accounts for investigation	Flag if regular paying connection (on time payment for last 6 cycles) going to default
	Irregular Payment Patterns Across Customer Segments	Flag any significant change in payment patterns, such as a 20% increase in partial payments or payment plans within a customer segment.
	High Volume of Payments Through Alternative Channels	Flag if there is a 25% increase in payments through alternative channels month-over-month.

Section	Anomaly/ Trigger	Business Logic
	Sudden Spike in Legal Actions for Collections	Flag if legal actions for collections increase by more than 50% compared to the 6-month average.
	Increase in Uncollected Bills	Flag if the percentage of uncollected bills increases by more than 10% compared to the average of the past 6 months.
	Increase in number of customers making partial payments for last 3 billing cycles	Flag any significant change in payment patterns, such as a 20% increase in partial payments or payment plans within a customer segment.
	Track the collections for past arrears	

## Attachment 7.6 Management Dashboard: Detailed list of reports

Report Name	Brief Description	Data Fields	
<b>Consumer due position</b>	<b>Details of the total due for each consumer</b>	Account number	
		Name	
		Address	
		Category	
		Status	
		Bills	
		Bill amount	
		M.Cost	
		PCA	
		Total	
		Last bill date	
		Contact number	
<b>Monthly billing summary report</b>	<b>Summarized view by area for count and value of bills, consumption split by category</b>	Area code	
		Area Name	
		Count Bills prepared	
		Count Domestic Bills prepared	
		Count Non-Domestic Bills prepared	
		Consumption	
		Consumption Domestic	
		Consumption non-Domestic	
		Billed Amount	
		Billed Amount Domestic	
		Billed Amount non-Domestic	
<b>Meter status report</b>	<b>Summarized view by area for count and status of meters, connections split by category</b>	Area code	
		Area Name	
		Count total Connection	
		Count total Connection – Billable Status	
		Count total Connection – Billed	
		Count total Connection – Unbilled	
		Count total Connection – Disc Status	
		Count total Connection – Domestic	
		Count total Connection – Nondomestic	

Report Name	Brief Description	Data Fields
		Count total Connection – Meter status – Metered
		Count total Connection – Meter status – Average meter
		Count total Connection – Non metered
		Count total Connection – Stop metered
<b>Unbilled list</b>	<b>Account wise view of all unbilled accounts</b>	Account number
		Name
		Category
		Status
		W. Con date
		Last reading
		MICode
<b>MI Wise monthly billing report</b>	<b>MI Wise summary of monthly billing</b>	MI Code
		Name
		Bills prepared
		Cumulative bills
		Billed Amount
		Cumulative amount
<b>Area wise total connected dues</b>	<b>Area wise total connected dues</b>	Area
		total accounts
		Total due amount
<b>VAT report</b>	Total VAT amount of billing	Total VAT amount of billing
<b>Waterbill collection</b>	<b>Report on Waterbill collections – total collected, and pending</b>	Area
		Billpay – Current
		Billpay – Arrear
		Billpay – Total
		JBL CASH – Current
		JBL CASH – Arrear
		JBL CASH – Total
		JBL Cheque – Current
		JBL Cheque – Arrear

Report Name	Brief Description	Data Fields
		JBL Cheque – Total
		Online bank – Current
		Online bank – Arrear
		Online bank – Total
		Total – Current
		Total – Arrear
		Total – Total
		Total Excise VAT
<b>Total Surcharge collection</b>	<b>Total Surcharge collection</b>	Month
		Year
		Billpay surcharge
		JBL Cheque surcharge
		JBL Cash surcharge
		Online bank surcharge
<b>MI wise disconnected dues</b>	<b>MI wise disconnected dues</b>	MI code
		total connections
		total dues
<b>MI wise connected dues</b>	<b>MI wise connected dues</b>	MI code
		total connections
		total dues
<b>Area wise disconnected dues</b>	<b>Area wise disconnected dues</b>	Area code
		total connections
		total dues

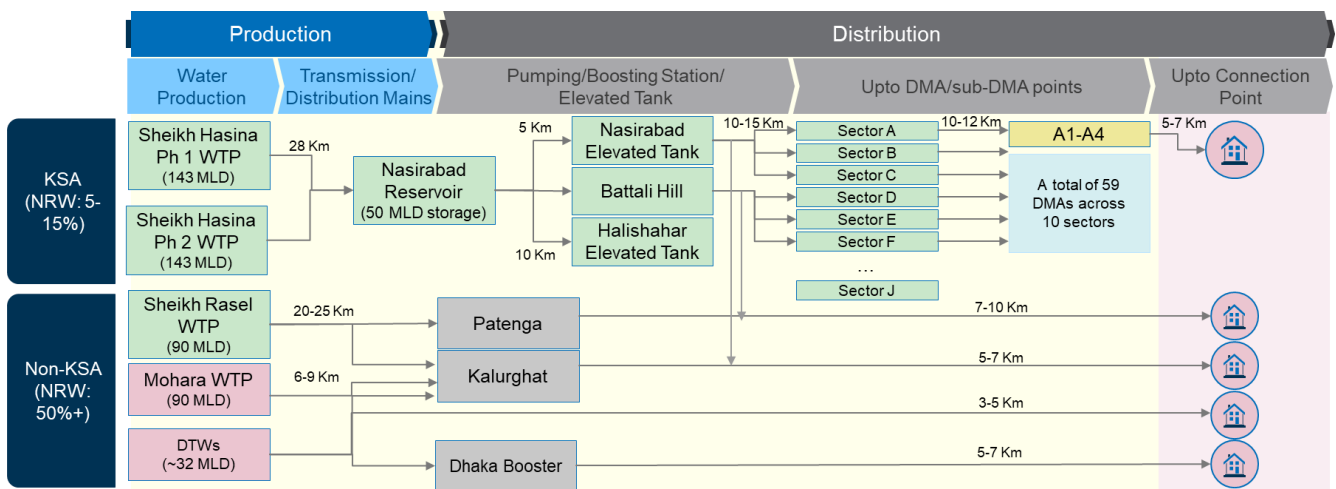
## Attachment 7.7 Management Dashboard: Go-Live checklist

Checklist Item	Criteria	Acceptable Range
<b>Pre-Go-Live Preparation</b>		
System Integration Testing	All system components integrated and functional	100% integration success
Performance Testing	Dashboard performance under load	With 100 concurrent users: Dashboard response time < 2 seconds, 99.5% uptime
Training Completion	Leadership members trained	100% of targeted users trained
Data Validation Checks	Accuracy of data validation and verification	100% accuracy in data validation from base systems
<b>Operational Readiness</b>		
Dashboard views and reports	Page Load times	Dashboard pages load time < 2 seconds, 99.5% uptime
Notifications and Alerts System	Effective delivery of all programmed notifications and alerts	99%+ delivery rate for notifications and alerts
Language Selection Functionality	Multi-language support functioning as expected	All supported languages fully operational
Login and Authentication Processes	Secure and efficient login/authentication mechanisms	100% success rate for OTP, biometric validations
<b>Post-Deployment Monitoring</b>		
Monitoring and Alerting System	Operational status of monitoring system	Continuous monitoring with <1 hour issue detection
Data Backup and Recovery	Operational status of backup and recovery systems	Daily backups, <4 hours Recovery Time Objective
<b>Compliance and Documentation</b>		
Compliance Checks	Compliance with regulations and data protection laws	100% compliance
Documentation Delivery	Availability of user manuals and operational documentation	Documentation provided to all stakeholders
<b>Final Checks</b>		
Final Review Meeting	Confirmation of system readiness	All checklist items reviewed and confirmed

## Attachment 8 NRW monitoring tool

### Attachment 8.1 NRW Monitoring Tool: Current Process

After the commissioning of KWSP Phase 1 & 2, a survey was conducted in September 2022 to measure NRW in each of 59 DMAs of KSA. No survey has been conducted thereafter.



The above network diagram provides a brief overview of water distribution network of the Chattogram Water & Sewerage Authority. There are ~90,000 connections in the Chattogram city. The green boxes in the above figure represent assets with real-time data availability on water flow and pressure. The yellow boxes in the above figure represents digital data availability with 1 day lag. The red boxes represents manual data availability (digitized daily but with 1 day lag). The grey boxes represent data unavailable for certain boosting stations.

Consumption data for connection points is available in digital form with 1-month lag.

CWASA uses SCADA (Supervisory Control & Data Acquisition) system across most of its water treatment, reservoirs and DMAs. SCADA system provides real-time information on water flow and pressure.

There are 5 major water production sources – 4 Water Treatment Plants and 45 DTWs. WTPs, Boosting station and DMAs with SCADA provides real time data on water flow and pressure.

#### Water Production Units



S No	Production Unit	Data Availability
1	Sheikh Hasina Pani Shoddhonagar (Water Treatment Plant) Phase – 1 (143 MLD) & Phase 2 (143 MLD)	Real-time water flow and pressure data availability from the SCADA system
2	Sheikh Rasel Pani Shoddhonagar (Water Treatment Plant) (90 MLD)	Real-time water flow and pressure data availability from the SCADA system
3	Mohara Water Treatment Plant (90 MLD)	Total water production data available on a daily basis at 1 day lag
4	A total of 45 DTWs	Aggregated data on water production by 45 DTWs available on a daily basis at 1 day lag

Reservoirs are used for water storage before supply to elevated tanks or secondary reservoirs. Elevated tanks pumps water to end consumers using gravity whereas boosting station uses boosting pumps to distribute water to end consumers.

S No	Boosting Station / Elevated Tanks	Data Availability
1	Nasirabad Reservoir	Real-time water in-flow & outflow data availability from the SCADA system
2	Nasirabad Elevated Tank	Real-time water in-flow & outflow data availability from the SCADA system
3	Battali Hill Reservoir	Real-time water in-flow & outflow data availability from the SCADA system
4	Hallishahar Elevated Tank	Real-time water in-flow & outflow data availability from the SCADA system
5	Patenga Boosting Station	None
6	Kalurghat Iron Removal Plant & Boosting Station	None
7	Dhaka Booster Boosting Station	None

### District Metered Area (DMA)

KSA is divided into 10 sectors which are serviced by 3 elevated tank/reservoir. Each Sector has 1 flow meter and 2 pressure meters to measure water flow and water pressure in real time. A total of 59 DMAs exist within these 10 sectors. Each DMA has 1 flow meter and 1 pressure meter to measure water flow and water pressure in real time.

