

**Terms of Reference  
for  
Consultancy Service for Preparation of Digital Transformations Strategy for  
CWASA  
(Package-CWSIP/S3)**

**1. General Background and Assignment Scope:**

Chattogram WASA (CWASA) serves roughly 2.3 million consumers, with 93,000+ connections. The total length of the pipe network is 962 kilometres. Daily water production is approximately 500 million Liters per day (MLD). Most of the water is sourced from the two rivers adjacent to Chattogram City – Halda and Karnaphuli. Water Treatment Plants are located along these two rivers that intake, treat and pump water to Chattogram City for distribution. A small portion is also sourced from deep tube wells (DTWs) located across the city.

CWASA is also in the process of establishing a sewerage treatment infrastructure to address the critical need for sustainable waste management. The sewerage treatment facilities are a testament to CWASA's commitment to environmental stewardship and public health, reflecting its forward-thinking approach to urban utility management. Through these facilities, CWASA enhances the quality of life for its residents and contributes to conserving the region's water bodies, paving the way for a cleaner and greener Chattogram.

There are five major water production sources – 4 Water Treatment Plants and Deep Tube Wells (DTWs).

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

As we move further into the 21st century, the water sector's reliance on data & digital technologies is becoming more pronounced. This is fuelled by the need for sustainable management of water resources amid growing populations and the heightened complexities of climate change. Digital technologies such as smart metering, remote sensing, and geographic information systems (GIS) provide real-time data that enable precise monitoring and management of water distribution systems. Integrated data management systems and data warehouses / data lakes are critical in managing the information collected and advanced data analytics are pivotal in predictive maintenance, detecting leaks, and optimizing water usage. Furthermore, digital platforms facilitate better customer interaction and engagement, allowing for more responsive service delivery.

In essence, integrating these technologies is transforming the water sector into a more efficient, transparent, and resilient system capable of meeting current and future demands. Recognizing the pivotal role of data in modernizing water resource management, optimizing operations and improving financial health, CWASA is formulating a comprehensive Digital Transformation Strategy to fortify its mission of delivering top-tier water and sewerage services in Chattogram. This strategy directly responds to the pressing demands of an expanding population and the challenges posed by climate change, which necessitate sustainable and efficient resource management.

CWASA currently utilizes some individual IT systems to manage its operations. These systems encompass a wide range of functionalities, from billing and customer service management to real-time data monitoring and infrastructure management. The diversity of these systems reflects CWASA's

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commitment to leveraging technology to enhance service delivery and operational efficiency. The current systems in use by CWASA are:

1. Water Billing System: Manages the billing process for water services, calculating charges based on water usage. It ensures accuracy in billing, reflecting actual consumption and any applicable rates or tariffs.
2. Online Water Billing System: Enables customers and users to access and review their water bills online for added convenience. This system also provides historical billing data and consumption patterns to help customers manage their water usage more effectively.
3. Online Payment Posting System: The ICT team can post consumer bills online and update customer account balances. It also maintains the ledger for all customers since their connection start date.
4. Water Works System: Tracks and manages the operations related to water bowser distribution to consumers.
5. Deep Tube Well Management System: Oversees the operation and maintenance of deep tube wells that supply water. It monitors water production from DTW daily.
6. Meter Replacement System: Manages the process of replacing old or faulty water meters to ensure accurate billing. This system also tracks the inventory and deployment of new meters, streamlining the replacement process.
7. New Connection Management System: It allows users to request a new connection through an online application. This system helps the user from the initial request to the final connection, ensuring a smooth customer experience.
8. Name Change Automation System: Automates updating customer names in the billing system for transferred accounts. This reduces administrative burdens and enhances data accuracy in customer records.
9. Production Posting System: Records and manages data related to water production volumes for operational reporting. This system aids in the daily monitoring of water production and resource planning.
10. Payroll: Manages employee salaries, wages, and other compensations through an automated system. It ensures timely and accurate payroll processing, including deductions, benefits, and tax computations.
11. Computerized Maintenance Management: Recording the scheduling, tracking, and documentation of maintenance activities. It maximizes equipment uptime and operational efficiency by ensuring that maintenance tasks are performed promptly and recorded accurately.
12. Customer Complaints Tracking: Keeps track of customer complaints from receipt through resolution, ensuring customer satisfaction. This system also analyses complaint data to identify and address recurring issues, improving overall service quality.
13. E GP (Government): A government platform for electronic procurement that CWASA uses to manage tenders and contracts. This system streamlines the procurement process, enhancing transparency and compliance with governmental regulations.
14. D Nothi (Government): A government document management and workflow system CWASA uses to process official documents. It ensures efficient handling of documents and supports accountability and traceability in administrative processes.
15. Tally: The Accounting software used by CWASA for financial management and reporting. Tally facilitates accurate financial reporting and analysis, supporting strategic financial decisions and compliance with accounting standards.
16. SCADA (Supervisory Control and Data Acquisition): Monitors and controls water distribution and plant operations through real-time data acquisition and automated controls. SCADA systems are crucial for maintaining the reliability and safety of water supply systems, providing operators with the tools needed to manage complex infrastructure effectively.