S No	Elevated Tank / Reservoir	Sectors	DMA
1	Nasirabad Elevated Tank	A	A1, A2, A3, A4
2		B	B1, B2, B3, B4, B5, B6, B7
3		C	C1, C2, C3, C4, C5, C6
4	Battali Hill Reservoir	D	D1, D2, D3, D4, D5

S No	Elevated Tank / Reservoir	Sectors	DMA
5		E	E1, E2, E3, E4, E5, E6, E7, E8
6		F	F1, F2, F3, F4, F5
7		G	G1, G2, G3, G4, G5
8	Hallishahar Reservoir	H	H1, H2, H3, H4
9		I	I1, I2, I3, I4, I5, I6, I7
10		J	J1, J2, J3, J4, J5, J6, J7, J8

Nasirabad Reservoir has a SCADA control room which also has Infrastructure Information Management System. For the ~47,000 connections in the KSA, shape file exists capturing all the distribution pipes and consumer connection points.

### Attachment 8.2 NRW Monitoring Tool: Proposed Process

The proposed methodology entails the seamless integration of data from Supervisory Control and Data Acquisition (SCADA) systems, where available, into a centralized repository. This integration is critical for achieving a comprehensive overview of the water utility's operational status. Furthermore, to enhance the geospatial analytics capabilities, shapefiles from the Infrastructure Information Management System, detailing the water distribution network, will be leveraged. Lastly, data from Online Water Billing System would also be leveraged.

### Attachment 8.3 Functional Requirement Specifications

Use Cases	Objective of this Use Case	Indicative List of Features	Front-end & Backend
Consumption Analytics	To analyze water consumption patterns across different customer segments and time periods to ensure identify discrepancies for water loss or unauthorized use	<ul style="list-style-type: none"> <li>Ability to track the consumption pattern of all the consumers using billing data</li> <li>Ability to forecast consumption using historical data for all consumers incorporating seasonality and trend</li> <li>Ability to identify consumers where the consumption deviates significantly from forecasted values</li> <li>Ability to identify DMA where the consumption deviates significantly from historical consumption</li> </ul>	Front-end and Backend
Water Accounting	To track the flow and usage of water throughout the supply system to ensure identify discrepancies indicative of water loss	<ul style="list-style-type: none"> <li>Ability to calculate water inflow to each DMA/Sector/Reservoir using SCADA data in real-time (&lt;5 min lag)</li> <li>Ability to calculate water consumption of each DMA using billing data</li> <li>Ability to calculate NRW for each DMA (daily/weekly/monthly)</li> </ul>	Front-end and Backend

Use Cases	Objective of this Use Case	Indicative List of Features	Front-end & Backend
		<ul style="list-style-type: none"> <li>Ability to calculate water loss across the water value chain (WTP to Reservoir, Reservoir to Sectors, Sectors to DMA etc.)</li> </ul>	
Geospatial Analytics	To visualize water distribution networks, consumer locations, and areas of interest (e.g., leaks, high consumption zones) on a map for improved operational oversight and planning.	<ul style="list-style-type: none"> <li>Ability to estimate collection by areas using billing data</li> <li>Ability to estimate &amp; visualize arrears outstanding by area using billing data</li> <li>Ability to identify &amp; visualize hotspots with high deviation in consumption by aggregating consumers' billing and location data</li> <li>Ability to visualize water losses across the distribution network at Sector/DMA level.</li> <li>Ability to visualize leakage points (after integration with Meter Reading App Issue tracking)</li> </ul>	Front-end and Backend
Pressure Analytics	To monitor water pressure and identify areas of sub-optimal pressure levels	<ul style="list-style-type: none"> <li>Ability to identify DMAs with consistent low-pressure</li> <li>Ability to score DMAs in terms of pressure quality</li> </ul>	Front-end and Backend
Supply Schedule Calculation	To measure and optimize water supply schedules for efficient water distribution.	<ul style="list-style-type: none"> <li>Ability to calculate total supply time for each DMA using SCADA data</li> <li>Ability to identify DMA with low supply time for each DMA (daily/weekly/monthly)</li> <li>Ability to calculate water availability for each DMA (Option to calculate availability upto per person per day)</li> <li>Ability to flag a consistent decrease in water distribution for each DMA (wherever applicable)</li> </ul>	Front-end and Backend
Faulty Meter Detection	To identify and flag meters with abnormal readings or patterns indicative of malfunctions or tampering, ensuring accurate billing and data integrity.	<ul style="list-style-type: none"> <li>Ability to identify faulty DMA/sector/flow meters using SCADA data</li> <li>Ability to identify anomalous consumption of DMA</li> </ul>	Front-end and Backend
Water Production Analytics	To analyze water production data, including volumes, times, to optimize production processes	<ul style="list-style-type: none"> <li>Ability to measure plant load factor for all water treatment plants &amp; Deep Tube Wells (Daily/weekly/monthly/yearly)</li> <li>Ability to measure load factor for boosting stations using SCADA data (Daily/weekly/monthly/yearly)</li> <li>Ability to identify sudden and consistent drop in production; Identify water production units with inconsistent production</li> </ul>	Front-end and Backend
Water quality metrics	To analyze water quality data	<ul style="list-style-type: none"> <li>Ability to view water quality metrics</li> </ul>	
KPI Calculation**	To compute Key Performance	Ability to estimate the following KPIs on daily, weekly, YTD, MTD, Previous Year etc. basis:	Front-end and Backend

Use Cases	Objective of this Use Case	Indicative List of Features	Front-end & Backend
	Indicators relevant to NRW management, operational efficiency, enabling performance tracking and improvement over time	<ul style="list-style-type: none"> <li>○ NRW in KSA &amp; non-KSA</li> <li>○ NRW during pumping to reservoirs (KSA area)</li> <li>○ NRW during pumping to Elevated Tanks</li> <li>○ NRW during pumping to DMAs &amp; sub-DMAs (KSA area)</li> <li>○ NRW during supply from sub-DMA to connection point</li> <li>○ Load factor of WTP</li> <li>○ Load factor of DTW</li> <li>○ Load factor of pumping stations</li> <li>○ Load factor of pumping mains</li> <li>○ Supply Schedule Adherence (%)</li> <li>○ Bills with High Deviation from historical average/last month's consumption</li> <li>○ Billable Water produced at the source</li> <li>○ Water supplied to end users (ML)</li> <li>○ Total vol of Water billed (ML)</li> <li>○ Total vol of Water Collected (avg over a time period in ML)</li> <li>○ Per Capita Consumption (L/day)</li> <li>○ Delinquency rate (%)</li> </ul>	

\*\*Please note that the outputs from the Meter Reading App's Admin Portal, Management Dashboard, and NRW Monitoring Tool may sometimes contain overlapping outputs or insights. This overlap is by design, aimed at reinforcing the reliability and coherence of our operational data. Our approach is centered on establishing a single version of the truth that ensures consistency and enhances decision-making across these initiatives.

### Attachment 8.4 NRW Monitoring Tool: Go-Live Checklist

Use Cases	Go-Live Checklist	Acceptable Range
Consumption Analytics	<ul style="list-style-type: none"> <li>● Ensure integration with billing data for tracking consumption patterns.</li> <li>● Validate forecasting models for accuracy in different consumer segments.</li> <li>● Implement deviation detection algorithms for identifying significant discrepancies.</li> </ul>	Deviation from forecasted values should not exceed $\pm 10\%$ for more than 5% of consumers.
Water Accounting	<ul style="list-style-type: none"> <li>● Integrate SCADA data for real-time water inflow tracking.</li> <li>● Validate calculations for water consumption and NRW in each</li> </ul>	NRW calculation within $\pm 5\%$ of actual for KSA region wherever data is available and data quality is acceptable

Use Cases	Go-Live Checklist	Acceptable Range
	DMA (wherever data is available) <ul style="list-style-type: none"> <li>• Test reporting features for daily/weekly/monthly NRW metrics.</li> </ul>	
Geospatial Analytics	<ul style="list-style-type: none"> <li>• Verify the integration of billing data with geospatial information.</li> <li>• Test map visualization features for operational planning.</li> </ul>	Hotspots should accurately represent areas with deviations greater than 15% from the norm, with a geographic accuracy of 95%.
Pressure Analytics	<ul style="list-style-type: none"> <li>• Integrate SCADA data for real-time pressure monitoring.</li> <li>• Validate the identification process for DMAs with low pressure.</li> <li>• Test the scoring system for pressure quality in DMAs.</li> </ul>	Pressure Calculations within +/-5% of actual for KSA region wherever data is available and data quality is acceptable
Supply Schedule Calculation	<ul style="list-style-type: none"> <li>• Ensure accurate calculation of supply time using SCADA data.</li> <li>• Validate identification of DMAs with low supply time.</li> <li>• Test water availability calculations and flagging system for decreases in distribution.</li> </ul>	Supply times should match within a $\pm 5\%$ range Water availability per person per within +/-5% range
Faulty Meter Detection	<ul style="list-style-type: none"> <li>• Test algorithms for identifying anomalous consumption and meter malfunction.</li> <li>• Validate the process for flagging inconsistent data.</li> </ul>	Faulty meters should be identified with a false positive rate of less than 5%, All detected anomalies should be identified within 24 hours.
Water Production Analytics	<ul style="list-style-type: none"> <li>• Verify the accuracy of plant and boosting station load factor measurements.</li> <li>• Implement detection features for sudden drops in production. Test for consistent identification of production units with inconsistent production.</li> </ul>	Sudden drops below 80/90% flagged with 90%+ accuracy when tested with historical data.
KPI Calculation	<ul style="list-style-type: none"> <li>• Implement calculation algorithms for each KPI.</li> </ul>	KPIs calculation within a $\pm 5\%$ tolerance, with monthly reviews to ensure continuous performance alignment.

## Attachment 9 Catalogue of application and system currently used in CWASA

SN	System Name	Category	Tech Spec
1	Water Billing System	Commercial & Billing/Revenue	Web App (IIS Windows 2012) SQL Server 2012
2	Online Water Billing system	Commercial & Billing/Revenue	VB APP SQL Server 2012
3	Online Payment Posting System	Commercial & Billing/Revenue	Web App (IIS Windows 2012) SQL Server 2012
4	Data Push Pull System	Commercial & Billing/Revenue	Web App (IIS Windows 2012) SQL Server 2012
5	Water Works System	Commercial & Billing/Revenue	Web App (IIS Windows 2012) SQL Server 2012
6	Deep Tube Well Management System	Commercial & Billing/Revenue	Web App (IIS Windows 2012) SQL Server 2012
7	New Connection Mgmt. System	Additional Customer Service	Web App (IIS Windows 2012) SQL Server 2012
8	Meter Replacement System	Commercial & Billing/Revenue	Web App (IIS Windows 2012) SQL Server 2012
9	Name Change Automation System	Additional Customer Service	Web App (IIS Windows 2012) SQL Server 2012
10	Meter testing input system	Additional Customer Service	Web App (IIS Windows 2012) SQL Server 2012
11	Production Posting System	Production, Maintenance, Operations & Distribution MODs	Web App (IIS Windows 2012) SQL Server 2012
12	Online Application System	Additional Customer Service	Web App (IIS Windows 2012) SQL Server 2012
13	Payroll	HR & Admin	Web App (IIS Windows 2012) SQL Server 2012
14	PF Mgmt. System	HR & Admin	Web App (IIS Windows 2012) SQL Server 2012
15	Computerized Maintenance Management	Production, Maintenance, Operations & Distribution MODs	Web App (IIS Windows 2012) SQL Server 2012
16	Customer Complaints Tracking Sys	Additional Customer Service	Cloud Provider
17	File Management System	HR & Admin	
18	E-letter archive system	HR & Admin	
19	Inventory Management System	HR & Admin	Web App (IIS Windows 2012)

SN	System Name	Category	Tech Spec
			SQL Server 2012
20	Motor Switching Automation App	Production, Maintenance, Operations & Distribution MODs	Web App (IIS Windows 2012) SQL Server 2012
21	Water Bill SMS sending System	Commercial & Billing/Revenue	Web App (IIS Windows 2012) SQL Server 2012
22	Employee Information System	HR & Admin	Web App (IIS Windows 2012) SQL Server 2012
23	Re-connection Management System	Production, Maintenance, Operations & Distribution MODs	Web App (IIS Windows 2012) SQL Server 2012
24	E GP (Government)	Accounts & Regulatory	Web App (IIS Windows 2012) SQL Server 2012
25	E Nothi (Government)	Accounts & Regulatory	Web App (IIS Windows 2012) SQL Server 2012
26	Tally	Accounts & Regulatory	Web App (IIS Windows 2012) SQL Server 2012
27	Billing Comparison system	Commercial & Billing/Revenue	Web App (IIS Windows 2012) Crystal Reports SQL Server 2012
28	New Connection Demand Note	Commercial & Billing/Revenue	Web App (IIS Windows 2012) SQL Server 2012

## Attachment 10 Nonfunctional requirements

### Attachment 10.1 Hardware Requirement

Sr. No	Application	Units
1	Smartphone (Android 10 & above, 4 GB RAM or more, Camera with 5 MP resolution or more; Inbuilt storage of 128 GB or more, Bluetooth)	120
2	Android Tablets (Android 13 & above, 8 GB RAM or more, Camera with 2 MP resolution or more; Inbuilt storage of 128 GB or more)	15
3	Handheld Portable Printer (58mm or more, Bluetooth, Thermal Label Receipt Printer)  Or  Handheld printers (120) – (56mm or more, Bluetooth, Thermal Label Receipt Printer), embedded with the phone (Android 10 & above, 2 GB RAM or more, Camera with 2 MP resolution or more; Inbuilt storage of 64GB or more, Bluetooth, GSM)	120
4	Server	2
5	Printer Rolls for the Handhold Portable Printer	1200

### Attachment 10.2 Volumetric

The system should be able to support the following number users and all users expected to join till 2027

	Metric	Number
<b>Meter Reading App</b>	Total Users	2024 – 45 2025 (onwards) – 80
	Total Users	2024 – 100 2027 (projected) – 200
<b>Management Dashboard</b>	Total Users	2024 – 100 2027 (projected) – 200

### Attachment 10.3 Response Time

Optimal response time is critical for enhancing user experience and fostering greater system adoption. It is imperative that the system delivers the following response times to meet these objectives effectively:



Application		Availability
<b>Meter Reading App</b>	Dynamic: (Page that requires access to a database)	Less than 2 seconds
	Static: (Page that does not require access to a database) <b>High-priority and frequently used journeys</b>	All other page loads – Less than 1 second
<b>Management Dashboard</b>	Dashboard screens response time	Less than ~2 seconds per tab refresh, including data and information load
<b>NRW Tool</b>	Dashboard screens response time	~2 seconds per tab refresh, including data and information load

Category	Service Range	Penalty
System Response Time measured monthly	< 2 seconds for 98% page loads when internet connectivity of 1 Mbps+ is available	No Penalty
	<3 seconds but more than 2 seconds for 98% page loads when internet connectivity of 1 Mbps+ is available	USD 100 for every reduction of 0.1s in the system response time
	>5 seconds but more than 3 seconds for 98%+ page loads when internet connectivity of 1 Mbps+ is available	USD 150 for every reduction of 0.1s in the system availability

## Attachment 10.4 Security Requirements

Criteria	Description
<b>Application Security</b>	<p>Role based authorization for access to specific modules</p> <ul style="list-style-type: none"> <li>• RASP (Runtime Application Self-Protection) to monitor applications in runtime for vulnerabilities and active threats. The Bidder is expected to procure and implement a RASP for the digital solutions.</li> <li>• Adopt secure coding guidelines using suitable SAST and DAST tools</li> </ul>
<b>Platform Security</b>	<p>Transport and Data encryption at all levels and integration layers.</p> <ul style="list-style-type: none"> <li>• Network and web portal firewalls</li> <li>• Security and audit logs corresponding to sessions to be maintained</li> </ul>
<b>Data Security</b>	<p>Strong Data model allowing for isolation of sensitive customer personal and CWASA financial data. Bidder to secure data for following scenarios</p>

Criteria	Description
	<ul style="list-style-type: none"> <li>• Data at rest – enterprise-level secure access for Admins, bidders may recommend encryption/tokenization of data depending on the sensitivity and business needs.</li> <li>• Data on the move – transport and payload encryption</li> <li>• Data masking in case of specific data extracts pertaining to customers PII data and CWASA financial data</li> <li>• Bidder can recommend suitable data classification and data loss prevention tools and must include in licensing budget</li> </ul>
<b>Server Security</b>	All application, database servers (virtual or physical) should be harden using a Microsoft security baseline and Level 1 CIS benchmark profile.
<b>Network Security</b>	The Bidder shall reuses CWASA’s existing network security components to meet security and compliance requirements as and when required. This may include tools such as: <ul style="list-style-type: none"> <li>• Firewall, WAF, Anti-DDoS, etc.</li> <li>• Data Loss Prevention (DLP)</li> <li>• Anti-Advanced Persistent Threat (Anti-APT)</li> <li>• Endpoint Detection and Response (EDR)</li> </ul>
<b>Vulnerability and Penetration Testing Report</b>	The Bidder is expected to conduct a VAPT/Pen Testing for Mobile App Web Application and Network

### Attachment 10.5 Data Localization

- Data will be hosted on-premises at the CWASA Headquarters, ensuring localized data storage and management within the organization.
- Encryption of data in transit and at rest.

### Attachment 10.6 System Availability

	Component	Definition	Service Level Value
<b>1</b>	Meter Reading App	Hours of Operation: 24/7	Uptime >=97.9%
<b>3</b>	MR Admin Portal	Hours of Operation: 8-8pm Sunday – Thursday	Uptime >=97.9%
<b>2</b>	MR Backend services	Hours of Operation: 8-8pm Sunday – Thursday	Uptime >=97.9% RTO: 4 Hours RPO: 4 Hour Data Loss
<b>4</b>	Management Dashboard	Hours of Operation: 8-8pm Sunday – Thursday	Uptime >=95%
<b>5</b>	NRW Tool Presentation Layer	Hours of Operation: 8-8pm Sunday – Thursday	Uptime >=95%
<b>6</b>	NRW Tool Application Layer	Hours of Operation: 8-8pm Sunday – Thursday	Uptime >=95% RTO: 4 Hours

			RPO: 1 Day Data Loss
7	Integration Service: SFTP	Hours of Operation: 24/7	Uptime >95%
8	Integration Service: API Mgmt.	Hours of Operation: 24/7	Uptime >95%
9	Data Platform	Hours of Operation: 24/7	Uptime >95% RTO: 4 Hours RPO: 1 Day Data Loss

Category	Service Range	Penalty
System Availability measured on monthly basis.	Server uptime of at least 97.9%	No Penalty
	Server uptime greater and equal to 95% and less than 97.9%	USD 100 for every reduction of 0.1% in the system availability
	Server uptime greater and equal to 90% and less than 95%	USD 150 for every reduction of 0.1% in the system availability
	Server uptime less than 90%	USD 200 for every reduction of 0.1% in the system availability

### Attachment 10.7 Warranty

1. The Bidder warrants that the Products supplied under the Contract are new, unused, of the most recent or current model and they incorporate all recent improvements in design and / or features. The Bidder further warrants that all the Products supplied under this Contract shall have no defect, arising from design or from any act of omission of the Bidder that may develop under normal use of the supplied Products in the conditions prevailing in Bangladesh.
2. Warranty for Hardware Components: Onsite comprehensive warranty for all the hardware components including free replacement of spares, parts, kits as and when necessary will be 36 months from date of installation or 39 months from date of delivery, whichever is later.
3. On-site comprehensive warranty and AMC: The warranty and AMC would be on-site and comprehensive in nature and back to back support from the OEM. Bidder will warrant all the hardware and software against defects arising out of faulty design, materials, and media workmanship etc. for a specified warranty period. Bidder will provide support for operating systems and other preinstalled software components during the warranty period of the hardware on which this software & operating system will be installed. Bidder shall repair or replace worn out or defective parts including all plastic parts of the Equipment at his own cost including the cost of transport.
4. During the term of the Contract, Bidder will maintain the equipment in perfect working order and condition and for this purpose will provide the following repairs and maintenance services:
  - a) Free maintenance services during the period of warranty and AMC.

Professionally qualified personnel who have expertise in the hardware and system software supplied by Bidder will provide these services.