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

There exists a significant opportunity for CWASA to adopt more advanced data and digital solutions, which could further optimize operations, enhance data analytics capabilities, and improve customer interactions, propelling CWASA into higher levels of digital maturity and operational excellence.

## 2. OBJECTIVES & EXPECTED RESULTS

The objectives of the consulting services include:

1. Develop a comprehensive digital transformation strategy, and roadmap that contain a list of proposed digital solutions that CWASA can implement over the coming years. The document should also serve the following strategic purpose:
  - a) Foundation for Digital Transformation: The document acts as the official blueprint of CWASA to transition into a digitally advanced organization. This means using data analytics to optimize water distribution, anticipate maintenance needs, improve customer service, and ensure sustainable water management practices.
  - b) Strategic Alignment: The strategy ensures digital initiatives align with CWASA's budget, available resources, and strategic goals. This alignment is crucial to prioritizing initiatives that deliver the most value and are feasible within the utility's operational constraints.
  - c) Blueprint for Technology Adoption: The document provides a technical roadmap for future IT changes or additions, acting as a guiding framework for evolving CWASA's technology architecture. This encompasses immediate IT improvements and longer-term digital innovation, such as smart metering systems, advanced water quality monitoring, and automated billing and customer service platforms.
  - d) Blueprint for Advanced IT Organization: Forming a capable IT organization within CWASA is pivotal for driving technological advancements and supporting the utility's data-driven transformation. This document proposes the capabilities required to drive the change.
2. Assess feasibility of proposed solutions, along with necessary hardware requirement as well as data storage requirements, data digitization needs, assess the costs (CAPEX and OPEX) & system requirements of various solutions, implementation & operations models.
3. Design an integrated digital & data management system/ERP for CWASA (including module specific requirements and key business process maps for key functions) and GIS based Asset Management System for CWASA.
4. Develop an implementation plan for the systems mentioned above.

This exercise will help guide CWASA with a clear vision and roadmap for incorporating data / digital technologies into its operations, ensuring that investments in data, digital, and IT align with long-term objectives. This catalyzes CWASA's evolution into a modern, responsive, and efficient water utility that leverages digital and data to meet water management challenges in a growing and dynamic Bangladesh.