- b) Bidder shall rectify any defects, faults and failures in the equipment and shall repair/replace worn out or defective parts of the equipment 24 x 7 x 365 basis on all days. In case any defects, faults and failures in the Equipment could not be repaired or rectified during the said period, the engineers of the Bidder are required to accomplish their duties beyond the said schedules in case of any situation if it warrants. In cases where unserviceable parts of the Equipment need replacement, the Bidder shall replace such parts, at no extra cost to CWASA, with brand new parts or those equivalent to new parts in performance. For this purpose the Bidder shall keep sufficient stock of spares at its premises.
  - c) Bidder shall ensure that faults and failures intimated by CWASA as above are set right within 12 hours of being informed of the same. In any case the Equipment should be made workable and available not later than the next day from the faults and failures intimated by CWASA.
  - d) Bidder shall ensure that the full configuration of the equipment is available to CWASA in proper working condition viz. uptime of 99.99% of the time on a 24 x 7 x 365 basis.
5. Warranty for Services – The Digital Partner warrants that all services under this Agreement will be performed with promptness and diligence and will be executed in a workmanlike and professional manner, in accordance with the practices and high professional standards used in well-managed operations performing services similar to the services under this Agreement. The Digital Partner represents that it shall use adequate numbers of qualified individuals with suitable training, education, experience, and skill to perform the services hereunder.
  6. Warranty for Software - The Digital Partner warrants that all custom developed and off-the-shelf software developed will operate in accordance with the agreed service level agreements (SLAs) and performance metrics for a period of one year from the date of delivery. Should any breach of the SLAs occur, or a Priority 1 issue arise, the Digital Partner commits to resolving such issues within 24 hours of notification. This warranty is contingent upon the software being used as prescribed under normal conditions and within the specified environment.

### **Attachment 11 Detailed evaluation criteria**

1. Bids for this RFP will be evaluated based on technical and commercial evaluation. The weightages for final technical score and commercial score will be 70:30 in this RFP.
2. Each of the Bids shall be evaluated as per the criteria and requirements specified in this RFP.
3. Technical Bids will be opened, evaluated, and assigned a technical score out of a maximum of 100 (One Hundred) marks based on both the technical submission and the presentation.

**Only the Bidders with total technical marks of 70% or more will qualify for the commercial bid evaluation.** Failing to secure minimum marks will lead to technical rejection of the Bid.

4. The commercial price Bid would be evaluated based on - Total Cost of Ownership (TCO) basis.
5. Only those Bidders who qualify in technical evaluation would be shortlisted for commercial evaluation
6. Final scores for each Bidder = 70% \* Technical score + 30% \* Commercial score

### **Attachment 11.1 Technical Bid evaluation**

Technical solution proposed by each Bidder will be evaluated as per the criteria prescribed in the section. Technical evaluation for each Bidder constitutes evaluation across 4 key parameters as described in the below table:

Sr no	Parameter	Criteria	Total Marks
1	Financial stability	Evaluation of company's financial health and robustness	5
2	Credentials in Software domain	Assessment of domain experience and project successes	35
3	Approach	Quality and thoroughness of strategy and project plan	25
4	Talent and capability	Team skill level, experience, and overall expertise	35

JICA DXLab reserves the right to check/validate the authenticity of the information provided in the Evaluation criteria and the requisite support must be provided by the Bidder. The following sections explain how the Bidders will be evaluated on each of the technical evaluation criteria.

For a PoC of such a large scale and complexity, it is imperative that the Bidder should deploy best in class professionals to ensure successful execution of this PoC.

- Bidder must commit 100 (Hundred) per cent time availability of the named Experts since Day 1 (One) of the PoC.
- Attrition or replacement of any of the named Experts on or after the date of Technical Presentation should be honored within two weeks. Resources must be replaced with a resource of equal or higher competence. The replacement of the resource shall be interviewed by evaluation team prior to the final hiring.
- Minimum of 3 named experts (Project Lead, Solution architect and Lead Business Analyst) have to be physically present in the presentation and may be interviewed / assessed during the presentation. Named experts cannot be substituted without a penalty charged to the Bidder.

- Constraints on availability of experts proposed must be stated. If necessary, backup resource profile shall be attached.

For reference projects to be submitted as part of requirements for similar projects completed: Project can be built/delivered incrementally through a Single or Multiple Purchase Orders/Contracts/Amendments/Extensions within 1 year.

### Attachment 11.1.1 Technical evaluation criteria and scoring guidelines

Sr no	Parameter	Criteria	Total Marks
1	<b>Financial stability (5)</b>	Annual turnover  In case of JV/ Consortium/ sub-contractors, the total turnover from lead Bidder only will be considered.	5
2	<b>Credentials (35)</b>	Relevant <b>project experience</b> in the following areas:	30
3		1. Core Applications, IT-OT, data engineering	
4		2. Customer applications development	
5		3. Management dashboard/ Data Visualization and Reporting System	
6		4. Analytics use cases 5. Managed services 6. Hardware Deployment - setup and configuration of hardware systems including Servers, networking equipment and end-user devices	
		Project experience to cover relevant sectors / geography:	
		1. Water utilities sector 2. public sector including Gov Ministries / Divisions / Agencies / Utilities 3. in Bangladesh 4. outside Bangladesh	
		Minimum of 5 and Maximum 8 projects examples which showcases at least: <ul style="list-style-type: none"> <li>• Any one of the capabilities mentioned, and</li> <li>• At least one of the sector / geography mentioned</li> </ul>	
		Each project must have a minimum size of USD 50k and must have started within last 3 years (from FY2021).	
		In case of > 5 projects are submitted, we shall choose the 5 most relevant to the scope of the project. Format for Project citation – Attachment 1 Form 1.5.	
		The Bidders must submit: <ul style="list-style-type: none"> <li>• At least one project with water utilities</li> <li>• At least two projects with international clients</li> <li>• At least three projects in Bangladesh</li> </ul>	

Sr no	Parameter	Criteria	Total Marks
		<ul style="list-style-type: none"> <li>At least two projects with public sector clients</li> </ul> <p>In case of JV/ Consortium/ sub-contractors, the project examples from lead Bidder, subcontractors and consortium members will be accepted.</p> <p>Atleast 75% of the project examples must be from the lead Bidder.</p>	
7		<p><b>Certifications/</b> Quality standards</p> <p>In case of JV/ Consortium/ sub-contractors, the certifications from lead Bidder only will be accepted.</p>	5
8	<p><b>Approach (25)</b></p> <p>Evaluation of suggested approach for:</p> <ol style="list-style-type: none"> <li>Setting up the data platform</li> <li>Quick wins implementation</li> <li>Quality of presentation and interactions</li> </ol> <p>Specificity of roadmap, timelines, and team structure to drive the project</p>	<p>Quality of proposed architecture for:</p> <p>Front-end - Channels - overview of the user interface and interaction channels</p>	4
9		<p>Quality of proposed architecture for:</p> <p>Backend - System of Engagement - outlines interactions between the data platform and backend systems.</p>	4
10		<p>Quality of proposed architecture for:</p> <p>Integration &amp; API - includes a general plan for API development and external system integration.</p>	4
11		<p>Quality of proposed architecture for:</p> <p>Infrastructure - includes high-level designs for the underlying systems that support the data platform. Plans for infrastructure setup and technology architecture</p>	3
12		<p>Implementation Approach - outlines the general phases of the project, from initial setup to final deployment.</p> <p>The Bidder will be assessed on the thoroughness of the plan including identification of key risks and dependencies</p>	5



Sr no	Parameter	Criteria	Total Marks
13		<p>Capacity Building and Training Approach</p> <p>Bidder needs to have a clear and detailed plan for capacity building of CWASA officials so that PoCs are effectively adopted by CWASA.</p>	5
14	<b>Talent and capability (35)</b>	<p><b>Manpower</b> (Digital and Industry specific) in Bangladesh and region to support</p>	5
15		<p><b>Project Lead</b> - Expert in leading diverse teams for software development projects, skilled in Agile methodologies, and adept at using modern project management techniques and tools e.g. JIRA. Should be 100% deployed in Chattogram Should be Bangla speaking.</p> <p>In case of JV/ Consortium/ sub-contractors, the employees from lead Bidder only will be accepted.</p> <p>The expert will be evaluated on:</p> <ul style="list-style-type: none"> <li>• Years of experience</li> <li>• Relevant projects experience</li> <li>• Relevant certifications</li> </ul>	8
16		<p><b>Solution Architect:</b> Strong understanding of areas related to Service Oriented Architecture, Integration Architecture and Design Patterns, API Management etc.</p> <p>In case of JV/ Consortium/ sub-contractors, the employees from lead Bidder only will be accepted.</p> <p>The expert will be evaluated on:</p> <ul style="list-style-type: none"> <li>• Years of experience</li> <li>• Relevant projects experience</li> <li>• Relevant certifications</li> </ul>	8
17		<p><b>Infrastructure expert:</b> Extensive detailed working knowledge and acumen in the employment of enterprise architecture best practices, including, but not limited to, logical and physical data architectures, network communications, operating systems, applications, data base servers, application servers, web servers, server consolidation, server performance, middleware, etc.</p>	2

Sr no	Parameter	Criteria	Total Marks
		<p>In case of JV/ Consortium/ sub-contractors, the employees from lead Bidder, subcontractors, and consortium members will be accepted.</p> <p>The expert will be evaluated on:</p> <ul style="list-style-type: none"> <li>• Years of experience</li> <li>• Relevant projects experience</li> <li>• Relevant certifications</li> </ul>	
18		<p><b>Data Engineer</b> needed with expertise in big data technologies, ETL processes, and database management. Fluent in Bangla, with strong programming skills, preferably located in Chattogram. Ability to design, build, and maintain scalable data infrastructure 100% deployed</p> <p>In case of JV/ Consortium/ sub-contractors, the employees from lead Bidder only will be accepted.</p> <p>The expert will be evaluated on:</p> <ul style="list-style-type: none"> <li>• Years of experience</li> <li>• Relevant projects experience</li> <li>• Relevant certifications</li> </ul>	5
19		<p><b>IT Security</b> - Possess extensive knowledge and experience in information technology security design, operations, encryption, information access. Strong knowledge of risk assessment procedures, policy formation, role-based authorization methodologies, authentication technologies and security attack pathologies</p> <p>In case of JV/ Consortium/ sub-contractors, the employees from lead Bidder only will be accepted.</p> <p>The expert will be evaluated on:</p> <ul style="list-style-type: none"> <li>• Years of experience</li> <li>• Relevant projects experience</li> <li>• Relevant certifications</li> </ul>	2