## 3. DETAILED TASKS

### 3.1. Task Description

The scope of work shall include but not be restricted to the tasks listed below:

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The scope of work shall comprise of detailed system diagnostics, solutions options, costing, phasing and implementation roadmap as part of an overall digital transformation strategy for CWASA. In detail, the activities will include

1. **The consultant shall review the current processes; systems and IT landscape and gather the necessary information and knowledge of CWASA's key objectives. The activities to be performed by the consultant will be as follows:**
  - a) Undertake a knowledge gathering exercise to comprehend all existing functions, departmental/zonal roles & responsibilities,
  - b) Review all the systems (Manual/MIS modules/IT), understand challenges in current system,
  - c) Assess how CWASA's personnel get access to information, and understand inter-linkages of data/function modules through series of consultations with the various departmental heads and CWASA management.
  - d) Undertake a comprehensive study of functions and work flow analysis, review current databases, data requirements, access rights to officials, list of reports & pre-defined queries, linkages with GIS Data, the need for software application based solutions for specific functions/activities.
  - e) Review the status of the existing IT infrastructure (software and hardware) and need for any procurements for upgrading IT infrastructure to support the effective implementation of proposed system. This includes a stocktaking of Hardware – Desktops, Laptops, Servers, Tablets, Printers and Plotters.
  - f) Assess the interoperability of existing software versions including, existing databases, ESRI ARC GIS and any other software packages and assess the viability of leveraging on the existing IT infrastructure for planning an integrated digital system for CWASA.
  - g) Conduct a comprehensive need assessment and present the findings to the CWASA management and WB team for feedback.
  - h) Benchmark at least two best-in-class utilities globally and at least two utilities (Preferably from South Asia) that are similar in scale and context to CWASA. From this benchmarking, the Consultant should distill the key best practices from an IT / digital systems architecture standpoint. The best practices should cover typical IT / digital systems deployed at such utilities (front-end / back-end), data management and analytics best practices, integration architecture and cloud enablement related practices
2. **Target State and Roadmap:** Based on the findings from the current state assessment, the consultant shall define target state to resolve the key functional and technical pain points and achieve the strategic business objectives for CWASA. The consultant shall perform the following activities:
  - a) Define the target architecture for CWASA highlighting the new solutions to be implemented to meet the gaps identified in the current state.
  - b) Identify the initiatives across applications, data, infrastructure and security architecture for achieving the target state
  - c) Identify the business and IT capabilities, skills and manpower needed to implement the IT initiatives
  - d) Identify the changes needed in the organization structure for driving the implementation of program of this scale
  - e) Consolidate all the initiatives and define a digital transformation roadmap for implementing the Integrated data management / ERP solution at CWASA with estimated budget. Develop a time-based roadmap with respective initiative timelines.

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f) CWASA's leadership and departments should be engaged through workshops and review meetings at each stage of the target state development. Consultant should also present the final findings to the CWASA management and WB team for feedback. Update the target state and roadmap based on the feedback.

3. **Feasibility assessment and functional and technical requirements for Integrated data Management / ERP solution and GIS based Asset Management Solution for CWASA:**  
Consultant shall carry out the following activities:

- a) Identify the required technical modules to meet business objectives and define module-wise functional requirements for each the CWASA's functions for which focused modules needs to be developed as part of the integrated data management system.
- b) Project the estimated number of users based on the growth projections of CWASA.
- c) Conduct a market analysis of potential solutions (software and hardware), including exploring the potential of customized solutions, proprietary off-the-shelf solutions and subscription based SaaS (software as a solution).
- d) Review the cloud service providers and SaaS / PaaS solutions that can meet CWASA's requirements and help in taking public cloud / hybrid-cloud / private-cloud decision.
- e) Conduct a feasibility assessment of implementing new solutions, along with necessary hardware requirement as well as data storage requirements, data digitization needs, assess the costs (capex and opex) & system requirements of various solutions, implementation & operations models and provide recommendations for the proposed solution for establishing an integrated digital system/ERP for CWASA.
- f) In addition to detailed technical specifications for the proposed system, the consultant shall provide the module specific requirements for key functions (to be agreed with CWASA and in particular for Financial Management function, MIS function, Enterprise asset management functions, CRM functions, Procurement, Material Management & Vendor Management, HR function, Water Utility & Billing function, GIS function, Complaint Management / Grievance redressal mechanism, Integrated Audit Management, legal cases management etc.
- g) The consultant shall also work with relevant CWASA staff to map 4-5 key processes related to the proposed systems and design improved ones.

4. **Implementation approach and scope of work:**

The consultant shall define the implementation approach and scope of work for implementation of the integrated data management platform / ERP solution for CWASA which should be aligned with the overall strategic roadmap for digital transformation at CWASA:

- a) Assess the institutional requirements, in terms of business process re-engineering required for efficiency and effectiveness of the recommended solution for integrated digital system for CWASA. These needs to be discussed and agreed with CWASA for buy-in on the implementation of the proposed solution.
- b) Conduct Requirement workshops and focused interviews of user groups through structured questionnaire, develop business processes flow diagrams and come up with high level design mapping the solution modules to various business processes.
- c) Detailed study of business processes for priority functions and Business process redesign for current processes to fit to selected best practices of proposed solution needs to be conducted by the consultant.

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- d) Develop the methodology for digital system implementation, the sequencing of phased implementation and identify sources of information to be used, institutional capacity building, business processes realignment etc.
- e) Define the migration and cut-over strategy including data migration, pilot run, parallel run, and approach for transition to new platform.
- f) Define the approach for testing and quality assurance for the new platform including UAT strategy and approach for the new system.
- g) Detail out the operational model for such model, procurement models, technical inputs (such as data inputs requirements) and outcomes for every activity of the project.
- h) Outline a capacity building program for CWASA's IT team and end-users to enable them to implement the roadmap and defined systems, including certifications for key CWASA staff.
- i) Design an internal project management unit at CWASA to drive implementation of the strategy. The roadmap should recommend the composition and skills of such a unit.
- j) Identify key performance indicators (KPIs) to track the impact of digital transformation. The implementation plans should list specific targets, such as reduction in customer billing complaints, improvement in revenue collection, % of assets logged in GIS with up-to-date condition data etc.
- k) Consolidate each of the above aspects to develop a digital transformation scope of work for CWASA, with specific details on each of the above.

## B. Deliverables

1. D1 - Inception report: Laying out the methodology and work plan for the project
2. D2 - Current state assessment report: Outlining the current business processes, IT landscape, current architecture, business and technology imperatives and challenges to be addressed.
3. D3 - Target state and digital transformation roadmap: Highlighting the business-related technology initiatives, Target enterprise architecture including business, application, data and technology architecture for CWASA along with a implementation roadmap of initiatives with estimated budget
4. D4 – Feasibility assessment and functional / technical requirements for the modules required to implement integrated data management system / ERP system to meet the target state for CWASA. Including feasibility assessment report for ERP/Integrated data management system, potential solutions and implementation partners.
5. D5 - Implementation approach, key target KPIs and scope of work including Bid documents for implementation of digital transformation initiative and GIS Based Asset Management System. Define the composition and skills of an internal project management unit to deliver the roadmap.

## 4. OFFICE LOCATION AND TIMING

### 4.1. Location

The Consultant shall set up a central office on a first priority basis at a suitable location in Chattogram City (must be approved/agreed by CWASA) in order to consult and coordinate with personnel of the Client as much as possible into the day-to-day work and to facilitate a maximum transfer of knowledge and experience, as well as with other Government agencies and organizations and Consultants involved in related projects.

### 4.2 Duration

The Contract period of this assignment is scheduled for 12 (Twelve) months approximately.

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## 5. PERSONNEL REQUIREMENTS

### 5.1. General

The Consultant is strongly encouraged to make appropriate use of available local expertise to ensure the local conditions and capacities are best considered. In selection of local individuals, if any, conflicts of interest shall be avoided.

### 5.2. Key Experts – Assigned duties and minimum required time input

The following table presents a complete list of Key Experts, both internationally and nationally experienced for the execution of the assignment.