Sr no	Parameter	Criteria	Total Marks
20		<p><b>Lead Business Analyst</b> - Experience in areas such as UML, Requirement Analysis and Documentation, Visio, Process Mapping and Re-engineering. Responsible for applying their knowledge of business process modelling methodologies to document processes and present new process designs  Should be 100% deployed in Chattogram  Should be Bangla speaking.</p> <p>In case of JV/ Consortium/ sub-contractors, the employees from lead Bidder only will be accepted.</p> <p>The expert will be evaluated on:</p> <ul style="list-style-type: none"> <li>• Years of experience</li> <li>• Relevant projects experience</li> <li>• Relevant certifications</li> </ul>	5

## Attachment 11.2 Commercial Bid evaluation

Commercial score for each shortlisted Bidder will be calculated as follows:

Commercial Score = (Minimum Total Cost of Ownership quoted/ Total Cost of Ownership by the Bidder) \*100

Basis the above definition, below is an example to further illustrate the calculation of commercial bid score:

Sr. No	Bidder	Total Cost of Ownership (USD)	Weighted Commercial Score
1	A	250,000	$(150,000/250,000) * 100 = 60$
2	B	200,000	$(150,000/200,000) * 100 = 75$
3	C	150,000	$(150,000/150,000) * 100 = 100$

Bidders to note 2 additional criteria in relation to the Commercial offer:

- The minimum price set for the commercial offer is 100K USD.
- Bidders bidding less than 50% of the arithmetic mean of all the bids that have passed technical qualification (70% marks) will be eliminated.

## Attachment 11.3 Overall evaluation

The detailed methodology is described below as an illustration:

- Suppose, There are three bidders A, B and C.
- Technical score will be arrived at treating the marks of the bidder scoring the highest marks (A) in technical evaluation as 70 (maximum).
- Weighted Technical score for other bidders (B, C, etc.) will be computed using the formula Marks of B/Marks of highest scorer A \* 70 and so on.
- Similarly, Commercial Score of all technically qualified bidders will be arrived at by taking the cost quoted by lowest (L1) bidder i.e., the lowest quote from all technically qualified bidders as 30 (maximum).
- Weighted Commercial score for other bidders will be calculated using the formula: Weighted Commercial Score = Cost of L1 bidder/Cost quoted by bidder \* 30.

- A Combined score will be arrived at, taking into account (i.e. adding) both weighted scores of Technical Bid evaluation and the Financial Bid evaluation.

Sr. No	Bidder	Technical Evaluation marks	Total Cost of Ownership in k USD	Weighted Technical Score (T)	Weighted Commercial Score (P)	Combined Score (HC = T+P) (out of 100)
1.	A	90	250	$(90/90)*100*70$ % = 70.00	$(150/250)*100*30$ % = 18	70.00 + 18.00 = 88.00
2.	B	80	200	$(80/90)*100*70$ % = 62.22	$(150/200)*100*30$ % = 22.5	62.22 + 22.50 = 84.72
3.	C	70	150	$(70/90)*100*70$ % = 54.44	$(150/150)*100*30$ % = 30	54.44 + 30.00 = 84.44

In the above example,

- Based on the Total Cost (TC) declared by the Bidders during the commercial bid evaluation, and further Combined and Final Evaluation using QCBS the Bidders will be categorized as HC1, HC2, HC3 etc.(In the ascending order, i.e. HC1 being the Bidder with the highest combined score, followed by HC2 with the next highest combined score and so on.).
- Bidder A with highest combined score of 88.00 becomes the successful bidder (HC1).
- The HC1 Bidder will be granted the opportunity to engage in contractual discussions. In the event that negotiations with the HC1 Bidder either fail or experience undue delays, the HC2 Bidder may be invited to enter into contractual discussions, subject to the discretion of both JICA DXLab and the contracting authority.

## Attachment 12 Secure Coding Checklist

Data Protection	
<i>A1 Injection, A4 Insecure Direct Object Reference</i>	
	Must <b>not</b> use direct object references
	<b>Disable browser and proxy caching</b> if processing confidential and/or proprietary information by using appropriate HTTP response headers (pragma, expires, cache-control)

	<b>Disable browser "auto-completion" features</b> on forms containing confidential and/or proprietary information
	If the "remember me" functionality is utilized for confidential data must <b>require the password to be entered manually</b> by the user upon revisit of the site
	If the "remember me" functionality is utilized for confidential data, upon revisit the pre filled text for the <b>user ID must be masked</b> (applicable to remember me" on web app level not browser level)
	Interpreted client side code (eg. database variables, database table names, etc.) must be <b>obfuscated</b> . Confidential data including <b>database connection strings and passwords/username must not be present in interpreted client side code</b>
	<b>Passwords must not be hardcoded</b> in any form (encrypted or unencrypted) in web application source code
	Confidential/PII data in form method and transmission <b>must not be sent via URL parameters</b> , it must be sent using POST parameters including HTML form inputs and URL redirection
	All server responses containing confidential information must have <b>caching disabled</b>
	<b>Accept only known valid data</b> - definition of allowed/valid characters must be incorporated into the design specifications
	<b>Reject known bad data:</b> filter out undesirable characters in all encoding formats accepted or processed
	<b>Sanitize bad data:</b> If escape characters are used to sanitize data, must ensure that the escaping is consistently utilized throughout in any portion of the application that could utilize the data
	<b>Database access control</b> must be handled by the application and database layers
	<b>Parameterized queries must be implemented for all database access</b> so values intended to be interpreted as data cannot be interpreted as a command instead
<b>Input Validation</b>	
<i>A1 Injection, A3 XSS, A4 Insecure Direct Object References, A10 Unvalidated Redirects or Forwards</i>	

	Must <b>not use non-validated redirects or forwards</b> - need to prevent redirection of any URL which may lead to impersonation or navigation to a rogue site
	Proper input validation must include <b>server-side validation and client side validation</b> where applicable of form (syntactic) and content (semantic)
	All input from external systems are considered "untrusted" and <b>proper server-side validation must occur at the receiving application prior to further processing</b>
	Must ensure that <b>client input cannot cause application faults</b> or unexpected behavior
	Input that is used for local file retrieval must be filtered to <b>ensure that the specific target file is appropriate</b>
	Validate that the input <b>does not specify a path outside the application root</b>
	Ensure <b>dynamically generated output is properly filtered and sanitized</b> to prevent the introduction of unfiltered, undesirable input streams
	Pages generated from database sources or other external input that may contain unfiltered data, <b>must not pass unfiltered data to the client</b>
	Identifiers used to access a system resources must employ a <b>level of indirection or white list validation</b>

<b>Exception Handling</b>	
<b><i>Information Gathering</i></b>	
	<b>Must not use Verbose Authentication Error Messages</b> - Enumerating Usernames/Passwords
	<b>Error pages must not return unfiltered data</b> such as raw URL requests or responses from external sites as this is a common vector for cross site scripting attacks
	Must not return <b>raw application or infrastructure error messages</b> to clients
	Comments in returned content <b>must not contain developer names, information related to implementation details of the app logic</b> or Confidential proprietary data not intended for end user review

	Must <b>trap all error and exception conditions</b> and handle them deliberately - at a minimum return a generic error message in all cases
	<b>Debug or test features must not be accessible</b> to end users on production systems
<b>Access Control</b>	
<i><b>A2 Weak Authentication &amp; Session Management, A7 Missing Function Level Access Control</b></i>	
	Authentication process must <b>utilize compliant encryption solutions</b> when transmitting credentials between client and server
	<b>Access rights are checked</b> before access is granted. Must use <b>server side access decision</b> for each access request prior to processing the transaction
	<b>Uniquely identify the principal</b> being authenticated
	<b>Prevent manipulation</b> of the identifying information
	<b>Validate the identifying information</b> was created from a trusted source
	<b>Prevent unauthorized reuse</b> of authentication tokens (through aggressive timeout values on the token)
	Provide <b>traceability</b> back to the original authentication
	Must use <b>native platform-managed server-side</b> session management mechanisms
	Role based access is <b>least privilege on a need to know basis</b>
<b>Session Management</b>	
<i><b>A2 Weak Authentication &amp; Session Management, A8 Cross Site Request Forgery</b></i>	
	<b>Domain restricted</b> to the most discreet host and path feasible
	Must <b>not allow a cookie to be replayed</b>
	HTTPS sessions must have the <b>secure attribute set</b>
	Must have the <b>HTTPONLY attribute set</b>
	Must <b>not have an expires attribute set</b>



	Must generate a <b>new session token/identifier when switching from unauthenticated to authenticated sessions</b>
	<b>Logout mechanisms invalidate session information on the server side</b> preventing subsequent access to the session or its stored information without re-authenticating
	Forms must use and <b>validate an anti-CSRF token</b> that prevents unauthorized form submission
	<b>Secure session tokens must be sufficiently large random</b> non modifiable unique to each session and generated by the issuing server
	Secure session tokens must not be transmitted as URL parameters - <b>use non-persistent cookies</b>
	Cookies must limit their scope to the <b>smallest domain required</b> and not contain unencrypted data

## **Attachment 13 No Deviation Certificate**

This document serves as a formal guarantee that our proposal aligns precisely with your Tender Enquiry/Request for Proposal (RFP), including any amendments, referenced as RFP document for Development, Implementation and Services of Meter Reading App, Management Dashboard & NRW Monitoring Tool at CWASA Chattogram (RFP Number : JICADXL-CWASA-20240410) released on 10<sup>th</sup> April 2024. We hereby explicitly affirm that our submission does not deviate from the stipulated technical (this includes, but is not limited to, the Scope of Work, Business Requirements Specification, Functional Requirements Specification, Cloud Requirements Specification, and Technical Requirements Specification), legal, or commercial requirements, whether directly or indirectly. We understand and acknowledge that should any deviation be discovered by the purchaser at any future stage, the purchaser reserves the right to undertake suitable action as deemed necessary, including but not limited to the termination of the contract.