Additionally, the expected time input by those key experts has been estimated, and a minimum total, separate for internationally and nationally experienced key experts, is defined in the table below-

Sl. No.	Position	Months
<b>International Key Staff / International Expert (IE)</b>		
1.	Team Leader /ERP Specialist	12
2.	System Integration and Data Storage Expert	6
3.	GIS Expert	3
4.	Finance Expert	3
5.	Institutional/Water-utility expert	2
<b>National Key Staff</b>		
6.	ERP Specialist	6
	<b>Total</b>	<b>32</b>

### 5.3 Key Experts- Minimum required qualifications

Required Qualification of the Key Staff for the implementation of this consultancy are given below-

#### A. Key Expert (International):

##### Key Expert 1: Team Leader /ERP Specialist

##### **Qualifications and skills:**

The Team Leader should have minimum Master's degree in Engineering or related field; S/he must be fluent in English and must have proven team management skills.

##### **General professional experience:**

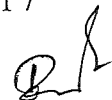
Minimum 20 (twenty) years of professional experience with a focus on IT / digital transformation projects.

##### **Specific professional experience:**

- Completed Minimum 02 (two) project for IT / digital transformation projects (i.e. Establishing Enterprise Resource Planning System) as Team Leader /ERP Specialist
- Experience of working with government utilities (preferably water utilities).

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## **Key Expert 2: System Integration and Data Storage Expert**

### **Qualifications and skills:**

The System Integration and Data Storage Expert Should have minimum Bachelor's degree in computer science and Engineering/Computer Engineering/Engineering, or related field.

### **General professional experience:**

15 (Fifteen) years of experience with a focus on IT / data architecture development.

### **Specific professional experience:**

- Completed Minimum 02 (two) project for IT / Data Architecture development (i.e. Establishing Enterprise Resource Planning System) as System Integration and Data Storage Expert.
- Experience of working with government utilities (including water utilities) will be an added advantage.

## **Key Expert 3 : GIS Expert**

### **Qualifications and skills:**

Bachelor's degree in Computer Science and Engineering/Computer Engineering/Urban and Regional Planning/Geography or related field.

### **General professional experience:**

Minimum 12 (Twelve) Years' experience in GIS Development and Implementation of GIS system.

### **Specific professional experience:**

- Completed 02 (Two) project for GIS Development and implementation of Water Utility as GIS Expert/Specialist

## **Key Expert 4 : Finance Expert**

### **Qualifications and skills:**

Master's degree in Finance/Accounting or related field. Advanced degree in Finance/CA/CFA will be an added advantage.

### **General professional experience:**

15 (Fifteen) years of experience in public financial management systems.

### **Specific professional experience:**

- Completed Minimum 02 (Two) project for establishment/improvement of Financial management systems of any water utility as Finance Expert.

## **Key Expert 5 : Institutional/Water-utility Expert**

### **Qualifications and skills:**

- Master's degree in Engineering/ Business administration or related field

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**General professional experience:**

- Minimum 15 (Fifteen) years of overall experience with increasing levels of responsibility and with a focus on business / public sector consulting.

**Specific professional experience:**

- Minimum 02 (Two) project of water utility development/ Public sector development completed as Institutional/Water-utility Expert

**B. Key Expert (National):**

1) **ERP Specialist**

**Qualifications and skills:**

- Bachelor's degree in Computer Science and Engineering/Computer Engineering or related field

**General professional experience:**

- Minimum 15 (Fifteen) years of experience in Enterprise Resource Planning software (i.e. SAP, JD Edwards, PeopleSoft, Oracle) with strong SAP and Microsoft knowledge

**Specific professional experience:**

- Minimum 02 (Two) project of development of ERP system (i.e. SAP, JD Edwards, PeopleSoft, Oracle etc.) completed as ERP Specialist.
- Experience of working in ERP projects with any public utility (preferably public water utility) will be an added advantage.

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