**(AUTHORIZED SIGNATORY) SIGNATURE:**

**NAME:**

**DESIGNATION:**

**ADDRESS:**

**SEAL:**

**DATE:**

## **Attachment 14 General Terms & Conditions**

### **Article 1 (Purpose of the Agreement)**

1. Among the services entrusted to Orderer from Japan International Cooperation Agency (“Client” or “JICA”) under the Agreement by and between Client and Orderer, Orderer shall entrust to Supplier, as subcontractor, the services specified in the SOW (the "Services"), and Supplier shall be entrusted the Services based on the contractual matters specified in this Agreement. Supplier shall be responsible for the completion of the Services.

### **Article 2 (The Services)**

The scope of the Services contracted by Orderer and accepted by Supplier shall be as set forth in the SOW. Provided, however, that if any change in the scope becomes necessary for any reason arising after the execution of this Agreement, such change may be made in writing upon mutual consultation.

### **Article 3 (Services Period)**

The Services period for the Services shall be as set forth in the SOW. Provided, however, that in any of the following cases, Orderer and Supplier may, upon mutual consultation, agree to change the Services period.

- (1) When there is an addition or change in the scope of the Services in accordance with the provision of Article 2.
- (2) When it is deemed reasonable to change the Services period due to a natural disaster or other force majeure, or for reasons beyond the control of Supplier.

### **Article 4 (Fee, Expense, and Payment Method)**

Orderer will pay Supplier the fee (“Fee”) for Services and expenses, as specified in the SOW. Supplier is responsible for all taxes related to the Services.

### **Article 5 (Responsibility of Supplier)**

1. Supplier shall strictly comply with the following provisions when providing the Services:
  - (1) Attendance of relevant business meetings held by Orderer including conference calls;
  - (2) Supplier Code of Conduct stipulated by Orderer;
  - (3) Any other arrangements pertaining the Service determined by Orderer.
2. In principle, workplaces shall be at Supplier's Office and other locations as agreed with Orderer.
3. Supplier shall use, store, and manage the information, materials, equipment, etc. provided by Orderer or Client (below, collectively the "Materials, etc.") with the due care of a good manager. Supplier shall not use the Materials, etc. for any purpose other than the Services. In the event that the Materials, etc. are no longer required due to termination, etc. of the Agreement, or at the request of Orderer, Supplier shall promptly return the Materials, etc. to Orderer, or dispose of the Materials, etc. in accordance with Orderer's instructions.
4. Supplier warrants and represents that: (a) it will perform the Services in a prompt, efficient, professional and ethical manner in accordance with that standard of skill, care, and diligence

normally provided by a professional providing the same types of services; (b) it will comply with all applicable laws and regulations governing Supplier's activities under this Agreement, including without limitation, export control laws, financial services and securities laws, modern slavery laws, and laws prohibiting bribery and corruption (as set out in Article 22). Supplier will promptly report to Orderer any actual or suspected instances of corruption, bribery, or Modern Slavery by Supplier's vendors, subcontractors, or agents. "Modern Slavery" has the meaning given to that term under the Modern Slavery law of the country where the Services are provided, or in the absence of such a law, as the term is defined by the United Nations Human Rights Council.

5. Supplier will cooperate with reasonable requests to participate in Orderer's supplier due diligence process. Supplier will keep sufficient records to enable Orderer to verify the source of supply of the Services and upon request by Orderer and provide Orderer with reasonable access to such records. Supplier will also maintain books and records that describe in accurate and reasonable detail all expenditures incurred by Supplier in connection with this Agreement and will permit Orderer to review and inspect such books and records as reasonably requested by Orderer.

#### **Article 6 (Subcontracting)**

Supplier shall not subcontract all or any part of the Services to any third party without the prior written consent of Orderer. In the case of subcontracting after obtaining the approval by Orderer, Supplier shall impose obligations equivalent to those of this Agreement and shall be responsible for the performance of the obligations by Supplier's subcontractor.

#### **Article 7 (Responsible persons and workers for the Services)**

1. Orderer and Supplier shall, promptly after the execution of this Agreement, notify the other party in writing or by email of the responsible person of each party for the purpose of accurate communication and confirmation of the status of the performance of the Services. The same shall apply in the event of any change in the person responsible for the Services.
2. Supplier, as an employer, shall be responsible for labor management, safety and health, visas and authorizations and all other obligations of Supplier to the workers in accordance with labor regulations and other applicable laws and regulations, and shall give all necessary instructions and orders to the workers in connection with the Services.

#### **Article 8 (Report)**

1. Supplier shall promptly report to Orderer the status of the performance of the Services upon Orderer's request and Orderer may, if necessary, request Supplier to change the contents of the Services by giving Supplier prior written notice.
2. If either Orderer or Supplier become aware of the occurrence of an accident that may impede the performance of the Services, Orderer or Supplier shall immediately report to the other party to that effect and promptly take emergency measures, regardless of where the responsibility for the accident lies.

3. The party who has taken emergency measures in accordance with the preceding paragraph shall report the results of the emergency measures to the other party without delay, and shall consult with the other party on the future course of action.

#### **Article 9 (Delivery and Inspection)**

1. Supplier shall deliver the output of the Services (the “Deliverables”) to Orderer by the delivery date in accordance with SOW. Provided, however, that Orderer may have Supplier provisionally deliver the Deliverables to Orderer prior to the delivery date for the purpose of confirming the contents of the Deliverables, etc. In this case, such provisional delivery shall not be treated as delivery of the Deliverables unless Orderer notifies Supplier that such provisional delivery shall be treated as delivery of the Deliverables.
2. Orderer will inspect the Deliverables within 15 (fifteen) business days from the date of receipt of the deliverables and notify Supplier of the results. Orderer will verify whether such Deliverable meets the specifications applicable to such Deliverables as agreed in the SOW.
3. In the event that any Deliverables does not meet such specifications, Orderer shall, at its discretion, take one of the following measures: (i) make to correct such non-conformity and re-deliver the corrected Deliverables to Orderer at no cost to Orderer; or (ii) if Orderer determines that Supplier cannot correct such non-conformity through reasonable efforts, refund to Orderer the portion of the Fee associated with such Deliverables.
4. Orderer's inspection shall be deemed complete when Supplier passes the inspection specified in Paragraph 2 of this Article or the reinspection specified in the preceding Paragraph.
5. Upon completion of the Services, Supplier shall submit a notification of completion of the Services to Orderer without delay. If Orderer requests Supplier to submit a notification of partial completion of the Services, Supplier will submit the notification as requested by Orderer.

#### **Article 10 (Non-conformity of Deliverables)**

If Deliverables are found to not be in conformity with the requirements specified in the SOW after acceptance, Orderer will notify Supplier to that effect within one (1) year from the date of finding such non-conformity. Supplier shall correct the non-conformity free of charge, or reduce the Fee for such non-conformity, except in the event that the non-conformity is attributable to Orderer’s direction. Such correction of Deliverables or reduction of the Fee will not preclude claim for damages by Orderer.

#### **Article 11 (Ownership and Intellectual Property Rights of the Deliverables etc.)**

1. The intellectual property rights of Deliverables set out in “8. Deliverables and timelines” created by the Digital Partner for this PoC shall be assigned to JICA (or party designated by JICA) upon completion of the inspection. The consideration for the assignment of rights set forth in the preceding paragraph a. shall be included in the commission fee.
2. The intellectual property rights of the Digital Partner that existed before the start of this work under this agreement shall remain with the Digital Partner.

3. The handling of personal information and other data obtained with necessary consent and approval for use during the PoC shall be conducted in accordance with all applicable local and international laws, rules, and guidelines.
4. In case the Digital Partner's solution requires data provided by CWASA for implementation, CWASA will retain the ownership of data and grant the use of the data for pre-agreed purposes. The Digital Partner shall be responsible for obtaining the necessary permits or authorizations and they are strictly limited to using the data for the pre-agreed purpose. Details of the terms will be negotiated between CWASA and the Digital Partner after partner selection.
5. All source code developed as part of this PoC shall be the exclusive property of JICA. Upon completion of the PoC, the selected vendor is required to deliver all source code, documentation, and related intellectual property to JICA, ensuring full transfer of ownership. The vendor must also provide comprehensive documentation and any necessary training to JICA's staff to ensure they have the knowledge and ability to use, modify, and maintain the software. JICA reserves the right to use, modify, and distribute the source code without restriction or additional compensation to the vendor. This clause is intended to ensure that JICA maintains complete control and flexibility over the developed software, aligning with our strategic goals and operational needs.
6. Items 1) through 4) above shall survive the termination of this Agreement.

#### **Article 12 (Representations and Warranties)**

1. Supplier represents and warrants that the Deliverables do not infringe the IPR or any other rights or interests of any third party.
2. If any lawsuit, claim, legal proceeding, etc. is asserted by a third party in connection with the use of the Deliverables by Orderer, Client or any other related parties who have been authorized to use the Deliverables by Orderer or Client, Supplier shall settle such lawsuit, etc. at its own cost and responsibility.
3. The provisions of this Article shall survive even after the termination of this Agreement.

#### **Article 13 (Confidential Information)**

1. "Confidential Information" is the fact of existing of this engagement, any information, know-how, data, process, technique, program, design, drawing, formula, test, work in process, engineering, manufacturing, marketing, financial or personnel matter, or sales, supplier, customer, employee, investor, financial or business information, information relating to operations or security or the like, whether in oral, written, graphic, magnetic, electronic, or any other form, which is known or should reasonably be known to be confidential, which is disclosed by Orderer, its officers and employees or Client and/or other third parties as provided to Orderer or Supplier for purposes of performing the Services, or accessed, observed or otherwise obtained by Supplier in connection with this Agreement and which is required to be protected hereunder by Supplier. Any such information received by Supplier, through Orderer or with the endorsement of Orderer, from any third party, their respective officers, employees,

representatives, agents, and consultants, shall likewise be considered as Confidential Information and shall be governed by the provisions of this Agreement.

2. Supplier shall not disclose or divulge to any third party, copy, reproduce or use for any purposes other than providing the Services during the term of this Agreement and even after the termination thereof any Confidential Information acquired in the course of performing this Agreement regarding Orderer's business activities, technologies, clients (including Client) and other matters. Supplier shall protect the confidentiality of the Confidential Information by exercising at least the same degree of care as Supplier employs in maintaining the confidentiality of its own confidential, proprietary, or nonpublic business information and/or trade secrets, but in no event less than a reasonable degree of care.
3. Supplier agrees that: (1) any Confidential Information shall be used by Supplier solely for the performance of the Services (the "Purpose"); (2) any Confidential Information disclosed hereunder shall remain at all times the property of Orderer; and (3) Supplier will not distribute, disclose or disseminate such Confidential Information to anyone except an employee, a member of management, or a member of directors of Supplier (each with a need to know); provided that any such person has been advised, and agrees to abide by the terms of this Agreement, and Supplier agrees to be responsible for the disclosure, use, or other treatment of Confidential Information by any such person.
4. In the event of any disclosure required by applicable law or legal process, Supplier shall:
  - (1) If not prohibited by the request or order, to the extent practically possible, immediately inform Orderer in writing of the existence, terms and circumstances surrounding the request or order;
  - (2) Consult with Orderer on what steps should be taken to avoid or restrict the disclosure of Confidential Information;
  - (3) Give Orderer the chance to defend, limit or protect itself against disclosure; and
  - (4) If disclosure of Confidential Information is lawfully required, to supply only that portion of the Confidential Information which is legally necessary and try to obtain confidential treatment for any Confidential Information required to be disclosed.
5. Upon the completion of the Purpose, or sooner upon request of Orderer, all Confidential Information in the possession of Supplier shall be returned to Orderer or destroyed, at the option and instruction of Orderer and Supplier shall certify such destruction in writing upon the request of Orderer.
6. Unless otherwise expressly warranted in writing, Orderer does not make any warranty as to the value or accuracy or completeness of Confidential Information disclosed hereunder. Orderer shall not be liable to Supplier for any expenses for losses, or for any action whatsoever or howsoever incurred or undertaken by Supplier due to any reliance on the Confidential Information disclosed hereunder. Orderer does not guarantee the accuracy or completeness of the Confidential Information and cannot be held responsible for any errors or omissions it may contain.
7. The Parties agree and acknowledge that any breach of the confidentiality obligations contained in this Agreement will cause irreparable loss and would not be compensable by monetary

damages alone and, accordingly, Orderer shall, in addition to the Other remedies they may have at law or in equity, be entitled to obtain specific performance or injunctive relief against Supplier in respect of the threatened breach of this Agreement or the continuation of this Agreement or the continuation of any such breach.

8. Supplier's obligation of confidentiality under this Article shall survive the expiration or termination of this Agreement.

#### **Article 14 (Handling of Personal Information)**

1. Supplier shall not leak, steal, or falsify any personal information (regardless of whether it is publicly known or unknown; "Personal Information") provided by Orderer (including Client and the other party), shall not use such Personal Information for any purpose other than the purpose of this Agreement, and shall handle Personal Information appropriately in accordance with the laws and regulations concerning the protection of Personal Information (including guidelines, policies, notices, etc. established by various government agencies). In addition, Supplier shall handle Personal Information in the same manner as the Confidential Information and manage it with the care of a good manager.
2. Supplier shall not subcontract the handling of Personal Information to a third party without the prior written consent of Orderer. In addition, in the event of such subcontracting with the consent of Orderer, Supplier shall impose on the sub-consignee obligations equivalent to the confidentiality obligations assumed by Supplier under this Agreement, and shall appropriately supervise the management of Personal Information at the subcontracted party in accordance with laws and regulations.
3. Supplier shall, upon Orderer's request, report the status of control over the protection of the relevant Personal Information to Orderer. Orderer also shall be entitled to make an appropriate investigation into the status of control over the relevant Personal Information in accordance with the mutual agreement on the method of verification and other related matters by Orderer and Supplier.
4. In the event that Supplier learns that a violation of this Article has occurred or is likely to occur, Supplier shall promptly report it to Orderer and follow Orderer's instructions.
5. The provisions of this Article shall survive even after the termination of this Agreement.
6. If Supplier is required to process Personal Information as a Processor in connection with the performance of the Services, Controller as specified in the SOW and Supplier will enter into a data processing agreement incorporating the terms required under any applicable legislation or regulation that relate to data protection, privacy, the use of information relating to individuals to which Supplier and/or Orderer are subject, including, without limitation, the General Data Protection Regulation (EU) 2016/679 (the "GDPR"), and any relevant national laws implementing the same, all as amended, replaced or superseded from time to time (the "Applicable Data Protection Laws").

#### **Article 15 (Independent)**

It is understood and agreed that each party hereto is an independent contractor and that neither party is, nor shall be considered to be, the other's agent, distributor, partner, fiduciary, joint ventures, co-owner, or representative, employer or employee. Neither party shall act or



represent itself, directly or by implication, in any such capacity or in any manner assume or create any obligation on behalf of, or in the name of, the other.

#### **Article 16 (Prohibition of Assignment of Rights and Obligations)**

Supplier shall not, without the prior written consent of Orderer, allow a third party to succeed to any position under this Agreement, or assign, assume, or grant as security any right or obligation arising in whole or in part in connection with this Agreement.

#### **Article 17 (Indemnity)**

1. Supplier will defend, indemnify and hold Orderer harmless from and against all third party claims, losses, expenses, damages, and injuries to persons or property (including reasonable attorney's fees) (collectively, "Claims") resulting from: (i) the negligence of Supplier, its employees, or its subcontractors in performing Services under this Agreement; (ii) fraud or misrepresentation by Supplier; (iii) third party claims for intellectual property infringement based in whole or in part upon Deliverables provided, or tools used by Supplier in providing the Services; (iv) breach of Article 4 Paragraph 4, Article 13, or Article 14 of this Agreement by Supplier, its employees, or its subcontractors.
2. The provisions of this Article shall survive even after the termination of this Agreement.

#### **Article 18 (Limitation of Liability)**

Supplier shall be solely responsible for any liabilities, costs, expenses, losses and damages incurred by Orderer and/or third party (including, but not limited to, Client) in connection with this Agreement and the performance of the Services and/or Deliverables, except for those caused by reasons attributable to Orderer. The provisions of this Article shall survive even after the termination of this Agreement.

#### **Article 19 (Late Completion)**

Supplier will be subject to a late completion deduction applicable to any Services or Deliverables not completed by the specified expected completion date in the SOW. Orderer will assess the late completion deduction on or after the expected completion date. Any late completion deduction will be payable to Orderer within 30 days of assessment or set off any fees due to Supplier. Any late completion deduction reflects the reduction in value as a result of the late completion and is without prejudice to any other right or remedy of Orderer.

#### **Article 20 (Terms and Termination of the Agreement)**

1. The term of this Agreement shall be from May 01, 2024 to October 31, 2024 unless otherwise terminated pursuant to this Article.
2. Orderer may immediately terminate this Agreement by rescission or voidance without prior notice to Supplier, if one of the following events occurs, or there is a strong probability that such an event may occur, provided, however, that rescission or voidance hereof does not have any retroactive effect on the Agreement:
  - (1) In the event of gross negligence or breach of trust with respect to the Agreement.

- (2) In the event of cancellation or suspension of a business license by the competent authorities, etc.
  - (3) In the event of an auction, provisional seizure, provisional disposition, provisional attachment, or petition for compulsory execution.
  - (4) If Supplier comes insolvent or is subject to a suspension of transactions by a bill clearing house.
  - (5) If Supplier receives a disposition for delinquent payment of taxes and public dues.
  - (6) If Supplier commits fraud or acts in bad faith.
  - (7) If Client raises legitimate complaints against the performance of the Services by Supplier.
  - (8) If the event that there are reasonable grounds to suspect Supplier is in breach of Article 4 Paragraph 4.
  - (9) In the event of any other serious reason similar to the preceding items that makes it difficult to continue the Agreement.
3. Notwithstanding the preceding Paragraph, Orderer may terminate this Agreement, for any reason whatsoever, upon at least 30 days' prior written notice to Supplier.
  4. Upon receipt of notice of termination from Orderer, unless otherwise advised by Orderer, Supplier will cease work immediately but will, upon request, perform such Services as may be requested by Orderer to transfer Services in process to Orderer or to a party designated by Orderer.
  5. Supplier may terminate this Agreement if Orderer is in material breach of any Agreement provision and as a result Supplier cannot complete the Services.
  6. If Paragraph 2 of this Article applies, Supplier shall not be entitled to make any claims for damages whatsoever against Orderer and shall be liable for such damages that Orderer and/or Client incurs as a result of the termination.

**Article 21 (Rejection of Antisocial Forces)**

1. Each of the parties hereby represents to the other party that it is not, and agrees that it will not be at any time during the term of this Agreement, a crime syndicate, a person who is a member of a crime syndicate or for whom five (5) years have not yet passed since leaving a crime syndicate, a semi-regular member of a crime syndicate, a company associated with a crime syndicate, a racketeer group, a group engaging in criminal activities under the pretext of conducting social campaigns or similar activities, a crime group specialized in intellectual crimes or any person equivalent to any of the above (hereinafter respectively referred to as a "Crime Syndicate Member") and that:
  - (1) It does not or will not have a relationship in which a Crime Syndicate Member is deemed to control its management;
  - (2) It does not or will not have a relationship in which a Crime Syndicate Member is deemed to have substantial involvement in its management;
  - (3) It does not or will not have a relationship in which it is deemed to make use of a Crime Syndicate Member for the purpose of gaining unjustifiable profit for itself, its own company or a third party or causing damage to a third party or for other improper purposes;

- (4) It does not or will not have a relationship in which it is deemed to have an involvement with a Crime Syndicate Member through provisions of funds or other assistance or otherwise; or
  - (5) None of its directors and officers or any person having substantial involvement in its management has or will have a relationship with a Crime Syndicate Member in a socially reprehensible manner.
2. Each of the parties hereby agrees that it will not do any of the following acts by itself or through any third party:
    - (1) Making violent demands;
    - (2) Making unreasonable demands beyond legal responsibility;
    - (3) Using intimidation or violence in relation to transactions;
    - (4) Impairing the credibility of the other party or interfering with the business of the other party by spreading rumors or using fraudulent means or force; or
    - (5) Equivalent to any of those set forth in the above Items.
  3. Each party may terminate this Agreement immediately without any notification in the case of any breach by the other party of any of the representations and agreement set forth in the preceding two paragraphs, in which case the terminating party shall not be liable for any damages incurred by the other party as a result of such termination. If the terminating party incurs any damage as a result of the termination, however, the breaching party shall be liable for all such damages.
  4. When received unfair intervention from a Crime Syndicate Member in connection with any transaction subject to this Agreement, each of the parties shall report to the other party such fact immediately.

#### **Article 22 (Prevention of Corrupt Activities)**

Supplier represents, warrants, and agrees to the following.

- (1) Supplier has not previously violated any laws, standards, and regulations relating to anticorruption or anti-bribery that may be applicable to Supplier, including the US Foreign Corrupt Practices Act of 1977, the UK Bribery Act 2010, and the Japanese Penal Code and Unfair Competition Prevention Act, and the anti-corruption laws of any country or territory in which Supplier does business in whole or in part (below, collectively "Anti-Corruption Laws and Regulations").
- (2) Supplier and all natural and legal persons acting on behalf of Supplier (i) understand that Anti-Corruption Laws and Regulations generally prohibit the offering of cash, entertainment, premiums, or other monetary or non-monetary goods or services (including payments referred to as facilitation payments (namely, the provision of money or goods to public officials for the facilitation of administrative services, which are customary, and below, collectively "Bribes, etc.") for the purpose of improperly influencing domestic or foreign public officials (including those deemed to be public officials by law), political party officials, political candidates, or other persons prohibited by anti-corruption laws and regulations (below, collectively "Public Officials"); and (ii) will comply and remain in compliance with Anti-Corruption Laws and Regulations with respect to this Agreement.

- (3) Supplier, in performing its Services with respect to this Agreement, shall not provide, offer or promise to provide any entertainment, premiums, or other Bribes, etc., which are inappropriate under commercial practices, even to private persons other than Public Officials.
- (4) Supplier shall ensure that its related officers, employees, contractors and agents understand and comply with the obligations set forth in Items (2) and (3) of this Article.
- (5) Supplier shall not act on behalf of Orderer, nor shall it negotiate with any Public Officials in its capacity as agent, representative or otherwise.
- (6) Supplier shall promptly notify Orderer if it becomes aware that a violation of this Article has occurred or is likely to occur.
- (7) In the event that (a) Supplier violates any of the Items of this Article, or (b) any inquiry or investigation by any governmental agency or other entity arises concerning potential violations of Anti-Corruption Laws and Regulations by Supplier or its agents, (i) Orderer may immediately terminate this Agreement by written notice to Supplier without any notice in addition to any other rights or legal remedies, and (ii) Orderer may withhold payment to Supplier.
- (8) If there is a suspicion of a breach by Supplier of any of the items of this Article, Orderer shall have the right to confirm that Supplier is in compliance with all of the obligations set forth in this Article. In addition, Supplier shall cooperate in such verification (including, but not limited to, providing Orderer with all materials, accounting books and records, and any other information relating to such breach that Orderer may request).

### **Article 23 (Force Majeure)**

1. For the purposes of this Agreement, “Force Majeure” means an event which is beyond the reasonable control of a Party, is not foreseeable, is unavoidable, and makes a Party’s performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible under the circumstances, and subject to those requirements, includes, but is not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood or other adverse weather conditions, strikes, lockouts or other industrial action, confiscation or any other action by Government agencies.
2. The failure of a Party to fulfill any of its obligations hereunder shall not be considered to be a breach of, or default under, this Agreement insofar as such inability arises from an event of Force Majeure.
3. The Party affected by an event of Force Majeure shall continue to perform its obligations under the Agreement as far as is reasonably practical and shall take all reasonable measures to minimize the consequences of any event of Force Majeure.
4. The Party affected by an event of Force Majeure shall notify the other party in writing of the situation without delay after the occurrence of such a fact, and Orderer and Supplier shall promptly confirm the fact of the occurrence of a Force Majeure and discuss and determine the necessary measures thereafter.

#### **Article 24 (Insurance)**

1. Supplier shall, at its own expense, secure and keep in full force and effect throughout the term of the Agreement, appropriate types and limits of insurance based on the services being provided and as required by law. Such insurance shall cover Supplier and its employees and include the following:
  - (i) Commercial General Liability insurance written on an occurrence form with limits not less than One Million Dollars (\$1,000,000) per occurrence and Two Million Dollars (\$2,000,000) annual aggregate, including coverage for bodily injury or death, premises operations, products-completed operations, contractual liability, personal injury and advertising injury, and independent contractors;
  - (ii) Workers' Compensation insurance providing statutory benefits for Supplier's officers and employees and Employer's Liability coverage with limits not less than One Million Dollars (\$1,000,000) Bodily Injury by Accident – each accident, One Million Dollars (\$1,000,000) Bodily Injury by disease – policy limit, One Million Dollars (\$1,000,000) Bodily Injury by disease – each employee;
  - (iii) Business Automobile Liability including coverage for owned, non-owned, leased, or hired vehicles used in connection with this Agreement with limits not less than One Million Dollars (\$1,000,000) each accident combined single limit for bodily injury and property damage;
  - (iv) Umbrella/Excess Liability insurance written on an occurrence form with limits not less than Five Million Dollars (\$5,000,000) per occurrence and Five Million Dollars (\$5,000,000) annual aggregate;
  - (v) Supplier shall procure Professional Indemnity insurance that is mutually agreeable for Orderer and Supplier. If any policy is written on a claims-made basis, Supplier warrants that any retroactive date under the policy shall precede the Effective Date of this Agreement.
  - (vi) If Supplier travels in connection with this Agreement, Supplier shall procure comprehensive insurance covering Supplier and its employees for all medical expenses, hospitalization, evacuation, repatriation, medical emergency, and accidental death & dismemberment;
  - (vii) Privacy/Network Security (Cyber) insurance, in an amount not less than One Million Dollars (\$1,000,000) each claim. This insurance shall provide protection, at a minimum, for 1) privacy breaches (including liability arising from the loss or disclosure of non-public information whether personal or corporate non-public information whether such information is owned by Orderer or for which Orderer is legally liable), 2) system breaches (including liability arising from the loss or disclosure of non-public information whether personal or corporate non-public information whether such information is owned by Orderer or for which Orderer is legally liable), 3) denial or loss of service, 4) introduction, implantation, or spread of malicious software code, 5) cyber extortion loss, 6) unauthorized access to or use of computer systems covering the acts of Supplier and its subcontractors or sub-subcontractors. Such coverage shall

also include regulatory fines and penalties, costs of notifying individuals of a privacy or security breach, the costs of credit monitoring services and any other related crisis management expenses.

2. Supplier shall add “Orderer , its affiliates and subsidiaries, and its officers, partners, and employees” as additional insureds under the Commercial General Liability, Business Automobile Liability, and Umbrella/Excess Liability policies, and said policies will provide cross-liability coverage per a separation of insureds or severability of interests clause. The Commercial General Liability and Umbrella/Excess Liability insurance must be primary and non-contributory and the Commercial General Liability, Business Automobile Liability, Workers’ Compensation, Property and Umbrella/Excess Liability insurer(s) must include a waiver of subrogation in favor of Orderer, its affiliates and subsidiaries, and its officers, partners, and employees. Supplier shall waive their rights of recovery against Orderer, its affiliates and subsidiaries, and its officers, partners, and employees. Supplier shall not cancel any required coverage without giving Orderer thirty (30) days prior written notice. Coverage shall apply on a worldwide basis.
3. Supplier shall place all policies with an insurance company with an A.M. Best rating of A- VIII or better. Supplier shall provide Orderer a certificate of insurance that evidences the required coverage and discloses any applicable self-insured retentions subsequent to execution of the Agreement but prior to services being performed, and annually thereafter no more than three (3) days post expiration of any policies, or more frequently if reasonably requested by Orderer, until the Agreement terminates.
4. If any policy is written on a claims-made basis, Supplier warrants that any retroactive date under the policy shall precede the effective date of this Agreement and that either continuous coverage will be maintained or an extended reporting period will be exercised for a period of three (3) years beginning at the time work under this Agreement is completed.
5. If this Agreement permits the use of subcontractors, the subcontractors will be subject to all of the Agreement’s minimum insurance requirements and Supplier will be responsible for ensuring the subcontractors meet the minimum requirements. Supplier must furnish subcontractors’ certificates of insurance evidencing such coverage upon request.
6. Orderer’s failure to request, review, or object to the terms of Supplier’s insurance will not waive any of Supplier’s obligations under this Agreement, waive any of Orderer’s rights under this Agreement, or limit or diminish Supplier’s liability under this Agreement.
7. The required limits of liability are the minimum amounts that must be obtained by Supplier, and in the event Supplier has or obtains applicable policies with limits in excess of the required minimums, the full amount of the limits shall be available to Orderer in the event of a claim covered by the policy.

### **Article 25 (Governing Law and Agreed Jurisdiction)**

1. This Agreement shall be governed by and construed in accordance with the laws of Japan.
2. The parties hereto shall submit exclusively to the Tokyo District Court if any dispute arises between both parties under, in connection with or with respect to this Agreement, despite any cause of action including a negligent or tort.
3. The provisions of this Article shall survive even after the termination of this Agreement.

### **Article 26 (Consultation)**

If any matter is not stipulated in this Agreement or if any question arises, both parties shall consult with each other based on the principle of good faith and fair dealing, and attempt to reach an amicable settlement.

### **Article 27 (Other Provisions)**

1. Orderer may disclose to Client this Agreement and submit the Deliverables and the contents of the Services. If requested by Orderer, Supplier will cooperate with Orderer for Client's audit in connection with this Agreement and/or the Services. In addition to complying with the obligations of Supplier set forth in this Agreement, Supplier will cooperate with Orderer to allow Orderer to comply with the executed agreement with Client to the extent that it relates to the Services entrusted by Orderer, whether or not set forth in this Agreement. Supplier will comply with Client's "Guidelines on Ethical Conduct for JICA's Implementing Partners".
2. Notwithstanding any provision of this Agreement, Supplier consents to public disclosure by Client of the existence of this Agreement, the fees and Supplier's details, including name and address.

## Attachment 15 Pre-Bid Conference Query Format

Tender Title: Development, Implementation and Services of Meter Reading App, Management Dashboard & NRW Monitoring Tool at CWASA Chattogram

RFP Number: JICADXL-CWASA-20240410

### Name of the Bidder:

Sr.No.	RFP Document Reference (Section & Page Number & Clause)	Brief Details/Query in reference to the clause

[Note: The above excel sheet need to be sent through email also at the email address [JICADXLab@bcg.com](mailto:JICADXLab@bcg.com)]

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Signature and Stamp